

## **APPENDIX 16**

### Aboriginal Cultural Values Assessment Report





**ACHM**

AUSTRALIAN CULTURAL  
HERITAGE MANAGEMENT

ACHAR

# Mangoola Coal Continued Operations Project

## Aboriginal Cultural Values Assessment Report

**By:** Dr Shaun Canning

**Date:** 10 April 2019

**Client Name:** Umwelt Australia Pty Ltd

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## Document Control Information

Document information
Client: Umwelt Australia Pty Ltd Client Contact: Daniel Sullivan Title: Mangoola Coal Continued Operations Project Subtitle: Aboriginal Cultural Values Assessment Report Our Ref: UW01 Date: 10 April 2019

Version	Date	Details

Recipient Name	Organisation	Hardcopy	Electronic	Transmission Method	Purpose	Date

Author, Reviewer and Approver details				
Prepared by:		Date:	Signature:	
Reviewed by:		Date:	Signature:	
Approved by:		Date:	Signature:	

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## Spatial Data

*Spatial data captured by Australian Cultural Heritage Management (Victoria) Pty Ltd in this document for any newly recorded sites has been obtained by using hand held or differential GPS units using the GDA94 co-ordinate system.*

# Executive Summary

Mangoola Coal Mine is an open cut coal mine located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman in the Upper Hunter Valley of NSW. Mangoola has operated the Mangoola Coal Mine in accordance with Project Approval (PA) 06\_0014 since mining commenced at the site in September 2010. The Mangoola Coal Continued Operations Project (MCCO Project) will allow for the continuation of mining at Mangoola into a new mining area to the immediate north of the existing operations. The MCCO Project will extend the life of the existing operation providing for ongoing employment opportunities for the Mangoola workforce. The MCCO Project Area includes the existing approved Project Area for Mangoola Coal Mine and the MCCO Additional Project Area

The MCCO Project Area includes the existing approved Project Area for Mangoola Coal Mine and the MCCO Additional Project Area as shown on Map 1-2. The Approved Disturbance Area for the current operations is not part of this assessment and this area, as shown on Map1-2, has been previously assessed.

Australian Cultural Heritage Management (ACHM) has been engaged by Umwelt (Australia) Pty Limited (Umwelt) on behalf of Mangoola Coal Operations Pty Limited (Mangoola) to complete an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Mangoola Coal Continued Operations Project (MCCO Project). The purpose of this assessment is to form part of an Environmental Impact Statement (EIS) being prepared by Umwelt to accompany an application for development consent under Divisions 4.1 and 4.7 of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) for the MCCO Project.

## Aboriginal Cultural Heritage Assessment Report

The process followed by Mangoola Project team to consult with the Registered Aboriginal Parties (RAPs) has been a continuation of Glencore's overall approach to cultural heritage assessment as previously utilised for the Bulga, Mount Owen and United Wambo JV EIS processes. When engaging in Aboriginal cultural heritage assessments within the Hunter Valley, members of the Aboriginal community(s) have self-nominated to be part of either (a) representative bodies or (b) to participate in cultural heritage assessment processes as individuals.

The representative bodies for this project are known as 'Knowledge Holder groups' in this ACHAR, and they are:

- Wonnarua Nation Aboriginal Corporation (WNAC)
- Plains Clan of the Wonnarua People, and the
- Gomeroi People
- Individuals not involved in the consultation and reporting processes of the 3 Knowledge Holder groups but who registered as RAPs were consulted separately, and their values are reported on by ACHM in this report.
- These individuals are referred to throughout this report as the 'Community RAPs'.
- The process provided consultation and engagement for all the RAPs and allowed opportunities for additional information, stories and knowledge from Wonnarua and Gomeroi people to be made known.

The Plains Clan of the Wonnarua People (PCWP) elected to write their own cultural values report for the MCCO Project. The disclosed text of that report is included in **Appendix 11.6**.

Cultural values assessment for the Community RAPs was undertaken by ACHM. The understanding of significance and the RAPs recommendations has also informed the MCCO Project on the development of a range of cultural heritage management recommendations. The publicly disclosed documents from the Knowledge Holder groups are included in this report.

Through the involvement of RAPs who identify a range of connections to both country and community, and through several past cultural heritage investigations, the region surrounding the MCCO Additional Project Area is known to contain a number of archaeological sites and to also hold certain cultural, historic and aesthetic values. The wider region has been identified as being of high cultural significance to many Wonnarua people, however the MCCO Additional Project Area has been assessed during this ACHAR process as holding lower cultural significance than much of the surrounding region.

This ACHAR also presents a summary of the archaeological values assessment of the MCCO Additional Project Area as well as a synthesis of the values and recommendations of all RAPs who participated in the cultural heritage assessment process.

## Assessment Approach

This ACHAR has been prepared in accordance with the SEAR requirements, the requirements of the 2005 DEC Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment, the Community Consultation guidelines of

the current Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010a), and the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011). It also been prepared in accordance with, and it also complies with the intent, requirements and assessment methodologies outlined in the Burra Charter (1999).

### Consultation Process

The MCCO Project has undertaken consultation consistent with the DEC (2005) and DECCW (2010a) guidelines and in accordance with the principles of The Burra Charter (Australia ICOMOS 1999). This has involved four consultation stages as detailed below.

**Stage 1:** MCCO conducted formal notification of the proposed MCCO Project and the ACHAR process and provided the opportunity for local Aboriginal people to formally register their interest in the MCCO Project.

**Stage 2:** MCCO conducted initial Project description consultation, which included presenting information on the proposed MCCO Project to all Aboriginal parties who registered an interest in **Stage 1**. This consultation included details of the MCCO Additional Project Area and proposed impacts, and a description of works proposed. Initial consultation also presented the draft Aboriginal Cultural Heritage Assessment Methodology for review by the RAPs, as well as an overview of the Draft Aboriginal Heritage Survey Methodology. Copies of this information were shared with all RAPs. Consultation with the RAPs involved a combination of consultation forums, including one on one meetings, small and large group briefing sessions, including onsite inspections. **Stage 2** also included correspondence with PCWP around a brief for them to produce their own cultural values report for this ACHAR.

**Stage 3:** Mangoola, OzArk and ACHM conducted further consultation which refined the cultural heritage assessment approach with the Community RAPs. The approach actively involved the Community RAPs in the assessment of their cultural heritage values, the likely MCCO Project impacts, if approved, and the development of management measures. The MCCO Project also engaged with the Knowledge Holder groups via a series of cultural values workshops, while PCWP were engaged to produce their own cultural values report to include in this ACHAR.

**Stage 4:** Mangoola conducted further consultation in relation to the RAPs review of the MCCO Projects draft cultural heritage assessment report, to seek feedback, modify reports as appropriate, receive and review submissions and to incorporate any additional input into the finalised ACHAR.

### Registered Aboriginal Parties

Throughout the course of the MCCO Project's consultation program, 37 parties registered an interest in the MCCO Project.

The RAPs included individuals from:

- Three Knowledge Holder groups (PCWP, Gomeroi and WNAC);
- The Wanaruah Local Aboriginal Land Council;
- The Hickey Family; and
- Individual RAPs.

A full list of all RAPs is contained in **Appendix 11.2**.

All RAPs were invited to participate in the assessment process from the time of their registration, with extensive consultation undertaken to inform the MCCO Project, the ACHAR, the AAIA undertaken by OzArk and the broader environmental assessment of the MCCO Project.

Participation opportunities have been provided to the RAPs through:

- Two series of workshops;
- Discussions and/or meetings with individuals;
- Development of an independent cultural heritage values assessment by PCWP;
- Archaeological investigations including survey and test excavation fieldwork onsite;
- Extensive correspondence between RAPs and the MCCO Project via phone and email.

Full records of all consultation are included in **Appendix 11.3**.

Throughout the MCCO Project, information was provided to RAPs in formal meetings or presentations and via mail, email or phone contact. Full details of the consultation process undertaken in relation to the ACHAR are contained in **Section 3** and copies of correspondence are contained in **Appendix 11.3** (Consultation Records).



The consultation approach also provided the RAPs with opportunities to decide in what manner they wanted their information shared and to identify any restricted access provisions. It allowed the RAPs to contribute their cultural knowledge through Mangoola and/or ACHM, or through the preparation of an independent report (PCWP). The process provided opportunities to identify a range of Aboriginal cultural values within the MCCO Additional Project Area. This included social, historic, scientific, aesthetic and spiritual values.

Where values have been provided by the RAPs as an outcome of the consultation process, they have been recorded and presented in this ACHAR. These values are discussed further in **Section 6**.

### **Aboriginal Archaeological Impact Assessment Results**

An AAIA was undertaken by OzArk alongside this ACHAR. The full AAIA report is included as Appendix 11.5.

The majority of Aboriginal sites identified have been assessed as having low scientific significance. The overall low scientific significance of the new sites is directly related to the extensive and long-running previous disturbances within the Proposed Disturbance Footprint.

### **Aboriginal Cultural Heritage Assessment Report**

RAPs consulted for the ACHAR identified concerns with current and future mining within the MCCO Project Area and the broader region, and that this mining poses a significant threat to Aboriginal cultural heritage values. Many RAPs expressed the view that mining continues to cause fragmentation to the cultural, spiritual and historic values of the cultural landscape including degradation to important waterways.

### **Direct Impacts**

The MCCO Project will directly impact a number of archaeological sites if approved, as discussed in the AAIA.

### **Indirect Impacts**

The MCCO Project may also result in indirect impacts on Aboriginal cultural heritage values. The indirect impacts often identified by RAPs include:

- Difficulty in remembering the landscape as it was prior to mining;
- Difficulty for Wonnarua people in accessing much of the land in the Hunter Valley due to private ownership and/or mining;
- Regardless of the current condition and/or status of the land in question, Wonnarua and Gomeroi people still feel a direct connection to the country of their ancestors, which would be further disrupted by more mining; and
- The predicted direct and indirect impact on the Aboriginal cultural heritage values of the Proposed Disturbance Footprint add to the cumulative impact of mining development on the cultural heritage resource of the upper Hunter Valley.

Mangoola and ACHM received positive feedback regarding the indirect intergenerational impacts of this ACHAR process. The process has allowed stakeholders to (a) involve themselves in detailed archaeological and cultural values consultations and (b) to have discussions with family members and particularly Elders who may not otherwise have been involved in the assessment processes. This has allowed the RAPs the opportunity to engage with these Elders to ensure thorough consultation providing positive intergenerational outcomes.

### **Cumulative Impacts**

Though the MCCO Project has been designed to avoid harm wherever practicable and the archaeological significance of the majority of sites within the Proposed Disturbance Footprint is low, the MCCO Project's impacts will further contribute to the cumulative loss of Aboriginal cultural values and archaeological sites within the local area, and the region more generally.

### **Avoidance of Harm**

In developing the footprint and the disturbance zone of the proposed MCCO Project, the MCCO Project team has considered numerous mining options, layouts, overburden emplacements and infrastructure arrangements to optimise the MCCO Project's final design to avoid harm to as many Aboriginal sites as possible

### **Aboriginal Cultural Heritage Management Measures**

The management measures proposed for the MCCO Project align to the Principles of the Burra Charter (ICOMOS, 1999) and to the Aboriginal Community Wellbeing toolkit and criterion from OEH (OEH 2012).

As a result of this assessment process, three of the eight wellbeing principles have been identified as priority areas most aligned to the context of the MCCO Project. The three principles most aligned are the following:

- Caring for Land and/or Cultural Awareness;
- Bringing People Together; and
- Education and learning.

These principles, in conjunction with the consultation outcomes with the RAPs, have informed the development and evaluation of management measures proposed for the MCCO Project.

Further, the following key considerations also guide the MCCO Project's recommendations and management outcomes:

- Alignment of the outcomes with the principles of the Strengthening Aboriginal Community Wellbeing Toolkit (OEH 2012) and the Burra Charter (2013);
- Aligning the recommendations with the findings of this ACHAR;
- Delivery of proposed management measures which are achievable;
- Includes a mix of short term and long-term management measures and implementation periods; and
- Foster and promote intergenerational equity through caring for country, education and research initiatives.

### Management Recommendations

A range of management recommendations are presented in **Section 8**. These recommendations have been developed in conjunction with the RAPs for the MCCO Project.

The management measures are based on the key themes and values of the RAPs which have been identified through the ACHAR process.

The proposed management and mitigation measures have also been separated into those located onsite (within the MCCO Additional Project Area) and those which are offsite (outside the MCCO Additional Project area or not requiring physical works within the MCCO Additional Project Area). The management and mitigation measures have also been developed to address intergenerational equity aspects and to respect the regional significance of culturally significant features which surround the MCCO Additional Project Area. These management measures have been developed in order to be consistent with the management measures recommended by the RAPs during this ACHAR process.

### Conclusions

This ACHAR has ascertained that there are no traditional *cultural values* associated with the MCCO Additional Project Area (directly and specifically) held by the participants in this ACHAR process. By '*traditional*' cultural values, we interpret this to mean an inherited and cohesive body of '*traditional*' knowledge, laws and customs that are still observed and maintained by a particular Indigenous group.

However, in common with many urbanised communities, strong contemporary cultural values exist in almost universal claims of 'connection' to the land in question, and a sense of anguish and/or anger at having been 'disconnected' from the land in question by historical circumstances.

It is the opinion of the author that the MCCO Additional Project Area has undergone considerable modification since European settlement. Traditional Aboriginal lifeways and customs began to disappear in the early days of contact with Europeans and had largely disappeared before the turn of the 19th Century. Much of the natural landscape no longer exists in any cohesive manner, as the long history of agriculture in the area has irreversibly altered the landscape. Combining the historical disconnection of people from place with the extensive landscape modification since settlement means that the MCCO Additional Project Area has a relatively low cultural significance when compared to other places within the wider region. This is also consistent with the archaeological assessment, which has determined that most of the archaeological sites are of low to moderate scientific significance.

# Table of Contents

Ownership and Disclaimer.....	iii
Spatial Data .....	iii
Executive Summary .....	iv
<b>1 Introduction .....</b>	<b>1</b>
1.1 Project Overview.....	1
1.2 Structure of the Report .....	5
1.3 Key Issues .....	5
13.1 Roadmap of the Report .....	6
13.2 Aboriginal Cultural Heritage Assessment Approach and Objectives.....	6
1.4 ACHAR Registered Aboriginal Parties.....	7
14.1 Other Consultant Input .....	7
14.2 About Dr Shaun Canning .....	7
1.5 Legislative Environment .....	8
15.1 Commonwealth Legislation .....	8
15.2 State Legislation .....	8
<b>2 Description of the Site .....</b>	<b>10</b>
2.1 Land Ownership .....	10
2.2 Environmental Overview.....	10
22.1 Topography / Landforms and Drainage.....	10
22.2 Geological Features and Resource Description .....	10
22.3 Vegetation .....	12
22.4 Climate.....	12
<b>3 Historical Background .....</b>	<b>13</b>
3.1 Historical Narrative of the Region.....	13
3.1.1 Prior to White Settlement .....	13
3.1.2 Post European Settlement .....	16
3.2 Post-Contact Land Use within the MCCO Additional Project Area .....	18
3.2.1 Agriculture .....	18
3.2.2 Mining.....	18
3.3 Approvals History .....	19
<b>4 Archaeology of the MCCO Additional Project Area .....</b>	<b>21</b>
4.1 Aboriginal Archaeological Impact Assessment .....	21
4.1.1 Effect of disturbance on the archaeological landscape.....	21
4.1.2 Archaeological Discussion and Management: Summary .....	22
4.2 Assessment of Scientific Significance .....	22
4.2.1 Likely Impacts to Aboriginal Cultural Heritage as a result of the Project.....	25
4.2.2 Impacts to a former portion of ACHOA-5.....	26

4.3	Archaeological Management of Known Aboriginal Sites .....	26
4.3.1	Archaeological salvage .....	26
4.3.2	Sites requiring specific management to prevent harm .....	27
4.3.3	Management of blast impacts.....	29
5	Aboriginal Community Consultation .....	30
5.1	Consultation Objectives and Approaches .....	30
5.2	Cultural Heritage Assessment Process for the Project.....	31
5.2.1	Four Stages of Consultation and Assessment .....	32
5.2.2	Agency Notification .....	32
5.2.3	Public Notification .....	32
5.2.4	Written Notification to invite Participation in the ACHAR Process.....	32
5.2.5	Registration of Aboriginal Parties.....	33
5.2.6	ACHAR Agreement with PCWP.....	33
5.2.7	Draft Archaeological Survey Methodology .....	33
5.2.8	Draft Archaeological Test Pitting Methodology .....	33
5.3	Stage 4 Consultation – Draft ACHAR Review .....	34
5.3.1	Comments on the Draft ACHAR .....	34
5.4	Summary of Consultation Activities .....	35
6	Cultural Heritage Values and Significance Assessment .....	36
6.1	Definition of Cultural Significance.....	36
6.2	Nature of Cultural Significance .....	36
6.2.1	Aesthetic Value.....	36
6.2.2	Historic Value .....	36
6.2.3	Scientific Value .....	37
6.2.4	Social Value .....	37
6.2.5	Spiritual Value .....	37
6.3	Degree of Cultural Significance .....	37
6.3.1	Rarity .....	37
6.3.2	Representativeness .....	38
6.3.3	Condition, Integrity and Authenticity.....	38
6.4	Collecting Cultural Values Information .....	38
6.4.1	Questionnaire.....	38
6.5	WNAC Cultural Values Workshops.....	39
6.6	Gomeroi Cultural Values Workshops .....	39
6.7	Hickey's Cultural Values Workshops .....	39
6.8	Community RAPs Cultural Values.....	39
6.9	Cultural Values of the Plains Clan of the Wonnarua People (PCWP).....	39
6.10	Dominant Themes.....	41
6.10.1	Limitations .....	42
6.11	Consolidated Cultural Values .....	42
6.12	Consolidated Statement of Significance .....	44



6.12.1	Summary Opinion.....	44
6.13	Conclusions .....	45
7	Avoidance of harm .....	46
7.1	Project Rationale .....	46
7.2	Opportunities to avoid impact .....	46
7.3	Sustainable Development Principles.....	46
8	Recommendations .....	48
8.1	Introduction .....	48
8.2	Management Measures .....	48
8.2.1	Aboriginal Cultural Heritage Management Plan .....	49
8.2.2	The proposed management measures from the Knowledge Holder groups and RAPs .....	49
8.2.3	Notes on RAP Recommendations.....	50
8.2.4	Proposed Management Measures .....	52
8.3	Management Measures - No Project Approval Scenario.....	55
9	Bibliography .....	56
10	Glossary.....	58
11	Appendices.....	66
11.1	Table of all Consultation Activities .....	66
11.2	List of RAPs for the Project.....	72
11.3	Consultation Documentation .....	73
11.3.1	Example Letter seeking Registrations .....	73
11.3.2	Public Notices .....	75
11.3.3	Agency Notifications.....	77
11.3.4	Agency Responses .....	90
11.3.5	Archaeological Survey Methodology.....	104
11.3.6	Archaeological Survey 28 Day Review Feedback from RAPs.....	141
11.3.7	Example letter - Archaeological Survey Invitation .....	143
11.3.8	Archaeological Survey Participants .....	149
11.3.9	OzArk Archaeological Survey Summary .....	150
11.3.10	OzArk Archaeological Survey Summary Presentation.....	157
11.3.11	Example Letter inviting RAPs to First Cultural Values Workshop and Site Tour .....	167
11.3.12	Cultural Values Workshop One Information .....	170
11.3.13	Cultural Values Workshop One - Agenda .....	175
11.3.14	Cultural Values Workshop One - Attendees.....	176
11.3.15	Example Letter inviting RAPs to Second Cultural Values Workshop .....	177
11.3.16	Cultural Values Workshop Two Information .....	179
11.3.17	Cultural Values Workshop Two - Questionnaire .....	189
11.3.18	Cultural Values Workshop Two - Attendees.....	191
11.3.19	Workshop Two Questionnaire Responses.....	193
11.3.20	Archaeological Test Excavation Methodology .....	197

11.3.21	Archaeological Excavation 28 Day Review Feedback from RAPs .....	218
11.3.22	Example Letter - Archaeological Test Pitting Invitation .....	219
11.4	28-Day Review Feedback .....	225
11.5	Aboriginal Archaeology Impact Assessment (AAIA) Report.....	240
11.6	Plains Clans of the Wonnarua Peoples ACHAR.....	564

## List of figures

Figure 3-1: The boundary lines of the Wonnarua and their neighbours according to Norman Tindale (1940).....	14
Figure 3-2: A canoe from the Hunter Valley. It is made from one single piece of bark and was designed for the quiet waters of the area's inland rivers (Australian Museum, 2010). ....	16
Figure 5-1: Integrated ACHAR approach. ....	31
Figure 6-1: Test analysis of the questionnaire responses from 17 of the RAPs. ....	39
Figure 11-1: Public Notice in the Hunter Valley News .....	75
Figure 11-2: Public Notice in the Muswellbrook Chronicle.....	76

## List of maps

Map 1-1: Location of the Mangoola Coal Continued Operations (MCCO) Project .....	3
Map 1-2: Proposed MCCO project .....	4
Map 2-1: Land Ownership. ....	11
Map 3-1: Tenements within the MCCO Project Area.....	20

## List of tables

Table 1-1: Report Roadmap.....	6
Table 1-2: EIS and ACHAR Consultants. ....	7
Table 1-3: Secretary's Environmental Assessment Requirements .....	9
Table 4-1: Scientific significance of newly recorded sites.....	22
Table 4-2: Significance assessment for all previously recorded sites .....	23
Table 4-3: Sites within the Proposed Disturbance Footprint.....	25
Table 4-4: Management recommendations for sites within the Proposed Disturbance Footprint .....	26
Table 4-5: Sites requiring specific management to ensure conservation.....	29
Table 5-1: Agency Notifications .....	32
Table 6-1: Consolidated Cultural Values .....	43
Table 8-1: Community RAP recommendations.....	49
Table 8-2: Recommendations made by the Wanaruah Local Aboriginal Land Council. ....	49
Table 8-3: Recommendations made by the Plains Clan of the Wonnarua People .....	49
Table 8-4: Recommendations made by the Gomeroi Knowledge Holders.....	50
Table 8-5: Recommendations made by the Wonnarua Nation Aboriginal Corporation. ....	50
Table 8-6: This table is a consolidated management recommendations and options table based on possible previous management recommendations from the PCWP, Gomeroi, WNAC and Community RAPs for this and other ACHAR's.....	51
Table 8-7: Proposed On-Site Management Measures from the Project .....	53
Table 8-8: Proposed Off-Site Management Measures. ....	54
Table 11-1: Consultation Activities .....	66

# 1 Introduction

ACHM has been engaged by Umwelt Australia Pty Ltd and Mangoola Coal Operations Pty Ltd (Mangoola) to complete an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Mangoola Coal Continued Operations Project (MCCO Project). The purpose of the assessment is to form part of an Environmental Impact Statement being prepared by Umwelt to accompany an application for development consent under Divisions 4.1 and 4.7 of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) for the MCCO Project.

This ACHAR has been prepared in accordance with the SEAR requirements, the requirements of the 2005 DEC Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment, the Community Consultation guidelines of the current Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010a), and the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011). It also been prepared in accordance with, and it also complies with the intent, requirements and assessment methodologies outlined in the Burra Charter (1999).

A stand-alone Aboriginal Archaeological Impact Assessment (AAIA) report was prepared by OzArk Environmental and Heritage Management (OzArk) to assess the archaeological values of the MCCO Project and provide management recommendations for sites within the MCCO Additional Project Area. The results of that archaeological assessment have been incorporated into this ACHAR.

## 1.1 Project Overview

Mangoola Coal Mine is an open cut coal mine located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman in the Upper Hunter Valley of NSW (refer Map 1-1). Mangoola has operated the Mangoola Coal Mine in accordance with Project Approval (PA) 06\_0014 since mining commenced at the site in September 2010.

The MCCO Project will allow for the continuation of mining at Mangoola Coal Mine into a new mining area to the immediate north of the existing operations. The MCCO Project will extend the life of the existing operation providing for ongoing employment opportunities for the Mangoola workforce. The MCCO Project Area includes the existing approved Project Area for Mangoola Coal Mine and the MCCO Additional Project Area as shown on Map 1-1 and Map 1-2. The Approved Disturbance Area for the current operations is not part of this assessment and this area, as shown on Map 1-1 and Map 1-2 has been previously assessed.

The MCCO Project generally comprises:

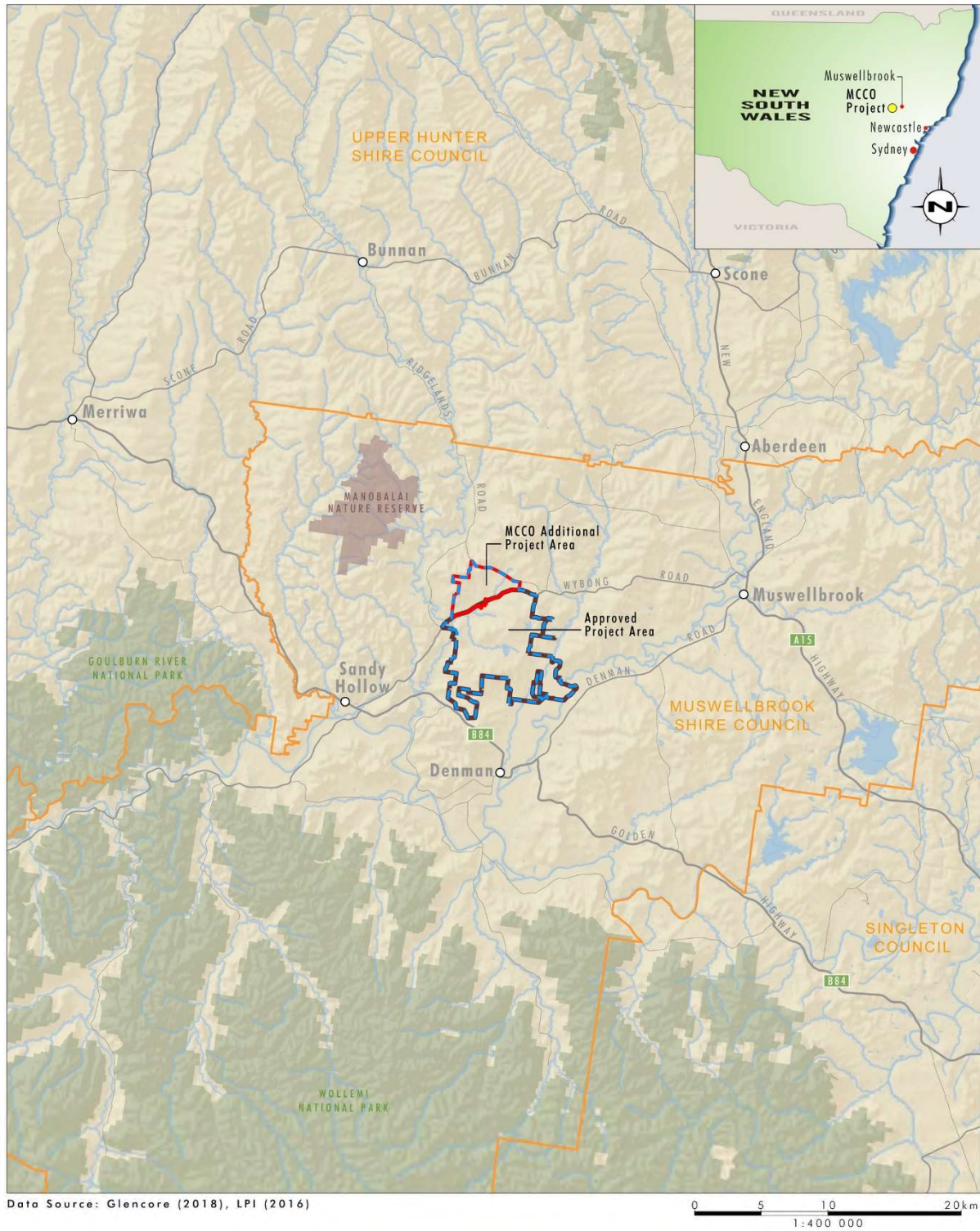
- open cut mining peaking at the same rate as that currently approved (13.5 Million tonnes per annum (Mtpa) of run of mine (ROM) coal) using truck and excavator mining methods
- continued operations within the existing Mangoola Coal Mine
- mining operations in a new mining area located north of the existing Mangoola Coal Mine, Wybong Road, south of Ridgeland Road and east of the 500 kV Electricity Transmission Line
- construction of a haul road overpass over Big Flat Creek and Wybong Road to provide access from the existing mine to the proposed Additional Mining Area
- establishment of an out-of-pit overburden emplacement area
- distribution of overburden between the proposed Additional Mining Area and the existing mine to optimise the final landform design of the integrated operation.
- realignment of a portion of Wybong Post Office Road
- the use of all existing or approved infrastructure and equipment for the Mangoola Coal Mine with some minor additions to the existing mobile equipment fleet
- construction of a water management system to manage sediment laden water runoff, divert clean water catchment, provide flood protection from Big Flat Creek and provide for reticulation of mine water. The water management system will be connected to that of the existing mine
- continued ability to discharge excess water in accordance with the Hunter River Salinity Trading Scheme (HRSTS)
- establishment of a final landform in line with current design standards at Mangoola Coal Mine including use of natural landform design principles consistent with the existing site
- rehabilitation of the proposed Additional Mining Area using the same revegetation techniques as at the existing mine



- a likely construction workforce of approximately 145 persons. No change to the existing approved operational workforce
- continued use of the mine access for the existing operational mine and access to/from Wybong Road, Wybong Post Office Road and Ridgeland Road to the MCCO Project Area for construction, emergency services, ongoing operational environmental monitoring and property maintenance.

Map 1-2 illustrates the key features of the MCCO Project.

The MCCO Project Area is located within the Hunter Coalfields in the Upper Hunter Valley of New South Wales (NSW). It is situated within a regional area primarily surrounded by agricultural and rural residential activities. Other mining operations are at some distance from the MCCO project area.



#### Legend

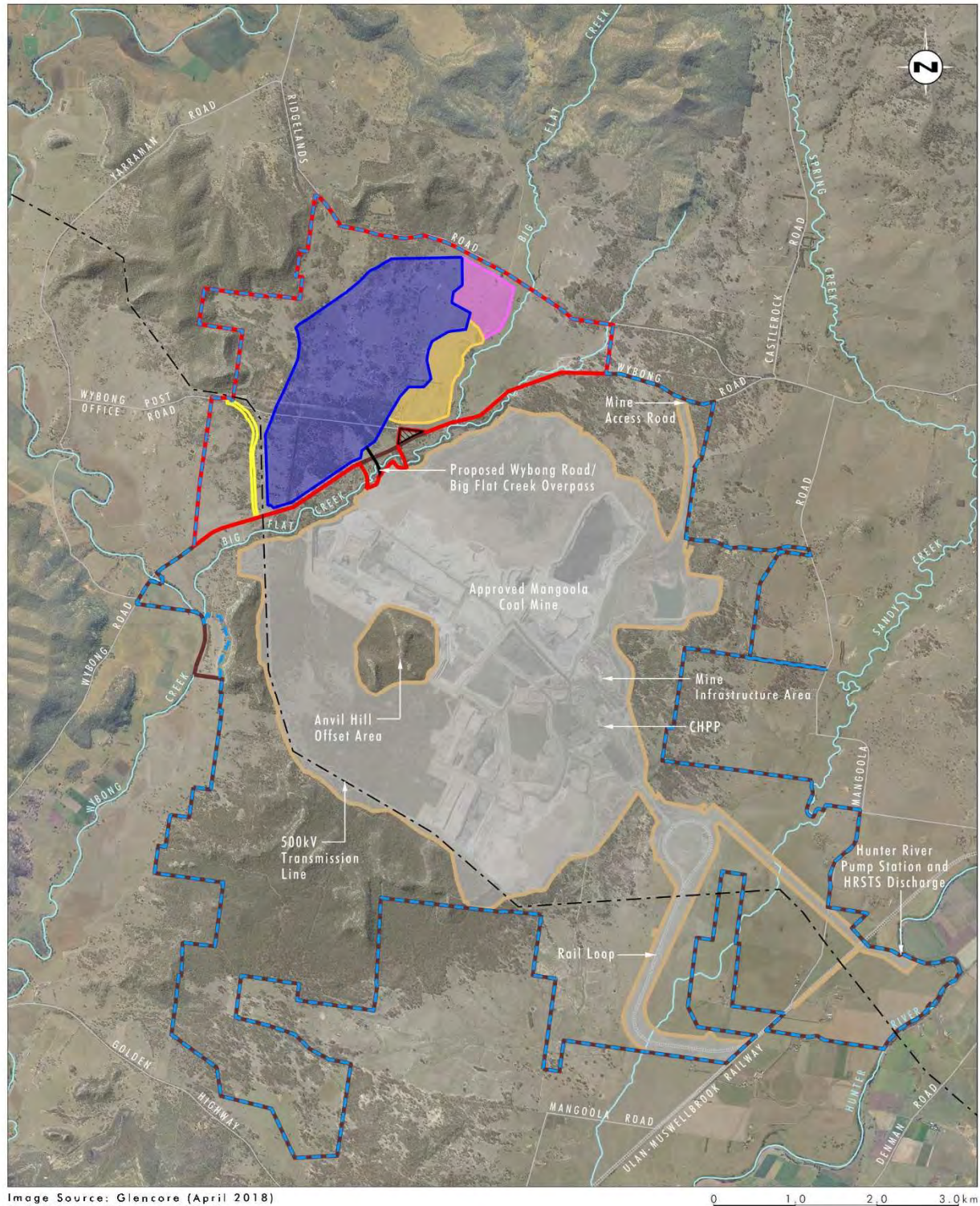
- ▬ MCCO Project Area
- ▬ Approved Project Area
- ▬ MCCO Additional Project Area
- ▬ Local Government Area

Regional Locality Plan

File Name (A4): R16/4004\_189.dgn  
20181004 14.01

Map 1-1: Location of the Mangoola Coal Continued Operations (MCCO) Project





#### Legend

- MCCO Project Area
- Approved Project Area
- Approved Mangoola Coal Mine Disturbance Area
- MCCO Additional Project Area
- Proposed Additional Mining Area
- Proposed Emplacement Area
- Proposed Topsoil Stockpile Area
- Wybong Post Office Road Realignment
- Crown Land (TSR) Excluded from MCCO Project Area

#### Key Features of the Mangoola Coal Continued Operations Project

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Map 1-2: Proposed MCCO project

## 1.2 Structure of the Report

The format of this report mirrors the format recommended by the Office of Environment and Heritage (OEH) in the *'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in New South Wales'* (2011).

The process followed by Mangoola Project team to consult with the Registered Aboriginal Parties (RAPs) has been a continuation of Glencore's overall approach to cultural heritage assessment as previously utilised for the Bulga, Mount Owen and United Wambo JV EIS processes. When engaging in Aboriginal cultural heritage assessments within the Hunter Valley, members of the Aboriginal communities may choose to be part of representative bodies or to participate in cultural heritage assessments as individuals.

The representative bodies for this project are known as 'Knowledge Holder groups' in this ACHAR, and they are:

- Wonnarua Nation Aboriginal Corporation (WNAC)
- Plains Clan of the Wonnarua People, and the
- Gomeroi People

The MCCO Project has engaged the Plains Clan of the Wonnarua People (PCWP) to write their own cultural values report for the MCCO Project. The disclosed text of that report is included in **Appendix 11.6**

RAPs whose views were not captured by those Knowledge Holder groups were also consulted for this ACHAR, and their cultural values, care and control and conservation recommendations have been included in this report.

This ACHAR presents a summary of the archaeological values assessment of the MCCO Additional Project Area as well as a synthesis of the values and recommendations of all RAPs who participated in the cultural heritage assessment process.

**Section 1** of this report introduces the MCCO Project and the ACHAR within a Project, EIS and legislative context.

**Section 2** of this report describes the MCCO Additional Project Area and presents a discussion of the environmental background of the MCCO Additional Project Area. A review of historical land use practices and previous approvals for other mining activities are also discussed.

**Section 3** presents a historical narrative of the MCCO Additional Project Area.

**Section 4** includes the results of the AAIA undertaken by OzArk and concludes with an assessment of the scientific significance of Aboriginal places identified through the archaeological values assessment. The AAIA prepared by OzArk is contained in **Appendix 11.5**

**Section 5** outlines the extensive consultation processes undertaken with RAPs for this ACHAR.

**Section 6** presents a discussion on cultural heritage values and significance assessment in general, alongside a consolidated statement of significance for the Aboriginal Places within the MCCO Additional Project Area formulated according to the cultural heritage industry best-practice guidance of the Burra Charter (Australia ICOMOS 1999).

**Section 7** discusses opportunities for avoiding and/or mitigating harm to Aboriginal cultural heritage.

**Section 8** presents management recommendations developed by the MCCO Projects stakeholders for both 'Project Approval' and 'No Project Approval' scenarios. Specific recommendations regarding intergenerational equity are also discussed.

## 1.3 Key Issues

The Aboriginal community of the Hunter Valley shares many similarities with other Aboriginal communities throughout Australia. One of those similarities is a degree of division among the people living in the Hunter Valley. There are divisions between several family groups, Knowledge Holder groups and individuals, which at the time of writing showed no progress towards resolution. Resolving this issue is beyond the scope of this report.

Because of these divisions within the community and groups, the individuals who registered as RAPs could not be consulted by the MCCO Project as a single group, and an alternative approach was required.

Following public notification, 35 RAPs registered for this project. By the end of the process, there were 37 RAP's.

In the interests of ensuring that all interested Aboriginal parties to the MCCO Project were consulted, the MCCO Project embarked on a process of consultation and reporting that has been utilised previously by Glencore at Bulga, Mt Owen and the United Wambo JV projects.



The key points of the ACHAR consultation process are as follows:

- There are 3 Knowledge Holder groups of (WNAC, PCWP and Gomeroi) registered for the MCCO Project. PCWP elected to produce their own cultural values assessment and write their own ACHAR, while WNAC and Gomeroi were part of the consultation process facilitated by ACHM and the MCCO Project. The key results of this work have been consolidated into this ACHAR.
- Individuals not involved in the consultation and reporting processes of the 3 Knowledge Holder groups but who registered as RAPs were consulted separately, and their values are reported on by ACHM in this report. These individuals are referred to throughout this report as the 'Community RAPs'
- One family group requested that they be consulted separately to all other groups (Hickey family). Feedback from the Hickey's has been included with the feedback from the Community RAPs.
- The process provided consultation and engagement for all the RAPs and allowed opportunities for additional information, stories and knowledge from Wonnarua and Gomeroi people to be made known.

### 1.3.1 Roadmap of the Report

For ease of reference, the following table provides page numbers and reference points to key issues in this report.

Table 1-1: Report Roadmap

Key Item	Section	Page
Project Overview	0	3
ACHAR Objectives	1.3.2	8
SEAR's	1.5.2	10
Consultation Processes	5	31
Cultural Values and Significance Assessment	6.0	66
Recommendations	8.0	81

### 1.3.2 Aboriginal Cultural Heritage Assessment Approach and Objectives

The cultural values and archaeological assessments culminating in the preparation of this ACHAR have been undertaken to provide:

1. Extensive and meaningful opportunities for engagement and consultation with Knowledge Holders and RAPs for the MCCO Project,
2. Full compliance with the Secretary's Environmental Assessment Requirements (SEARs),
3. Full compliance with the OEH (2010) Aboriginal cultural heritage consultation requirements for proponents,
4. Full compliance with the OEH (2011) Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW,
5. An objective archaeological assessment to determine the scientific significance of the archaeological places within the MCCO Additional Project Area, and
6. The identification of cultural values and the determination of cultural significance which are consistent with the guidance provided in the Burra Charter and Indigenous Cultural Heritage Management Practice Note (Australia ICOMOS, 2013).

The objectives of this report are to:

1. Present the MCCO Project's consultation methodologies and processes as agreed with the RAPs and utilised in this Project, and
2. Ensure that Aboriginal people can participate in and improve the outcomes of the assessment by:
  - (a) Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the MCCO Additional Project Area,
  - (b) Influencing the design of the method to assess cultural and scientific significance of Aboriginal object(s) and/or place(s) within the MCCO Additional Project Area,
  - (c) Actively contributing to the development of cultural heritage management options and recommendations for any Aboriginal object(s) and/or place(s) within the MCCO Additional Project Area; and
  - (d) Commenting on draft assessment reports before they are submitted by the proponent as part of the EIS

- (e) Providing input into the intergenerational equity program proposed by Mangoola.

## 1.4 ACHAR Registered Aboriginal Parties

This report is a consolidation of cultural values assessments undertaken and reported on by the RAPs and ACHM. Any information produced by the consultation processes as utilised for this report were to comply with the 2010 OEH Draft Guidelines for Community Consultation at all times, and the results of that information is consolidated and presented in this ACHAR.

The groups consulted are:

1. WNAC
2. PCWP
3. Gomeroi, and
4. Community RAPs

The Community RAPs are not members of the Knowledge Holder groups but are RAPs for the MCCO Project. ACHM was also contracted to undertake the community consultation and cultural values reporting with this group. The results of that consultation process are presented in this report. The Hickey family are a part of the Community RAPs; however as noted, they requested a separate consultation process.

The consultation process has involved consultation with all 37 RAPs from the four discrete groups. The process has also facilitated the Knowledge Holder groups being able to consult with a large number of Aboriginal people who (a) were not RAPs for the MCCO Project but (b) are traditional owners of the Hunter Valley area, and therefore constitute important stakeholders.

This journey was not without commercial and practical risk for the proponent and the participants; however, the author believes the process and outcomes have been both innovative and beneficial for all concerned.

### 1.4.1 Other Consultant Input

Several parties have been involved in the preparation of components of this report.

Alongside the consultants noted in Table 1-2, below, Mangoola personnel have also provided extensive amounts of information and support for the final report. Jason Martin, Lori-Dennen-King and Tim Walls from Glencore assisted greatly with the content.

Table 1-2: EIS and ACHAR Consultants.

Organisations	Individual(s)	Role
ACHM	Dr Shaun Canning	Cultural values recording, consultation workshops, significance assessment, ACHAR consolidation and preparation
OzArk	Ben Churcher	Archaeological survey, excavation and reporting
Umwelt	Numerous	EIS preparation, GIS, environmental and proposed development sections, mapping, historic heritage

This report has been written primarily by Dr Shaun Canning, Principal Heritage Advisor with ACHM.

### 1.4.2 About Dr Shaun Canning

Dr Shaun Canning is the Managing Director and the Principal Heritage Advisor of Australian Cultural Heritage Management (Vic) Pty Ltd. (ACHM), which specializes in cultural heritage assessment, expert advice, management of complex and large-scale cultural heritage management projects (primarily in relation to Australian Indigenous culture and heritage), native title advice and research, Indigenous community consultation and development matters, geographic information systems, cartography and analysis. Shaun has been involved extensively in the completion of over 500 cultural heritage management projects nationally.

Shaun holds a Bachelor of Arts degree majoring in Cultural Heritage Studies and Anthropology, a Bachelor of Applied Science (Hons) degree in Parks, Recreation and Heritage, and a PhD in Australian Indigenous Archaeology (La Trobe), specialising in predictive modelling and cultural heritage management in southern Victoria. Shaun was the recipient of a 3-year Australian Postgraduate Award Scholarship to complete his PhD. Shaun has extensive experience in Indigenous cultural heritage management in the resources, urban development, infrastructure and public land management sectors, alongside considerable experience in community consultation and Aboriginal education. Shaun has expertise in complex project management, and the use of GIS and predictive modelling in archaeological, cultural and natural heritage management contexts.

Shaun is a Fellow of the Australian Anthropological Society (F.AAS), a member of the International Council on Monuments and Sites (M. ICOMOS), a full member of the Australian Association of Consulting Archaeologists (M. AACAI) and a Certified Environmental Practitioner (CenvP) through the Environment Institute of Australia and New Zealand (EIANZ).

Shaun is an 'Expert Member' of the ICOMOS International Committee on Archaeological Heritage Management (ICAHM), an Honorary Research Associate of the Archaeology Program at La Trobe University, a member of the Indigenous Relations Working Group committee of the Minerals Council of Australia, and a member of the EnviroDevelop Technical Standards Development Taskforce for the Urban Development Institute of Australia (UDIA). He is the current Chair of the EIANZ Heritage Special Interest Section (SIS).

## 1.5 Legislative Environment

The following sections present the Commonwealth and State statutory controls that provide legal protection for Aboriginal cultural heritage in NSW, and that identify the approval processes for any proposed Project that seeks to impact Aboriginal cultural heritage places and objects.

### 1.5.1 Commonwealth Legislation

#### **Aboriginal and Torres Strait Islander Heritage Protection Act 1984**

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (the ATSIHP Act) provides for the declaration by the Minister for the protection of Aboriginal cultural heritage of significance to Indigenous Australians, generally in circumstances where State or Territory laws fail to do so. The power to make declarations is meant to be used as a last resort, after the relevant processes of the state or territory have been exhausted; no declarations have been made under the ATSIHP Act in relation to the MCCO Additional Project Area.

#### **Native Title Act 1993**

The Native Title Act 1993 provides for the recognition and determination of native title in Australia, processes for how future activity can proceed on native title land, and to provide compensation where native title is impaired or extinguished.

Native Title Act processes for the purposes of the MCCO Project are not discussed within this report

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

The *Protection of Movable Cultural Heritage Act 1986* (the PMCH Act) implements Australia's obligations under the UNESCO Convention on the Means of Prohibiting the Illicit Import, Export and Transfer of Ownership of Cultural Property. Under the PMCH Act it is unlawful to export a 'protected object' from Australia without a certificate or permit from the Environment Minister. This Act is not directly relevant to this report.

### 1.5.2 State Legislation

#### **Environmental Planning and Assessment Act 1979**

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the main piece of legislation regulating land use in NSW.

The Act is administered by the Department of Planning and Environment (DPE) and guides the process of land development, including the assessment and management of cultural heritage impacts.

Coal mining is State Significant Development, and the Minister for Planning and Environment is the consent authority for it. Applications for approval of State Significant Development are made under Part 4 of the EP&A Act. As the MCCO Project is State Significant Development, the MCCO Project is seeking Part 4 development consent for the MCCO Project.

This ACHAR (including the AAIA) has been prepared in accordance with SEAR's. The SEARs for the MCCO Project were issued by DPE on 15 February 2019 (replacing a previous version of the SEARs issued on 22 August 2017) and identify the specific requirements to be addressed by the EIS for the project.

Specific to the assessment of Aboriginal cultural heritage impacts, the SEAR's require that the EIS must include:

- An assessment of the potential impacts of the development on Aboriginal heritage (cultural and archaeological), including consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage;

The archaeological and cultural values assessments along with this ACHAR have been prepared in accordance with the SEARs.

Table 1-3: Secretary's Environmental Assessment Requirements

SEAR	Where Addressed
An assessment of the potential impacts of the development on Aboriginal heritage (cultural and archaeological), including consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage	Chapters 4-7

#### **National Parks & Wildlife Act 1974**

The *National Parks & Wildlife Act 1974* (NP&W Act) is the primary law in NSW that provides protection for Aboriginal cultural heritage. The Act is administered by the Office of Environment and Heritage (OEH), which is within the Department of Premier and Cabinet NSW.

Under section 86(1) and 86(4) of the Act, it is an offence to harm an Aboriginal object or an Aboriginal place. The NP&W Act provides for several defences to prosecution for harming Aboriginal objects or places including that the person harmed the object or place in accordance with an Aboriginal Heritage Impact Permit (AHIP) or that the person exercised due diligence.

Under Section 4.41 of the EP&A Act, an AHIP is not required, and the NP&W Act provisions prohibiting harm to Aboriginal objects and places are not applicable, to State Significant Development that is authorised by development consent.

#### **Heritage Act 1977**

The *Heritage Act 1977* provides for the protection of natural, cultural and built heritage that are of State or local heritage significance in NSW, through the register of heritage places or items on the State Heritage Register and the making of interim heritage orders and emergency orders to protect heritage items or places at risk.

The registration on the State Heritage Register or the making of interim register order places limits on what can be done to the heritage, although interim heritage orders do not apply to State Significant Development under the EP&A Act.

## 2 Description of the Site

### 2.1 Land Ownership

Except for some small sections of public road corridor and Crown roads, Mangoola owns all the land within the MCCO Project Area (See Map 2-1, below).

The land to the immediate south of the MCCO Additional Project Area is occupied by the existing Mangoola Coal Mine which is surrounded by Mangoola owned buffer land. To the north and east are further areas of Mangoola owned grazing land and existing ecological offsets. Land to the north-west includes a parcel of forested Crown Land which is surrounded by private grazing properties associated with the community of Manobalai and further west by privately owned properties associated with the community of Wybong. The nearest townships are Muswellbrook and Denman which lie approximately 20 km east and 10 km west of the MCCO Additional Project Area respectively.

### 2.2 Environmental Overview

Within the MCCO Project Area is the existing approved Mangoola Coal Mine which has been operated in accordance with NSW approval PA 06\_0014 since September 2010 and the MCCO Additional Project Area which has historically been used for agriculture since the 1800s and is comprised predominately of degraded grazing land and patches of native woodland.

#### 2.2.1 Topography / Landforms and Drainage

The topography of the MCCO Project Area is generally characterised by lower slopes along with undulating hills and rocky outcrops associated with Anvil Hill within the approved Mangoola Coal Mine and to the north and west of the MCCO Additional Project Area. Lower topographic areas are associated with drainage lines feeding Sandy Creek to the south east and Big Flat Creek which flows through the MCCO Project Area.

A dominant topographical feature in the surrounding landscape is the series of undulating wooded hills which occur outside and to the north of the MCCO Additional Project Area. These hills rise to a maximum height of approximately 360 metres (m) Australian Height Datum (AHD) and are elevated approximately 200 m above the surrounding area.

The MCCO Project lies entirely within the catchment of Big Flat Creek, which is part of the upper catchment of the Hunter River. Big Flat Creek drains south-westerly through the MCCO Additional Project Area before it converges with a major tributary and continues below the southern boundary of the MCCO Additional Project Area.

The MCCO Additional Project Area has been subject to agricultural land uses, including intensive grazing and pasture improvement. Remnant native vegetation is generally confined to watercourses, roadsides and areas of steeper topography that are not suitable for agricultural purposes.

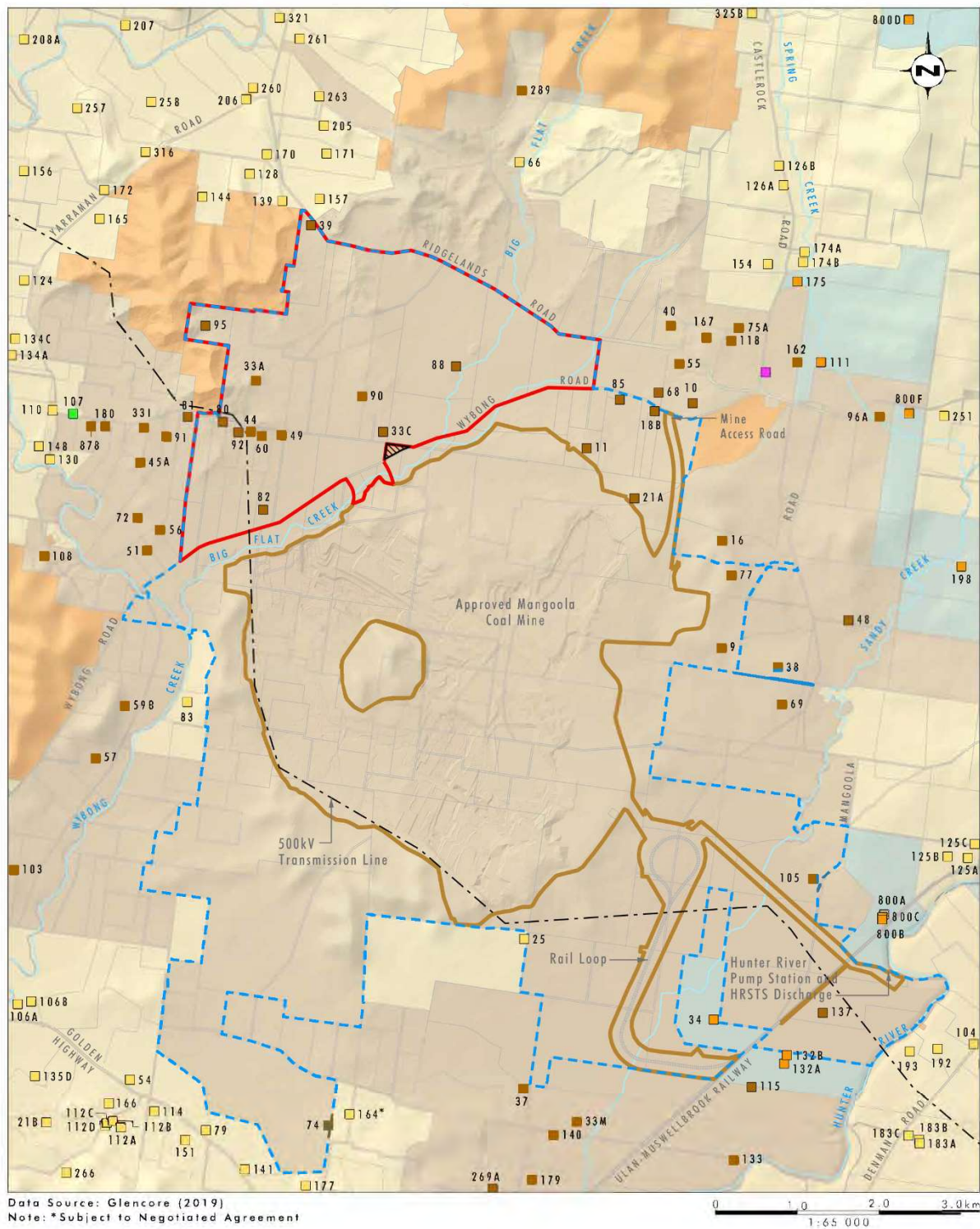
#### 2.2.2 Geological Features and Resource Description

The MCCO Project Area is located within the Hunter Coalfields of the Sydney Sedimentary basin. The coal seams within the MCCO Additional Project Area form part of the Late Permian Newcastle Coal Measures of the Singleton Super Group. They gently dip to the west at about 2 degrees below horizontal, reaching a maximum depth to the floor of the lowest seam of approximately 125 metres at lowest point relative to the highest topographical location within the MCCO Additional Mining Area.

The target coal resources occur within both the Approved Mangoola Coal Mine and the MCCO Additional Project Area, and in order of increasing depth, include:

- Wallarah seam
- Great Northern seam
- Fassifern seam, and
- Upper Pilot seams.

These resources are overlain by younger Triassic aged Narrabeen Group sandstones and conglomerates, which are identifiable as the rocky escarpments in the landscape.



Map 2-1: Land Ownership.



In addition to the hard rock strata, the surface drainage channels host Quaternary to recent unconsolidated alluvial and colluvial materials of variable thickness and extent. Alluvium is mapped as being present along Wybong Creek to the west, and Sandy Creek, over 5 km to the south east of the proposed additional mining area. With regard to Big Flat Creek there is no mapped alluvium within the disturbance footprint associated with the proposed additional mining area of the MCCO Additional Project Area, instead the alluvial deposits near the junction of this creek with Wybong Creek transition to shallow colluvium sourced from the weathered conglomerates, sandstones, siltstones, and tuffs.

To determine the soils and the likely age of the parent material they are derived from, a review of detailed soil landscapes mapping and geological mapping was undertaken to determine whether Permian derived soils occur within the MCCO Additional Project Area. The MCCO Additional Project Area is situated on the edge of the Permian Singleton Coal Measures mapping with much of the surface geology being formed by the Triassic Narrabeen group (as determined both from regional geological mapping and from detailed geological investigations undertaken within the MCCO Additional Project Area). The detailed soil survey undertaken within the MCCO Additional Project Area found that the soils have mostly been derived from the Triassic Narrabeen group.

### **2.2.3 Vegetation**

The MCCO Additional Project Area has been subject to agricultural land uses, including intensive grazing and pasture improvement. Remnant native vegetation is generally confined to watercourses, roadsides and areas of steeper topography that are not suitable for agricultural purposes.

The MCCO Additional Project Area encompasses sections of the Central Hunter Foothills, and Lees Pinch Foothills landscape units (Mitchell 2002). Before historical clearing, the dominant vegetation of the Central Hunter Foothills landscape unit would have been comprised of woodlands to open forest of spotted gum, forest red gum, narrow-leaved ironbark, red ironbark, white box, slaty gum, rough-barked apple, with kangaroo and wallaby grass (Mitchell 2002: 112). The vegetation of the Lees Pinch Foothills landscape unit would have comprised of woodland of red ironbark, stringybarks, grey gum, and black cypress pine on slopes and ridges with ironbark and scattered forest red gum along streams (Mitchell 2002: 92).

Currently, the primary vegetation of the MCCO Additional Project Area includes derived grassland paddocks, dense *allocasuarina* regrowth forests and stands of open regrowth eucalypt woodland. The vegetation communities of the steep slopes and crest of the northern and western sandstone ridges retain significant stretches of remnant vegetation and are more consistent with those characterising the landscape units detailed above.

### **2.2.4 Climate**

The Bureau of Meteorology (BOM) record station with the longest climate records near to the MCCO Additional Project Area is located at the Scone Soil Conservation Service (BOM 2018). Climate statistics from the Scone Soil Conservation Service indicate that the region experiences a mostly temperate climate with temperatures above zero during the cooler months. The climate statistics for 1965-2018 show that the highest mean monthly temperatures are in January (31.4°) and the lowest mean monthly temperatures are in July (4.7°). Rainfall is greatest in January (mean rainfall: 81.8 millimetres [mm]) and the lowest in July (mean rainfall: 36.3 mm). The annual average rainfall is 640.1 mm.

## 3 Historical Background

### 3.1 Historical Narrative of the Region

Literature and research concerning the Wonnarua of the central Hunter Valley area is incomplete, largely as a result of omissions, silence and antiquated concepts of ethnology. In relation to New South Wales' Indigenous population, ethnohistoric attention has focused on coastal communities to the detriment and exclusion of those inland, thereby making the material about the Wonnarua patchy at best, but more commonly absent (Brayshaw, 1987: 74). Research into the language group was further hampered by changing notions of significance. In considering the lack of historical and archaeological information about campsites, Koettig (1990: 35) for example acknowledges that they were neglected as an important subject matter by her peers for many, many decades, because they were regarded as relatively unimportant, especially when compared to ceremonial sites. Even though they are now deemed to be of significance, the literature remains largely silent about them.

Nolan (2012:78) reminds her readers there was a popular concept during the colonial period that time (and therefore history) in the new colony of New South Wales began with the arrival and occupation of Europeans. Consequently, there was a lack of activity in recording the detailed lives of Indigenous people at the commencement of European settlement. This, however, began to change from the 1830s, yet by this time, these communities had already been adversely and irretrievably effected by disease, violence, displacement and dispossession and so the accounts were not a true reflection of how they once had lived (Umwelt, 2011).

#### 3.1.1 Prior to White Settlement

The land of the Wonnarua was vast and stretched over much of the Hunter Valley. Tindale (1974: 201) estimated that it covered over five thousand square kilometres. Its borders were somewhat vague and, as a result, often erroneously recorded in the literature, possibly because of the new settlers' lack of understanding of the complexity of Indigenous society and its association with land. Tindale (1974: 201) defined Wonnarua country as being located on the '*upper Hunter River from a few miles above Maitland west to Dividing Range. The southern boundary with the Darkinjang is on the divide north of Wollombi*'. The Wonnarua's neighbours were the Darkinung (to the south), the Awabakal (to the south east), the Worimi (to the east) and the Wiradjuri (to the west) (Horton, 1994). They had close ceremonial ties to the Darkinung and Wiradjuri people (Macquarie University, 2009). See Figure 3-1, below.

The population of the Wonnarua prior to European settlement is unknown, and approximations vary widely. Estimates vary and were most likely made well after populations had declined, so must be treated with caution. Discrepancies also arose partly because when official census were conducted, Indigenous people often went unseen by Europeans, either intentionally or unintentionally. When travelling through the area in 1825, Cunningham observed that although no Aboriginal people had been seen '*their recent marks on the trees and fired country*' showed that they had been in the area (Cunningham (1825) cited in Bradshaw 1987: 20).

The structure of Indigenous communities was complex. The Wonnarua comprised a nation, or language group. They all spoke the one language and shared similar customs and beliefs. However, within that group there was clans, each with their own territories. According to Fawcett (1898: 180), Wonnarua men belonged to one of four skin groups: either of the *Ippye*, *Kumbo*, *Murree* or *Kubbee*. Women, conversely, were either *Ippatha*, *Butha*, *Matha* or *Kubbitha*. With marriage within skin groups strictly forbidden, members of different clans lived together in small communities or familial groups.

As Miller (1985) discusses, kinship was the very thing that '*welded Koori society together*' since everyone was related to one another in a web of obligations, biological connections and spiritual associations. While the mother and father were important people in a child's life, a boy or girl's uncle (mother's brother) was particularly significant as it was he who taught them many things in their early lives. For males, this relationship altered, though, when boys were initiated after reaching puberty and were transformed into men.





Figure 3-1: The boundary lines of the Wonnarua and their neighbours according to Norman Tindale (1940).

Spiritual kinship also united the Wonnarua with one another, the landscape and everything in it, *'thus kinship interwove throughout Aboriginal society, creating a very complex dynamic in which every individual had a specific relationship with every other individual, with the food they ate, and with the land'* (Bradshaw, 1987: 37). Before a child was born, he or she was assigned totems and skin groups according to that of the biological father (Miller, 1985). The child's mother was from the opposite totem and skin group. The totem system linked them with the Dreaming as it was a *'legacy of the spirits'* (Miller, 1985).

Life for the Wonnarua was intensely spiritual, as it was for all Indigenous people. Everything in the landscape was created by the spirits. A new born baby was perceived as a spirit in physical, human form (Miller, 1985). Events, natural or otherwise, were perceived as the workings of benevolent or malevolent spirits. Everything from food shortages and droughts to births and deaths could be explained by the actions of unseen evil or benign actors. Consequently, the Wonnarua along with most Australian Indigenous people saw themselves not as the owners of resources or land but rather as custodians, for these were all created in the Dreamtime by the ancestral or mythical beings. The myths that surrounded and influenced their daily lives were passed on from one generation to another and *'each clan acted as caretakers for those legends which were manifested in the topography of their region'* (Needham, 1981: 4).

The Wonnarua lived a semi nomadic life but, it was not random wanderings. The position of camps was often determined by the availability of natural resources, like food and water, which were sometimes seasonal or affected by floods, droughts and other climatic events. The availability of water was especially important in choosing a location, *'irrespective of the size of the watercourse.'* The smaller the waterway, the smaller the camp (Koettig, 1990). Many creeks and creek junctions were particularly popular, as is evident in the archaeological record of the Singleton, Muswellbrook and Jerrys Plain region (Brayshaw, 1987: 96). Koettig (1990: 118) reinforces this with her modelling of a variety of Indigenous sites types in the Hunter Valley, the vast majority of which are located in close proximity to water courses.

The sourcing of other natural resources besides food and water also dictated campsite locations. For example, the construction of a canoe being in proximity to a place with suitable trees that had just the right bark to construct it, as did the making of implements (like boomerangs and shields) or the sourcing of other raw materials, such as stone, ochre or resin (Umwelt 2011). Together with natural resources, a suitable vantage point in case of conflict was often considered when deciding on a camp site (Umwelt 2011).

At other times, social events and obligations also influenced a camp's location. Interaction between different nations and clans was an essential aspect of life for all Wonnarua. It provided them with opportunities to trade goods, participate in important ceremonies and strengthen kinship and trading relationships. During the hot summer months when fish were most plentiful, the Wonnarua visited the cooler coastal lands of the Worimi or Awabakal while in the cooler months, the neighbours journeyed to Wonnarua country and took part in *'ritual'* kangaroo hunts (Brayshaw 1987: 82). Such activities not only provided participants with food but also strengthened social and economic ties between the various groups.

Trading relationships between inland and coastal Indigenous communities provided each group with opportunities to procure items that were unavailable in their traditional lands or were in short supply. The Wonnarua traded possum skins for shells with coastal tribes as neither group could source such materials from their traditional lands. The shells were used for a range of purposes such as sharpening tools to fashioning fishhooks (Brayshaw 1987: 67).

Ceremonies were an important aspect of life for the Wonnarua. They were frequently held when natural resources, like food and water, were plentiful. There is now little evidence detailing where such events took place, but it is known that they rotated around various sites, thereby allowing *'the local environment to fully recover from periods of intensive exploitation'* (Umwelt 2011). Initiation ceremonies were important rites of passage for boys having reached puberty. It *'would make them spiritually as well as physically different from women. No longer would they eat the female species of game or collect fruits and yams or even eat with the women'* (Miller 1985). It was a time when they assumed greater responsibilities as they went from being a boy to a man. The actual ceremony was one occasion when neighbours participated in the event. A messenger would be sent to other clans or nations inviting them to the gathering. Two circular clearings would be prepared with a connecting pathway, creating sacred ground where certain parts of the ceremony would take place. These areas were known as 'Bora' grounds.

Being a hunter and gatherer society, much time was spent procuring food and it was frequently sourced within about five kilometres (or a day's walk) of the campsite. The Wonnarua consumed a diet high in protein and obtained this from kangaroo, emu, bandicoot, possum, native rats, fish, insect lava, lizards, snakes, grubs and caterpillars. The water lily was also a popular item of food (Fawcett 1898: 152). Food gathering was performed according to strict gender roles. Men fished, hunted larger game, like wallaby and kangaroo, and used bark nets knitted by women to catch eels, emus and other animals. Women, on the other hand, gathered fruits, grubs, roots, plants and hunted smaller animals, like lizards (Miller 1985).

The landscape provided the Wonnarua with all the tools and items they required for daily living. Bark was one of the most common materials used by the Wonnarua, possibly because of its adaptability (Brayshaw 1987: 59). It was utilised in the construction of many things, from shelters and transportation to shields and implements. Cord from different types of bark was also made and was used for a variety of purposes, such as in the weaving of nets or the securing of stone points to spear shafts (Brayshaw 1987: 60-63). The manufacture of string by women was a sight of interest and intrigue for some early Europeans:

*They twist and roll the bark in a curious manner with the palm of the hand upon the leg; with this string they form nets of curious workmanship. In some the meshes are very small and neat, and the whole knit without a knot, excepting at its completion (Ebsworth in Brayshaw 1987: 63).*

With a number of large rivers and creeks in the region, bark canoes were important objects for the Wonnarua. The canoes were usually made from one piece of bark and then shaped with the use of fire which made the material malleable. The Australian Museum's Morrison Collection has two bark canoes from the Hunter Valley region (Nolan 2012: 32). Since the vessels were not built to withstand the rigors of the ocean, Nolan (2012, p. 34)

speculates that they were constructed by one of the valley's inland tribes and used for some of the area's calmer waters.



Figure 3-2: A canoe from the Hunter Valley. It is made from one single piece of bark and was designed for the quiet waters of the area's inland rivers (Australian Museum, 2010).

Along with bark, hard wood was also used to create several different tools. Women's yam sticks, often left undecorated and used in food gathering and preparation, were constructed from wood and were sometimes up to two metres in length (Brayshaw 1987: 65). Hard wood shields and boomerangs were also made.

Boomerangs were important hunting and fighting implements. Their unique, aerodynamic shape enabled the hunter to kill or wound prey from a great distance and, in the hands of a skilled thrower, with great accuracy. They also served as percussive instruments during ceremonies and as fire lighting aids (Australian Museum, 2010.). The Morrison Collection also contains a number of boomerangs from the Hunter Valley region. Since Alexander Morrison sourced many of his artefacts from the St Clair Mission which accommodated a large number of Wonnarua people, it is possible that some of the boomerangs and other objects were made by the Wonnarua (Gray, 2010; Nolan, 2012).

Animals not only provided food for Indigenous communities but a variety of other items. Kangaroo bone was shaped into sewing implements, such as needles, which were needed for making animal skin capes, mending garments or the repair of other goods (Brayshaw 1987:67). Kangaroo and possum skins provided the Wonnarua with warmth and were often sewn together to create articles of clothing, like cloaks or the 'belts' men wore (Brayshaw 1987: 67). A cloak currently housed in the Smithsonian Institute in the United States of America was made in the Hunter Valley and comprises twenty-two possum (*Trichosurus vulpecula*) skins and one grey kangaroo (*Macropus giganteus*) skin (Brayshaw 1987: 72).

Aboriginal people were adept at modifying the landscape to suit their needs (Brayshaw 1987: 20). Fire was one of the tools the Wonnarua people used for 'herding' kangaroos. About a month prior to the hunt, Wonnarua people deliberately burnt areas of grassland, thereby attracting kangaroos when the newly germinated grasses grew some weeks later. One visitor to the region in 1830 observed '*a large flock of kangaroos feeding upon young and tender grass which had sprung up after a fire of the natives*' (Brayshaw 1987: 21). The deliberate lighting of fire also increased an area's biodiversity and facilitated travel by destroying the undergrowth that sometimes-made movement through the country more arduous. The Wonnarua also altered waterways by creating weirs and fish traps to assist in the sourcing of fish, eels and other water creatures. This was sometimes achieved by the use of grasses (Brayshaw 1987: 77).

### 3.12 Post European Settlement

The first official European excursion into the Hunter Valley occurred in 1801 when Lieutenant-Colonel Paterson led a party of men along the Coal River (later Hunter River) to explore the region's coal supplies (Brayshaw 1987: 9). Just over a decade later, Europeans were residing at Patersons Plains and Wallis Plains (now known as Maitland) (Umwelt 2011). The establishment of a penal colony at Port Macquarie from 1804 to 1821 slowed the

area's settlement but by 1821, the area near Ravensworth had been occupied by the new arrivals, thereby making James Bowman's Ravensworth property the most northern settlement in the valley. By 1826 surveying of the central Hunter Valley had been completed by Henry Dangar which only served to open it up to further development and exploitation (Brayshaw 1987: 9). Soon after completing his survey, Dangar commented on the speed of the transformation, writing that

*'... this division of country ... which, in 1822, possessed little more than its aboriginal [sic] inhabitants, in 1826-7, more than half a million of acres were appropriated and in a forward state of improvement' (Brayshaw 1987: 10).*

The Hunter Valley was one of the first areas in the new colony to be settled outside of Sydney and Newcastle. Land with river frontages along the Goulburn and Hunter Rivers and their larger tributaries were the first properties to be acquired by the new occupants. By 1827, 25% of the valley had been appropriated by Europeans (Daly & Brown 1964: 53). For the new settlers, the region *'seemed [like] a pastoral arcadia of thinly wooded alluvial flats, long grass and abundant game'* where profits could be readily made (Nolan 2012: 15). In 1826, one man commented that *'in all these luxuriant plains there is scarcely a superfluous tree to be seen... [The land is] is only requiring the instrumentality of the plough to produce abundant crop'* (Nolan 2012: 15).

With European settlement, radical changes to the landscape soon followed. Tracts of land were denuded of the already relatively sparse timber to make way for agriculture and livestock and coal was mined to build, develop and power the new colony. According to Dangar, 25,000 horned cattle and 80,000 sheep soon roamed the Valley (Brayshaw 1987: 10). Animals not only damaged native vegetation by eating and stamping on it, but also necessitated the felling of trees and the parcelling of land with fences to contain them and support the people who were entrusted with their care. Such actions affected the habitats and habits of the plants and animals that were central to the day to day existence of the Wonnarua.

As Europeans appropriated the central Hunter Valley for their own purposes, the Wonnarua were forced off their lands. Initially the settlers occupied the best, flat locations along rivers and creeks but soon spread further afield as they appropriated more and more land. This forced Indigenous clans to retreat further and further inland. Consequently, they were driven to seek resources beyond their traditional boundaries in ways that contravened millennia old systems of obligations, customs and responsibilities, and led to conflict with neighbouring groups. As Fawcett (1898: 152) described in 1898:

*Their tribal boundaries were both well-defined and clearly understood both by themselves and the members of their neighbouring tribes. So strictly were all rights and privileges understood, that for one tribe to enter into the district of another in pursuit of game was considered an offence of great magnitude and a good ground for a hostile meeting.*

As displacement became more widespread, violent disputes between the Wonnarua and European settlers intensified. Initially when Europeans settled in the region *'the natives were acknowledged to be a harmless, inoffensive race of people, and for the first two or three years they continued on the best terms with the colonists. Subsequently, however, quarrels arose through their ignorance of [English] laws relative to the right of property'* (Breton 1833: 218-219). For the Europeans, land ownership equated to rights (such as restricted access) yet for the Wonnarua, it concerned both rights and obligations. While the new settlers saw the taking of their stock as theft, and therefore punishable, the Indigenous community perceived it very differently (Umwelt 2011). Not surprisingly, relations between the two deteriorated.

Some people in the Hunter Valley, like Reverent Lancelot Threlkeld, believed they were *'in a state of warfare'* with the Indigenous population and, in 1826, landowners petitioned Governor Darling for protection from the armed *'tribes of black natives'* as they feared the *'revenge and depredation of these infuriated and savage people'* (Umwelt 2011). Darling's response to the petition *'encouraged the settlers to use 'vigorous measures' to establish ascendancy over the Aboriginal resistance, resulting in the forming of many vigilante groups'* (Umwelt 2011). European arms soon proved too powerful and that resistance by the valley's original occupants had largely ceased by 1830, less than three decades after Europeans arrived in the area.

The ensuing breakdown of Indigenous communities is largely attributed to the dispossession of their land, and the subsequent loss of traditional lifestyle, but this is not the only cause. The onset of new, introduced diseases, such as measles and small pox, and infections such as sexually transmitted syphilis, decimated communities as they had no natural resistance to these ailments. The smallpox epidemic of 1789 killed many even before Europeans had forayed beyond Sydney and this was followed by a second outbreak in 1829-31 (Brayshaw 1987: 49). A submission from the Reverend William Ross, Minister of the Church of Scotland to a Select Committee of Inquiry, established to investigate Aboriginal affairs in the colony in 1846, noted that *'the number [of Indigenous people] has greatly diminished; within the last seven years the decrease has certainly been one-third of the number'*. The writer explained that the camps of between eighty and ninety people he had seen seven years earlier were now no more than twenty-five (Select Committee on the Condition of the Aborigines, 1846).

Deaths resulting from disease or sickness frequently affected those most vulnerable - the young and the elderly, which had profound ramifications on Aboriginal communities long into the future. The death of the elderly not only meant that there were fewer and fewer elders to guide and unite communities, but also that the passing down of important responsibilities, teachings and knowledge from one generation to the next was irrevocably interrupted. The death of the young resulted in smaller communities since births could no longer replace those lost. The inability to produce future generations was further hampered by the spread of sexually transmitted diseases which left a large number of Indigenous adults infertile and increased the number of miscarriages and still births. Fawcett (1898: 153) lamented that *'half a century of British debauchery, disease, and vice and their accompaniments, have almost wiped [the Wonnarua] out altogether. A few years and their land will know them no more'*.

With the loss of their land and lifestyle, the Wonnarua were forced to rely ever more on European settlers. According to Umwelt (2011) the traditional way of life for the Wonnarua, including the continuation of their ceremonies, had all but gone by the 1870s and they began to increasingly adopt the ways of Europeans. Initially, Aboriginal farm labourers and itinerant workers were sought after but this declined from the middle of the 1870s for a variety of reasons, including the introduction of wire fencing (which reduced the number of required farm hands) and the arrival of more white workers in the region.

Others settled on religious or government run reserves or missions. From the 1860s, reserves became increasingly popular in New South Wales as they were perceived as a means of controlling and attending to the welfare of Indigenous populations. The missions also provided Colonial authorities with the opportunity to 'civilise' Aboriginal people by teaching them the English way of life, from customs and beliefs to daily activities and language [Nolan 2012, p. 24]. Seldom does such civilisation come at such a high price.

From 1890, many of the local Indigenous population, including *Wonnarua, Awabakal, Worimi and Darkinung* people, resided at the St Clair mission. Founded by Reverend J S White, the sixty-acre property was established in Carrowbrook, between Muswellbrook and Singleton (Nolan 2012). There the residents farmed the land whilst maintaining some traditional aspects and rituals of their culture. In 1905, the Baptist run Aborigines Inland Mission took over the site and the continuation of traditional ways was no longer acceptable (Gray 2010). In 1918, the site came under the control of the Aborigines Protection Board and was renamed the Mount Olive Reserve. Under the new managers, adherence to strict rules was expected and any breaches resulted in removal (Umwelt, 2011). The reserve remained operational until 1923 when it closed, forcing its residents to move elsewhere. Many of these twice dispossessed people chose to settle around the township of Singleton and the surrounding region.

## 3.2 Post-Contact Land Use within the MCCO Additional Project Area

### 3.2.1 Agriculture

Most of the native vegetation within and surrounding the MCCO Additional Project Area exists as either a highly disturbed remnant or re-growth from extensive historical clearing for agriculture. The MCCO Additional Project Area has a long history of agricultural use, including crops, olive groves and more recently extensive cattle grazing. As such, the grasslands across much of the area are either pasture improved, or the quality of the grasslands has been heavily reduced by grazing. The higher quality vegetation occurs in the steeper areas of the MCCO Additional Project Area however most of this area still exhibits some form of modification, either from timber collection, recreational use or cattle grazing.

Land parcels situated within the MCCO Additional Project Area are currently used for low intensity grazing. The land use to the north and east are further areas of Mangoola owned grazing land and existing biodiversity offsets. Land to the immediate north-west and west includes a parcel of forested Crown Land and private grazing properties. The MCCO Additional Project Area is bordered to the south by the existing Mangoola Coal Mine, with a small parcel of Crown land associated with a Travelling Stock Route (TSR) being located at the corner of Wybong Post Office Road and Wybong Road (outside the MCCO Project Area).

The predominant land uses within the localities surrounding the MCCO Project Area include grazing, intensive agriculture, vineyards, olive plantations, rural residential and commercial land uses. Other surrounding land uses include bushland and community uses (including the Wybong Hall).

### 3.2.2 Mining

As identified above, current and historic land uses within the MCCO Project Area include agriculture, recreational uses and, to the south of Wybong Road, open cut coal mining in the approved Mangoola Coal Mine.

Within the MCCO Additional Project Area other disturbances include infrastructure installations such as former and current Electricity Transmission Lines and approved mine related activities such as exploration drill pads.

Mining related disturbances, such as drill pads, were subject to due diligence inspections prior to the works commencing (Umwelt 2017, EMM 2017).

Mining activities within the localities surrounding the MCCO Project Area include the existing coal mining operations of Mount Pleasant (9 kilometres north east), Bengalla (10 kilometres east) and Mount Arthur Coal (12 kilometres south east).

### 3.3 Approvals History

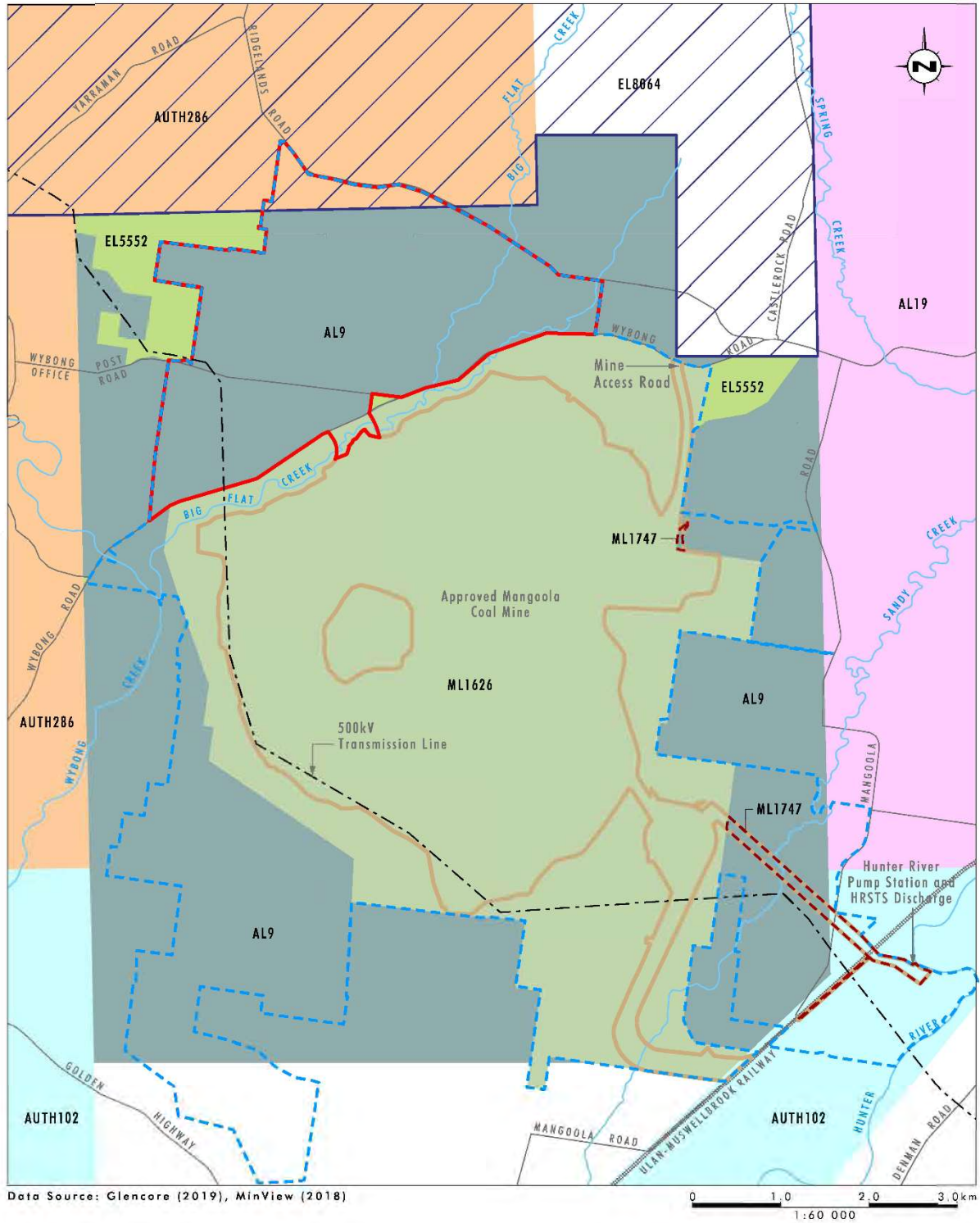
The MCCO Project Area includes the existing approved Project Area for Mangoola Coal Mine and the MCCO Additional Project Area as shown in Map 3-1, below.

Mangoola has operated the Mangoola Coal Mine since mining commenced at the site in September 2010 in accordance with Project Approval 06\_0014 which was originally granted in June 2007 under Part 3A of the NSW Environmental Planning & Assessment Act 1979 (EP&A Act).

Mangoola currently holds mining tenements covering the existing operations, the MCCO Additional Project Area and surrounding lands. These tenements include Mining Lease (ML) 1626, ML 1747, Assessment Lease (AL) 9 and Exploration Lease (EL) 5552 and are illustrated on Map 3-1. The proposed Additional Mining Area and proposed Emplacement Areas are located entirely within AL 9. The extent of the proposed Additional Mining Area was determined following extensive mineral exploration activities undertaken in accordance with conditions of AL 9 and the Mining Act 1992.

Mangoola Coal has completed extensive mineral exploration activities within the MCCO Additional Project Area to define the extent of further coal resources to the north of Wybong Road.





### Legend

- |  |   |
|--|---|
| <span style="border: 1px solid red; padding: 2px;"> </span> MCCO Project Area  | <span style="background-color: orange; border: 1px solid black; padding: 2px;"> </span> AUTH286 - Secretary of the Department of Planning and Environment |
| <span style="border: 1px solid orange; padding: 2px;"> </span> Approved Mangoola Coal Mine Disturbance Area  | <span style="background-color: #d3d3d3; border: 1px solid black; padding: 2px;"> </span> AL9 - Mangoola   |
| <span style="border: 1px solid red; padding: 2px;"> </span> MCCO Additional Mining Area  | <span style="background-color: #90ee90; border: 1px solid black; padding: 2px;"> </span> EL5552 - Mangoola  |
| <span style="background-color: #f0f0f0; border: 1px solid black; padding: 2px;"> </span> EL8064 - Ridgeland Coal Resources Pty Limited                     | <span style="background-color: #90ee90; border: 1px solid black; padding: 2px;"> </span> ML1626 - Mangoola  |
| <span style="background-color: #ffccff; border: 1px solid black; padding: 2px;"> </span> L19 - Muswellbrook Coal Company Ltd                               | <span style="border: 1px dashed red; padding: 2px;"> </span> ML1747 - Mangoola  |
| <span style="background-color: #e0ffff; border: 1px solid black; padding: 2px;"> </span> AUTH102 - Secretary of the Department of Planning and Environment |   |

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20190327 16.24

Tenements

Map 3-1: Tenements within the MCCO Project Area

## 4 Archaeology of the MCCO Additional Project Area

### 4.1 Aboriginal Archaeological Impact Assessment

The Aboriginal archaeological impact assessment of the MCCO Additional Project Area was undertaken by OzArk. The following section is an edited extract of the archaeological assessment summary report written by Ben Churcher (OzArk).

Assessment of the MCCO Additional Project Area took place with the assistance of the RAPs and Wonnarua Knowledge Holders from 5 February 2018 and included a 13-day survey program and a test excavation program that ran between 15-18 May 2018.

The assessment of the MCCO Additional Project Area recorded 12 artefact scatters and 13 isolated finds. It also re-assessed 49 previously recorded and registered sites that were known to exist in the MCCO Additional Project Area. Therefore, in total, the archaeological assessment considers 74 sites. Most of these sites are stone artefact sites although there are two potential archaeological deposits (PADs) and five rock shelters with PAD in this number.

The impact assessment concluded that there are 26 sites (15 artefact scatters and 11 isolated finds) within the Proposed Disturbance Footprint that will be impacted by the MCCO Project if it is approved.

As a result of information gained during the survey and test excavation, most of the sites (n=24; 92 per cent of all 26 sites liable to be impacted) have been assessed as having low scientific significance. In most cases this is because the sites are low density artefact scatters or isolated finds located in landforms with thin A-Horizon soils where further subsurface archaeological deposits are unlikely. In some cases, the artefacts may be more numerous, but erosion has affected a large percentage of the site and the visible artefacts are displaced and of limited archaeological value. The remaining two sites have been assessed to have a low-moderate or moderate scientific significance. Due to the level of existing disturbance within the Proposed Disturbance Footprint, no sites have been assessed as having a high scientific significance.

#### 4.1.1 Effect of disturbance on the archaeological landscape

The major disturbances within the MCCO Additional Project Area that have altered the archaeological landscape are:

1. Extensive clearing of native vegetation - apart from some small pockets of vegetation in the western portions, the entirety of the MCCO Additional Project Area has been cleared. This would suggest that certain site types, such as scarred trees, will be extremely rare within the MCCO Additional Project Area. In addition, extensive clearing will have encouraged downslope movement of soils. As the MCCO Additional Project Area is generally sloping from north to south, this would indicate that soils, as well as the artefacts that may have been within them, have accumulated in the southern portions of the MCCO Additional Project Area.
2. Soil movement - as noted above, landforms in the north of the MCCO Additional Project Area are within degrading environments, while landforms in the south adjacent to Big Flat Creek are within an aggrading environment. The archaeological implications are that sites in the north may have been displaced or destroyed, while sites in the south are either buried or are representations of artefacts that have accumulated in these more low-lying areas.
3. Cultivation - substantial parts of the MCCO Additional Project Area have historically been cultivated. While cultivation may not completely remove archaeological material from an area, it will, at least in the upper-most levels, severely disturb any archaeological deposits.
4. Erosion - inspection of the MCCO Additional Project Area during the current assessment found that erosive degradation of drainages has been extensive in the past. The drainage systems including Big Flat Creek, have become channelised (perhaps losing their former Chain of Ponds morphology) and many show evidence of bank collapse. Large areas of deep sheet wash erosion are present in the north. Additionally, extensive gully erosion of creek banks and sheet wash erosion of adjacent landforms was identified across the MCCO Additional Project Area. The major tributary to Big Flat Creek in the eastern portion of the MCCO Additional Project Area has been subject to significant modification through erosion. The channelised eastern extent of this tributary is deeply incised and broadens out into a wide sand plain in the west.

In summary, the impact of historical European farming practices within the MCCO Additional Project Area has led to a significant modification of the pre-1788 environment. This includes a marked change in vegetation cover, increased erosion and morphological changes to the local creeks. The impact of all these disturbances on



the archaeological record is profound and any archaeological investigations of areas such as the MCCO Additional Project Area are inevitably examining a depleted and disrupted archaeological landscape.

#### 4.1.2 Archaeological Discussion and Management: Summary

The assessment of the MCCO Additional Project Area recorded 12 artefact scatters and 13 isolated finds. It also re-assessed 49 previously recorded and registered sites that were known to exist in the MCCO Additional Project Area. Therefore, in total, the archaeological assessment considers 74 sites.

### 4.2 Assessment of Scientific Significance

25 new sites were recorded within the MCCO Additional Project Area during the survey consisting of 12 artefact scatters and 13 isolated finds. Of the artefact scatters, nine sites recorded less than 10 artefacts and only one site recorded a high artefact density of over 100 artefacts (MN OS12). Only at three locations was it assessed that there is potential for subsurface deposits: MN OS7 (low–moderate potential); MN OS11 (moderate potential); and MN OS12 (moderate potential). None of the recorded sites was remarkable in its manifestation; either in terms of the types of artefacts recorded, the raw material the artefacts were manufactured from or the density and nature of the surface artefact manifestation. The recorded sites are also very representative of artefact sites in the upper Hunter Valley both in terms of the types of artefacts recorded and the raw materials from which the artefacts were manufactured.

As a result, most newly recorded sites have a low scientific significance as they generally have:

- A low artefact density
- No associated subsurface deposits
- No remarkable features and are generally representative of other artefact sites in the upper Hunter Valley
- A high likelihood of being in a secondary context
- A limited ability to inform on the nature and spatial extent of past Aboriginal occupation in the MCCO Additional Project Area.

Table 4-1 shows the scientific significance of the newly recorded artefact scatters and isolated finds. Under the column 'Justification' a brief explanation is given of those site features that elevate or lower a particular site's scientific significance.

Table 4-1: Scientific significance of newly recorded sites

Site Name	Feature(s)	Potential for subsurface deposits	Scientific Significance	Justification
Mangoola North OS1	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Mangoola North OS2	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Mangoola North OS3	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Mangoola North OS4	Artefacts: 4	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Mangoola North OS5	Artefacts: 11	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Mangoola North OS6	Artefacts: 8	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Mangoola North OS7	Artefacts: 2	Low–moderate	Low–moderate	Low artefact density; some potential for associated subsurface deposits
Mangoola North OS8	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Mangoola North OS9	Artefacts: 6	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Mangoola North OS10	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Mangoola North OS11	Artefacts: 12	Moderate	Low–moderate	Low–moderate artefact density; some potential for associated subsurface deposits
<b>Mangoola North OS12</b>	<b>Artefacts: 100+</b>	<b>Moderate</b>	<b>Moderate</b>	<b>High artefact density; some potential for associated subsurface deposits</b>
Mangoola North IF1	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context

Mangoola North IF2	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF3	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF4	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF5	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF6	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF7	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF8	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF9	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF10	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF11	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Mangoola North IF12	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context

There are 49 previously recorded sites within the MCCO Additional Project Area.

All these sites were re-assessed during the 2018 survey to determine their current condition and significance. Table 4-2 lists the 49 previously recorded sites in the MCCO Additional Project Area. The scientific significance of these sites includes the determination of 'unknown' at some sites, such as the five rock shelter sites, where a PAD has been registered but there is no surface manifestation of artefacts. To accurately determine the scientific values at these sites further investigation, most likely excavation, would be required. Other sites range from low scientific values (in the majority) to a few sites with moderate-high scientific values. These latter sites have been afforded higher scientific values due to the high density of surface artefacts and the high possibility that there are *in situ* archaeological deposits. However, as the sites are also heavily eroded in places, a determination of high scientific values is not made at these sites as there is a high chance, in areas, of disturbance.

Table 4-2: Significance assessment for all previously recorded sites

AHIMS	Site name	Site Type	Scientific Significance	Justification
37-2-0509	Sandy Hollow, Singleton 1	Artefact scatter	Low-moderate	Moderate density of surface artefacts. Some potential for subsurface deposits
37-2-0739	Manobalai-Castle Rock 2	Isolated artefact	Low	Precise location of site is unknown
37-2-0740	Manobalai-Castle Rock 3	Isolated artefact	Low	Precise location of site is unknown
37-2-0741	Manobalai-Castle Rock 4	Artefact scatter	Low	Precise location of site is unknown
37-2-0742	Manobalai-Castle Rock 5	Artefact scatter	Low-moderate	Moderate density of surface artefacts. Some potential for subsurface deposits
37-2-2164	BFC01	Artefact scatter	Low	Artefacts unable to be located
37-2-2190	BFC28	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-2191	BFC29	Artefact scatter	Low	Artefacts unable to be located
37-2-2193	BFC31	Artefact scatter	Moderate	Moderate surface artefact density and some potential for subsurface deposits. Some general disturbances in the area
37-2-3882	BFC69	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-3883	BFC70	Artefact scatter	Low	Artefacts unable to be located
37-2-3884	BFC71	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-3990	BFC90	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-3991	BFC91	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-4109	BFC96	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-4116	BFC92	Artefact scatter	Low	Low artefact density and low probability of

				associated subsurface deposits
37-2-4117	BFC93	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-4118	BFC94	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-4119	BFC95	Artefact scatter	Low-moderate	Moderate density of surface artefacts. Some potential for subsurface deposits
37-2-4491	BFC99	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-4492	BFC100	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-4563	BFC102	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
<b>37-2-4580</b>	<b>BFC107(MDG1)</b>	<b>Isolated artefact</b>	<b>Low</b>	<b>Isolated artefact without associated subsurface deposits. Likely in a secondary context</b>
37-2-4582	BFC109 (MDG3)	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-4863	BFC111	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5425	BFC150	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5428	BCF113A	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-5430	BFC115	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5431	BFC116	Artefact scatter	Low	Moderate artefact density but highly disturbed (erosion) with a low probability of associated subsurface deposits
37-2-5432	BFC117	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5433	BFC118	PAD	Unknown	Undetermined until further investigation can take place
37-2-5434	BFC119	PAD	Unknown	Undetermined until further investigation can take place
37-2-5439	BFC124	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-5440	BFC125	Artefact scatter	Moderate	Moderate-high artefact density and moderate probability of associated subsurface deposits
37-2-5441	BFC126	Artefact scatter, PAD	Moderate-high	High artefact density and high probability of associated subsurface deposits
37-2-5442	BFC127	Artefact scatter, PAD	Moderate-high	High artefact density and high probability of associated subsurface deposits
37-2-5443	BFC128	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place. Preliminary assessment would indicate that PAD is unlikely due to the slope of the rockshelter floor and the restricted depth of potential deposit
37-2-5444	BFC129	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place. Preliminary assessment would indicate that PAD is unlikely due to the slope of the rockshelter floor and the restricted depth of potential deposit
37-2-5445	BFC130	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place. Preliminary assessment would indicate that PAD is unlikely due to the slope of the rockshelter floor and the restricted depth of potential deposit
37-2-5446	BFC131	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place. Preliminary assessment would indicate that PAD is unlikely due to the small size of the rockshelter
37-2-5447	BFC132	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place
37-2-5448	BFC133	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5449	BFC134	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context

37-2-5450	BFC135	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-5451	BFC136	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-5452	BFC137	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5480	MCO001	Isolated artefact	Low-moderate	Now recorded as an artefact scatter with a moderate density of surface artefacts. Some potential for subsurface deposits
37-2-4490	BFC98	Artefact Scatter		Salvaged
<b>37-2-5429</b>	<b>BCF114A</b>	<b>PAD</b>		<b>Site was situated on an undifferentiated, sloping landform on thin soils. Nearby watercourse was assessed as a modified drainage, rather than a true creek. As such, the presence of a PAD was assessed as unlikely. BC114A was investigated in the test excavation program.</b>

#### 4.2.1 Likely Impacts to Aboriginal Cultural Heritage as a result of the Project

The preceding investigation has determined that there are 74 known Aboriginal sites in the MCCO Additional Project Area consisting of:

- 25 newly recorded sites,
- 49 previously recorded sites (BFC98 has been salvaged under permit and BFC114a has been determined to be 'not a site').

Of these 74 sites, 26 are located within the Proposed Disturbance Footprint and will be impacted should the MCCO Project be approved.

Table 4-3 lists the 26 sites within the Proposed Disturbance Footprint. Most of the sites that will be impacted by the MCCO Project have a low scientific significance. Only two sites have higher values, with one having moderate scientific values and the other having low-moderate scientific values.

Table 4-3: Sites within the Proposed Disturbance Footprint

AHIMS	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Scientific significance
37-2-0741	Manobalai-Castle Rock 4	282366	6429691	Artefact Scatter	Low
37-2-2193	BFC31	281240	6426955	Artefact Scatter	Moderate
37-2-3884	BFC71	279867	6427119	Isolated Find	Low
37-2-3990	BFC90	281031	6428000	Artefact Scatter	Low
37-2-4116	BFC92	281209	6427089	Artefact Scatter	Low
37-2-4117	BFC93	281221	6427043	Artefact Scatter	Low
37-2-4118	BFC94	281279	6427036	Artefact Scatter	Low
37-2-4119	BFC95	281295	6427016	Artefact Scatter	Low- moderate
37-2-4491	BFC99	280346	6427883	Isolated Find	Low
37-2-4492	BFC100	280903	6427775	Isolated find	Low
37-2-4563	BFC102	279819	6426539	Artefact Scatter	Low
37-2-5425	BFC150	281157	6427427	Isolated Find	Low
37-2-5428	BFC113A	280986	6428161	Isolated Find	Low
37-2-5430	BFC115	281046	6428510	Isolated Find	Low
37-2-5431	BFC116	280994	6428280	Artefact Scatter	Low
37-2-5432	BFC117	280935	6428081	Isolated Find	Low
37-2-5449	BFC134	280473	6428323	Artefact Scatter	Low
Pending	MN OS9	280665	6426947	Artefact Scatter	Low
Pending	MN OS8	281323	6427157	Artefact Scatter	Low
Pending	MN OS6	281484	6427507	Artefact Scatter	Low
Pending	MN OS4	280897	6428031	Artefact Scatter	Low
Pending	MN OS1	281109	6429054	Artefact Scatter	Low
Pending	MN IF3	282813	6428831	Isolated Find	Low
Pending	MN IF5	281343	6428107	Isolated Find	Low
Pending	MN IF6	281266	6427960	Isolated Find	Low
<b>Pending</b>	<b>MN IF11</b>	<b>281179</b>	<b>6427171</b>	<b>Isolated Find</b>	<b>Low</b>

## 4.2.2 Impacts to a former portion of ACHOA-5

As part of the original approval for the Mangoola Coal Mine a conservation area was proposed along Big Flat Creek (ACHOA-5) which shared both ecological and archaeological values. During the planning phase for this Project it was identified that an access corridor would be required across Big Flat Creek and Wybong Road to link the two operational areas.

As such, approximately 12.0 ha of originally proposed area of ACHOA-5 is located within the MCCO Additional Project Area. Of this, approximately 4.20 ha lies within the Proposed Disturbance Footprint and is proposed to be impacted by the MCCO Project should it be approved. This represents approximately 1% and 0.4% of all ACHOA area currently managed by Mangoola respectively.

This portion of the former ACHOA has been excised from the Voluntary Conservation Agreement (VCA). This VCA application will ensure the protection of the remaining portion of ACHOA-5 in perpetuity.

The overpass area providing connection to the MCCO Project contains five sites that are within the Proposed Disturbance Footprint and will be impacted by the MCCO Project. These sites are 37-2-4117 (BFC93: low scientific significance); 37-2-4116 (BFC92: low scientific significance); 37-2-4119 (BFC95: low-moderate scientific significance); 37-2-4118 (BFC94: low scientific significance); and 37-2-2193 (BFC31: moderate scientific significance).

To mitigate the loss of scientific values at these sites, a program of limited manual excavation is proposed to take place in the former portion of ACHOA-5 so that information regarding the nature and extent of these sites is captured, but only after project approval. This methodology is detailed within the MCCO Aboriginal Archaeology Assessment Report.

## 4.3 Archaeological Management of Known Aboriginal Sites

### 4.3.1 Archaeological salvage

As a result of the current assessment, 26 sites have been recorded within the Proposed Disturbance Footprint. 45 sites in the MCCO Additional Project Area will be avoided as they are located outside of the Proposed Disturbance Footprint. As seen in Table 4-4, the most common management strategy recommended on archaeological grounds alone is for the salvage of a site through the recording and collection of surface artefacts. This recommendation is made due to:

- The nature of the recorded sites (93% of sites are isolated finds or low-density artefact scatters with no associated subsurface deposits)
- Generally thin A-Horizon soils that preclude subsurface archaeological deposits
- Being generally located in landforms of lower archaeological potential (i.e. in areas distant to reliable water)
- Generally high previous disturbance from a range of factors including erosion and land use practices
- The low archaeological values assigned to the sites.

Sites designated for surface artefact collection have a very limited ability to further inform the community about the history and culture of the area. While any potential research questions are limited, some information can nevertheless be gained.

Table 4-4 sets out the recommended archaeological management of all sites within or adjacent to the Proposed Disturbance Footprint.

Table 4-4: Management recommendations for sites within the Proposed Disturbance Footprint

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
37-2-0741	Manobalai-Castle Rock 4	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-2193	BFC31	Artefact Scatter	Moderate	Total (Although the site spans the Proposed Disturbance Footprint boundary, it is recommended that the entire site be salvaged.)	Moderate surface artefact density and some potential for subsurface deposits. Some general disturbances in the area	Archaeological excavation as the site is located within a former portion of ACHOA-5 and was intentionally not investigated during the test excavation program.
37-2-3884	BFC71	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact

37-2-3990	BFC90	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-4116	BFC92	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-4117	BFC93	Artefact Scatter	Low	Total	Low density artefact scatter	Archaeological excavation as the site is located within a former portion of ACHO-5 and was intentionally not investigated during the test excavation program. Excavation at this site to sample northern bank of Big Flat Creek.
37-2-4118	BFC94	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-4119	BFC95	Artefact Scatter	Low-moderate	Total	Moderate surface artefact density and some potential for subsurface deposits. Some general disturbances in the area	Archaeological excavation as the site is located within a former portion of ACHOA-5 and was intentionally not investigated during the test excavation program.
37-2-4491	BFC99	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-4492	BFC100	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-4563	BFC102	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-5425	BFC150	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5428	BFC113A	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5430	BFC115	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5431	BFC116	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-5432	BFC117	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5449	BFC134	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
Pending	MN OS1	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
Pending	MN OS4	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
Pending	MN OS6	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
Pending	MN OS8	Artefact Scatter	Low	Total	Low density artefact scatter	Archaeological excavation as the site is located within a former portion of ACHOA-5 and was intentionally not investigated during the test excavation program. Excavation at this site to sample northern bank of Big Flat Creek.
Pending	MN OS9	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
Pending	MN IF3	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
Pending	MN IF5	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
Pending	MN IF6	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
Pending	MN IF11	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact

### 4.3.2 Sites requiring specific management to prevent harm

There are four sites that are closely adjacent to the Proposed Disturbance Footprint and may be unintentionally harmed by the MCCO Project unless specific management is undertaken to avoid impacts. Due to their proximity to proposed works, these sites are at greater risk of unintentional impact when compared to sites located

further away. These sites should be permanently fenced and signed prior to works beginning to provide adequate protection.

Table 4-5: Sites requiring specific management to ensure conservation

AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	site type	Scientific significance
37-2-0742	Manobalai-Castle Rock 5	283181	6429240	Artefact Scatter	Low-moderate
37-2-5433	BFC118	282324	6428173	PAD	Unknown
37-2-5480	MCO001	283039	6428912	Artefact Scatter	Low
Pending	MN OS5	279841	6427694	Artefact Scatter	Low

### 4.3.3 Management of blast impacts

There are five previously registered rock shelters with PAD within the Project Area: BFC128 (37-2-5443); BFC129 (37-2-5444); BFC130 (37-2-5445); BFC131 (37-2-5446); and BFC132 (37-2-5447).

All rock shelters were inspected during the survey and none recorded any evidence of Aboriginal occupation and all were regarded as being very unlikely to contain PAD. However, they have been registered on AHIMS and so there are two courses of possible action:

- Undertake archaeological excavations within the rock shelters to determine if they are sites or not; or
- Undertake to preserve the sites in situ. This would mean ensuring that blast impacts were managed to ensure that no harm came to the shelters or the potential deposits within them.

The blast assessment completed by Enviro Strata Consulting as part of the MCCO EIS has not identified any significant ground vibration levels that are likely to cause impacts to the identified rockshelter sites. As per the current operation, an assessment of blast impacts will be undertaken on a yearly basis by an independent consultant for the Project to ensure that there are no impacts occurring to these sites as a result of blasting by the project. It is recommended that the rockshelter sites be included in the annual site condition monitoring requirements.



## 5 Aboriginal Community Consultation

Aboriginal people have rights and interests in the assessment and control of cultural heritage objects and places. In recognising these rights and interests, all parties concerned with identifying, conserving and managing cultural heritage should acknowledge, accept and act on the principles that Aboriginal people:

- are the primary source of information about the value of their heritage and how this is best protected and conserved;
- must have an active role in any Aboriginal cultural heritage planning process;
- must have early input into the assessment of the cultural significance of their heritage and its management so they can continue to fulfil their obligations towards their heritage; and
- must control the way in which cultural knowledge and other information relating specifically to their heritage is used, as this may be an integral aspect of its heritage value.

Consultation with Aboriginal people about cultural heritage places and the way those places should be managed is required under Part 6 of the NP&W Act. The processes of consultation are specifically outlined in the Department of Environment, Climate Change and Water publication 'Aboriginal cultural heritage consultation requirements for proponents 2010'.

This project has followed these guidelines and has also been consistent with the DECC 2005 guidelines.

Table 11.1 outlines the extensive series of consultation activities and workshops conducted by the MCCO Project throughout the preparation of this ACHAR.

### 5.1 Consultation Objectives and Approaches

*'Consultation with Aboriginal people is an integral part of the process of investigating and assessing Aboriginal cultural heritage. Aboriginal people who hold cultural knowledge about the area, objects and places that may be directly or indirectly affected by the proposed activity must be given the opportunity to be consulted. This is done through the process of investigating, assessing and working out how to manage the harm from the proposed activity. Consultation must adhere to the requirements set out in Clause 80C of the NPW Regulation' (OEH 2011:2).*

*'Conservation, interpretation and management of a place should provide for the participation of people for whom the place has special associations and meanings, or who have social, spiritual or other cultural responsibilities for the place' (Australia ICOMOS 1999).*

Based on the SEAR's and OEH guidelines for Aboriginal cultural heritage assessment in NSW, Aboriginal participation and involvement in all stages of cultural heritage assessment and management has been fundamental to the MCCO Project's ACHAR.

After formal notification and expressions of interest in the MCCO Project by the RAPs, Project staff approached the Knowledge Holder groups (WNAC, Gomeroi and the PCWP) to understand if they wished to use the consultation model that has been developed during the consultation process for other Glencore sites (namely the Bulga Optimisation Project, the Mt Owen Continued Operations Project and the United Wambo JV Project).

PCWP chose to provide their own cultural values assessment report to the MCCO Project, while the WNAC and Gomeroi participated in the site visits and workshops facilitated by ACHM and Mangoola.

Fundamental to the consultation process was the active participation of all RAPs in the assessment of Project impacts, and the development of management recommendations and measures relevant to the Aboriginal cultural significance values statements and assessment concerns.

The steps employed in the cultural heritage assessment for the MCCO Project include(d):

- Extensive workshop discussions with the Community RAPs
- RAPs statements of cultural values, survey methodology comments and sharing of historic information including Project area land use context statements;
- Reference to OzArk archaeological reports to gain an understanding of other components of the Aboriginal cultural heritage assessment;
- Facilitation of RAPs consultation on the cultural values of the MCCO Additional Project Area, and where required, Walks on Country to discuss Aboriginal cultural heritage values;
- Archival investigation;

- Consultation with OEH; and
- Assessment of the key cultural heritage issues for the MCCO Project, considering relevant guidelines, policies and plans and input from RAPs including Traditional Owners and Knowledge Holders.

As an outcome of this process, this ACHAR presents a combined understanding of Aboriginal cultural heritage values of the MCCO Additional Project Area, as identified by all RAPs, historical research and the archaeological assessment.

This ACHAR also presents an impact assessment that incorporates the views of all RAPs and presents a series of management measures and recommendations that have been prepared in consultation with the RAPs.

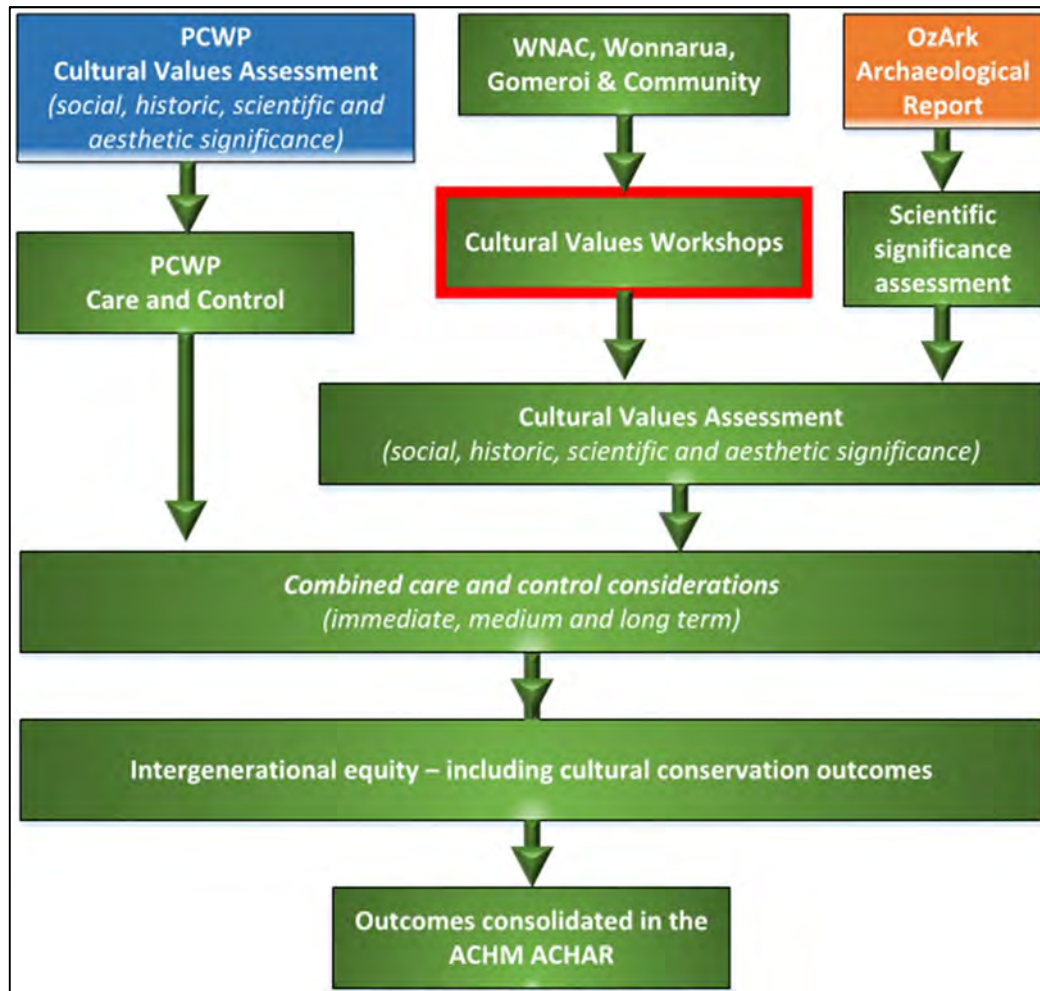


Figure 5-1: Integrated ACHAR approach.

The following sections provide a summary of the key stages of consultation with and involvement of all of the RAPs in the preparation of the ACHAR, excluding a description of the consultation undertaken for the separate report prepared by the PCWP and the report information compiled in consultation with the Community RAPs. Figure 5-1 (above) illustrates how the information gathered from both workshops and the PCWP assessment sources, combined with the results of the MCCO Project's archaeological assessment have been prepared to provide a comprehensive assessment of cultural significance values of the Proposed Disturbance Footprint in the MCCO Additional Project Area, and to provide a consolidated management framework for the MCCO Project based on intergenerational equity and Care and Control considerations.

## 5.2 Cultural Heritage Assessment Process for the Project

The key stages of the cultural heritage assessment process used by the MCCO Project are derived from the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011).

The stages of consultation and assessment, as described in the Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005) include:

- Undertaking a preliminary assessment to determine if the MCCO Project is likely to have an impact on Aboriginal cultural heritage

- Identifying the Aboriginal cultural heritage values associated with the area through consultation with Aboriginal people with cultural knowledge or responsibilities for country in which the proposed project occurs, written and oral research and field investigations
- Understanding of the significance of the identified Aboriginal cultural heritage values
- Assessing the impacts of the proposed development on Aboriginal objects and Aboriginal places
- Describing and justifying the proposed outcomes and alternatives, and
- Documenting the Aboriginal cultural heritage impact assessment and the conclusion and recommendations to afford appropriate protection of Aboriginal cultural value.

### 5.2.1 Four Stages of Consultation and Assessment

Consultation consistent with the DEC (2005) and DECCW (2010a) guidelines and in accordance with the principles of The Burra Charter (Australia ICOMOS, 2013) has involved four consultation stages as detailed in the DECCW (2010a) guidelines outlined below.

**Stage 1:** During Stage 1 the MCCO Project undertook formal notification of the proposed Project and the ACHAR process, and the opportunity for Aboriginal parties to formally register their interest in the MCCO Project. Stage 1 of the DECCW (2010) consultation process aims to *'Identify, notify and register Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and / or places in the area of the proposed Project'*.

### 5.2.2 Agency Notification

In accordance with Section 4.1.2 of DECCW (2010), the MCCO Project notified the following organisations on 5th October 2017 about the MCCO Project, and sought information on any Aboriginal people or organisations who may hold cultural knowledge relevant to determining the cultural significance associated with the MCCO Additional Project Area:

Table 5-1: Agency Notifications

Agency	Date Notified	Date Response	Response
Wanaruah Local Aboriginal Land Council (WLALC)	05/10/2017	20/10/2017	Provided extensive list of RAP's not necessarily represented by or associated with the WLALC
Office of the Registrar of Aboriginal Land Rights Act (ORLAR)	05/10/2017	10/10/2017	Advised that there were no Registered Aboriginal Owners pursuant to Division 3 of the Aboriginal Land Rights Act 1983
Office of Environment and Heritage (OEHL)	05/10/2017	11/10/2017	Responded with list of individuals who might have interests in the MCCO Additional Project Area
Native Title Services Corporation (NTSCorp)	05/10/2017	20/11/2017	Advising that NTSCorp represent the Gomeroi People native title claimants
National Native Title Tribunal (NNTT)	05/10/2017	05/10/2017	Advised that Gomeroi People and Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People have overlapping native title claims over the MCCO Additional Project Area
Muswellbrook Shire Council (MSC)	05/10/2017	16/10/2017	Provided contact details for WLALC and HVAC
Hunter Local Land Services (HLLS)	05/10/2017		No response

### 5.2.3 Public Notification

Advertisements were placed in the following publications seeking registrations of interest for the MCCO Project

- Hunter Valley News (published 11th October 2017)
- Muswellbrook Chronicle (published 13th October 2017)

A copy of these advertisement is provided in **Appendix 11.3.2**.

### 5.2.4 Written Notification to invite Participation in the ACHAR Process

Following the newspaper advertisements and correspondence mentioned above, a comprehensive list was developed containing the contact details of 91 Aboriginal parties. A written notification was posted to each of these between 26th-30th October 2017 to provide the opportunity to register an interest and participate.

In accordance with Section 4.1.6 of DECCW (2010a) guidelines, on the 14th December 2017 a copy of the following documentation was provided to OEH and WLALC at the end of the formal Stage 1 registration period:

- The Advertisements placed in the Muswellbrook Chronicle and the Hunter Valley News;
- Copies of original letters sent to Aboriginal parties notifying them of the MCCO Projects Aboriginal cultural heritage assessment process; and
- A list or record of those Aboriginal parties who registered an expression of interest in the MCCO Project's Aboriginal cultural heritage assessment.

As specified in Section 4.1.5 of DECCW (2010a) guidelines, all RAPs were afforded the opportunity to withhold their information being provided to OEH.

A copy of the initial letter sent to the identified individuals and organisations is shown in **Appendix 11.3.1**.

## **5.2.5 Registration of Aboriginal Parties**

In accordance with Section 4.1.3 of DECCW (2010), all 91 Aboriginal parties identified through the process noted above were sent notification letters, introducing the MCCO Project and inviting their registrations of interest by 13th November 2017. By 14th December 2017 the MCCO Project had 37 Registered Aboriginal Parties.

A full list of all RAPs is included in **Appendix 11.2**.

**Stage 2:** Mangoola, OzArk, and ACHM conducted initial Project description consultation, which included presenting information on the proposed Project to all Aboriginal parties who registered an interest in Stage 1. Four of these Aboriginal stakeholder groups asked to be consulted separately. Copies of this information was shared with all RAPs. Consultation with the RAPs involved a combination of consultation forums, including meetings, briefing sessions and included inspections of the MCCO Additional Project Area. Stage 2 also included the briefings to the PCWP, Gomeroi and WNAC groups. In accordance with Section 4.2.1 of DECCW (2010a), the RAPs who had registered an interest in the MCCO Project during Stage 1 were sent a letter on 19th-22nd February 2018 inviting their participation in the archaeological surveys commencing on the 5th February 2018.

## **5.2.6 ACHAR Agreement with PCWP**

Through the consultation during **Stage 2** PCWP elected to produce their own ACHAR. The PCWP report was to be completed and delivered to Mangoola with a comprehensive assessment of the cultural values of the MCCO Additional Project Area from the PCWP's perspective, and to provide management recommendations for the MCCO Project. These recommendations were to specifically address intergenerational equity as well as Care and Control considerations.

The remaining RAP's and Knowledge Holder groups were consulted during sessions facilitated by Mangoola and ACHM.

## **5.2.7 Draft Archaeological Survey Methodology**

In accordance with Sections 4.2, 4.3.1 and 4.3.2 of DECCW (2010a), the Draft Archaeological Survey Methodology, including a Project Community Information Sheet was mailed out to Registered RAPs for comment (28-day review) on 15th December 2017. MCCO received positive feedback from a number of RAPs. This feedback is presented in **Appendix 11.3.6**.

## **5.2.8 Draft Archaeological Test Pitting Methodology**

In accordance with Sections 4.2, 4.3.1 and 4.3.2 of DECCW (2010a), the Draft Archaeological Test Pitting Methodology and archaeological survey results summary was sent out to RAPs for comment (28-day review) on 6th April 2018. MCCO received positive feedback from a number of RAPs. This feedback is presented in **Appendix 11.3.21**.

**Stage 3** of the DECCW (2010a) consultation process relates to (a) gathering information about the cultural significance and cultural values of an assessment area, (b) seeking Aboriginal registrant information that will enable the cultural significance of the place to be determined and (c) providing Aboriginal registrants with the opportunity to provide input on cultural heritage management options.: During Stage 3, OzArk conducted extensive archaeological fieldwork and ACHM conducted cultural values workshops and consultation with WNAC, Gomeroi and the Community RAPs. The PCWP chose to conduct their own consultation, which is presented in **Appendix 11.6**

As part of the overall assessment approach, Mangoola also conducted regular consultation; and provided support and advice to the PCWP, Gomeroi and WNAC in relation to the MCCO Project, and specifically in relation to the preparation of separate ACHAR's or targeted cultural values workshops. To assist the groups, Mangoola provided access to materials and facilitated land access, to enable these groups to assess their cultural heritage

values, the significance of Aboriginal cultural places and artefacts, the likely Project impacts, if approved, and their management measures. Many of the RAPs were also involved in the archaeological fieldwork.

Some of the RAPs also provided comment on site specific and cultural, social, historic and aesthetic values, which included the significance of archaeological and cultural sites, and values associated with flora and fauna and landscape features to inform the assessment and management measures.

The MCCO Project and ACHM conducted workshop sessions during Stage 3 to review and discuss the Community RAPs and the Knowledge Holder group values and recommendations, prior to the issue of the ACHAR reports for their 28-day review period. This approach provided the opportunity for all RAPs to discuss recommendations and to provide further comment on Aboriginal cultural heritage values and management measures.

During **Stage 3** activities included:

- Proposal from PCWP to undertake their own cultural values assessment (contracts exchanged).
- WNAC cultural values site visit and closed values meeting / workshops (held 9-10 May and 17-21 September 2018). The discussions from the 17th September meeting were not to be disclosed.
- Gomeroi cultural values site visit and workshops (held 9-10 May and 17 September 2018)
- Community RAP cultural values site visit and workshops (held 9-10 May and 17 September 2018)
- Hickey Family cultural values workshop (held 20 September 2018)
- Invitations to RAP's for participation in the archaeological survey (sent out 19th January 2018)
- Invitations to RAP's for participation in the archaeological test pitting (sent out 6th April 2018)
- Archaeological survey (13 days fieldwork)
- Archaeological test excavation (1-day fieldwork).

### 5.3 Stage 4 Consultation – Draft ACHAR Review

**Stage 4:** Mangoola, OzArk and ACHM conducted further consultation in relation to the RAPs review of the MCCO Projects draft cultural heritage assessment report, to seek feedback, modify reports as appropriate, receive and review submissions and to incorporate any additional input into the finalised ACHAR.

Stage 4 of the DECCW (2010a) consultation process relates to RAPs reviewing the draft ACHAR and providing feedback.

Each of the RAPs was contacted by phone and asked how they would like to receive the Draft ACHAR. The options were either by email (file transfer) or by Express Post (hard copy).

A hard copy was sent by default to any of the RAPs who could not be contacted.

Draft copies of the ACHAR were dispatched to all RAP's on the 19th December 2018.

This communication also informed the RAPs that the 28-day review period would end on 25th January 2019 (however this was subsequently extended by several days). Comments on the Draft ACHAR were received from 6 RAPs.

Copies of the feedback received from the RAPs on the draft ACHAR is included in **Appendix 11.4**.

#### 5.3.1 Comments on the Draft ACHAR

The majority of feedback received about the draft ACHAR was of a positive nature and supportive of the manner in which the ACHAR process had been conducted. Following the 28-day review period a total of six comments (see Appendix 11.4) were received including five comments that were largely supportive of the content of the draft ACHAR and were mainly in relation to the archaeological investigation completed as part of the AAIA. The AAIA provided additional response to some of the comments raised in the submissions received and is provided in Appendix 11.5.

The only negative commentary received during the entire ACHAR process came from the Wanaruah Local Aboriginal Land Council (WLALC) and indicated that the WLALC represented 3,000-4,000 Wonnarua people of the Hunter Valley. The comments from the WLALC were, in part, critical of the ACHAR approach undertaken however did not introduce further additional material from Traditional Owners relevant to the MCCO Additional Project Area.

The ACHAR is not intended to be a work of exhaustive historical scholarship, but an attempt to capture the contemporary cultural values and views of those Aboriginal people who registered an interest in participating in the consultation and fieldwork program for the MCCO Project. The ACHAR has covered the items raised in the



response by the WLALC and (in particular) Section 6 of this ACHAR deals with the cultural and spiritual significance of the Project Area extensively.

Several other important points of clarification were raised by the WLALC and are responded to below:

- WLALC regard the Tindale (1940) map on in Figure 3-1 as 'wildly inaccurate'. The author recognises that not everyone agrees with the maps of country created by Tindale, however as one of the foremost anthropologists of his time, we cannot ignore his work in this context, and relatively few other credible sources of this type exist.
- Spiritual and Cultural significance are discussed at length in Section 6 of this ACHAR.
- WLALC have suggested that a range of additional historical and literary source material should have been included in the ACHAR. As noted, this is a cultural values assessment and not intended to be an exhaustive historical review of the wider Hunter Valley and it is the view of the author that consideration of the suggested additional literature would not alter the conclusions of this ACHAR.
- The WLALC response introduces the importance of several sites in the region to Wonnarua people (i.e. a Bora Ground near Yarraman Holiday Stay and "Skull Rock"). While these places are undoubtedly significant, they are both located well outside the MCCO Project Area and not going to be impacted. They are therefore not directly relevant to this ACHAR.
- There is absolutely no misunderstanding on the part of the author as to the differences between knowledge holders and Native Title holders / applicants. Regardless, all RAPs who participated the consultation program as part of the preparation of this ACHAR were provided opportunities to provide their cultural values in respect to the MCCO Additional Project Area.
- The WLALC response mentions the remaining physical evidence of caves, cultural objects and modified trees as being of traditional cultural and contemporary value. For the sake of clarity, there are no caves or modified trees within the MCCO Additional Project Area.

## 5.4 Summary of Consultation Activities

**Appendix 11.1** provides a detailed log of all consultation activities undertaken for the MCCO Project.

## 6 Cultural Heritage Values and Significance Assessment

Assessing the cultural significance of places or objects is central to both understanding and managing heritage places and is a requirement of the Aboriginal Cultural Heritage Assessment reporting process. This section briefly describes the process and presents the cultural significance assessment for the Aboriginal heritage places in the MCCO Additional Project Area.

This section of the report specifically recognises that Aboriginal people are the primary determinants of information regarding the significance of cultural heritage objects, places or values. Indeed, this primacy is explicitly recognised by the Office of Environment and Heritage:

*OEH recognises and acknowledges Aboriginal people as the primary determinants of the cultural significance of their heritage. In recognising these rights and interests, all parties concerned with identifying, conserving and managing cultural heritage should acknowledge, accept and act on the principles that Aboriginal people:*

- *Are the primary source of information about the value of their heritage and how this is best protected and conserved,*
- *Must have an active role in any Aboriginal cultural heritage planning process,*
- *Must have early input into the assessment of the cultural significance of their heritage and its management so they can continue to fulfil their obligations towards their heritage, and*
- *Must control the way in which cultural knowledge and other information relating specifically to their heritage is used, as this may be an integral aspect of its heritage value.*

### 6.1 Definition of Cultural Significance

Cultural significance can be associated with or attached to any place, concept or object by any group or groups of people and is embodied in the place itself (i.e. its fabric, use, associations, and meanings, relationship to other concepts, places or objects). Place means any geographically defined area, and may include features, elements, objects, spaces and views. The place may have tangible (physically identifiable) or intangible (conceptual ideas or spiritual beliefs) values or a combination of both, or a range of values held by different individuals or groups. Places can be large or small, discrete or widespread. The concept of place can embody all of the physically identifiable elements of a landscape (i.e. historical, indigenous or natural heritage values). Place may also exist in the intangible realm, where conceptual or spiritual values are held over places or landscapes with little observable physical evidence or fabric (Australia ICOMOS, 2013).

### 6.2 Nature of Cultural Significance

The nature of cultural significance is determined by understanding the interrelationship of the following core values, and the constituent factors assessed. These values are:

#### 6.2.1 Aesthetic Value

A concept, place or object can have cultural significance if it is significant in exhibiting particular aesthetic characteristics. Such as:

- Importance to a community for aesthetic characteristics.
- Importance for its creative, design or artistic excellence, innovation or achievement.
- Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or
- Otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.

#### 6.2.2 Historic Value

A concept, place or object can have cultural significance if it is significant in exhibiting particular historic characteristics. Such as:

- It is significant in the evolution or pattern of the history of a locality, region, state, nation or people.
- Importance for the density or diversity of cultural features illustrating the human occupation and evolution of the locality, region, state or nation.
- Importance in relation to an event, phase or activity of historic importance in the region, state or nation

- Importance for close association with an individual or individuals whose life, works or activities have been significant within the history of the region, state or nation
- Importance as an example of technical, creative, design or artistic excellence, innovation or achievement in a period.

### 6.2.3 Scientific Value

A concept, place or object can have cultural significance if it is significant in exhibiting scientific characteristics. Such as:

- It has demonstrable potential to yield information that will contribute to an understanding of the natural or cultural history of the region, state or nation
- Importance for information contributing to a wider understanding of natural or cultural history by its use as a research site, teaching site, type locality, reference or benchmark site.
- Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the locality, region, state or nation.
- It is significant in demonstrating a high degree of technical innovation or achievement.

### 6.2.4 Social Value

A concept, place or object can have cultural significance if it is significant in exhibiting social characteristics. Such as:

- Association with a community or cultural group for social, cultural, educational or spiritual reasons.
- Importance as a concept, place or object highly valued by a community or cultural group for reasons of social, cultural; religious, spiritual, aesthetic or educational associations.
- Importance in contributing to a community's sense of place and/or identity.

### 6.2.5 Spiritual Value

The Draft 2013 ICOMOS practice note '*Understanding and Assessing Cultural Significance*' defines 'spiritual value' as the '*intangible values and meanings embodied in or evoked by a place which give it importance in the spiritual identity, or the traditional knowledge, art and practices of a cultural group. Spiritual value may also be reflected in the intensity of aesthetic and emotional responses or community associations and be expressed through cultural practices and related physical structures*' (ICOMOS, 2013: 1).

The physical qualities of the place may inspire a strong and/or spontaneous emotional or metaphysical response in people, expanding their understanding of their place and purpose in the world, particularly in relation to the spiritual realm. The term spiritual value was recognised as a separate value in the 1999 Burra Charter (ICOMOS, 1999). It is still included in the definition of social value in the Commonwealth and most state jurisdictions. Spiritual values may be interdependent on the social values and physical properties of a place and its surrounding landscape.

A place may exhibit spiritual values if:

- The place contributes to the spiritual identity or belief system of a cultural group
- The place is a repository of knowledge, traditional art or lore related to spiritual practice of a cultural group
- The place is important in maintaining the spiritual health and well-being of a culture or group
- The physical attributes of the place play a role in recalling or awakening an understanding of an individual or group's higher purpose and place in relation to the spiritual realm.
- The spiritual values of the place find expression in cultural practices or human-made structures or inspire creative works.

## 6.3 Degree of Cultural Significance

Once the nature of the cultural significance of a place or object is understood, it is essential to understand the extent or degree of that cultural significance. This is typically established by considering:

### 6.3.1 Rarity

A concept, place or object can have cultural significance if it:

- Demonstrates or possesses rare, uncommon or endangered aspects of the cultural heritage of a locality, region, state or nation.
- Demonstrates or possesses rare, endangered or uncommon structures, landscapes or phenomena.
- Demonstrates or possesses a distinctive way of life, custom, process, land-use, function or design no longer practiced in, or in danger of being lost from, or of exceptional interest to, the region, state or nation.

### 6.3.2 Representativeness

A concept, place or object can have cultural significance if it:

- Is significant in demonstrating the characteristics of a class of cultural concepts, objects, places or environments in the State.
- Is important in demonstrating the principal characteristics of a range of concepts, objects, landscapes or environments, the attributes of which identify it as being characteristic of its class.
- Is important in demonstrating the principal characteristic of the range of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the locality, region, state or nation.

### 6.3.3 Condition, Integrity and Authenticity

- Condition refers to the current state of the concept, place or object in relation to each of the values for which that concept, place or object has been assessed. Condition reflects the cumulative effects of management and environmental events.
- Integrity is a measure of the likely long-term viability or sustainability of the values identified, or the ability of the concept, place or object to restore itself or be restored, and the time frame for any restorative process.
- Authenticity refers to the extent to which the fabric of the concept, place or object is in its original state.

## 6.4 Collecting Cultural Values Information

Cultural Values information was collected during a series of site visits and two separate cultural values workshops for each group held during May and September 2018 respectively. During these activities, ACHM discussed the importance of including any '*cultural values*' in the ACHAR to both demonstrate connection to the places concerned but also to preserve any cultural knowledge which might exist regarding the MCCO Additional Project Area.

Most of the outcomes from the cultural values workshops were more management oriented than an exposition of any cultural values.

Over the course of the cultural values workshop and site visit very little traditional or cultural knowledge was forthcoming, despite considerable efforts being applied to elicit any such knowledge or values. Many of the participants felt that this knowledge had generally been lost largely through historical circumstance (i.e. dispossession and forced resettlement) and through the passage of time (i.e. loss of elders and distance of contemporary people to past events).

In general, the participants in the workshops and site visit expressed a strong contemporary '*connection to country*' and were generally opposed to mining and the environmental damage which this may entail, but did not demonstrate any traditional lore, ritualised usage or customary connection to the MCCO Additional Project Area, nor did the RAPs specifically object to this Project.

### 6.4.1 Questionnaire

During the workshops held in September 2018, a questionnaire was developed and handed out to workshop participants to augment the collection of cultural values information from the RAP's (see example in **Appendix 11.3.17**). The questionnaire was handed out to all participants in the workshops, however only 17 were completed and returned. An analysis of the resulting information from those who completed the questionnaires (n=17) provided the following key focus areas.

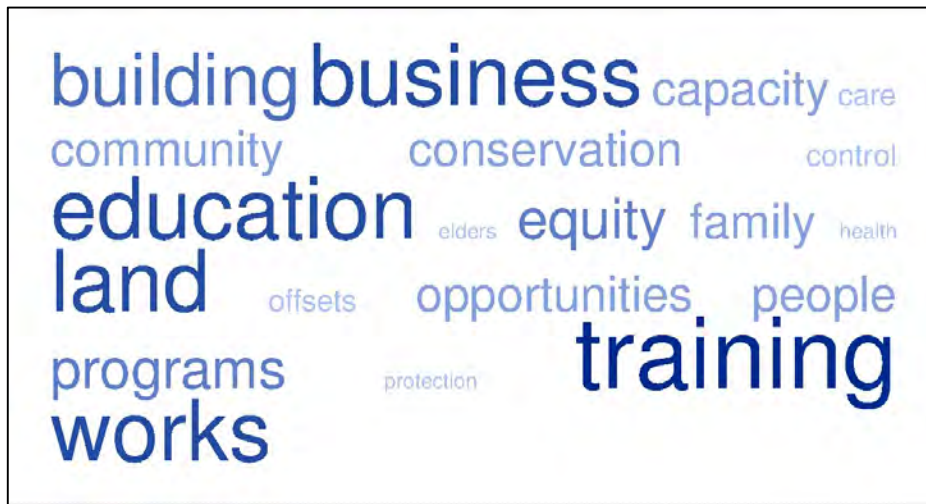


Figure 6-1: Test analysis of the questionnaire responses from 17 of the RAPs.

## 6.5 WNAC Cultural Values Workshops

An initial workshop was held with the WNAC in Muswellbrook in May 2018. A very well attended 2-day workshop was then held on the 18-19th September with WNAC in Singleton. This 2-day session followed a one-day 'in-house' workshop held by WNAC where the group assembled to discuss the MCCO Project with no outside attendees. The WNAC workshop focused broadly on employment, health, business opportunities and training for WNAC members, with only generic references to the cultural values of the MCCO Additional Project Area.

## 6.6 Gomeroi Cultural Values Workshops

An initial workshop was held with the Gomeroi in Muswellbrook in May 2018. A second workshop was then held on the 17th September in Muswellbrook. There were 3 attendees only at both workshops.

## 6.7 Hickey's Cultural Values Workshops

Representatives of the Hickey family requested that they be consulted separately by the MCCO Project. To facilitate this, the MCCO Project arranged for separate workshops in May 2018 and September 2018. There were no attendees at the May 2018 workshop. Two individuals who were not RAPs were sent along to the September 2018 workshop to represent the Hickey's; however, they did not feel comfortable commenting on behalf of the Hickey family. During the workshop discussions however, the two participants were provided with project updates and information to pass back to the Hickey Family. There were also discussions about the Aboriginal cultural values of the MCCO Project area.

## 6.8 Community RAPs Cultural Values

An initial workshop was held with the Community RAP group in Muswellbrook in May 2018. A one-day workshop was then held on the 17th September with the Community RAP group in Muswellbrook. The direction of workshop focused broadly on employment, health, business opportunities and training, with only generic references to the cultural values of the Project Area.

## 6.9 Cultural Values of the Plains Clan of the Wonnarua People (PCWP)

The cultural values report written by the PCWP was disclosed to ACHM. The following is an extract from the PCWP report and recommendations which is included in full in **Appendix 11.6**.

The cultural landscape is greater than the sum of its parts, and the inter-relationships between the parts can be significant. For this reason, the details matter, significant loss of integrity and meaning can occur through the attrition of many small elements (Context et al 2002 cited in Brown 2010).

From the outset, the PCWP have been concerned to ensure that no single Aboriginal item or place within the project be subject to an evaluation based on the systematic ranking of its Aboriginal cultural values relative to the other items or places within the project area. This type of ranking is counter to the expression and belief of the PCWP that it is not one item, artefact, grinding groove, plant or animal species that is of value to them in the project but rather it is the sum total of all such component parts of the landscape, and its surrounds, that provide cultural meaning to them. This has been clearly articulated by the late Aunty Barbara Foot. The following is an amended extract of notes made by Ms

Sarah Paddington of OEH when in conversation with Aunty Barbara Foot and her son David in February 2011:

*'As a girl I would travel along Bowmans [Creek]. We'd go from the mission, to school to town ... My Dad had a lot of cultural knowledge. He passed it on to me. He'd tell me places I could and couldn't go. He showed me important places. Places our ancestors still come through. I know how to read the signs of the land, the seasons. The signs are our lore, they show the way – like people used street signs to have order. Some of the signs, the trees, have been cleared but we know where they were from our ancestors, and we know what they tell us. People not from here don't have that knowledge....*

*The area is all important to us. We can't break it up for each mine – that is how they are getting away with destroying so much of our culture. They don't understand how it all links together, so it doesn't seem as important when you look at this little bit or that little bit. That's how they are breaking up our community too – the mine mention money and that starts fights. The mines want the fights as they get to keep what they want if the community is distracted (Aunty Barb Foot, February 2011 cited in attachment to email forwarded by Ms Sarah Paddington of OEH to Mr Scott Franks and Mr Robert Lester, 17 April 2011).'*

In line with Aunty Barb's assessment, it remains the broad view of the PCWP that the steady attrition of elements of the Aboriginal cultural landscape within their Wonnarua Country - especially those items of Aboriginal material culture subject to archaeological assessment - has occurred as a direct result of the application of a process of systematic ranking of items or places. The purpose of this section then is to provide a synthesis of the cultural values that the PCWP ascribes to the project area; and to provide a summary of these values in the context of standard Burra Charter significance criteria. The statement of cultural significance that results from this summary and synthesis is by necessity at the 'whole of landscape' rather than the individual item or place. Tocomwall acknowledges that this 'whole of landscape' approach is not the evaluation mode adopted in the broader context of cultural heritage studies in NSW, both of which attribute some form of ranking of significance to component parts of the Aboriginal cultural landscape within the project area. Whilst this may make some elements of the integration of this report within the broader cultural values assessment challenging, Tocomwall believes that to include such rankings would be counter to the PCWPs world view; and consequently, would not be an effective synthesis of their cultural knowledge in and of the project area and its surrounds.

The Heads of Family of the PCWP collectively support the following overview statement in relation to the cultural significance of the study area to them:

*'We need to look at the landscape from a position of duty, responsibility, and focus on the achievement of inter-generational equity. We do not own the land, in terms of European concepts of ownership. Our ownership is in the context of the use of the land and its various animals and plants to sustain our bodies and we gave/give homage to them by creating ceremonial dances for them. The importance of this process should not be underestimated, for it is how our people worked with the environment, the landscape, our neighbours and how we all from different Aboriginal language groups, worked as one with Mother Nature. We were practising land management thousands of years before Europeans invaded our country.'*

The study area is in an area with close proximity to places that have been used by our people since the time of creation. The location of ceremonial sites in the general area, as well as pathways between them, known today as song lines, indicates that the cultural landscape of the study area and its environs holds significant values to the PCWP. The path was placed there by our creator Baiami, which in the beginning would have been sheltered from prying eyes and onlookers who were not supposed to know or see what was going on, unless invited. This pathway contains sites for initiations and religious practises (Dream Time).

*'These same lands that may have interaction with this mine are places that represent what our people are about. The landscape (and its environs: my addition) has present ceremonial places (bora grounds), scarred trees, fishing holes, teaching and birthplaces and places to camp and prosper. In today's terms this is our home and our community. Even today you can talk to any member of our claim group and all will have some type of association with this area.*

*Having Glencore work with our people to understand its importance is a great step forward but at this stage it is a very small one as almost all reports that have been undertaken in the Hunter Valley and elsewhere, in the past regarding Aboriginal Cultural Heritage Values, are centred solely on the identification of stone objects within a given location. The normal stakeholder incentive for involvement in this process is for paid fieldwork participation and often their expertise is in stone materials and identification only.*

*Consideration in the past, by those in the archaeological industry, is that Aboriginal people had more to say about the landscape than just stones and bones. This has never been fully canvassed which has been a fundamental flaw in almost all previous reports. There has not been an inclusion of the values that Aboriginal people place on the fauna and flora within a given study area. This is a major issue, not only for Aboriginal people but for the wider community. The history of this country is for all to protect. As the human race, we learn from our past and our history to better understand the future.*



*The Hunter Valley has been heavily impacted on for decades from both coal mining and the agricultural industries. The Plains Clans of the Wonnarua People's (PCWP's) country only has approximately 7.5% of our lands left untouched. Our own traditional lores and customs need to be able to protect this remaining pristine country for our people to live in harmony and for all future generations to learn from. We need to continue teaching our people and all future generations about who we are and where we are from.*

*Most surveys focus tend on the artefacts that are found on the day and invariably no real effort is taken to understand why they are there, what is happening or where the artefacts are located. Most are recorded as isolated finds when in fact it is a series of sites that make up a complex camping ground being a recognised Aboriginal site. We were taught from these lands as we grew up. It is a place where our families lived, hunted and learnt to interpret the lands. To a non-Aboriginal person in this area is your house, school, hospital, church, shopping centre, doctors, police station, your whole community or society. That is why most reports do not reflect this; it is very complex for a non-Aboriginal to understand and interpret the lands and put into words.*

*The land around the project is extremely important to our people. Today, the lands, as in most other areas, are one of many pages in a book and allow us look back in time. It gives our people a better understanding of the stories we were told, when we were young, what they were about and about why. The land still has the footprints of our people from the beginning of time and allows our people to have direct contact with our lands and our elders. As we looked around the landscape and participated in surveys or test excavations, we found many artefacts. Each time we encountered these objects we felt the presence of our people and the excitement that we were now standing in one of our people's houses. It is a firsthand experience and shows where our people lived, hunted, fought to defend their lands, thrived and were happy and cried.*

*This part of the Hunter Valley makes us feel like we are coming home. The reality is though that this is a place that will not be here in the future. Just as what has happened to the other homes of our people it will be lost. To try and put in words exactly what this place is worth is beyond comprehension (Heads of Family of the PCWP, September 2015).'*

The landscape of the project area has a fundamental significance because of its historical, social, and scientific value to the PCWP. For the PCWP the study area and surrounds is a complex, multi-layered cultural landscape where in combination (a) the biophysical attributes of the landscape including the drainage systems, fauna and flora, geology and soils; (b) the material traces of traditional Wonnarua people; (c) the historical associations and experiential reference points of its members, and in particular those of the Franks family (and all associated descendant families); and (d) the various spiritual, lived experiences and economic attachments of contemporary PCWP members contribute to a high level of cultural significance for which words are considered inadequate to describe. This immensely important cultural landscape is however perceived by the PCWP to be highly fragmented and subject to catastrophic change and despoilment by the physical action and aesthetic impact of past, current and future mining activities. Mining has been a progressive and substantial intrusion on this cultural landscape for which the PCWP feel a profound and enduring sense of loss. This loss is compounded by their feelings of guilt and distress at not being able to protect the land for which they have custodial responsibility.

The PCWP report focuses on the desire for a holistic approach to heritage assessments of entire landscapes, rather than a site by site assessment of the MCCO Additional Project Area, alongside the significance of all parts of the landscape to the PCWP.

## 6.10 Dominant Themes

There can be little doubt that the wider region surrounding the MCCO Additional Project Area is an area that holds high cultural value(s) for Wonnarua and Gomeroi people. The wider landscape of the Hunter Valley is one deeply imbued with meaning to both Wonnarua and Gomeroi people.

Many of the values expressed by those consulted throughout this project related to the wider region rather than the MCCO Additional Project Area specifically. Senses of loss and longing, a variety of expressions of 'connectedness' and 'belonging' to landscapes, waterways, vegetation and animal communities, connection to other known significant places within the region (i.e. Baimie Cave or various waterways) were expressed by those consulted. Alongside the loss and longing, there is also an element of celebration in that those who are speaking for country today have survived for nearly 200 years since first settlement and have adapted to and overcome much adversity.

Many of the RAPs present at the workshops and site visit were deeply anti-mining, which is not an uncommon sentiment among many Aboriginal communities Australia-wide. Almost all the RAPs expressed strong connections to the archaeological sites which occur throughout the MCCO Additional Project Area (and the wider region in general) even though some were highly critical of archaeologists and archaeological practices through time. It is not uncommon for archaeologists to be criticised for their role in Aboriginal cultural heritage management. Often, archaeologists are viewed as the facilitators of cultural destruction by Aboriginal people

and have been criticized for many years for having too much '*power*' in the assessment of Aboriginal cultural heritage (*c.f.* Fourmile, 1989). Extensive consultation with Aboriginal communities about their '*cultural values*' alongside robust archaeological assessment is a way of attempting to overcome this perception, as well as limiting the archaeological assessment to questions of scientific values rather than cultural values.

Any destruction of landscapes, including the physical, spiritual, and natural values imbued in it are seldom condoned by Aboriginal people. One theme often repeated in Aboriginal communities is the concern that contemporary Aboriginal communities have for the opinion of future generations and the overwhelming fear that people in the future will think the people of today stood by and watched their 'country' being 'destroyed' without defending it (i.e. sense of guilt).

Collated responses from the workshop questionnaires are included in **Appendix 11.3.19**

#### **6.10.1 Limitations**

There have been few limitations on the effective completion of this ACHAR.

Notably, the resources below have been incorporated into this report:

- The ACHAR from the PCWP was fully disclosed to ACHM, so there has been no restriction on ACHM's ability to report on the cultural values presented by PCWP;
- Information from the WNAC, Gomeroi and Community RAPs disclosed workshops is included in this report.

Consolidated recommendations based on all the workshops and PCWP cultural values assessment are presented in Section 8.

### **6.11 Consolidated Cultural Values**

To the extent possible, given the paucity of information provided by the RAPs, ACHM have constructed the following table of cultural values. These tables also include oral and written information gathered by ACHM through the workshop(s) and site visits with the Project RAPs.

A list of cultural values for the proposed Project Area is consolidated in Table 6-1 below.

Value / Theme	Hickey's Cultural Values Workshops	Community RAPs	WNAC Cultural Values Workshops	Gomeroi Cultural Values Workshop	PCWP Cultural Values Report
Ancestral Connections to Places	Expressed Verbally	Expressed Verbally	Strongly Expressed	Expressed Verbally	Strongly Expressed
Contemporary Connection to Country	Expressed Verbally	Expressed Verbally	Strongly Expressed	Expressed Verbally	Strongly Expressed
'Cultural Values' over the Proposed Project Area	None Expressed	None Expressed	Generic values but not specific to Project Area	Generic values but not specific to Project Area	Generic values but not specific to Project Area
Connection to Archaeological sites	Expressed Verbally	Expressed Verbally	Expressed	Expressed Verbally	Strongly Expressed
Song lines	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area
Traditional Knowledge	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area
'Special' or Named Places	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area
'Dreaming Tracks'	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area
Creation Myths	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area
Mythological Associations	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area
Lore Grounds	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area
Resource Procurement / Extraction and Use Sites (i.e. Stone Quarry)	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area.
Resource Procurement / Extraction and Use Sites- (i.e. Flora and Fauna)	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area.
Massacre Sites	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area
Contact History	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area
Mission Period	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area	None identified in the MCCO Additional Project Area

Table 6-1: Consolidated Cultural Values

## 6.12 Consolidated Statement of Significance

The assessment of cultural significance presented in this section relates primarily to the MCCO Additional Project Area, *but also includes commentary on the cultural significance of the wider region.*

It is noted that the numerous Aboriginal stakeholders who participated in this cultural values assessment process hold values which relate to the wider Hunter Valley region generally, and less directly to the MCCO Additional Project Area (specifically).

There was very little additional information presented in any of the workshops, site visits or written material which relate specifically to the MCCO Additional Project Area.

A common theme in many Aboriginal cultural heritage assessments is the proprietary interest members of the relevant Aboriginal communities hold regarding the wider cultural landscape including archaeological sites or places within any given area. This Project is no exception in this regard. Within the context of the current assessment, there are strong on-going connections to places created and used by ancestors alongside demonstrably strong interests in the way those places are managed or harmed because of this Project. These sentiments are not unique and must certainly be considered in the overall assessment of the significance of the places in question. The connection to these places is noted as often being relatively unspecific and generally do not appear to relate to any surviving traditional knowledge or customary cultural practices.

The cultural values expressed by the participants in this assessment have been consistent in voicing an overarching concern for the wider landscape and criticism of the negative impact of mining on that landscape. Consistent in the material collected is a sense of 'loss' or 'outrage' and grief at the treatment of Aboriginal people since First Settlement (dispossession and genocide are mentioned repeatedly) through to more contemporary experiences (i.e. the Stolen Generation).

There is also a consistent theme of the 'powerlessness' Aboriginal people often feel when confronted by situations where they feel disempowered or unable to exercise influence on decision makers. There is a sense of loss and lament for what once was, but with a very strong expression of 'corporate' ownership of the wider region by the Wonnarua and Gomeroi people (regardless of the variety of ways in which those groups represent their own interests). There is also an element of celebrating the survival of those who are now 'speaking for country'. While the entire estate of the Wonnarua people is significant to those concerned, there is little direct evidence (anecdotal or otherwise) of any particular or specific places or values of significance within the MCCO Additional Project Area.

For many of the informants, the contemporary attachment to place appears based on the linkage to archaeological places which were created by 'the ancestors' and thereby constituting a connecting thread to a cultural world from another time.

This general lack of direct or specific cultural knowledge in no way diminishes the strength of connection to the places within the MCCO Additional Project Area. However, the attachment to place is one which is predominantly of contemporary association rather than traditional knowledge, custom, lore or practice.

It is noted that the surrounding area is held to be of higher significance to many members of the Wonnarua community, however the sites and/or places within the MCCO Project held no higher significance or value(s) than any other.

Significantly, many of the comments during the workshops highlighted the benefits of this ACHAR process to the RAPs. Participants describe the process as having empowered the groups concerned by having provided the opportunity for the groups to get together to discuss the cultural values assessments and discuss how this process has benefited the group(s) as a whole.

### 6.12.1 Summary Opinion

Material presented or discussions with the participants often evoked the trauma of early European settlement and the lasting effects of frontier violence, dispossession and the importance of Wonnarua and Gomeroi cultural survival through time. These effects are seen within the context of contemporary Aboriginal society, and the attempts by Aboriginal communities today to preserve remnants of cultural landscapes, places, lore, culture and belonging. This is in no way denying the *bona fides* of the individuals involved or their life experiences but is merely a comment on the events of the shared history of the Hunter Valley which has seen much of that rich past destroyed.

The material collected during the ACHAR process for this Project clearly communicates a deep contemporary attachment to place, although in common with most of the more urbanised regions of Australia, the understanding of 'place' and the cultural lore and traditions associated with it only exist in a fragmentary state.

There has been some discussion of connections to apical ancestors who originate from within Wonnarua country. Members of the different Knowledge Holder groups claim connection to some (or all) of these apical ancestors (e.g. *Sarah Madoo*). There is however, no evidence of any continuing traditional practices or observances of ritual or ceremony within the MCCO Project area, which can be directly attributed to the post-European settlement disruption and dislocation of traditional Aboriginal culture throughout the Hunter Valley. Knowledge of some of these practices does still exist.

There was some discussion of creation or ancestral beings (i.e. *Baimie*) in discussions about ritual practices or ritualised places, named landscape features or places within or in proximity to the MCCO Additional Project Area where ritual or lore may have been physically practiced. Much of the discussion is descriptive and relates to generalised Aboriginal lifeways at the time of first settlement, and the historical impact of white settlement on Aboriginal people and is common to many Aboriginal groups throughout Australia.

## 6.13 Conclusions

This ACHAR has ascertained that there are no traditional *cultural values* associated with the MCCO Additional Project Area (directly and specifically) held by the participants in this ACHAR process. By '*traditional*' cultural values, we refer to these in the Native Title sense as an inherited and cohesive body of '*traditional*' knowledge, laws and customs that are still observed and maintained by a group. However, in common with many urbanised communities, strong contemporary cultural values exist in almost universal claims of 'connection' to the land in question, and a sense of anguish and/or anger at having been 'disconnected' from the land in question by historical circumstances.

It is the opinion of the author that the MCCO Additional Project Area has undergone considerable modification since European settlement. Traditional Aboriginal lifeways and customs began to disappear in the early days of contact with Europeans and had largely disappeared before the turn of the 19th Century. Much of the natural landscape no longer exists in any cohesive manner, as the long history of agriculture in the area has irreversibly altered the landscape. Combining the historical disconnection of people from place with the extensive landscape modification since settlement means that the MCCO Additional Project Area has a relatively low cultural significance when compared to other places within the wider region. This is also consistent with the archaeological assessment, which has determined that most of the archaeological sites are of low scientific significance.

## 7 Avoidance of harm

### 7.1 Project Rationale

The OEH (2011) guidelines state that an ACHA report must include *'Justification for any likely harm, including a discussion of any alternatives considered for the proposal. This must demonstrate how all feasible options to avoid or minimise harm were considered'*.

In developing the footprint and the design of the proposed impacts for the Project, Mangoola has considered mining options, layouts, overburden emplacements and infrastructure arrangements to optimise the Project's final design in conjunction with constraints and attempting to reduce the impacts to cultural heritage.

### 7.2 Opportunities to avoid impact

Throughout the design phase of the Project, efforts have been made to reduce the total amount of disturbance to the land. The completed design has been optimised and incorporates:

- a. The removal of the Eastern Out of Pit Emplacement Area
- b. A redesign of the clean water diversion drains and
- c. An overall reduction in disturbance of approximately 100 ha.

These efforts during the redesign phase of the project have reduced the potential harm to Aboriginal cultural heritage within the MCCO Project area.

### 7.3 Sustainable Development Principles

This ACHAR has considered the impact of the proposed Project on the known Aboriginal objects of the MCCO Additional Project Area and places external to it, and the range of cultural significance values associated with the MCCO Additional Project Area.

Impact assessment has included consideration of the proposed activity and direct impacts, indirect impacts and cumulative impacts to archaeological and /or cultural places and ecologically sustainable development (ESD) principles. OEH (2011) requires that proposed development activities be discussed in the context of ESD, in particular the principles of precautionary approach and intergenerational equity.

As stated by OEH (2011):

1. The precautionary principle states that where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
2. The principle of inter-generational equity holds that the present generation should make every effort to ensure the health, diversity and productivity of the environment – which includes cultural heritage – is available for the benefit of future generations.

The Project's RAPs have been involved in a formal and structured program of consultation and participation via site visits, workshops and producing their own reports.

The RAPs undertook inception briefings and task inductions prior to any archaeological or cultural survey, focusing on providing a clear understanding of the Project and its description, the MCCO Additional Project Area, and the area proposed to be disturbed for the Project. The briefings described the types of activities proposed and their potential impacts, being the extension of the mining area, and the area required for the construction of associated infrastructure.

The following opportunities for consultation and site access were provided by the Project:

- Site visits (which were well attended). Site visits were available at any time throughout the Project.
- A series of RAP workshops were held in May and September 2018
- Archaeological survey results were sent by letter to all RAPs (including those who participated in the fieldwork).
- Archaeological sub-surface testing results were presented during the September 2018 workshops.
- Feedback was provided to all RAPs in order to understand the direct impacts, and the RAPs were given formal opportunities to comment on and provide feedback on indirect and cumulative harm.



The Project's proposed management measures including conservation, care and control and intergenerational equity were derived from the input and suggestions of the RAPs.

## 8 Recommendations

### 8.1 Introduction

As discussed in detail in Section 4, there are 26 archaeological sites located within the Proposed Disturbance Footprint that will be impacted by the Project

The 26 sites that are liable to be impacted consist of 15 artefact scatters and 11 isolated finds. 24 of these sites (92 per cent) are assessed as having low scientific values due to low artefact densities, lack of associated subsurface deposits and observed disturbances. Two sites (8 per cent) have either low-moderate or moderate scientific significance with both being in the previously planned portion of the ACHOA that will be impacted by the Wybong Road Overpass

The Project would also result in indirect impacts to Aboriginal cultural heritage values within the MCCO Additional Project Area and the wider region and would also add to the cumulative loss of cultural heritage in the Hunter Valley.

The Project consulted with the RAPs to seek input and then feedback into the development of management options and recommendations should the Project be approved or not approved.

For the Project, all Aboriginal registrants were afforded opportunities to identify mitigation and management, care and control considerations and intergenerational equity options to inform the consolidated management options presented in this ACHAR.

### 8.2 Management Measures

Management measures presented here are consistent with those developed for other recent Glencore projects in the Hunter Valley.

There are two types of management measures developed because of the assessment process:

1. On-Site Management Measures, and
2. Off-Site Management Measures

On-site management measures may include actions such as archaeological salvage, protective fencing, artefact analysis, curation arrangements, induction programmes and the development or updating of an ACHMP.

Off-site management measures may include actions such as community development programmes, scholarships, educational activities or elder's camps.

In these projects, management measures have aligned to the Aboriginal Community Wellbeing Toolkit and criterion from OEH, in particular the elements that focus on 'Culture'. For the Project, of the 8 key principals of the toolkit, the following three are the basis of the management measures proposed:

- Sense of Community;
- Education and learning, and
- Cultural identity.

Some of the principals of the Toolkit (such as Infrastructure and services, economic strength and development, and community health and safety) are more closely aligned with the existing and ongoing Glencore Australia Reconciliation Action Plan process which includes consultation with a working group that includes local Aboriginal community Representatives.

The proposed management measures have been developed for the Project based on the assessment outcomes including recommendations from the workshops and other submissions. Whilst a range of different views and recommendations were provided some common themes were presented which strongly aligned with 'Sense of Community', 'Education' and 'Learning and Cultural Identity' principals.

This led the Project to propose funding projects in:

- **Caring for Land** – This was a common theme raised by the community. The program proposed focuses on Education and Learning from the Wellbeing Toolkit;
- **Sense of Community and Cultural Identity** – There were a range of management measures raised that involved bringing people together for community and/or Cultural purposes and activities. The program proposed focuses on the Sense of Community and Cultural Identity aspects of the Wellbeing Toolkit, and.

- **Education and Learning** – There were a range of management measures raised that involved Cultural Awareness/Education/Training, especially for younger people (both for Aboriginal and non-Aboriginal youth). The program focuses on Education and Learning with potential flow on effects to the Cultural Identity and Sense of Community aspects of the Wellbeing Toolkit.

The proposed management measures will also include:

- a. Alignment to the principles of the Aboriginal Community Wellbeing Toolkit (OEH 2012) that the project focuses on;
- b. Alignment with findings from this ACHA and the Archaeological assessment;
- c. the need for management options to be achievable for practical implementation;
- d. Provision of sustainable outcomes to promote intergenerational equity;
- e. Able to show value for money.

Table 8-6 contains the proposed management and mitigation measures which will be implemented should the Project be approved.

### 8.2.1 Aboriginal Cultural Heritage Management Plan

Mangoola has an existing Aboriginal Cultural Heritage Management Plan which will be significantly revised to reflect the results of the archaeological assessment undertaken for the Project and this ACHAR.

### 8.2.2 The proposed management measures from the Knowledge Holder groups and RAPs

The following care and control, conservation and intergenerational equity management measures have been compiled from verbal and written material collected from the RAPs during the site visits and workshops throughout 2018.

These measures are described in the following tables and have been summarised by themes and 'areas of commonality'. This has allowed the Project to formulate a set of common recommendations to mitigate or offset harm.

Table 8-1: Community RAP recommendations.

Rec No.	Community RAPs Recommendation
RAP01	Ensure equal participation in all cultural heritage work for all RAPs
RAP02	Return all cultural materials held by archaeological consultants to the MCCO Additional Project Area immediately, with materials to be stored on-site by Glencore until a suitable place for repatriation can be determined.
RAP03	Provide opportunities for training and education to Wonnarua people
RAP04	Glencore facilitate training and employment of young people in the mine other than through engagement in cultural heritage work
RAP05	Glencore to facilitate access to areas set aside as cultural heritage offsets
RAP06	Any materials repatriated from the archaeological salvage should be relocated as close to the point of origin as possible.

Table 8-2: Recommendations made by the Wanaruah Local Aboriginal Land Council.

Rec. No.	Wanaruah LALC Recommendations
WLALC01	Local Historical Research to fill in gaps or confirm existing knowledge
WLALC02	Cultural Protection Areas, including 100-200m buffers along Wybong and Big Flat Creek
WLALC03	Creation of an Aboriginal controlled cultural education unit
WLALC04	Apprenticeships for 3-5 Wanaruah people
WLALC05	Support for Business Start-Ups

Table 8-3: Recommendations made by the Plains Clan of the Wonnarua People

Rec. No.	Plains Clan of the Wonnarua People
PCWP01	Desire to partner with Glencore in longer term mine related activities that bring economic and cultural benefit to PCWP

Table 8-4: Recommendations made by the Gomeroi Knowledge Holders

Rec. No.	Gomeroi
GOM01	Provide opportunities for education and training both within the mines and outside the mines
GOM02	Cultural heritage survey participation equity

Table 8-5: Recommendations made by the Wonnarua Nation Aboriginal Corporation.

Rec No.	Wonnarua Nation Aboriginal Corporation
WNAC01	WNAC seek funding to augment an existing community-based health fund
WNAC02	WNAC seek funding for regular community gatherings to allow members to reconnect with people and country
WNAC03	WNAC seek funding for an arts fund
WNAC04	WNAC seek funding for education opportunities including options such as Clontarf / Polly Farmer / Scholarships / Apprenticeships
WNAC05	WNAC seeking funding for small business opportunities and capacity development
WNAC06	Request access to land to ensure continued cultural connection

### 8.2.3 Notes on RAP Recommendations

While certain specific items have been recommended by the RAP's (as outlined in the preceding four tables) there are also a wide range of general themes that have emerged from our work with the same RAP's over the last 8 years. Sometimes individuals have difficulty articulating what they would like to see as outcomes from a specific project. The general themes are recurring however and focus on (a) equity in heritage management field work (b) land access (c) business opportunities (d) education opportunities (e) heritage preservation / land management and (e) employment opportunities.

There are also circumstances where individuals and/or groups may not want to have their specific recommendations publicly disclosed as there may be existing commercial sensitivities or negotiations already underway.

Table 8-6 builds on the specific recommendations provided by the RAPs in Tables 8-1 to 8-5.

Table 8-6: This table is a consolidated management recommendations and options table based on possible previous management recommendations from the PCWP, Gomeroi, WNAC and Community RAPs for this and other ACHAR's.

Action Area	Action Number	Theme	Gomeroi	WNAC	PCWP	Community RAP	Hickey's
ACHMP	A1	Cultural Awareness Induction / Training					
	A2	Cultural Signage and Education					
ACHAR	A3	Recognition of Stakeholders in ACHAR					
Survey, Collection and Analysis	A4	Cultural Heritage Equity	X	X		X	X
	A5	Archaeological Methodology and protocols			X		
	A6	Archaeological Interpretation			X		
Care and Control	A7	Establish Artefact Storage facility / Keeping Place					
	A8	Learning and Land Access		X		X	
	A9	3D Scan / Modelling of Project Area					
	A10	Final landform and revegetation involvement		X	X		
	A11	Mine site land management contracts		X	X		
Research and Additional Assessment	A12	Wonnarua Cultural Mapping and recording			X	X	
	A13	Museum Collections			X		
	A14	Cultural Heritage Research			X	X	
	A15	Flora and Fauna Research			X		
Intergenerational Equity	A16	Cultural Heritage training					
	A17	Employment and Business Opportunities	X	X	X	X	
	A18	Regular Community Meetings / Meeting Place		X			
	A19	Research on Wonnarua horticulture		X			
	A20	Wonnarua lore and custom training					
	A21	Wonnarua Educational Funding Scholarships / Apprenticeships / School Based	X	X		X	
	A22	Horticultural & Revegetation Training					
	A23	Rehabilitation / Land Management & Training		X		X	

## **8.2.4 Proposed Management Measures**

Table 8-7 and Table 8-8 contain the Cultural Heritage Management and Conservation Measures which were developed from the management and conservation measures proposed by RAPs and Knowledge Holder groups during the Aboriginal Cultural Heritage Assessment undertaken for the MCCO Project. These have been derived by assessing each and every RAPs management and mitigation suggestions.

By providing common themes to the RAPs management and mitigation suggestions, the Project is better able to review and respond to the RAPs care and control, conservation and intergeneration equity recommendations.

The MCCO Project proposes management measures which address specific RAP derived issues. The MCCO Project have drawn out the consistent themes from the RAPs and have developed measures to be undertaken in the event of approval, which address these key themes.



Table 8-7: Proposed On-Site Management Measures from the Project

	Action No	Action Item	MCCO Management Measure
<b>Aboriginal Cultural Heritage Management Plan (ACHMP)</b>	R01	Update ACHMP	The existing Aboriginal Cultural Heritage Management Plan (ACHMP) will be reviewed for the Project within 12 months of Project Approval to outline all Aboriginal heritage management measures for the Project, responsibilities of all parties and the timeframe for required heritage works. The ACHMP will include a staged approach to the required research and salvage works to ensure that areas required for earliest disturbance are completed as a priority.
	R04	ACHMP Dispute Resolution process	The revised ACHMP will include specific provisions regarding ongoing engagement with the RAPs and would include mechanisms for dispute resolution and communications protocols.
<b>Survey, collection and analysis</b>	R05	Survey, collection and Analysis	Salvage (excavation, analysis and collection) as per the recommendations of the OzArk Archaeological Values Assessment Report for the salvage of the 128 sites to be harmed within the Proposed Disturbance Footprint. See the OzArk report - Management and Mitigation of Recorded Aboriginal Sites (Appendix 11.5) for further details.
	R06	Discovery of previously unknown cultural heritage items	The Project agrees to follow all relevant NSW Government guidelines regarding the location of human skeletal remains. The Project will apply the precautionary principle to the development of management measures for the Proposed Disturbance Footprint. This approach will include the development of culturally appropriate management measures for the management of human remains, should this occur during the Project life. Protocols and approach will be developed in consultation with RAPs and updated in the revised ACHMP
	R07	Recording of Archaeological Sites	The ACHMP will be revised to include the new sites identified in the Aboriginal Archaeological Values Assessment Report completed for the Project
<b>Care and Control</b>	R09	Care and Control Measures regarding Aboriginal Objects	Care and control management measures will be developed and included in the ACHMP for Aboriginal objects recovered through the Archaeological research and salvage program implemented for the Project and for long term storage of artefacts recovered from previous research and salvage programs. The care and control management measures will have regard to cultural considerations. '  The Project acknowledge the desire for a regional Wonnarua Keeping Place. Mangoola also acknowledged the MCCO Project lies on the overlapping boundary to the Gomeroi Native Title Claim. However, this facility does not currently exist. The MCCO Project propose to store artefacts from the salvage program on-site. Should a regional Keeping Place be developed, subject to community support, MCCO would support the relocation of cultural heritage material to that place. MCCO will consider the repatriation of artefacts across rehabilitation areas as part of a closure planning process at the cessation of mining.
	R10	Repatriation of artefacts from MCCO Project Area	MCCO acknowledge the desire for a regional Wonnarua Keeping Place. Mangoola also acknowledged the MCCO Project lies on the overlapping boundary to the Gomeroi Native Title Claim. However, this currently does not exist. MCCO propose to store artefacts from the salvage program on-site. Should a regional Keeping Place be developed, subject to community support, MCCO would support the relocation of artefacts.  MCCO will consider the repatriation of artefacts across rehabilitation areas as part of a closure planning process at the cessation of mining.
	R11	Sites not to Be Impacted	The Project will implement the Aboriginal archaeological management measures program for sites in the MCCO Additional Project Area that will not be impacted by the Project as recommended in the Aboriginal Archaeological Values Assessment report for the Project. These measures will be further outlined in the updated ACHMP. As noted in the AAIA 45 sites in the MCCO Additional Project Area will be avoided as they are located outside of the Proposed Disturbance Footprint. Further Mangoola will provide for the maintenance of the landscape in a 23.5 ha area termed here the 'MCCO Cultural Heritage Management Area' that encompasses landforms adjacent to the tributary to Big Flat Creek in the southeast of the MCCO Additional Project Area.

Table 8-8: Proposed Off-Site Management Measures.

	Action No	Action Item	MCCO Proposed Management Measure
<b>Intergenerational Equity</b>	R12	Education and Learning	<p>Currently Glencore Coal Assets Australia (GCAA) through its voluntary Community Investment Program is committed to:</p> <ul style="list-style-type: none"> <li>The Galuwa Aboriginal School scholarship program which currently supports 30 scholarships for Aboriginal students from the Upper Hunter in years 6,7 and 8 to support their academic progress, cultural identity and career aspirations.</li> <li>Singleton Clontarf Academy supporting 80 Aboriginal boys and 4 staff at Singleton High School to support the personal development and education of these boys.</li> </ul> <p>GCAA's approach to supporting Aboriginal education is to work closely with NSW Department of Education to provide meaningful and needed Aboriginal education support that compliments and does not duplicate existing initiatives within NSW Education and other providers who support Aboriginal Education.</p> <p>Further support of Aboriginal education following approval of the MCCO Project would be considered, to align to this approach to support similar Aboriginal education initiatives where there is a substantiated gap in support or service provision.</p>
	R13	Sense of Community and Cultural Identity	<p>Knowledge Holders and RAPs raised a range of issues and potential mitigation strategies with regards to cultural loss, these included:</p> <ul style="list-style-type: none"> <li>A desire for community (or groups) to come together outside of development application/disturbance processes, and</li> <li>A desire for a range of cultural experiences (such as cultural camps, Elders Camps, teaching to younger generations)</li> </ul> <p>Mangoola would consider supporting a program or activities to assist in promoting cultural awareness and education for young people.</p>
	R14	Leadership, Empowerment and Influence	Employment opportunities for Aboriginal stakeholders was raised as an item that would benefit the wider community. Mangoola in consultation or conjunction with GCAA would consider supporting a traineeship or work experience program through a third-party provider in the area of cultural heritage management, biodiversity or land management, ecology, rehabilitation or other appropriately related field.
	R15	Land Management	A process and criteria for the application offer this support would be developed following approval of the MCCO Project.
<b>Timing and Support for the Research, Caring for Land, Bringing People Together and Cultural Awareness and Education Programs</b>			The support for these programs would be available for applications from the local Aboriginal community for a period of 3 years from the commencement of the MCCO Project. A process and criteria for the application for this support would be developed following approval of the MCCO Project. A total budget of \$150,000 will be allocated for these programs, subject to approval of the MCCO Project.

### 8.3 Management Measures - No Project Approval Scenario

Should the proposed Project not be approved the potential impacts would not occur, and there would be no risk to the cultural values and archaeological sites identified in this ACHAR.

In this scenario, the Project would not need to update the existing approved ACHMP and would continue to monitor and manage the identified Aboriginal archaeological and cultural heritage values related to the existing approved mining area through that management plan.

## 9 Bibliography

Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cmth).

Aborigines. Replies to a Circular Letter, addressed to the Clergy, of all Denominations, By Order of the Select Committee on the Condition of the Aborigines. Ordered, By the Council, 31st October 1846. Sydney: Printed by W.W. Davies, At the Government Printing Office.

Australia ICOMOS 1999, The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance Australia ICOMOS Incorporated Burwood

Australia ICOMOS 2013 Draft Practice Note: Understanding and Assessing Cultural Significance Australia ICOMOS Incorporated Burwood

Australia ICOMOS. 2000. The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 1999, with associated Guidelines and Code on the Ethics of co-existence.

Australian Heritage Commission (AHC), 2001. Significance Assessment of Heritage Places. Australian Heritage Commission, Canberra.

Australian Museum, 2010, Morrison Collection: boomerangs from the Hunter Valley region, viewed 26 June 2013, <<http://australianmuseum.net.au/Morrison-Collection-Boomerangs-from-the-Hunter-Valley-Region>>

Biodiversity Conservation Act 2016, New South Wales.

Blyton, G, D. Heitmeyer and J. Maynard. 2004. A history of Aboriginal and European contact in Muswellbrook and the Upper Hunter Valley. Umuliko Centre for Indigenous Higher Education, The University of Newcastle. A Project of the Muswellbrook Shire Council Aboriginal Reconciliation Committee.

BOM 2018 Bureau of Meteorology. 2016. Summary statistics SCONE SCS. [http://www.bom.gov.au/climate/averages/tables/cw\\_061089.shtml](http://www.bom.gov.au/climate/averages/tables/cw_061089.shtml) Accessed 03/07/18.

Brayshaw, H. 1987. Aborigines of the Hunter Valley. A study of Colonial Records. Scone and Upper Hunter Historical Society, Scone, NSW.

Breton, W. H. 1833. Excursions in NSW, WA & Van Diemens Land (1830-33). London.

Corporations (Aboriginal and Torres Strait Islander) Act 2006 (Cmth).

Cunningham, P. 1825. Two years in New South Wales. London.

Daly, M & Brown, J 1964. The Hunter Valley Region NSW Hunter Valley Research Foundation, Newcastle.

Dangar, H 1824 Field Book 220 2/4860 and Field Book 221 2/4861 in Brayshaw, H 1987 Aborigines of the Hunter Valley: a study of colonial records, Scone and Upper Hunter Historical Society, Scone.

Dean-Jones, P. and Mitchell, P. 1993. New South Wales Department of the Environment and Conservation. Hunter Valley Aboriginal Sites Assessment Project: Environmental Modelling for Archaeological Site Potential in the Central Lowlands of the Hunter Valley. Report to NSW National Parks and Wildlife Service.

Department of Environment and Conservation (DEC) 2005 Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation. Sydney.

Department of Environment Climate Change and Water (DECCW) NSW 2010 Aboriginal cultural heritage consultation requirements for proponents 2010: Part 6 National Parks and Wildlife Act 1974. Sydney.

Dunne, A. 2012. From Brook to Broke: A History of Broke, *Fordwich*.

Ebsworth. H T 1826 A letter book, kept at Sydney and Port Stephens ML MS B852 in Brayshaw, H 1987 Aborigines of the Hunter Valley: a study of colonial records, Scone and Upper Hunter Historical Society, Scone.

EMM Consulting Pty Limited. 2017. Appendix 8 Aboriginal due diligence site inspection results. Report to Mangoola Coal Operations Pty Limited.

Environment Planning and Assessment Act 1979 (NSW).

Environment Protection and Biodiversity Conservation Act 1999 (Cmth).

Fawcett, J W, 1898 'Notes on the customs and dialect of the Wonnah-Ruah', Science, August 22, pp/ 152-154 and 180-181 <<http://www.newcastle.edu.au/resources/divisions/academic/library/cultural%20Collections/pdf/fawcett1898.pdf>>

Fourmille, H (1989) Who Owns the Past? Aborigines as Captives of the Archives [online]. Aboriginal History, Vol. 13, 1989: 1-8.

Gray, A 2010 St Clair Mission, viewed 26 June 2013 <<http://australianmuseum.net.au/St-Clair-Mission>>

Heritage Act 1977 (NSW).

Heritage Office and Department of Urban Affairs and Planning (DUAP), 1996. Regional Histories.

Department of Urban Affairs and Planning and Heritage Council of New South Wales.

Horton, D (ed.) 1994, *The encyclopaedia of Aboriginal Australia*, Aboriginal Studies Press for the Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra.

Howe, J 1819 Windsor Papers ML MS 106 in Brayshaw, H 1987 *Aborigines of the Hunter Valley: a study of colonial records*, Scone and Upper Hunter Historical Society, Scone.

Journal of the Royal Australian Historical Society 1953.

Koettig, M 1990 *Regional Study of Heritage Significance Central Lowlands Hunter Valley*, Electricity Commission Holdings, July 1990, Vol 3: Assessment of Aboriginal Sites

Kovac, M. and Lawrie J.W., 1991. *Soil Landscapes of the Singleton 1:250,000 Sheet*. Soil Conservation Service of New South Wales, Sydney.

Lucas, Stapleton and Partners Pty Ltd 2013. *Hunter Estates: A Comparative Study of pre-1850s Homestead Complexes in the Hunter Region*. Volume 1: Historical Context and Survey of Sites.

Macquarie University 2009, *Australian Aboriginal tribes*, viewed 26 June 2013, <[www.libmq.edu.au/all/journeys/related/tribes.html](http://www.libmq.edu.au/all/journeys/related/tribes.html)>.

McDonald. 1878. cited in *Australian Languages and Traditions*. Journal of the Anthropological Institute of Great Britain and Ireland. 7: 255-258.

Miller J 1985, *Koori: A will to win*, viewed 26 June 2013, <<http://www.wonnarua.org.au/images/about%20the%20wonnarua%202.pdf>>.

Mitchell 2002 Mitchell, P. 2002. *Description for NSW (Mitchell) Landscapes Version 2*. Department of Environment and Climate Change NSW.

National Parks & Wildlife Act 1974 (NSW).

Native Title Act 1993 (Cmth).

Needham, B 1981 *Burrageurra: where the spirit walked – Aboriginal sites in the Cessnock-Wollombi region of the Hunter Valley*, NSW, Cessnock.

Nolan, R 2012 *“We want to do what they did” History at St Clair*, BA (Hons), University of Sydney, Sydney

Office of Environment and Heritage (OEH) 2010 *Guide to Investigating, assessing, and reporting on Aboriginal Cultural Heritage in New South Wales*.

Office of Environment and Heritage (OEH) 2012 *Strengthening Aboriginal Community Wellbeing Toolkit*.

OzArk Environmental & Heritage Management Pty Ltd. 2018. *Aboriginal Archaeology Impact*

Assessment. Mangoola Coal Continued Operations Project. Mangoola Coal Mine, Wybong, NSW.

Protection of Movable Cultural Heritage Act 1986 (Cmth).

OzArk Environmental & Heritage Management Pty Ltd. 2018. *Aboriginal Archaeology Impact Assessment*. Mangoola Coal Continued Operations Project. Mangoola Coal Mine, Wybong, NSW.

Tindale, N B 1940 *‘Map showing the distribution of the Aboriginal tribes of Australia’* [cartographic], in *Digital Collections Maps*, National Library of Australia, viewed 3 July 2012, ><http://www.nla.gov.au/apps/cdview/?pi=nla.map-gmod91-e>>.

Tindale, N. B. 1974 *Aboriginal tribes of Australia: their terrain, environmental controls, distribution, limits, and proper names*. Australian National University Press. Canberra.

Umwelt 2017. *Aboriginal Archaeological and Ecological Due Diligence Assessment of Proposed Borehole Locations*, MCCO NSW. Report to Mangoola Coal Operations Pty Limited.

Wood, W. Allan. 1972. *Dawn in the Valley*. Wentworth Books, Sydney.

## 10 Glossary

**Absolute Dating:** Is the process of determining a specific date for an archaeological or paleontological site or artefact. Some archaeologists prefer the terms chronometric or calendar dating, as use of the word "absolute" implies a certainty and precision that is rarely possible in archaeology. See also relative dating.

**Adze:** A stone tool made on flakes with steep flaking along the lateral margins and hafted for use as a wood working tool.

**Alluvial Terrace:** A terraced embankment of loose material adjacent to the sides of a river valley.

**Amorphous:** Showing no definite crystalline structure.

**Angle Of Applied Force:** The angle at which the force of flaking is applied to a core.

**Angular fragment:** A piece of stone that is blocky or angular.

**Anisotropic:** Having some physical properties which vary in different directions.

**Anvil:** A portable stone, used as a base for working stone tools. Anvils most frequently have a small circular depression in the centre which is the impact damage from where cores were held while being struck by a hammer stone. An anvil may be a multi-functional tool also used as a grindstone and hammer stone.

**Archaeological Context:** The situation or circumstances in which a particular item or group of items is found.

**Archaeological site types:** The archaeological site types encountered in Australia can be divided into three main groups:

**Historical archaeological site:** An archaeological site formed since the European settlement containing physical evidence of past human activity (for example a structure, landscape or artefact scatter).

**Aboriginal contact site:** A site with a historical context such as an Aboriginal mission station or provisioning point, or a site that shows evidence of Aboriginal use of non-traditional Aboriginal materials and technologies (e.g. metal or ceramic artefacts).

**Aboriginal prehistoric archaeological site:** A site that contains physical evidence of past Aboriginal activity, formed or used by Aboriginal people before European settlement.

These sites may be:

Artefact scatters	Scarred Trees
Isolated artefacts	Mounds
Rock shelters	Rock art
Burial Structures	Hearths
Shell middens	Quarries
Ethnographic Items	Grinding Patches

**Archaeology:** The study of the past through the systematic recovery and analysis of material culture. Archaeology relies heavily upon science and cognate disciplines to provide interpretations of the past life ways of the peoples under investigation.

**Artefact:** any movable object that has been utilised modified or manufactured by humans.

**Artefact scatter:** A surface scatter of cultural material. Aboriginal artefact scatters are often defined as being the occurrence of five or more items of cultural material within an area of about 10m x 10m.

**Australian Height Datum:** The datum used to determine elevations in Australia. The AHD is based on the mean coastal sea level being zero metres AHD.

**Australian Small Tool Tradition:** Stone tool assemblages found across Australia, with the exception of Tasmania, dating between 8000 BP to European contact. The tool types include hafted implements (e.g. Bondi points), bifacial and unifacial points, geometric microliths, and blades. The assemblage is named for its distinct lack of larger 'core tools' which characterised earlier assemblages.

**Axe:** A stone-headed axe or hatchet or the stone head alone, characteristically containing two ground surfaces which meet at a bevel.

**Backed Artefact:** Backed artefacts are flakes retouched until they have one or more steep and relatively thick surfaces that are covered with negative scars. Since the backing retouch was accomplished with a bipolar and/or anvil-rested knapping technique, these retouched surfaces typically show negative scars originating from two directions, a pattern that is sometimes described as "double backing". Backed pieces are a feature of the 'Australian small tool tradition', dating from about 8000 BP in southern Australia.

**Bearing:** An angle measured clockwise from a north line of 0° to a given surveyed line.

**Bevelled Edge:** An edge which has had its angle altered.

**Biface:** A flaked stone artefact which has flake scars on both ventral and dorsal surfaces.

**Bipolar:** Technique of knapping where a core is rested on an anvil and force applied to the core at an angle close to 90° in the direction of the core's contact with the anvil.

**Blade:** A flake at least twice as long as it is wide.



**Blaze:** A mark carved in a tree trunk at about breast height. This type of mark was traditionally used by explorers or surveyors to indicate a route of passage in a certain direction, or a particular camp location.

**Bulb of Percussion:** Is a convex protuberance located at the proximal end of the ventral surface of a flake, immediately below the ring crack.

**Bulbar Scar:** The negative scar on a core that results from the bulb of percussion on the extracted flake.

**Burial site:** Usually a sub-surface pit containing human remains and sometimes associated artefacts. Human burials can also occur above the ground surface within rock shelters or on tree platform burials.

**Burin:** A stone implement roughly rectangular in shape with a corner flaked to act as a point for piercing holes.

**Cadastral:** From the Latin, a cadastre is a comprehensive register of the real property of a country, and commonly includes details of the ownership, the tenure, the precise location (some can include GPS coordinates), the dimensions (and area), the cultivations if rural and the value of individual parcels of land.

**Chert:** Is a fine-grained silica-rich microcrystalline, cryptocrystalline or microfibrinous sedimentary rock that may contain small fossils. It varies greatly in colour (from white to black), but most often manifests as gray, brown, greyish brown and light green to rusty red. Its colour is an expression of trace elements present in the rock, and both red and green are most often related to traces of iron (in its oxidized and reduced forms respectively).

**Cleavage Plane:** A plane of weakness or preferred fracture in a rock.

**Composite:** An artefact made up of two or more parts joined together.

**Conchoidal Fracture:** describes the way that brittle materials break when they do not follow any natural planes of separation. Materials that break in this way include flint and other fine-grained minerals, as well as most amorphous solids, such as obsidian and other types of glass. Conchoidal fractures often result in a curved breakage surface that resembles the rippling, gradual curves of a mussel shell; the word "conchoid" is derived from the word for this animal. A swelling appears at the point of impact called the bulb of percussion. Shock waves emanating outwards from this point leave their mark on the stone as ripples. Other conchoidal features include small fissures emanating from the bulb of percussion.

**Conjoin:** A physical link between artefacts broken in antiquity. A conjoin set refers to a number of artefacts which can be been refitted together.

**Contours:** Lines joining points of equal height on a topographic map. Contour lines that are relatively close together depict an area of steep terrain on the earth's surface; whereas lines depicted a distance apart represent flat areas on the earth's surface.

**Core:** An artefact from which flakes have been detached using a hammer stone. Core types include single platform, multi-platform, and bipolar forms.

**Cortex:** Weathered outer surface of rock, usually chemically altered.

**Crazing:** Production of visible surface cracks by uncontrolled heating of rock.

**Crown land:** Technically belonging to the reigning sovereign, is a class of public land, provided for the enjoyment and benefit of the people.

**Crushing:** Abrasion, small fracturing and the formation of ring cracks, usually along an artefacts edge.

**Cryptocrystalline:** Rock in which the crystal structure is too fine for clear resolution with an optical microscope.

**Cultural significance:** Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations (Australia ICOMOS Burra Charter Article 1.2).

**Cultural Materials:** The products of human behaviour, such as stone artefacts or food debris.

**Datum:** In surveying and geodesy, a datum is a reference point or surface against which position measurements are made, and an associated model of the shape of the earth for computing positions. Horizontal datum's are used for describing a point on the earth's surface, in latitude and longitude or another coordinate system. Vertical datum's are used to measure elevations or underwater depths. The previous datum used in Australia was known as the Australian Geodetic Datum (AGD). However, this was restricted because it was defined to best fit the shape of the earth in the Australian region only. The change in datum's had a major consequence to all coordinates. Both latitudes/longitudes and eastings/northings were shifted by approximately 200 metres in a north-easterly direction.

**Debitage:** The termdebitage refers to the totality of waste material produced during lithic reduction and the production of chipped stone tools. This assemblage includes, but is not limited to, different kinds of lithic flakes, shatter, and production errors and rejects.

**Decortication:** Removal of cortex from a stone artefact.

**Dendrochronology:** Is the method of scientific dating based on the analysis of tree-ring growth patterns.

**Denticulated:** Describes a stone tool which has one edge worked into a series of notches giving a toothed or serrated cutting edge.

**Discard:** The movement of an object from its systemic context to an archaeological context.

**Distal:** The end of a flake opposite the bulb; the area of a flake containing its termination.

**Direct Freehand Knapping:** A method of holding the material to be flaked in the unsupported hand and directing the hammer stone with the other hand.

**Dorsal Surface:** The face of a flake which was the core surface prior to flake removal and may therefore retain negative flake scars or cortex.

**Edge ground implement:** A tool, such as an axe or adze which has been flaked to a rough shape and then ground against another stone to produce a sharp edge.

**Edge modification:** Irregular small flake scarring along one or more margins of a flake, flaked piece or core, which is the result of utilisation/retouch or natural edge damage. Edge damage refers to the removal of small flakes from the edge of an artefact.

**Elevation:** The height above mean sea level.

**Eraillure Flake:** A flake formed between the bulb of force and the bulbar scar. Sometimes the eraillure flake adheres to the core in the bulbar scar. The eraillure flake leaves no scar on the core, but always leaves a scar on the ventral surface of the flake. The eraillure flake is convex / concave (like a meniscus lens), has no distinct features on the "dorsal face", but may contain compression rings on the bulbar face.

**Ethno-archaeology:** The study of human behaviour and of the material culture of living societies in order to learn how items enter the archaeological record, thus allowing the formation of hypotheses as to how items of material culture entered the archaeological record in pre-history.

**Ethnographic Site:** Often overlooked in cultural heritage management, an ethnographic site is one which has particular spiritual or ritual significance to a particular group of people. They are more commonly referred to as 'dreaming sites' in Australia, and most appropriately recorded by someone with anthropological qualifications.

**Excavation:** The systematic recovery of archaeological data through the exposure of buried sites and artefacts. Excavation is a destructive process, and hence it is accompanied by comprehensive recording of every aspect.

**Excavation Report:** Once an excavation has finished, a report outlining the reasons, aims, methods used and findings from the excavation as well as some conclusions drawn from interpreting the artefacts.

**Faceted Platform:** A platform which is created by the removal of a number of flake scars.

**Feather Termination:** A termination of the fracture plane that occurs gradually (i.e. there are no sharp bends in the plane), producing a thin, low angled distal margin.

**Feature:** In excavations, a feature is something that a human made in the past that has not been or cannot be moved. Examples of this would be a house floor or a hearth (fire pit). When archaeologists are excavating, they often come across features.

**Flake:** A piece of stone removed from a core during the process of knapping by the application of external force, which characteristically shows traces of the processes of removal: concentric fracture ripples and a bulb of percussion. Flakes with a length: breadth ratio of 2:1 or more are usually referred to as blades. In some cases, flakes are the result of shaping a block of stone into a tool of some kind. When removed from a prepared core, however, they were usually used as blanks for making tools. Primary flakes (also called decortication flakes) are large, thick flakes struck off a core when removing the cortex and preparing it for working. Secondary flakes (also called reduction flakes) are large flakes struck off a piece to reduce its size or thickness. Tertiary flakes are small flakes struck off when shaping the detail of a piece to make a specific tool. Retouching flakes are tiny, extremely thin flakes pinched or pushed off a piece to finish it, to fine-shape part of the surface, sharpen it, or resharpen it. Notching flakes are produced when putting hafting notches in stone tools.

**Force:** The quantity of energy exerted by a moving body; power exerted; energy exerted to move another body from a state of inertia.

**Formal tool:** an artefact that has been shaped by flaking, including retouch, or grinding to a predetermined form for use as a tool. Formal tools include scrapers, backed pieces, adzes and axes.

**Fracture:** Irregular surface produced by breaking a mineral across rather than along cleavage planes.

**GDA94:** Geocentric Datum of Australia. A spatial reference system which is universally implemented across Australia. The Geocentric Datum of Australia (GDA) is a coordinate reference system that best fits the shape of the earth as a whole. It has an origin that coincides with the centre of mass of the earth, hence the term 'geocentric'

**Geodesy:** The science and mathematical calculations of the shape and size of the Earth.

**Geographic coordinates:** a geographic coordinate system enables every location on the earth to be specified, using mainly a spherical coordinate system. There are three coordinates: latitude, longitude and geodesic height.

**Geographic Information Systems:** Is any system for capturing, storing, analysing, managing and presenting data and associated attributes which are spatially referenced to Earth. GIS is a system or tool or computer based methodology to collect, store, manipulate, retrieve and analyse spatially (georeferenced) data.

**Geometric microlith:** A small tool that has been fashioned from breaking apart a microblade. The piece is then retouched or backed and a small tool formed.

**Gilgai soils:** Soils with an undulating surface, presenting as a pattern of mounds and depressions. Gilgai soils contain swelling clays, which shrink and swell with alternate drying and wetting cycles. They display strong cracks when dry. Elements of the soil circulate and move during the shrink-swell process.

**Global Positioning System:** GPS is a satellite based navigation system originally developed by the United States Department of Defence. A GPS receiver calculates a position by measuring distances to four or more satellites of a possible 24. These orbit the Earth at all times.

**Grain:** A description of the size of particles or crystals in rocks or sand. Coarse grained rocks have particles or crystals which are large (1mm or more), and fine grained rocks have particles which are small (0.1mm or less).

**Greywacke:** Hard fine-grained rock of variable composition containing some quartz and feldspar but mostly very fine particles of rock fragments.

**Graticule:** A network of crossing lines on a map representing parallels of latitude and meridians of longitude as defined by the projection.

**Grid:** The division of an archaeological site into small squares that denote different areas of excavation, making it easier to measure and document the site.

**Grid coordinates:** A point on a map given as an easting and northing reading. The values are given in metres.

**Grindstone:** The abrasive stone used to abrade another artefact or to process food. Upper and lower grind stones used to grind plants for food and medicine and/or ochre for painting. A hammer stone sometimes doubles as a hammer stone and/or anvil.

**Hammer stone:** a piece of stone, often a creek/river pebble/cobble, which has been used to detach flakes from a core by percussion. During flaking, the edges of the hammer stone become 'bruised' or crushed by impact with the core. Hammer stones may also be used in the manufacture of petroglyphs.

**Hand-Held:** Description of the method used to immobilize the rock during knapping, it which it is held in one hand and struck by a hammer stone held in the other hand.

**Hardness:** Resistance of material to permanent deformation.

**Hearth:** Usually a sub-surface feature found eroding from a river or creek bank or a sand dune – it indicates a place where Aboriginal people cooked food. The remains of hearth are usually identifiable by the presence of charcoal and sometimes clay balls (like brick fragments) and hearth stones. Remains of burnt bone or shell are sometimes preserved with a hearth.

**Heat treatment:** The thermal alteration of stone (including silcrete) by stone workers to improve its flaking qualities.

**Heritage:** The word 'heritage' is commonly used to refer to our cultural inheritance from the past that is the evidence of human activity from Aboriginal peoples through successive periods of later migration, up to the present day. Heritage can be used to cover natural environment as well, for example the Natural Heritage Charter. Cultural heritage can be defined as those things and places associated with human activity. The definition is very broad, and includes Indigenous and historic values, places and objects, and associated values, traditions, knowledge and cultures.

**Heritage Place:** A place that has aesthetic, historic, scientific or social values for past, present or future generations – 'this definition encompasses all cultural places with any potential present or future value as defined above'. Heritage place can be subdivided into Aboriginal place and historical place, for the purposes of this document.

**Hinge Termination:** A fracture plane that turns sharply toward the free surface of the core immediately prior to the termination of the fracture. The bend of the ventral surface is rounded and should not be confused with a step termination.

**Historic place:** A place that has some significance or noted association in history.

**Homogeneous:** Uniform structure and property throughout the material.

**Hunter-gatherer:** A member of a society who gains their subsistence in the wild on food obtained by hunting and foraging.

**Hydrology:** Is the study of the movement, distribution, and quality of water throughout the Earth.

**ICOMOS (International Council on Monuments and Sites):** ICOMOS is a nongovernment professional organisation closely linked to UNESCO, with national committees in some 100 countries with the headquarters in France. ICOMOS promotes expertise in the conservation of cultural heritage. It was formed in 1965, and has a responsibility to advise UNESCO in the assessment of sites proposed for the World Heritage List. Australia ICOMOS was formed in 1976. Its fifteen member executive committee is responsible for carrying out national programmes and participating in decisions of ICOMOS.

**Incipient Crack:** A crack or line of weakness in the rock.

**Inclusion:** An impurity or foreign body in the stone that reduces the homogeneity of the rock.

**Indirect Percussion:** Punch technique.

**Interpretation:** The process of explaining the meaning or use of an artefact.

**Inward Force:** Force applied to the platform, and directed into the body of the core.

**Isolated artefact:** The occurrence of less than five items of cultural material within an area of about 100 sq. metres. It/they can be evidence of a short-lived (or one-off) activity location, the result of an artefact being lost or discarded during travel, or evidence of an artefact scatter that is otherwise obscured by poor ground visibility.

**Knapper:** A person who creates stone artefacts by striking rocks and causing them to fracture.

**Knapping Floor:** The debris left on one spot and resulting from the reduction of one block of raw material. A knapping location is a site comprised of one or more knapping floors.

**Koori:** Koori is an Aboriginal term used to describe Indigenous people from Victoria and southern New South Wales.

**Lateral Margins:** The margins of a flake either side of the percussion axis.

**Latitude:** The angular distance along a meridian measured from the Equator, either north or south.

**Layer:** The layer is the level in which archaeologists dig. All excavation sites have different numbers of layers. Archaeologists try to work out when they are moving to a new layer by cultural or man-made clues like floors, but sometimes they will go by changes in soil colour or soil type.

**Longitude:** The angular distance measured from a reference meridian, Greenwich, either east or west.

**Longitudinal Cross Section:** The cross-section of a flake along its percussion axis.

**Magnetic north:** The direction from a point on the earth's surface to the north magnetic pole. The difference between magnetic north and true north is referred to as magnetic declination.

**Maintenance:** The process of keeping an artefact in a particular state or condition. An edge which is being used is maintained by flaking off blunted portions. A core is maintained by keeping its characteristics within the limits required for certain types of flaking.

**Manufacture:** The process of making an artefact.

**Manuport:** Foreign fragment, chunk or lump of stone that shows no clear signs of flaking but is out of geological context and must have been transported to the site by people.

**Map scale:** The relationship between a distance on a map and the corresponding distance on the earth's surface.

**Margin:** Edge between the ventral and dorsal surfaces of a flake.

**Material culture:** A term that refers to the physical objects created by a culture. This could include the buildings, tools and other artefacts created by the members of a society.

**Mercator projection:** A conformal cylindrical projection tangential to the Equator. Rhumb lines on this projection are represented as straight lines.

**Meridian:** A straight line connecting the North and South Poles and traversing points of equal longitude.

**MGA94:** The Universal Transverse Mercator coordinates of eastings, northings, and zones generated from GDA94 are called Map Grid of Australia 1994 coordinates.

**Microblade:** A very small narrow blade.

**Microcrystalline:** Rocks in which the crystals are very small but visible in an optical microscope.

**Microwear:** Microscopic use-wear.

**Moiety:** A moiety is a half. Tribes were composed of two moieties (halves) and each clan belonged to one of the moieties.

**Mound:** These sites, often appearing as raised areas of darker soil, are found most commonly in the volcanic plains of western Victoria or on higher ground near bodies of water. The majority were probably formed by a slow buildup of debris resulting from earth-oven cooking; although some may have been formed by the collapse of sod or turf structures. It has also been suggested some were deliberately constructed as hut foundations.

**Morphology:** The topographical characteristics of the exterior of an artefact.

**Mosaic:** A number of continuous aerial photographs overlapped and joined together by way of 'best fit' to form a single non-rectified image.

**Negative Bulb of Force:** The concave surface left after a flake has been removed. See Bulbar Scar.

**Notched:** Serration or series of alternating noses and concavities.

**Obtrusiveness:** How visible a site is within a particular landscape. Some site types are more conspicuous than others. A surface stone artefact scatter is generally not obtrusive, but a scarred tree will be.

**Overhang:** The lip on a core or retouched flake, caused by the platform being undercut by the bulb on the flake removed.

**Overhang Removal:** The act of brushing or tapping the platform edge in order to remove the overhang in a series of small flakes.

**Overlays:** The Victorian Planning Provisions establish a number of different Overlays to show the type of use and development allowed in a municipality. Heritage Overlays will list places of defensible cultural heritage significance.

**Patina:** An alteration of rock surfaces by molecular or chemical change (but not by attrition, hence not to be confused with sand blasting).

**Pebble/cobble:** Natural stone fragments of any shape. Pebbles are 2-60 mm in size and cobbles are 60-200 mm in size.

**Percussion:** The act of hitting a core with a hammer stone to strike off flakes.

**Percussion Flaking:** The process of detaching flakes by striking with a percussor.

**Percussion Length:** The distance along the ventral surface from the ring crack to the flake termination.

**Place:** Place means a site, area, land, landscape, building or other works, group of buildings or other works, and may include components, contents, spaces and views. (Australia ICOMOS Burra Charter Article 1.1)

**Plane of Fracture:** The fracture path which produces the ventral surface of a flake.

**Planning scheme:** The legal instrument that sets out the provisions for land use, development, and protection in Victoria. Every municipality in Victoria has a planning scheme.

**Platform:** Any surface to which a fabricator is applied when knapping.

**Platform Angle:** 1. The angle between the platform and core face on a core. 2. The angle between the platform and dorsal surface on a flake. 3. The angle between the platform and flaked surface on a retouched flake.

**Platform Preparation:** Alteration of the portion of the platform which receives the fabricator by grinding, polishing or flaking. Removal of small flake scars on the dorsal edge of a flake, opposite the bulb of percussion. These overhang removal scars are produced to prevent a platform from shattering.

**Platform removal flake:** A flake which contains a platform on the dorsal surface.

**Point of force application:** The area of the platform in contact with the indenter during knapping. Also known as point of contact.

**Positive Bulb of Force:** Bulb of force.

**Post-depositional processes:** The natural or cultural processes which may differentially impact upon archaeological sediments after they deposited.

**Potlids:** A concave-convex or plano-convex fragment of stone. Potlids never have a ringcrack or any other feature relating to the input of external force. They often have a central protuberance which indicates an internal initiation to the fracture. Potlids are the result of differential expansion of heated rock.

**Pre-contact:** Before contact with non-Aboriginal people.

**Post-contact:** After contact with non-Aboriginal people.

**Pressure Flaking:** The process of detaching flakes by a pressing force. Also Static Loading.

**Primary decortication:** The first removal of cortex from a core, creating a primary decortication flake. The flake will have a dorsal surface covered entirely by cortex.

**Procurement:** Obtaining raw materials.

**Provenance:** The location of an artefact or feature both vertically and horizontally in the site. Archaeologists record the provenance of artefacts and features in their field books and on the artefact bag. Provenance is important because it gives archaeologists the history and context of an object, i.e., exactly where it was found on the site.

**Punch:** An object which is placed on a core or retouched flake and receives the blow from the percussor.

**Quarry:** A place where humans obtained stone or ochre for artefact manufacture. A place where stone or ochre is exposed and has been extracted by Aboriginal people. The rock types most commonly quarried for artefact manufacture in Victoria include silcrete, quartz, quartzite, chert and fine-grained volcanics such as greenstone.

**Quartz:** A form of silica.

**Quartzite:** Sandstone in which the quartz sand grains are completely cemented together by secondary quartz deposited from solution.

**Radiocarbon Dating:** Also called carbon dating and C-14 dating. It is used to work out the approximate age of an artefact by measuring the amount of carbon 14 it contains. This dating technique is not perfect. It can only be used on organic remains (typically wood or charcoal). Also radiocarbon is only accurate to  $\pm 50$  years, and cannot accurately date objects more than 50,000 years old.

**Redirecting Flake:** A flake which uses an old platform as a dorsal ridge to direct the fracture plane.

**Redirection:** Rotation of a core and initiation of flaking from a new platform situated at right angles to a previous platform. It produces a redirecting flake.

**Reduction:** Process of breaking down stone by either flaking or grinding.

**Reduction Sequence:** A description of the order in which reduction occurs within one block of stone.

**Rejuvenate:** The process of flaking in such a way that further reduction is possible or is easier. This usually involves removing unwanted features, such as step terminations, or making unsuitable characteristics more favourable, for example changing the platform angle. A Rejuvenation flake is a flake that has been knapped from a core solely for the purpose of preparing a new platform and making it easier to get flakes off a core, as it reduces that angle between platform and core surface.

**Relative Dating:** A general method of dating objects, which uses their relation to other objects. For example, artefacts found in lower layer are typically older than artefacts in higher layer.

**Relic:** Deposit, object or material evidence of human past.

**Replica:** A copy of a prehistoric artefact made by a modern investigator for research purposes.

**Replicative Systems Analysis:** A method of analysing prehistoric artefacts by creating exact replicas of all the manufacturing debris.

**Reserves:** The word 'reserve' derives from the land being reserved for a particular public use. Crown land retained in public ownership, but not reserved is termed unreserved Crown land.

**Resharpening:** The process of making a blunt edge sharper by grinding or flaking.

**Retouched Flake:** A flake that has subsequently been re-flaked. A flake, flaked piece or core with intentional secondary flaking along one or more edges.

**Retouching:** The act of knapping a flake into a retouched flake.

**Ridge:** The intersection of two surfaces, often at the junction of two negative scars.

**Ring Crack:** A circular pattern of micro-fissures penetrating into the artefact around the Point of Force Application and initiating the fracture. It appears on the ventral surface usually as a semi-circular protuberance on the edge of the platform.

**Rock art:** Paintings, engravings and shallow relief work on natural rock surfaces. Paintings were often produced by mineral pigments, such as ochre, combined with clay and usually mixed with water to form a paste or liquid that was applied to an unprepared rock surface.

**Run:** A large area of land in which squatters could pasture their stock without a lot of fencing necessary. Employed shepherds looked after various areas of the runs. Runs became consolidated pastoral holdings. Many of the runs were about 25 sq miles in area and later became parishes.

**Sand:** Quartz grains with only a small content of other materials. Grain size 2.00 mm to 0.05 mm.

**Sandstone:** A sedimentary rock composed of sand, and with only a small amount of other material, which has been consolidated by argillaceous or calcareous bonding of grains.

**Sahul:** This is the name given to the continent when Australia and New Guinea were a single landmass during the Pleistocene era. During this period, sea levels were approximately 150 metres lower than present levels.

**Scar:** The feature left on an artefact by the removal of a flake. Includes negative bulb, negative ring crack and negative termination.

**Scarred tree:** Scars on trees may be the result of removal of strips of bark by Aborigines e.g. for the manufacture of utensils, canoes or for shelter; or resulting from small notches chopped into the bark to provide hand and toe holds for hunting possums and koalas. Some scars may be the result of non-Aboriginal activity, such as surveyors' marks.

**Scraper:** A flake, flaked piece or core with systematic retouch on one or more margins.

**Screen:** A screen is used by an archaeologist to sift excavated soil in search of small artefacts like nails, ceramic fragments, and organic material like seeds, shell, and bone. Can be either manual (hand held) or mechanical.

**Secondary Decortication:** The removal of cortex from a core after the primary decortication flake. A secondary decortication flake is one that has both cortex and flake scars on the dorsal surface.

**Selection:** Runs were subdivided into selections for farming, agriculture and grazing homesteads. After a period of yearly rental payments, the selector could often obtain freehold ownership.

**Shell midden:** A surface scatter and/or deposit comprised mainly of shell, sometimes containing stone artefacts, charcoal, bone and manuports. These site types are normally found in association with coastlines, rivers, creeks and swamps – wherever coastal, riverine or estuarine shellfish resources were accessed and exploited.

**Sieve:** See Screen.

**Significance:** Significance is a term used to describe an item's heritage value. Values might include natural, Indigenous, aesthetic, historic, scientific or social importance.

**Silica:** Silicon dioxide.

**Silcrete:** A silicified sediment.

**Siliceous:** Having high silica content.

**Site:** An area designated for archaeological exploration by excavation and/or survey usually due to the presence of a concentration of cultural material.

**Step Termination:** A fracture plane that turns sharply towards the free surface of the core immediately prior to the termination of the fracture. The bend of the ventral surface is sharp, often a right angle.

**Stratification:** Over time, debris and soil accumulate in layers (strata). Colour, texture, and contents may change with each layer. Archaeologists try to explain how each layer was added—if it occurred naturally, deliberately (garbage), or from the collapse of structures—and they record it in detailed drawings so others can follow. Stratigraphy refers to the interpretation of the layers in archaeological deposits. Usually, the artefacts found on top are the youngest (most recent), while those on the bottom are the oldest.

**Structures (Aboriginal):** Can refer to a number of different site types, grouped here only because of their relative rarity and their status as built structures. Most structures tend to be made of locally available rock, such as rock arrangements (ceremonial and domestic), fish traps, dams and cairns, or of earth, such as mounds or some fish traps.

**Surface Site:** A site where artefacts are found on the ground surface.

**Taphonomy:** The study of the depositional and preservation processes which produce archaeological or paleontological material.

**Termination:** The point at which the fracture plain reaches the surface of a core and detaches a flake.

**Tertiary Flake:** A flake without cortex.

**Theodolite:** Instrument used by a surveyor for measuring horizontal and vertical angles.

**Thermal Treatment:** Alteration of siliceous materials by controlled exposure to heat.

**Thickness:** Measurement of the distance between the dorsal and ventral surfaces of a flake.

**Thumbnail scraper:** A convex edged scraper that is small, generally the size of a thumbnail.

**Tool:** Any object that is used.

**Topographic map:** A detailed representation of cultural, hydrographic relief and vegetation features. These are depicted on a map on a designated projection and at a designated scale.

**Transverse Cross Section:** The cross section of a flake at 90° to the length.

**Transverse Mercator projection:** A projection similar to the Mercator projection, but has the cylinder tangent at a particular meridian rather than at the equator.

**True north:** The direction to the Earth's geographic North Pole.

**Tula:** A flake with a prominent bulb, large platform and platform/ventral surface angle of about 130°, which is retouched at the distal end. Not to be confused with a Tula Adze.

**Tula Adze:** A composite tool observed ethnographically, consisting of a stone artefact (often a Tula), a wooden handle and resin.

**Unidirectional Core:** Core from which flakes were removed from one platform surface and in only one direction.

**Unifacial:** Artefact flaked on only one side.

**Unit:** Archaeologists lay out a grid over a site to divide it into units, which may vary in size, and then figure out which units will be dug. Archaeologists dig one unit at a time. Keeping track of specific measurements between artefacts and features gives archaeologists the ability to draw an overall map looking down on the site (called a floor plan), to get the bigger picture of the site.

**Use-wear:** Damage to the edges or working surfaces of tools sustained in use.

**Ventral Surface:** The surface of a flake created when it is removed and identified mainly by the presence of a ring crack.

**Visibility:** The degree to which the surface of the ground can be seen. This may be influenced by natural processes such as wind erosion or the character of the native vegetation, and by land-use practices, such as ploughing or grading. Visibility is generally expressed in terms of the percentage of the ground surface visible for a project area.



# 11 Appendices

## 11.1 Table of all Consultation Activities

Table 11-1: Consultation Activities

Date	Stage	Consultation Type	OEHL Requirement Section	Description	To/From Who	Notes
05-Oct-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Hunter Local Land Services (HLLS)	Send via Express Post (see Resister)
05-Oct-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Office of Environment and Heritage (OEHL)	Send via Express Post (see Resister)
05-Oct-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Native Title Services Corporation (NTSC)	Send via Express Post (see Resister)
05-Oct-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Muswellbrook Shire Council (MSC)	Send via Express Post (see Resister)
05-Oct-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Office of the Registrar of Aboriginal Land Rights Act	Send via Express Post (see Resister)
05-Oct-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	National Native Title Tribunal (NNTT)	Send via email to enquiries@nntt.gov.au
05-Oct-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Wanaruah Local Aboriginal Land Council (WLALC)	Send via Express Post (see Resister)
	1	Letters to Agencies		Receiving information regarding RAPs	HLLS	6/10/17 - letter delivery date 20/10/17 - LDK left voice message on Toby Whaleboat's mobile 6/11/17 - LDK sent email to Toby Whaleboat and admin address. As per phone conversation, Toby will reply to email.
20-Oct-17	1	Letters to Agencies		Receiving information regarding RAPs	OEHL	received via email (6/10/17 - letter delivery date)
20-Nov-17	1	Letters to Agencies		Receiving information regarding RAPs	NTSC	6/10/17 - letter delivery date 20/10/17 - LDK contact NTSC and indicated they would send the information via email 6/11/17 - LDK sent email, followed by a phone conversation: NTSC cannot provide names at present. Solicitor (Grace Manning-Davis) will send through a summary of conversation 16/11/17 - LDK left message for Grace Manning-Davis (solicitor)
16-Oct-17	1	Letters to Agencies		Receiving information regarding RAPs	MSC	received via email (6/10/17 - letter delivery date)
10-Oct-17	1	Letters to Agencies		Receiving information regarding RAPs	Office of the Registrar	received via email (6/10/17 - letter delivery date)
05-Oct-17	1	Letters to Agencies		Receiving information regarding RAPs	NNTT	received via email (6/10/17 - letter delivery date)
20-Oct-17	1	Letters to Agencies		Receiving information regarding RAPs	WLALC	received via email (6/10/17 - letter delivery date)
05-Oct-17	1	Public Notices RAPs		Public Notice in Newspaper	Muswellbrook Chronicle	proof sent to Fairfax Media for publication
05-Oct-17	1	Public Notices RAPs		Public Notice in Newspaper	Hunter Valley News	proof sent to Fairfax Media for publication
13-Oct-17	1	Public Notices RAPs	4.1.3, 4.1.4	Public Notice in Newspaper	Muswellbrook Chronicle	appeared in publication
11-Oct-17	1	Public Notices RAPs	4.1.3, 4.1.4	Public Notice in Newspaper	Hunter Valley News	appeared in publication
26-Oct-17 to 30-Oct-17	1	Letter sent to known parties	4.1.3, 4.1.4, 4.1.5, 4.2	Invitation to register as an MCCO Project RAP	91 contacts (two group mailings))	
23-Oct-17 to 22-Nov-17	1	Letters of registration from RAPs		RAP Registration	Registrations received as per folder (33 RAPs)	
14-Dec-17	1	Copy of EOI Letters, Registered RAPs List and Public	4.1.6	Email submission as per Section 4.1.6	OEHL - Steven Cox	91 letters, 33 Registered RAPs and 2 Public Notices

## Mangoola Coal Continued Operations Project

		Notices				
14-Dec-17	1	Copy of EOI Letters, Registered RAPs List and Public Notices	4.1.6	Email submission as per Section 4.1.6	WLALC - Noel Downs	91 letters, 33 Registered RAPs and 2 Public Notices
15-Dec-17	2	Send Draft Archeological Survey Methodology to RAPs for Comment	4.2, 4.3.1, 4.3.2	Draft Archeological Survey Methodology, including an MCCO Community Information Sheet, mailed out to Registered RAPs for comment (28-day comment period)	33 Contacts as listed in RAP database	
15-Dec-17	2	Send Draft Archeological Survey Methodology to RAPs for Comment	4.2, 4.3.1, 4.3.2	Draft Archeological Survey Methodology, including an MCCO Community Information Sheet, mailed out for comment (28-day comment period)	Scott Franks	Information to Scott Franks was sent via email by JM
19-Dec-17	2	Send Draft Archeological Survey Methodology to RAPs for Comment	4.2, 4.3.1, 4.3.2	Draft Archeological Survey Methodology, including an MCCO Community Information Sheet, emailed out for comment (28-day comment period) to all registered RAPs with an email address	All RAP emails on Registered RAP list (except Scott Franks)	
19-Dec-17	2	Send Draft Archeological Survey Methodology to NTSCorp	4.2, 4.3.1, 4.3.2	Draft Archeological Survey Methodology, including an MCCO Community Information Sheet, emailed to NTSCorp in relation to Gomerioi People	Grace Manning-Davis	Email from JM
19-Dec-17	2	Send Draft Archeological Survey Methodology to WNAC	4.2, 4.3.1, 4.3.2	Draft Archeological Survey Methodology, including an MCCO Community Information Sheet, emailed to Laurie Perry (WNAC)	Laurie Perry	Email from JM Email filed under Correspondenc/01 Methodology
19-Jan-18	2	Letter of Engagement - Seek Cultural Information from RAPs (General)	3.4, 4.3.3	Provision of field work details/expectations/Registration of Engagement Form/Field Worker Application Form		Express Post
19-Jan-18	2	Letter of Engagement - Seek Cultural Information from RAPs (Gomerioi)	3.4, 4.3.3	Provision of field work details/expectations/Registration of Engagement Form/Field Worker Application Form		Express Post
22-Jan-18	2	Letter of Engagement - Seek Cultural Information from RAPs (PCWP)	3.4, 4.3.3	Provision of field work details/expectations/Umbrella Agreement	Scott Franks (PCWP)	Email from JM Includes Umbrella Agreement
22-Jan-18	2	Letter of Engagement - Seek Cultural Information from RAPs (HVAC)	3.4, 4.3.3	Provision of field work details/expectations/Umbrella Agreement	Rhonda Griffiths/Ross Pahuru (HVAC)	Email from JM Includes Umbrella Agreement
22-Jan-18	2	Letter of Engagement - Seek Cultural Information from RAPs (WNAC)	3.4, 4.3.3	Provision of field work details/expectations/Umbrella Agreement	Laurie Perry (WNAC)	Email from JM Includes Umbrella Agreement
05-Feb-18	2	Archeological Walking Survey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		
06-Feb-18	2	Archeological Walking Survey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		
07-Feb-18	2	Archeological Walking Survey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		

## Mangoola Coal Continued Operations Project

08-Feb-18	2	Archeological Walking Suvey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		
09-Feb-18	2	Archeological Walking Suvey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		
12-Feb-18	2	Archeological Walking Suvey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		
13-Feb-18	2	Archeological Walking Suvey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		
14-Feb-18	2	Archeological Walking Suvey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		
15-Feb-18	2	Archeological Walking Suvey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		
16-Feb-18	2	Archeological Walking Suvey of the MCCO Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs		
06-Apr-18	2	Test Excavation Methodology - RAP comment request and Preliminary Archeological Assessment Summary (OzArk)	4.2, 4.3.1, 4.3.2	Draft Test Excavation Methodology and Archeological Assessment Summary mailout to all Registered RAPs for comment (28-day comment period)	36 Contacts as listed in RAP database	Express Post
06-Apr-18	2	Test Excavation Methodology - RAP comment request and Preliminary Archeological Assessment Summary (OzArk)	4.2, 4.3.1, 4.3.2	Draft Test Excavation Methodology and Archeological Assessment Summary emailed for comment (28-day comment period)	Des Hickey (WW)	Email from JM
06-Apr-18	2	Test Excavation Methodology - RAP comment request and Preliminary Archeological Assessment Summary (OzArk)	4.2, 4.3.1, 4.3.2	Draft Test Excavation Methodology and Archeological Assessment Summary emailed for comment (28-day comment period)	Scott Franks (PCWP)	Email from JM
06-Apr-18	2	Test Excavation Methodology - RAP comment request and Preliminary Archeological Assessment Summary (OzArk)	4.2, 4.3.1, 4.3.2	Draft Test Excavation Methodology and Archeological Assessment Summary mailed out for comment (28-day comment period)	Grace Manning-Davis (NTSCorp), representing Gomeroi	Express Post
06-Apr-18	2	Test Excavation Methodology - RAP comment request and Preliminary Archeological Assessment Summary (OzArk)	4.2, 4.3.1, 4.3.2	Draft Test Excavation Methodology and Archeological Assessment Summary emailed for comment (28-day comment period)	Grace Manning-Davis (NTSCorp), representing Gomeroi	Email from JM
16-Apr-18	3	Invitation to Cultural Values Workshops/Site tour	4.3.3	Mailout Cultural Values Workshop invite	Un-aligned RAPs (9 RAP groups)	Mail out (regular post) - see RAP Database under Workshop Groups
16-Apr-18	3	Invitation to Cultural Values Workshops/Site tour	4.3.3	Mailout Cultural Values Workshop invite	HVAC (14 RAP groups)	Mail out (regular post) - see RAP Database under Workshop Groups

## Mangoola Coal Continued Operations Project

16-Apr-18	3	Invitation to Cultural Values Workshops/Site tour	4.3.3	Mailout Cultural Values Workshop invite	Hickeys (6 RAP groups)	Mail out (regular post) - see RAP Database under Workshop Groups
16-Apr-18	3	Invitation to Cultural Values Workshops/Site tour	4.3.3	Mailout Cultural Values Workshop invite	Gomerioi (3 RAP groups)	Mail out (regular post) - see RAP Database under Workshop Groups
16-Apr-18	3	Invitation to Cultural Values Workshops/Site tour	4.3.3	Mailout Cultural Values Workshop invite	WNAC (3 RAP groups)	Mail out (regular post) - see RAP Database under Workshop Groups
16-Apr-18	3	Invitation and schedule regarding Values Workshops (email)	4.3.3	Email Cultural Values Workshop invite to those RAPs with an email address	Group 1 - HVAC - 12 RAP Groups	Email - see RAP Database under Workshop Groups
16-Apr-18	3	Invitation and schedule regarding Values Workshops (email)	4.3.3	Email Cultural Values Workshop invite to those RAPs with an email address	Group 2 - Gomerioi - 3 RAP Groups	Email - see RAP Database under Workshop Groups
16-Apr-18	3	Invitation and schedule regarding Values Workshops (email)	4.3.3	Email Cultural Values Workshop invite to those RAPs with an email address	Group 3 - WNAC - 3 RAP Groups	Email - see RAP Database under Workshop Groups
16-Apr-18	3	Invitation and schedule regarding Values Workshops (email)	4.3.3	Email Cultural Values Workshop invite to those RAPs with an email address	Group 4 - Hickeys- 6 RAP Groups	Email - see RAP Database under Workshop Groups
16-Apr-18	3	Invitation and schedule regarding Values Workshops (email)	4.3.3	Email Cultural Values Workshop invite to those RAPs with an email address	Group 5 - Un-aligned - 8 RAP Groups	Email - see RAP Database under Workshop Groups
17-Apr-18	2	Test Excavation Methodology - RAP comment request and Preliminary Archeological Assessment Summary (OzArk)	4.2, 4.3.1, 4.3.2	Draft Test Excavation Methodology and Archeological Assessment Summary emailed for comment (28-day comment period) to those RAPs that had not yet received documents by mail	3 RAPs (W. Taggart, WNAC and UAC)	
24-Apr-18	2	Test Excavation Notification to OEH	Requirement 15c of the Code of Practice	Notification to OEH re: Test Excavation date (14 days prior to activity)	Originally sent to Nicole Davis (who is on leave) so forwarded to regional mail address (rog.hcc@environment.nsw.gov.au) which is the standard address for all Project queries and notifications	Sent via email by Ben Churcher (OzArk) - see Test Excavation Methodology' folder under 'Correspondence'
30-Apr-18	2	Test Excavation Notification to OEH		Receipt of Notification from OEH	From OEH (Nicole Davis) to OzArk (Ben Churcher)	Email from OEH
09-Apr-18	2	Test Excavation Methodology - RAP Reply	4.3.3	Test Excavation Methodology - RAP Comments	From Culturally Aware (Tracey Skene)	Comments send via email
15-Apr-18	2	Test Excavation Methodology - RAP Reply	4.3.3	Test Excavation Methodology - RAP Comments	From Didge Ngunawal Clan (Paul Boyd and Lilly Carroll)	Comments send via email
17-Apr-18	2	Test Excavation Methodology - RAP Reply	4.3.3	Test Excavation Methodology - RAP Comments	Murra Bidgee Mullangari Aboriginal Corporation (Ryan Johnson)	Comments send via email
27-Apr-18	2	Test Excavation Methodology - RAP Reply	4.3.3	Test Excavation Methodology - RAP Comments	Muragadi Heritage Indigenous Corporation (Jesse Carroll-Johnson)	Comments send via email
09-May-18	3	Cultural Values Workshop and MCCO Site Tour	4.3.3	Workshops held at MCCO Project Office and included a bus tour of the Project area	HVAC (12 RAPs) and Gomerioi (4 RAPs)	

## Mangoola Coal Continued Operations Project

10-May-18	3		4.3.3	Workshops held at MCCO Project Office and included a bus tour of the Project area	WNAC (4 RAPs + 8 Elders) and Hickeys (0 RAPs)	
15-May-18	3	Test Excavation (1 site)	4.3.3	Test excavation on one PAD site that included 2 archeologists and 2 RAPs		
16-May-18	3	Archeological Walking Suvey of the MCCO Project Area (unassessed areas)	4.3.3	Walking survey in Project area that was not previously assessed (2 archeologist and 4 RAPs)		
17-May-18	3	Archeological Walking Suvey of the MCCO Project Area (unassessed areas)	4.3.3	Walking survey in Project area that was not previously assessed (2 archeologist and 4 RAPs)		
18-May-18	3	Archeological Walking Suvey of the MCCO Project Area (unassessed areas)	4.3.3	Walking survey in Project area that was not previously assessed (2 archeologist and 4 RAPs)		
30-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite mailout	HVAC (16 RAP groups)	Mail out (regular post)
30-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite mailout	WNAC (6 RAP groups)	Mail out (regular post)
30-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite mailout	Hickeys (7 RAP groups)	Mail out (regular post)
30-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite mailout	Gomerioi (3 RAP groups)	Mail out (regular post)
30-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite mailout	Un-aligned RAPs (4 RAP groups)	Mail out (regular post)
30-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite emailed to those RAPs with an email address	WNAC (6 RAP groups)	Email - to those RAPs with email addresses
30-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite emailed to those RAPs with an email address	Gomerioi (3 RAP groups)	Email - to those RAPs with email addresses
31-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite emailed to those RAPs with an email address	Hickeys (7 RAP groups)	Email - to those RAPs with email addresses
31-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite emailed to those RAPs with an email address	HVAC (13 RAP groups)	Email - to those RAPs with email addresses
31-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite emailed to those RAPs with an email address	Un-aligned RAPs (4 RAP groups)	Email - to those RAPs with email addresses
31-Aug-18	3	Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite mailout	Paulette Ryan (HTO) - new address	Mail out (regular post)
17-Sep-18	3	Cultural Values Workshop #2	4.3.3 - 4.3.7	Cultural Values Workshop #2 held in Muswellbrook for Gomerioi (3 RAPs) and HVAC (11 RAPs)		
18-Sep-18	3	Cultural Values Workshop #2	4.3.3 - 4.3.7	Cultural Values Workshop #2 (Day 1) held in Singleton for WNAC (5 RAPs and 15 Elders)		
19-Sep-18	3	Cultural Values Workshop #2	4.3.3 - 4.3.7	Cultural Values Workshop #2 (Day 2) held in Singleton for WNAC (5 RAPs and 15 Elders)		
20-Sep-18	3	Cultural Values Workshop #2	4.3.3 - 4.3.7	Cultural Values Workshop #2 held in Muswellbrook for Hickeys (2 RAPs)		

19-Dec-18	4	Draft Aboriginal Cultural Values Assessment Report - provide to RAPs for review and comment	4.4.1 - 4.4.3	Email link of Draft ACVAR to those RAPs requesting the ability to download file via file transfer	19 RAPs	Refer to file for details: RAP Comment Log_ACHAR
19-Dec-18	4	Draft Aboriginal Cultural Values Assessment Report - provide to RAPs for review and comment	4.4.1 - 4.4.3	Express Post hard copy of ACVAR to those RAPs request it be mailed directly or those RAPs who could not be contacted to inquire about preference.	20 RAPs	Refer to file for details: RAP Comment Log_ACHAR

## 11.2 List of RAPs for the Project

Group/Organisation	First Name	Surname
A1 Indigenous Services	Carolyn	Hickey
Aboriginal Native Title Consultants	John & Margaret	Matthews
AGA Services	Ashley, Gregory & Adam	Sampson
Amanda Hickey Cultural Services (AHCS)	Amanda	Hickey
Cacatua General Services	George & Donna	Sampson
Crimson-Rosie	Jeffery	Matthews
Culturally Aware	Tracey	Skene
Devine Diggers Aboriginal Cultural Consultants	Deidre	Perkins
Didge Ngunawal Clan (DNC)	Paul & Lilly	Boyd & Carroll
Gidawaa Walang Cultural Heritage Consultancy	Craig	Horne
Gomerioi Bigambul Traditional Owners	Fay	Twidale
Gomerioi Namoi Traditional Owners	Stephen	Talbot
Gomery Cultural Consultants	David	Horton
Gringai Aboriginal Corporation	Gregory	Heard
Hunter Traditional Owners Environmental Management Service	Paulette	Ryan
Hunter Valley Aboriginal Corporation	Rhonda	Griffiths
Hunter Valley Cultural Services	Luke	Hickey
Indigenous Learning	Craig	Archibald
Jarban & Mugrebea	Barry	French
JLC Cultural Services	Jenny-Lee	Chambers
Lower Hunter Aboriginal Incorporated	David	Ahoy
Muragadi Heritage Indigenous Corporation	Vickilee	Paddison
Murra Bidgee Mullangari Aboriginal Corporation	Ryan & Darleen	Johnson (Carroll)
N/A	Carleen	Dent
N/A	Warren	Taggart
Nyanga Walang	Kevin	Duncan
Plains Clans of the Wonnarua People (PCWP)	Scott	Franks
Ungooroo Aboriginal Corporation	Taasha	Layer
Upper Hunter Wonnarua Council Inc	Rhoda & Victor	Perry
Valley ELM Corp	Irene	Ardler
Wallangan Cultural Services	Maree	Waugh
Wanaruah Local Aboriginal Land Council	Noel	Downs
Wattaka Wonnarua Cultural Consultants Services	Des	Hickey
Widescope Indigenous Group Pty Ltd	Steven & Donna	Hickey
Wonn 1 Contracting (Kauwul)	Arthur	Fletcher
Wonnarua Nation Aboriginal Corporation	Laurie	Perry
Yinarr Cultural Services	Kathleen	Steward-Kinchela



## 11.3 Consultation Documentation

### 11.3.1 Example Letter seeking Registrations

# GLENCORE

26 October 2017

Bec Bell  
Black Creek Aboriginal Corporation  
PO Box 6  
Cessnock NSW 2325

Dear Bec;

***Re: Invitation for Aboriginal parties to register their expressions of interest to participate in cultural heritage consultation for the Mangoola Coal Continued Operations Project***

Mangoola Coal Operations Pty Ltd (Mangoola Coal), a subsidiary of Glencore PLC, owns and operates the Mangoola Open Cut Mine (Mangoola) which is located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman in the Upper Hunter Valley, NSW.

Mangoola Coal is seeking approval for the Mangoola Coal Continued Operations (MCCO) Project to continue its current open cut mining operation into a new mining area to the immediate north of the existing operations as identified in **Figure 1**.

As part of the MCCO Project, we are currently initiating consultation in accordance with the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.

If you hold cultural knowledge relevant to determining the significance of Aboriginal objects(s) and/or place(s) in the vicinity of Mangoola Coal, we invite you to participate in consultation regarding the proposed continuation of open cut mining operations. The purpose of the consultation is to enable assessment of Aboriginal Cultural Heritage associated with the MCCO Project.

Please register your interest in this process of community consultation by responding in writing either by fax or e-mail. Include your name/organisation and all contact details (mailing address, phone/mobile number, email, etc.) to Lori Dennen-King (details below) by **Monday, 13 November 2017**.

If you or your organisation wishes to register interest please note that, as per the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*, we are required to provide your contact details to the Office of Environment and Heritage unless you advise that you do not wish your details to be released.

All registered people or parties will be contacted to discuss the proposed project and consultation opportunities to inform the Aboriginal Cultural Heritage Assessment.

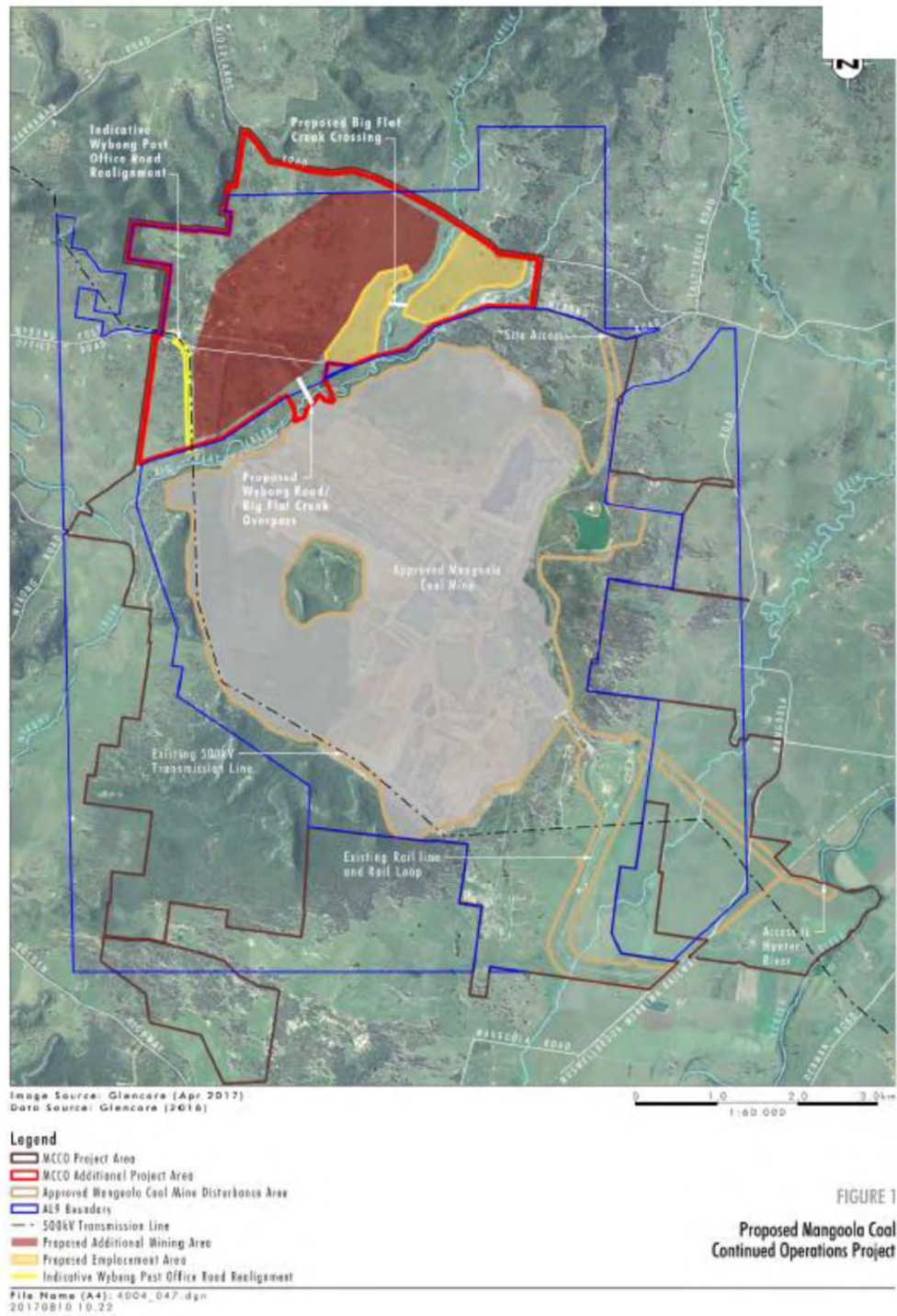
Kind Regards,



Lori Dennen-King  
Approvals Officer  
Mangoola Coal – A Glencore managed company  
Email: [lori.dennen-king@glencore.com.au](mailto:lori.dennen-king@glencore.com.au)  
Fax: (02) 6549 5655

Page 1 of 148

# GLENCORE





## 11.32 Public Notices

huntervalleynews.net.au

Wednesday, October 11, 2017 HUNTER VALLEY NEWS 13

**Connect with Classifieds** Phone: 02 6543 3011 Email: classifieds@hunter@fairfaxmedia.com.au

**Public Notices**

**AGM - TransCare Hunter Ltd**  
TransCare Hunter Ltd (TransCare) is a progressive community organisation which is holding its Annual General Meeting at its admin centre 214 Kelly Street Scone on:  
**Tuesday 17th October 2017 at 11 am**  
TransCare is seeking community minded people who would like to be part of this dynamic service provider of community services within the Upper Hunter and Muswellbrook shires by nominating to become a director.  
There will be seven (7) directors' positions vacant where nominators will be received up to the commencement of the meeting.  
Call Alan Gordon CEO on 0543 3113 for enquiries.

**MANGOOKA OPEN CUT**  
GLENORE  
**Public Notice**  
Invitation for Aboriginal parties to register their expressions of interest to participate in cultural heritage consultation for the Mangoola Coal Continued Operations Project  
Mangoola Coal Operations Pty Ltd (Mangoola Coal), a subsidiary of Glencore PLC, owns and operates the Mangoola Open Cut Mine (Mangoola) which is located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman.  
Mangoola Coal is seeking approval for the Mangoola Coal Continued Operations (MCCO) Project to continue its current open cut mining operation into a new mining area to the immediate north of the existing operations.  
As part of the MCCO Project we are currently inviting consultation in accordance with the Office of Environment and Heritage's Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.  
Aboriginal people or other parties who hold cultural knowledge relevant to determining the significance of Aboriginal objects (s) and/or places in the vicinity of Mangoola Coal are invited to participate in consultation regarding the proposed continuation of open cut mining operations. The purpose of the consultation is to enable assessment of Aboriginal Cultural Heritage associated with the MCCO Project.  
Aboriginal people or other parties who wish to register their interest in this process of community consultation must respond in writing (fax or e-mail) and include your name/organisation, contact details including address and phone numbers, and send to Jason Martin by 30 October 2017.  
All registered people or parties will be contacted to discuss the proposed project and consultation opportunities to inform the Aboriginal Cultural Heritage Assessment.  
Jason Martin  
Approvals Manager  
Glencore - Mangoola Coal  
Email: Jason.Martin@glencore.com.au  
Fax: 02 6543 5655

**Public Notices**

**ARTC ROAD CLOSURES**  
The Australian Rail Track Corporation (ARTC) will be carrying out important maintenance works at the following level crossings. Please note that times are approximate only and may be subject to change depending on a number of factors.  
**Mangoola Road, Denman**  
Closed for up to 20 min intervals between 9:00am and 2:00pm  
**Thursday 12th October**  
We apologise for any inconvenience caused by these works, and if you have any further questions please contact Kathy Rawson on 1800 965 979 (toll free) or email [arcommunity@artc.com.au](mailto:arcommunity@artc.com.au)

**Public Notices**

**NOTICE TO Classified Advertisers**  
All classified display and classified semi display advertising is sold in whole centimetre units and column units. Classified line advertisements are charged on the total number of lines. A minimum number of lines may be required. The full Terms and Conditions of Advertising of the Hunter Valley News are available from our office or by phoning (02) 65433011

**Public Notices**

**"In lodging**  
An advertisement with us, you agree that we may publish the advertisement on our website. We provide this service at no additional cost. The general terms and conditions that apply to publication of advertisements in our publications apply also to publication of material on our website.

**Public Notices**

**Witnesses Sought**  
Would anyone who has any information about or who has witnessed an accident involving a motorcycle and a car on the New England Highway, Muswellbrook NSW 2333 at approximately 11:00pm on 15 September 2017 please contact:  
Andrew Tudhope at Shanahan Tudhope Lawyers on (02) 9282 2888 or email [andrewt@stlaw.com.au](mailto:andrewt@stlaw.com.au)

**Public Notices**

**MANGOOKA OPEN CUT**  
GLENORE  
**Public Notice**  
Road Closures Due to Blasting Activities - Wybong Road  
Mangoola Coal Operations wish to advise that Wybong Road closures due to blasting activities may take place between:  
**Monday 16th October 2017 and Friday 20th October 2017**  
The road will be closed between west of the mine entrance road for up to 3kms west along Wybong Road. The road closure will occur between 10am and 2pm and be closed for 15 minutes but most likely between 12:00pm and 12:30pm. These times are subject to change depending on environmental conditions. Roadside signs will display the date and approximate time of each closure.  
For further information, please contact our Blasting and Community Response Hotline: 1800 014 339

**Positions Vacant**

**Boilermakers wanted**  
Numerous positions exist for qualified boilermakers in Gunnedah NSW. Must have a license, and wages will be negotiated for applicants who have current EWP, confined spaces and working at heights competencies as well as a MP truck license.  
Area: Gunnedah  
Ph: 0267423306  
Email: [8kmplytd@bigpond.com](mailto:8kmplytd@bigpond.com)

**Positions Vacant**

**Dump Truck Driver**  
Muswellbrook  
Earth-mover seeks experienced person with truck licence pref. for local jobs. Good, consistent work for right people.  
For details phone Jim 0428 689 102  
Email resumes to: [warren@robos.net](mailto:warren@robos.net)

**Positions Vacant**

**PMP DISTRIBUTION WALK AND BE PAID**  
Delivers required to deliver CATALOGUES & NEWSPAPERS on a regular basis in the following area: SINGLETON  
Car & Phone essential 0428 256 654

**Positions Vacant**

**Dispensary Technician**  
Are you customer focused with experience in pharmacy? WE WANT YOU!  
We are seeking an experienced Dispensary Technician to join our friendly team. Cert I & II in Pharmacy is desirable.  
Full-time permanent position Monday-Friday 9am-5pm  
Some Saturday mornings 9am-12:30pm  
Present your resume to Wally for email to [scone.chemistadmin@bigpond.com](mailto:scone.chemistadmin@bigpond.com)

**Positions Vacant**

**GARDENER (EXPERIENCED) FULL TIME POSITION**  
AVAILABLE AT HORSE STUD IN ABERDEEN  
MON - FRI 7:00AM - 4:00PM  
Must be competent in all aspects of garden maintenance, including plants, mowing, spraying and equipment maintenance. Current drivers licence & own transport essential. PLEASE EMAIL RESUME AND REFERENCES to [bill.catt@muswell.com.au](mailto:bill.catt@muswell.com.au) or phone 0413 121 772

**Positions Vacant**

**WE ARE HIRING!!**  
Wideland Motor Group  
Muswellbrook are looking for 2 x Sales Trainers for our Ford, Isuzu Ute & Toyota New Vehicle Operations...  
You will need to be Well Presented with the Ability to Follow Set Sales Procedures and work within a Team Environment as well as Independently.  
As a Requirement you will have a Year 12 Minimum Education and Manual Drivers Licence.  
We will provide the Successful Applicants with Full Time Employment with on the Job Sales Training and Manufacturer Based Product Training.  
You will enjoy the Industry Salary along with Unclaimed Commission Structure and Manufacturer Bonus Schemes.  
If this Sounds like your Dream Career, Please Drop your Resume with Cover Letter, outlining why you think you will make a Successful Sale Consultant, to Reception Desk at Wideland Motor Group  
113 Maitland Road, Muswellbrook

**Positions Vacant**

**4 A RELAXING**  
sensual body rub by mature, buxaceous Azzie call Hunni 0422 620 271.

**Positions Vacant**

**MUSWELLBROOK/ SINGLETON**  
New to town young Asian lady In/out Ph 0420 705 185.

**Positions Vacant**

**PROMOTE YOUR BRAND**  
ADD A LOGO TO YOUR AD

**YOUR Hunter Valley News is NOW ALSO available at...**  
Muswellbrook  
• Muswellbrook Fair  
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• Farmers Barn  
• Pumps & Pipeline  
• The Old Teahouse  
Denman  
• Denman IGA  
• Denman Visitors Centre  
• Sandy Hollow Garage  
Merriwa  
• Merriwa IGA  
• Central Auto  
Aberdeen  
• All Seasons Irrigation  
Scone  
• Caltex Service Station  
• Scone Rural Supplies  
• Visitors Information Centre  
• Scone Library  
• Gundy General Store

**Record art entries**  
HUNTER VALLEY NEWS  
6543 3066

**Bringing home the ?**  
Let our unique ValueMyCV tool tell you what you should be earning.  
Upload your CV to [Adzuna.com.au](http://Adzuna.com.au)  
Your new job starts here

Figure 11-1: Public Notice in the Hunter Valley News



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Fairfax Media

## Index

Adult Services.....	12
Death Notices.....	12
General Notices.....	12
In Memoriam.....	12
Livestock.....	12
Motor Vehicles.....	13
Positions Vacant.....	12
Public Notices.....	12
Real Estate Auctions.....	12
Removals & Storage.....	12
Trades & Services.....	13

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throughout Australia  
Ongoing business advertising self service  
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Email! now available 😊

## General Notices

**SAVE TIME, EMAIL YOUR AD**  
[kerrie.hawkins@fairfaxmedia.com.au](mailto:kerrie.hawkins@fairfaxmedia.com.au)  
[donna.honeysett@fairfaxmedia.com.au](mailto:donna.honeysett@fairfaxmedia.com.au)

## Public Notices

### MANGOOLA OPEN CUT GLENORE

**Public Notice**  
**Road Closures Due to**  
**Blasting Activities - Wybong Road**  
Mangoola Coal Operations wish to advise that Wybong Road closures due to blasting activities may take place between:

**Monday 16th October 2017 and**  
**Friday 20th October 2017**

The road will be closed between west of the mine entrance road for up to 3kms west along Wybong Road. The road closure will occur between 10am and 2pm and be closed for 15 minutes but most likely between 12:00pm and 12:30pm. These times are subject to change depending on environmental conditions. Roadside signs will display the date and approximate time of each closure.

For further information, please contact our Blasting and Community Response Hotline: 1800 014 339

### MANGOOLA OPEN CUT GLENORE

**Public Notice**  
**Invitation for Aboriginal parties to**  
**register their expressions of interest to**  
**participate in cultural heritage consultation**  
**for the Mangoola Coal Continued**  
**Operations Project**

Mangoola Coal Operations Pty Ltd (Mangoola Coal), a subsidiary of Glenore PLC, owns and operates the Mangoola Open Cut Mine (Mangoola) which is located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman.

Mangoola Coal is seeking approval for the Mangoola Coal Continued Operations (MCCO) Project to continue its current open cut mining operation into a new mining area to the immediate north of the existing operations.

As part of the MCCO Project we are currently initiating consultation in accordance with the Office of Environment and Heritage's Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.

Aboriginal people or other parties who hold cultural knowledge relevant to determining the significance of Aboriginal objects(s) and/or place(s) in the vicinity of Mangoola Coal are invited to participate in consultation regarding the proposed continuation of open cut mining operations. The purpose of the consultation is to enable assessment of Aboriginal Cultural Heritage associated with the MCCO Project.

Aboriginal people or other parties who wish to register their interest in this process of community consultation must respond in writing (fax or e-mail) and include your name /organisation, contact details including address and phone numbers, and send to Jason Martin by 30 October 2017.

All registered people or parties will be contacted to discuss the proposed project and consultation opportunities to inform the Aboriginal Cultural Heritage Assessment.

Jason Martin  
Approvals Manager  
Glenore - Mangoola Coal  
Email: [Jason.Martin@glenore.com.au](mailto:Jason.Martin@glenore.com.au)  
Fax: (02) 6549-5655

EMOJI  
NOW AVAILABLE

ALL OUR  
CLASSIFIEDS  
APPEAR  
ONLINE

## Public Notices

### AGM - TransCare Hunter Ltd

TransCare Hunter Ltd (TransCare) is a progressive community organisation which is holding its Annual General Meeting at its admin centre 214 Kelly Street Scone on:

**Tuesday 17th October 2017 at 11 am**

TransCare is seeking community minded people who would like to be part of this dynamic service provider of community services within the Upper Hunter and Muswellbrook shires by nominating to become a director.

There will be seven (7) directors' positions vacant where nominations will be received up to the commencement of the meeting.

Call Alan Gordon CEO on 6545 3113 for enquiries.

### DEPARTMENT OF INDUSTRY - CROWN LANDS & WATER DIVISION (formerly DPI Water) HUNTER REGULATED RIVER ALLUVIAL WATER SOURCE

An application for a WATER SUPPLY WORK APPROVAL has been received from MACH ENERGY AUSTRALIA PTY LTD for a bore on Lot 22 DP 564140 for construction purposes. (Ref: A011109).

Objections to the granting of this approval must be registered in writing to Dept. of Industry - Crown Lands & Water Division, PO Box 2213, Dangar NSW 2309, within 28 days of this publication. The objection must include your name and address and specify the grounds of the objection. Any queries should be directed to (02) 4904 2512, Estelle Avery, Senior Water Regulation Officer.

## Public Notices

### NOTICE TO Classified Advertisers

All classified display and classified semi display advertising is sold in whole centimetre and column units. Classified line advertisements are charged on the total number of lines. A minimum number of lines may be required. The full Terms and Conditions of Advertising of the Muswellbrook Chronicle are available from our office or by phoning: (02) 65433011

### "In lodging

An advertisement with us you agree that we may publish the advertisement on our website. We provide this service at no additional cost. The general terms and conditions that apply to publication of advertisements in our publications apply also to publication of material on our website.

## Positions Vacant

### Dozer, Excavator Operators

Upper Hunter earth - mover seeks exp /reliable people for local jobs. Good, consistent work for right people. For details phone Jim 0428 689 102. Email resumes to: [warren@robbsos.net](mailto:warren@robbsos.net)

## Positions Vacant

### RIDGELANDS

**Would you like to contribute to your community?**

**NOMINATIONS ARE NOW OPEN FOR THE APPOINTMENT OF COMMUNITY MEMBERS TO THE RIDGELANDS COMMUNITY FUND INVESTMENT COMMITTEE**

Ridgeland is in the process of establishing the Ridgeland Community Fund Investment Committee. Two positions are available for community representatives; and as a result we are looking for interested people that live locally to volunteer for Investment Committee membership.

The Investment Committee will review and assess proposals for local initiatives which may include construction and/or maintenance of infrastructure; environmental conservation works; research, training or education; community welfare; community events.

As a member of the Ridgeland Community Fund Investment Committee, you will be expected to:

- contribute constructively to investment committee discussions;
- attend meetings;
- support project implementation (if required); and
- communicate information to the broader community relating to the initiatives.

If you would like to apply, please download a nomination form from the Ridgeland website at [www.ridgelandresources.com.au](http://www.ridgelandresources.com.au)

Applications must be lodged via email to the contact@ridgelandresources.com.au by 27th October 2017.

Please contact 1800 137 958 for further information.

## Removals & Storage

2 Anywhere & Anytime

**2 Men & A Truck**

Cheap rates, min. 2 hrs  
Ph. 0407 455 224

## Adult Services

MUSWELLBROOK/ SINGLETON New to town young Asian lady.

In/out 2h 0420 705 165.

PRETTY Asian, skinny, busty, NE Hwy, Singleton Lala, Xxi, M'brook. In/out. 0469 562 862.

adzuna

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[designlink@fairfaxmedia.com.au](mailto:designlink@fairfaxmedia.com.au)

Fairfax Media

## Real Estate Auctions

★ Professionals  
Boyle Estate Agents

12 John Howe Circuit, Muswellbrook



Positioned in Eastbrook Links Residential Estate offering 4 x bedrooms with walk-in robe + ensuite to main; built-in robes to remaining 3. Tiled throughout with carpet in bedrooms only. Deck, double garage, split system air & water tank.

INSPECT Wed, 6 Sat, 10.30 - 11 am  
AUCTION Sat, 21st October at 11 am - Agents rooms  
CONTACT John Boyle 0407 291413  
WEB 2333.com.au

44 Bridge Street, Muswellbrook  
[www.2333.com.au](http://www.2333.com.au)

Figure 11-2: Public Notice in the Muswellbrook Chronicle.

### **11.33 Agency Notifications**

# GLENCORE

5 October 2017

Planning and Aboriginal Heritage Section  
Office of Environment and Heritage  
Locked Bag 1002  
DANGAR NSW 2309

To whom it may concern,

**Re: Mangoola Coal Continued Operations Project – Request for Provision of Known Aboriginal Parties**

Mangoola Coal Operations Pty Ltd (Mangoola Coal), a subsidiary of Glencore PLC, owns and operates the Mangoola Open Cut Mine (Mangoola) which is located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman. Mangoola commenced mining activities in 2010 and has approval to mine up to 13.5 Million tonnes (Mt) of run of mine coal through to 2029.

Mangoola Coal is seeking approval for the Mangoola Coal Continued Operations (MCCO) Project to continue its current open cut mining operation into a new mining area to the immediate north of the existing operations. The MCCO Project would provide access to approximately 45 Mt of coal resources located on land largely owned by Mangoola Coal.

As part of the MCCO Project we are currently initiating consultation in accordance with the Office of Environment and Heritage's, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. Accordingly, we are now seeking to identify any Aboriginal parties who may hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the vicinity of the MCCO Project Area as identified on **Figure 1**.

If the Office and Environment and Heritage can identify and provide contact details for any known Aboriginal parties with a cultural interest in the area, we will invite them to register their interest in being consulted regarding proposed open cut mining at Mangoola.

I would appreciate it if you could provide any feedback regarding any known Aboriginal parties by 27 October, 2017.

Regards,



Jason Martin  
Project Approvals Manager  
Mangoola Coal – A Glencore managed company  
Tel: +61 2 6549 5577  
Mob: +61 422 215 589  
Fax: +61 2 6549 5655  
E: [jason.martin@glencore.com.au](mailto:jason.martin@glencore.com.au)



# GLENCORE



Image Source: Glencore (Apr 2017)  
Data Source: Glencore (2016)

0 1.0 2.0 3.0 km  
1:60 000

## Legend

- MCO Project Area
- MCO Additional Project Area
- Approved Mangoola Coal Mine Disturbance Area
- AL9 Boundary
- 500kV Transmission Line
- Proposed Additional Mining Area
- Proposed Emplacement Area
- Indicative Wybong Post Office Road Realignment

File Name (A4): 4004\_047.dgn  
20170810 10.22

FIGURE 1  
Proposed Mangoola Coal  
Continued Operations Project



# GLENCORE

5 October 2017

Nicole Courtman  
Office of the Registrar, Aboriginal Land Rights Act 1983  
PO Box 112  
GLEBE NSW 2037

Dear Nicole,

***Re: Mangoola Coal Continued Operations Project – Request for Provision of Known Aboriginal Parties***

Mangoola Coal Operations Pty Ltd (Mangoola Coal), a subsidiary of Glencore PLC, owns and operates the Mangoola Open Cut Mine (Mangoola) which is located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman. Mangoola commenced mining activities in 2010 and has approval to mine up to 13.5 Million tonnes (Mt) of run of mine coal through to 2029.

Mangoola Coal is seeking approval for the Mangoola Coal Continued Operations (MCCO) Project to continue its current open cut mining operation into a new mining area to the immediate north of the existing operations. The MCCO Project would provide access to approximately 45 Mt of coal resources located on land largely owned by Mangoola Coal.

As part of the MCCO Project we are currently initiating consultation in accordance with the Office of Environment and Heritage's, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. Accordingly, we are now seeking to identify any Aboriginal parties who may hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the vicinity of the MCCO Project Area as identified on **Figure 1**.

If the Office of the Registrar can identify and provide contact details for any known Aboriginal parties with a cultural interest in the area, we will invite them to register their interest in being consulted regarding proposed open cut mining at Mangoola.

I would appreciate it if you could provide any feedback regarding any known Aboriginal parties by 27 October, 2017.

Regards,



Jason Martin  
Project Approvals Manager  
Mangoola Coal – A Glencore managed company  
Tel: +61 2 6549 5577  
Mob: +61 422 215 589  
Fax: +61 2 6549 5655  
E: [jason.martin@glencore.com.au](mailto:jason.martin@glencore.com.au)

# GLENCORE



Image Source: Glencore (Apr 2017)  
Data Source: Glencore (2016)

0 1.0 2.0 3.0 km  
1:60 000

## Legend

- MCCO Project Area
- MCCO Additional Project Area
- Approved Mangoola Coal Mine Disturbance Area
- AL9 Boundary
- 500kV Transmission Line
- Proposed Additional Mining Area
- Proposed Employment Area
- Indicative Wybong Post Office Road Realignment

File Name (A4): 4004\_047.dgn  
20170810 10.22

FIGURE 1

Proposed Mangoola Coal  
Continued Operations Project

# GLENCORE

5 October 2017

Mr Noel Downs  
Chief Operating Officer  
Wanaruah Local Aboriginal Land Council  
19 Maitland Street  
MUSWELLBROOK NSW 2333

Dear Mr Downs,

**Re: Mangoola Coal Continued Operations Project – Request for Provision of Known Aboriginal Parties**

Mangoola Coal Operations Pty Ltd (Mangoola Coal), a subsidiary of Glencore PLC, owns and operates the Mangoola Open Cut Mine (Mangoola) which is located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman. Mangoola commenced mining activities in 2010 and has approval to mine up to 13.5 Million tonnes (Mt) of run of mine coal through to 2029.

Mangoola Coal is seeking approval for the Mangoola Coal Continued Operations (MCCO) Project to continue its current open cut mining operation into a new mining area to the immediate north of the existing operations. The MCCO Project would provide access to approximately 45 Mt of coal resources located on land largely owned by Mangoola Coal.

As part of the MCCO Project we are currently initiating consultation in accordance with the Office of Environment and Heritage's, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. Accordingly, we are now seeking to identify any Aboriginal parties who may hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the vicinity of the MCCO Project Area as identified on **Figure 1**.

If the Wanaruah Local Aboriginal Land Council can identify and provide contact details for any known Aboriginal parties with a cultural interest in the area, we will invite them to register their interest in being consulted regarding proposed open cut mining at Mangoola.

I would appreciate it if you could provide any feedback regarding any known Aboriginal parties by 27 October, 2017.

Regards,



Jason Martin  
Project Approvals Manager  
Mangoola Coal – A Glencore managed company  
Tel: +61 2 6549 5577  
Mob: +61 422 215 589  
Fax: +61 2 6549 5655  
E: [jason.martin@glencore.com.au](mailto:jason.martin@glencore.com.au)



# GLENCORE



Image Source: Glencore (Apr 2017)  
Data Source: Glencore (2016)

0 1.0 2.0 3.0 km  
1:60 000

## Legend

- MCO Project Area
- MCO Additional Project Area
- Approved Mangoola Coal Mine Disturbance Area
- AL9 Boundary
- 500kV Transmission Line
- Proposed Additional Mining Area
- Proposed Employment Area
- Indicative Wybong Post Office Road Realignment

File Name (A4): 4004\_047.dgn  
20170810 10.22

FIGURE 1

Proposed Mangoola Coal  
Continued Operations Project

# GLENCORE

5 October 2017

Natalie Rotumah  
Native Title Services Corporation  
PO Box 2105  
STRAWBERRY HILLS NSW 2012

Dear Natalie,

**Re: Mangoola Coal Continued Operations Project – Request for Provision of Known Aboriginal Parties**

Mangoola Coal Operations Pty Ltd (Mangoola Coal), a subsidiary of Glencore PLC, owns and operates the Mangoola Open Cut Mine (Mangoola) which is located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman. Mangoola commenced mining activities in 2010 and has approval to mine up to 13.5 Million tonnes (Mt) of run of mine coal through to 2029.

Mangoola Coal is seeking approval for the Mangoola Coal Continued Operations (MCCO) Project to continue its current open cut mining operation into a new mining area to the immediate north of the existing operations. The MCCO Project would provide access to approximately 45 Mt of coal resources located on land largely owned by Mangoola Coal.

As part of the MCCO Project we are currently initiating consultation in accordance with the Office of Environment and Heritage's, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. Accordingly, we are now seeking to identify any Aboriginal parties who may hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the vicinity of the MCCO Project Area as identified on **Figure 1**.

If the Native Title Services Corporation can identify and provide contact details for any known Aboriginal parties with a cultural interest in the area, we will invite them to register their interest in being consulted regarding proposed open cut mining at Mangoola.

I would appreciate it if you could provide any feedback regarding any known Aboriginal parties by 27 October, 2017.

Regards,



Jason Martin  
Project Approvals Manager  
Mangoola Coal – A Glencore managed company  
Tel: +61 2 6549 5577  
Mob: +61 422 215 589  
Fax: +61 2 6549 5655  
E: [jason.martin@glencore.com.au](mailto:jason.martin@glencore.com.au)



# GLENCORE



Image Source: Glencore (Apr 2017)  
Data Source: Glencore (2016)

0 1.0 2.0 3.0 km  
1:60 000

## Legend

- MCCO Project Area
- MCCO Additional Project Area
- Approved Mangoola Coal Mine Disturbance Area
- AL9 Boundary
- 500kV Transmission Line
- Proposed Additional Mining Area
- Proposed Employment Area
- Indicative Wybong Post Office Road Realignment

File Name (A4): 4004\_047.dgn  
20170810 10.22

FIGURE 1

Proposed Mangoola Coal  
Continued Operations Project

# GLENCORE

5 October 2017

Mr Steve McDonald  
General Manager  
Muswellbrook Shire Council  
PO Box 122  
MUSWELLBROOK NSW 2333

Dear Steve,

***Re: Mangoola Coal Continued Operations Project – Request for Provision of Known Aboriginal Parties***

Mangoola Coal Operations Pty Ltd (Mangoola Coal), a subsidiary of Glencore PLC, owns and operates the Mangoola Open Cut Mine (Mangoola) which is located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman. Mangoola commenced mining activities in 2010 and has approval to mine up to 13.5 Million tonnes (Mt) of run of mine coal through to 2029.

Mangoola Coal is seeking approval for the Mangoola Coal Continued Operations (MCCO) Project to continue its current open cut mining operation into a new mining area to the immediate north of the existing operations. The MCCO Project would provide access to approximately 45 Mt of coal resources located on land largely owned by Mangoola Coal.

As part of the MCCO Project we are currently initiating consultation in accordance with the Office of Environment and Heritage's, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. Accordingly, we are now seeking to identify any Aboriginal parties who may hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the vicinity of the MCCO Project Area as identified on **Figure 1**.

If the Muswellbrook Shire Council can identify and provide contact details for any known Aboriginal parties with a cultural interest in the area, we will invite them to register their interest in being consulted regarding proposed open cut mining at Mangoola.

I would appreciate it if you could provide any feedback regarding any known Aboriginal parties by 27 October, 2017.

Regards,



Jason Martin  
Project Approvals Manager  
Mangoola Coal – A Glencore managed company  
Tel: +61 2 6549 5577  
Mob: +61 422 215 589  
Fax: +61 2 6549 5655  
E: [jason.martin@glencore.com.au](mailto:jason.martin@glencore.com.au)



# GLENCORE



Image Source: Glencore (Apr 2017)  
Data Source: Glencore (2016)

0 1.0 2.0 3.0 km  
1:60 000

## Legend

- MOCO Project Area
- MOCO Additional Project Area
- Approved Mangoola Coal Mine Disturbance Area
- AL9 Boundary
- 500kV Transmission Line
- Proposed Additional Mining Area
- Proposed Emplacement Area
- Indicative Wybong Post Office Road Realignment

File Name (A4): 4004\_047.dgn  
20170810 10.22

FIGURE 1

Proposed Mangoola Coal  
Continued Operations Project

# GLENCORE

5 October 2017

Mr Toby Whaleboat  
Hunter Local Land Services  
816 Tocal Road  
Private Bag 2010  
PATERSON NSW 2421

Dear Toby,

**Re: Mangoola Coal Continued Operations Project – Request for Provision of Known Aboriginal Parties**

Mangoola Coal Operations Pty Ltd (Mangoola Coal), a subsidiary of Glencore PLC, owns and operates the Mangoola Open Cut Mine (Mangoola) which is located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman. Mangoola commenced mining activities in 2010 and has approval to mine up to 13.5 Million tonnes (Mt) of run of mine coal through to 2029.

Mangoola Coal is seeking approval for the Mangoola Coal Continued Operations (MCCO) Project to continue its current open cut mining operation into a new mining area to the immediate north of the existing operations. The MCCO Project would provide access to approximately 45 Mt of coal resources located on land largely owned by Mangoola Coal.

As part of the MCCO Project we are currently initiating consultation in accordance with the Office of Environment and Heritage's, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. Accordingly, we are now seeking to identify any Aboriginal parties who may hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the vicinity of the MCCO Project Area as identified on **Figure 1**.

If the Hunter Local Land Services can identify and provide contact details for any known Aboriginal parties with a cultural interest in the area, we will invite them to register their interest in being consulted regarding proposed open cut mining at Mangoola.

I would appreciate it if you could provide any feedback regarding any known Aboriginal parties by 27 October, 2017.

Regards,



Jason Martin  
Project Approvals Manager  
Mangoola Coal – A Glencore managed company  
Tel: +61 2 6549 5577  
Mob: +61 422 215 589  
Fax: +61 2 6549 5655  
E: [jason.martin@glencore.com.au](mailto:jason.martin@glencore.com.au)



# GLENCORE



Image Source: Glencore (Apr 2017)  
Data Source: Glencore (2016)

0 1.0 2.0 3.0 km  
1:60 000

## Legend

- MCCO Project Area
- MCCO Additional Project Area
- Approved Mangoola Coal Mine Disturbance Area
- AL9 Boundary
- 500kV Transmission Line
- Proposed Additional Mining Area
- Proposed Employment Area
- Indicative Wybong Post Office Road Realignment

File Name (A4): 4004\_047.dgn  
20170810 10.22

FIGURE 1

Proposed Mangoola Coal  
Continued Operations Project

### 11.34 Agency Responses

10 October 2017



11-13 Mansfield Street  
Glebe NSW 2037  
PO Box 112, Glebe NSW 2037  
T: 02 9562 6327 F: 02 9562 6350

Jason Martin  
Project Approvals Manager  
Mangoola Coal – A Glencore managed company  
E: Jason.martin@glencore.com.au

Dear Jason

#### **Re: Request - Search for Registered Aboriginal Owners**

I refer to your letter dated 5 October 2017 regarding an Aboriginal Cultural Heritage Assessment within the Mangoola Open Cut Mine, NSW.

I have searched the Register of Aboriginal Owners and the project area described does not have Registered Aboriginal Owners pursuant to Division 3 of the Aboriginal Land Rights Act 1983 (ALRA).

I suggest that you contact the Wanaruah Local Aboriginal Land Council on 02 6543 1288. They may also be able to assist you in identifying other Aboriginal stakeholders for this project.

Yours sincerely

**Jodie Rikiti**  
**Administration Officer**  
Office of the Registrar, ALRA





20<sup>th</sup> October 2017

**Attn: Jason Martin**

Mangoola Coal

[Jason.martin@glencore.com.au](mailto:Jason.martin@glencore.com.au)

***Re: Mangoola Coal Continued Operations Project – Request for Provision of Known Aboriginal Parties***

Dear Jason,

Thank you for your letter dated 5<sup>th</sup> October 2017 relating to the above subject.

Wanaruah Local Aboriginal Land Council wishes to be consulted on these matters.

Please find attached a list of Registered Aboriginal Parties who may also wish to be included in this consultation process.

Please do not hesitate to contact Wanaruah LALC should you require any further information or assistance in this venture.

We look forward to working with you in the future.

Yours sincerely,

Renee MacDonald

Administration Officer

Wanaruah Local Aboriginal Land Council





DOC17/498469-1

Mr Jason Martin  
Mangoola Coal  
jason.martin@glencore.com.au

Dear Jason

**Mangoola Coal Continued Operations Project**

In response to your request under Section 4.1.2(a) of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010), please find attached a list of known Aboriginal parties that have self-nominated for Muswellbrook Shire Council Local Government Area (LGA). Please note the following information with respect to Aboriginal consultation for your project.

Aboriginal stakeholder lists maintained by OEH are comprised of self-nominated individuals and organisations

Please note that the attached list is comprised only of self-nominated individuals and Aboriginal organisations who could have an interest in your project. The list is not vetted by OEH. As the list comprises only of self-nominated individuals and Aboriginal organisations, it is not necessarily an exhaustive list of all Aboriginal parties who may hold an interest in the project. Further consultation in accordance with step 4.1.2 of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010) is required to identify Aboriginal people who may hold either cultural or historical knowledge relevant to determining the significance of Aboriginal objects or places within your proposed project area.

**Ensure you document the consultation process**

Please ensure all consultation undertaken in accordance with the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010) is documented within an Aboriginal Cultural Heritage Assessment Report (ACHAR). This must include copies of all correspondence sent to or received from all Registered Aboriginal Parties (RAPs) throughout the entire consultation process. Omission of these records in the final ACHAR may cause delays in the assessment of an Aboriginal Heritage Impact Permit (AHIP) application or a major project Aboriginal cultural heritage assessment, and could require parts of the consultation process to be repeated if the evidence provided to OEH does not demonstrate that the consultation process has been conducted in accordance with our consultation requirements.

**Demonstrate that reasonable consultation attempts have been made**

Please ensure you provide evidence to demonstrate that reasonable attempts have been made to contact the relevant parties identified through step 4.1.2 of the *Aboriginal cultural heritage consultation*

Locked Bag 1002 Dangar NSW 2309  
Level 4, 26 Honeysuckle Drive Newcastle NSW 2300  
ABN 30 841 387 271  
www.environment.nsw.gov.au

*requirements for proponents* (DECCW 2010). If this evidence is not provided, OEH may deem that the consultation process has not complied with the consultation requirements. Similarly, the proponent is required to record all feedback received from RAPs, along with the proponent's response to the feedback. Where concerns or contentious issues are raised by RAPs during the consultation process, OEH expects that reasonable attempts are made to address and resolve these matters, however OEH acknowledges that in some cases, this may not be achievable. In the case where conflict cannot be resolved, it is the responsibility of the proponent to record these differences and provide the necessary information in their ACHAR with their AHIP application or major project ACHAR.

#### Consultation should not be confused with employment

As outlined in Section 3.4 of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010), the consultation process involves getting the views of, and information from, Aboriginal people and reporting on these. It is not to be confused with other field assessment processes involved in preparing a proposal and an application. OEH does not have any role with respect to commercial engagement. Where RAPs are engaged commercially to provide field services as part of an assessment process, that is a matter for the proponent to manage as they see fit. However, if a proponent is proposing to undertake consultation processes or elicit cultural information from RAPs during the course of conducting a field survey, OEH considers this to form part of the consultation process, and expects that all RAPs would be afforded the opportunity to be involved in the process.

#### Contacting our office

To ensure we can respond to enquiries promptly, please direct future correspondence to our central mailbox: [rog.hcc@environment.nsw.gov.au](mailto:rog.hcc@environment.nsw.gov.au).

Should you require any further information, please do not hesitate to contact us.

Yours sincerely



**STEVEN COX**  
Senior Team Leader Planning  
Hunter Central Coast Branch  
Regional Operations Division

11 October 2017



## Attachment A

## Hunter Central Coast Branch - Aboriginal Stakeholder Register for Muswellbrook Shire Council LGA

Please note that this list is valid at the time of sending only, and should not be used for subsequent projects.

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Aboriginal Native Title Elders Consultants	John and Margaret	Matthews	4 Calgaroo Avenue	MUSWELLBROOK	NSW	2333		0417 725 956	
AGA Services	Ashley, Gregory & Adam	Sampson	22 Ibis Parade	WOODBERRY	NSW	2322	Donna Sampson 0403 765 019	Ashley Sampson 0401 958 051	<a href="mailto:aga.services@hotmail.com">aga.services@hotmail.com</a>
Aliera French Trading	Aliera	French	238 Gommera St	BLACKSMITHS	NSW	2281		0421 299 963	<a href="mailto:Aliera.french.trading@hotmail.com">Aliera.french.trading@hotmail.com</a>
Cacatua Culture Consultants	Donna & George	Sampson	22 Ibis Parade	WOODBERRY	NSW	2322		0434 877 016	<a href="mailto:cacatua4service@tpg.com.au">cacatua4service@tpg.com.au</a>
Crimson-Rosie	Jeffery	Matthews	6 Eucalypt Avenue	MUSWELLBROOK	NSW	2333	02 6543 4791		
Culturally Aware	Tracey	Skene	7 Crawford Place	MILFIELD	NSW	2325		0474 106 537	<a href="mailto:traceyamorrung-pa.com.au">traceyamorrung-pa.com.au</a>
D F T V Enterprises	Derrick	Vale Snr	5 Mountbatten Close	RUTHERFORD	NSW	2320		0438 812 197	<a href="mailto:deckavale@hotmail.com">deckavale@hotmail.com</a>

Page 4

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Deslee Talbott Consultants	Deslee	Matthews	Unit 2 / 19 South Street	GUNNEDAH	NSW	2380		0431 205 336	<a href="mailto:m-desley@hotmail.com">m-desley@hotmail.com</a>
Divine Diggers Aboriginal Cultural Consultants	Deidre	Perkins	6 Ashleigh Street	HEDDON GRETA	NSW	2321	02 4937 4573	0425 654 290 preferred	<a href="mailto:dedenmaree3@hotmail.com">dedenmaree3@hotmail.com</a>
Gidawaa Walang & Barkuma Neighbourhood Centre Inc.	Ann Hickey	Debbie Dacey-Sullivan	76 Lang Street	KURRI KURRI	NSW	2327	02 4937 1094	Anne 0411 196 991	<a href="mailto:gidawaa.walang@hotmail.com">gidawaa.walang@hotmail.com</a>
Hunter Traditional Owner	Paulette	Ryan	165 Susan Street	SCONE	NSW	2337		0431 109 001	<a href="mailto:hto.paulette@gmail.com">hto.paulette@gmail.com</a>
Hunter Valley Aboriginal Corporation	Rhonda	Griffiths	182 Bridge St	MUSWELLBROOK	NSW	2333	02 6543 1180		<a href="mailto:h973809@bigpond.net.au">h973809@bigpond.net.au</a>
Hunters & Collectors	Tania	Matthews	U211 Walowa St	NARRABRI	NSW	2390	0409 193 612		<a href="mailto:Tamatthews10@hotmail.com">Tamatthews10@hotmail.com</a>
Jarban & Mugrebea	Les	Atkinson	11 Nelson Street	CESSNOCK	NSW	2325		0466 316 069	<a href="mailto:les.atkinson@hotmail.com">les.atkinson@hotmail.com</a>
Jumbunna Traffic Management Group Pty Ltd	Norm	Archibald	17 Flobern Ave	WAUCHOPE	NSW	2446		0413 718 149	<a href="mailto:jtmmanagement@live.com.au">jtmmanagement@live.com.au</a>
Kawul Cultural Services	Vicky	Slater	33 Gardner Circuit	SINGLETON	NSW	2330		0421 077 521	<a href="mailto:Vicki.slater@hotmail.com">Vicki.slater@hotmail.com</a>
Kawul Pty Ltd trading as Wonn1 Sites	Arthur	Fletcher	619 Main Road	GLENDALE	NSW	2285	02 4954 7751	0402 146 193	<a href="mailto:Wonn1sites@gmail.com">Wonn1sites@gmail.com</a>



Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Lower Hunter Aboriginal Incorporated	David	Ahoy	5 Killara Drive	CARDIFF SOUTH	NSW	2285		0421 329 520	<a href="mailto:lowerhunterai@gmail.com">lowerhunterai@gmail.com</a>
Lower Hunter Wonnarua Cultural Services	Lea-Anne Ball and Uncle Tommy Miller		51 Bowden Street	HEDDON GRETA	NSW	2321	02 4937 2694	0402 636 521 (Uncle)	<a href="mailto:tm.miller@southernphone.com.au">tm.miller@southernphone.com.au</a>
Lower Wonnarua Tribal Consultancy Pty Ltd	Barry	Anderson	156 The Inlet Road	BULGA	NSW	2330	02 6574 5303	0417 403 153	
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson	& Darleen Johnson-Carroll	PO Box 246	SEVEN HILLS	NSW	2147		0497 983 332	<a href="mailto:murrabidgeemullangari@yahoo.com.au">murrabidgeemullangari@yahoo.com.au</a>
Myland Cultural & Heritage Group	Warren	Schillings	30 Taurus Street	ELERMORE VALE	NSW	2287		0431 392 554	<a href="mailto:warren@yarnteen.com.au">warren@yarnteen.com.au</a>
Roger Matthews Consultancy	Roger	Matthews	15 Parkinson Avenue	MUSWELLBROOK	NSW	2333		0455 671 288	
Ungooroo Aboriginal Corporation	Alan	Paget	PO Box 3095	SINGLETON	NSW	2330	02 6571 5111		<a href="mailto:admin@ungooroo.com.au">admin@ungooroo.com.au</a>
Wallagan Cultural Services	Maree	Waugh	PO Box 40	CESSNOCK	NSW	2325		0439 813 078	<a href="mailto:Mareewaugh30@hotmail.com">Mareewaugh30@hotmail.com</a>

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Wattaka Wonnarua CC Service	Des	Hickey	4 Kennedy Street	SINGLETON	NSW	2330	6573 3786	0432 977 178	<a href="mailto:deshickey@bigpond.com">deshickey@bigpond.com</a>
Widescope Indigenous Group	Steven	Hickey	73 Russell Street	EMU PLAINS	NSW	2750		0425 232 056 0425 230 693	<a href="mailto:Widescope_group@live.com">Widescope_group@live.com</a>
Wonnarua Culture Heritage	Gordon	Griffiths	19 O'Donnell Crescent	METFORD	NSW	2323	02 4934 6437	0401 028 807	
Wonnarua Elders Council	Richard	Edwards	PO Box 844	CESSNOCK	NSW	2325			
Wonnarua Nation Aboriginal Corporation	Laurie	Perry	254 John St	SINGLETON	NSW	2330	02 6571 5419	0412 593 020	<a href="mailto:L.perry@optusnet.com.au">L.perry@optusnet.com.au</a>
Yarrowalk (A division of Tocomwall Pty Ltd), Tocomwall Pty Ltd on behalf of Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People NSD1680/2013	Scott	Franks	PO Box 76	CARRINGBAH	NSW	1495		0404 171 544	<a href="mailto:scott@tocomwall.com.au">scott@tocomwall.com.au</a>
Yinarr Cultural Services	Kathleen	Steward Kinchela	Lot 5 Westwood Estate	MERRIWA	NSW	2329		0475 436 589	<a href="mailto:yinarrcultural@bigpond.com">yinarrcultural@bigpond.com</a> <a href="mailto:dontminemeay@gmail.com">dontminemeay@gmail.com</a>

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
	Steve	Talbott	73 Kiah Road	GILLIESTON HEIGHTS	NSW	2321		0429 662 911	<a href="mailto:gomerol.namoi@outlook.com">gomerol.namoi@outlook.com</a>
	Kevin	Duncan	95 Moala Parade	CHARMHAVEN	NSW	2263		02 4392 9346 0431 224 099	<a href="mailto:kevin.duncan@bigpond.com">kevin.duncan@bigpond.com</a>
Didge Ngunawal Clan	Paul Boyd	& Lilly Carroll	7 Siskin St	QUAKERS HILL	NSW	2763		042682 3944	<a href="mailto:didgeengunawalclan@yahoo.com.au">didgeengunawalclan@yahoo.com.au</a>
Indigenous Learning	Craig	Archibald	2 Victoria Street	BELLBIRD HEIGHTS	NSW	2325	0455 550 549	0467 229 507	indiglearning@gmail.com



Our Ref: NTS 008: Gomeroi

20 November 2017

Jason Martin

Project Approvals Manager  
Mangoola Coal – Glencore managed company

**WITHOUT PREJUDICE**

**By email:** [jason.martin@glencore.com.au](mailto:jason.martin@glencore.com.au)

Dear Mr Martin,

**Re: Gomeroi People and Mangoola Open Cut - Glencore**

We write in relation to the Gomeroi People Native Title Determination Application (NSD2308/2011) (**Gomeroi Application**). We note that the Mangoola operations fall partially within the Gomeroi Application. NTSCORP received Glencore's correspondence in relation to Mangoola Coal dated 18 August 2017, 5 October 2017, 18 October 2017 and 26 October 2017. We provide the following information generally in response to the correspondence received.

**Background**

NTSCORP Limited (**NTSCORP**) has statutory obligations under the *Native Title Act 1993* (Cth) (**NTA**) to protect the native title rights and interests of Traditional Owners in New South Wales (**NSW**) and the Australian Capital Territory (**ACT**).

NTSCORP is funded under Section 203FE of the NTA to carry out the functions of a native title representative body in NSW and the ACT. NTSCORP provides services to Aboriginal Traditional Owners who hold or may hold native title rights and interests in NSW and the ACT, specifically to assist them to exercise their rights under the NTA.

*Gomeroi People Native Title Determination Application*

On 19 and 20 July 2016 an authorisation meeting of all members of the Gomeroi native title claim group was held in Tamworth (**Authorisation Meeting**). At the Authorisation Meeting, resolutions were passed confirming the following:

- Mr Sam Hegney of Sam Hegney Solicitors was removed as solicitor representing the Gomeroi People native title claim group in relation to the Gomeroi Application and any future act matters.

Level 1, 44-70 Rosehill St Redfern NSW 2016 Australia  
t: +61 2 9310 3188

PO Box 2105 Strawberry Hills NSW 2012 Australia  
f: +61 2 9310 4177

abn: 71 098 971 209  
w: [www.ntsCorp.com.au](http://www.ntsCorp.com.au)



- The current 19 people comprising the Gomeroi Applicant are no longer authorised by members of the Gomeroi People native title claim group. These people are Norman McGrady (now deceased), Maureen Sulter, Susan Smith, Michael Anderson, Raymond Welsh (Snr), Richard Green, Greg Griffiths, Elaine Binge, Alfred Priestly, Leslie 'Jacko' Woodbridge, Ray Tighe, Alfred Boney, Anthony Munro, Madeline McGrady, Jason Wilson, Bob Weatherall, Lyall Munro Jnr, Clifford Toomey and Burrul Galigabali (now deceased).
- A new Applicant was elected and authorised by the Gomeroi People native title claim group. The Gomeroi persons who have been authorised as the new Applicant are: Jason Wilson, Leslie (Phil) Duncan, Marcus waters, Donald Craigie, Barry French, Raymond Weatherall, Jennifer Bennett/Ellis, Sheryl Barnes/Nicholls, Rose Nean, Sharon Porter, Tania Matthews, Natasha Talbot, Emily Roberts, Malcolm Talbot, Fay (Connie) Twidale, Stephen Talbot, Gary Binge, Maria (Polly) Cutmore, Dennis Griffen.
- NTSCORP was appointed as solicitor representing the Gomeroi People native title claim group in relation to the Gomeroi Application and any related future act matters.

Based on instructions from the Gomeroi People native title claim group given at the Authorisation Meeting, NTSCORP filed an application under section 66B of the NTA to remove the individuals currently listed as the Applicant for the Gomeroi Application and replace them with the 19 people who were elected and authorised at the Authorisation Meeting as the new Applicant.

The application under section 66B was heard by the Federal Court in June 2017. The Judge's decision in this matter is currently reserved, but is likely to be handed down in the next two months. This will determine who comprises the Applicant for the Gomeroi Peoples native title claim as well the solicitor on the record.

#### **Identifying Aboriginal people who should be consulted in relation to Mangoola operations**

As you are aware, the *National Parks and Wildlife Act 1974* (NSW) requires that 'traditional owners or custodians' be the primary persons consulted by proponents in relation to proposed projects. According to the NSW Office of Environment and Heritage Publication *Aboriginal cultural heritage consultation requirements for proponents 2010*, traditional owners or custodians are in the first instance to be identified through the following:

- Native title holders
- Registered native title claimants
- Aboriginal Owners registered under the Aboriginal Land Rights Act 1983 (NSW).

Given the outcomes of the authorisation meeting held on 19 and 20 July 2016, the 19 people who have been elected and authorised to be the new Applicant by the Gomeroi People native title claim group are also relevant persons to deal with as representatives of



native title holders. However, NTSCORP understands that some members of the Gomeroi Applicant currently listed on the court's record may continue to have an interest in relation to cultural heritage protection.

#### **Aboriginal Cultural Heritage Management Plan**

We understand that Mangoola may still engage persons who are currently listed on the Court's record as the Gomeroi Applicant in respect of any cultural heritage related matters. As these persons are still current registered native title claimants, Mangoola may continue to consult with them in line with the cultural heritage requirements, in order to ensure it satisfies the cultural heritage requirements.

On behalf of the new Gomeroi Applicant, NTSCORP shall provide written comments on the draft Aboriginal Cultural Heritage Management Plan on or before 24 November 2017.

As referred to above, we confirm that the Gomeroi Applicant currently listed on the Court's record does not have authority to speak on behalf of the Gomeroi People native title claim group nor have the authority to enter into any binding agreement on behalf of the Gomeroi People native title claim group.

#### **Further Information:**

Should you require any further information, please do not hesitate to contact me via email at: [gmanning-davis@ntscorp.com.au](mailto:gmanning-davis@ntscorp.com.au) or via phone on 02 9310 3188.

Regards,

A handwritten signature in blue ink, appearing to read "Grace Manning-Davis", written over a faint, stylized graphic that resembles a heart or a stylized 'G'.

Grace Manning-Davis  
Solicitor – Strategic Development  
**NTSCORP Limited**

Cc: Cameron Eckersle, Environment and Community Officer - Mangoola Coal



---

**From:** Martin, Jason (Mangoola - AU)  
**Sent:** Monday, 16 October 2017 9:53 AM  
**To:** Dennen-King, Lori (Mangoola - AU)  
**Subject:** FW: Mangoola Coal Continued Operations Project - Aboriginal Organisational contacts

FYI –MSC's response below.

Regards,  
Jason,

*Project Approvals Manager*  
Phone: +61 2 6549 5577  
Mobile +61 (0) 422 215 589

---

**From:** Scott Brooks [mailto:Scott.Brooks@muswellbrook.nsw.gov.au]  
**Sent:** Monday, 16 October 2017 9:05 AM  
**To:** Martin, Jason (Mangoola - AU) <Jason.Martin@glencore.com.au>  
**Subject:** FW: Mangoola Coal Continued Operations Project - Aboriginal Organisational contacts

Jason,  
In response to your letter to Council dated 5<sup>th</sup> October regarding known aboriginal parties, please see Council's known contacts below.

Kind regards,

Scott Brooks  
Contractor, Mining Liaison  
02 6549 3862  
0419 970 924  
[scott.brooks@muswellbrook.nsw.gov.au](mailto:scott.brooks@muswellbrook.nsw.gov.au)



[www.muswellbrook.nsw.gov.au](http://www.muswellbrook.nsw.gov.au)

---

**From:** Kim Manwarring  
**Sent:** Thursday, 12 October 2017 8:41 AM  
**To:** Scott Brooks  
**Subject:** Mangoola Coal Continued Operations Project - Aboriginal Organisational contacts

Good Morning Scott

Aboriginal Organisational contacts as discussed.

Wanaruah Local Aboriginal Land Council  
Noel Downs  
CEO  
[ceo.wanaruah@bigpond.com](mailto:ceo.wanaruah@bigpond.com)  
[admin.wanaruah@bigpond.com](mailto:admin.wanaruah@bigpond.com);

02 65431288

Hunter Valley Aboriginal Corporation  
Ross Pahuru  
Manager  
[Manager@hvacorp.org.au](mailto:Manager@hvacorp.org.au)

02 65431180

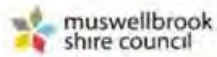
Regards

**Kim Manwarring**  
**Coordinator, Community Partnerships**

Direct: 02 6549 3764  
Mobile: 0408 978 512

[www.muswellbrook.nsw.gov.au](http://www.muswellbrook.nsw.gov.au)

*I respectfully acknowledge the local Aboriginal people who are the Traditional Owners and Custodians of the land on which I work.*



explore [www.workingwithindigenoustralians.info](http://www.workingwithindigenoustralians.info)

---

**From:** Martin, Jason (Mangoola - AU)  
**Sent:** Friday, 6 October 2017 7:37 AM  
**To:** Dennen-King, Lori (Mangoola - AU)  
**Subject:** FW: SR3170: Mangoola Coal Continued Operations Project - Request for Provision of Known Aboriginal Parties - SR3170  
**Attachments:** 20171005\_SR3170\_Muswellbrook\_Shire\_Council\_LGA\_Overlap\_Report.xlsx

FYI

Regards,  
Jason.

*Project Approvals Manager*  
Phone: +61 2 6549 5577  
Mobile +61 (0) 422 215 589

---

**From:** Enquiries [mailto:Enquiries@nntt.gov.au]  
**Sent:** Thursday, 5 October 2017 6:42 PM  
**To:** Martin, Jason (Mangoola - AU) <Jason.Martin@glencore.com.au>  
**Subject:** RE: SR3170: Mangoola Coal Continued Operations Project - Request for Provision of Known Aboriginal Parties - SR3170

## UNCLASSIFIED

**Native title search – NSW – Mangoola Coal Continued Operations extent within Muswellbrook Shire Council LGA**  
**Your ref: - Our**  
**ref: SR3170**

**Dear Jason Martin,**

Thank you for your search request received on 05 October 2017 in relation to the above area, please find your results attached.

**Please note:** Where the area identified to be searched is indistinct, generalised, or is for a freehold parcel, the results provided may relate to the Local Government Area (LGA) or Local Aboriginal Land Council (ALC).

### Search Results

The results provided are based on the information you supplied and are derived from a search of the following Tribunal databases:

- Schedule of Native Title Determination Applications
- Register of Native Title Claims
- Native Title Determinations
- Register of Indigenous Land Use Agreements
- Notified Indigenous Land Use Agreements



For more information about the Tribunal's registers or to search the registers yourself and obtain copies of relevant register extracts, please visit our [website](#).

**Please note:** There may be a delay between a native title determination application being lodged in the Federal Court and its transfer to the Tribunal. As a result, some native title determination applications recently filed with the Federal Court may not appear on the Tribunal's databases.

The search results are based on analysis against external boundaries of applications only. Native title applications commonly contain exclusions clauses which remove areas from within the external boundary. To determine whether the areas described are in fact subject to claim, you need to refer to the "Area covered by claim" section of the relevant Register Extract or Schedule Extract and any maps attached.

#### **Search results and the existence of native title**

Please note that the enclosed information from the Register of Native Title Claims and/or the Schedule of Applications is **not** confirmation of the existence of native title in this area. This cannot be confirmed until the Federal Court makes a determination that native title does or does not exist in relation to the area. Such determinations are registered on the National Native Title Register.

#### **Tribunal accepts no liability for reliance placed on enclosed information**

The enclosed information has been provided in good faith. Use of this information is at your sole risk. The National Native Title Tribunal makes no representation, either express or implied, as to the accuracy or suitability of the information enclosed for any particular purpose and accepts no liability for use of the information or reliance placed on it.

If you have any further queries, please do not hesitate to contact me on the number below or on the free call number 1800 640 501.

Regards,

Enquiries

**Public enquiry hours are 8.30am to 4.30pm**

**National Native Title Tribunal | Perth**

Facsimile (08) 9425 1193 | Email [enquiries@nntt.gov.au](mailto:enquiries@nntt.gov.au)

**Freecall 1800 640 501 | [www.nntt.gov.au](http://www.nntt.gov.au)**

*Shared Country Shared Future*

*Celebrating 25 Years of Native Title Recognition [www.nativetitle25.gov.au](http://www.nativetitle25.gov.au)*

---

**From:** [Jason.Martin@glencore.com.au](mailto:Jason.Martin@glencore.com.au) [<mailto:Jason.Martin@glencore.com.au>]

**Sent:** Thursday, 5 October 2017 10:29 AM

**To:** Enquiries <[Enquiries@nntt.gov.au](mailto:Enquiries@nntt.gov.au)>

**Cc:** [Lori.Dennen-King@glencore.com.au](mailto:Lori.Dennen-King@glencore.com.au)

**Subject:** SR3170: Mangoola Coal Continued Operations Project - Request for Provision of Known Aboriginal Parties

National Native Title Tribunal,

In the attached document, please find information requesting a list of known Aboriginal parties who may hold cultural knowledge relevant to the Mangoola Coal Continued Operations Project described within.

If you have any questions or require any further clarification, please do not hesitate to contact me directly on the details below.

Regards,  
Jason

### 11.35 Archaeological Survey Methodology



A view of the central portion of the MCCO Additional Project Area.

#### ABORIGINAL CULTURAL HERITAGE SURVEY METHODOLOGY

---

**Mangoola Coal Continued Operations**  
**Muswellbrook LGA**  
**November 2017**

Prepared by  
OzArk Environmental & Heritage Management Pty Ltd  
for  
Umwelt Australia Pty Limited  
on behalf of  
Mangoola Coal Operations Pty Limited



**Environmental and  
Heritage Management P/L**

**OzArk EHM**  
145 Wingewarra St  
(PO Box 2069)  
Dubbo NSW 2830

Phone: (02) 6882 0118  
Fax: (02) 6882 0630  
enquiry@ozarkehm.com.au  
www.ozarkehm.com.au

**DOCUMENT CONTROLS**

Proponent	Mangoola Coal Operations Pty Limited		
Client	Umwelt (Australia) Pty Limited		
Project No / Purchase Order No.			
Document Description	<i>Aboriginal Cultural Heritage Survey Methodology, Mangoola Coal Continued Operations</i>		
	Name	Signed	Date
Clients Reviewing Officer			
Clients Representative Managing this Document	OzArk Person(s) Managing this Document		
	Ben Churcher		
Location	OzArk Job No.		
	1768		
Document Status <b>V2.1 DRAFT</b>	Date 24 November 2017		
Draft V1.1 Author to Editor OzArk 1 <sup>st</sup> Internal (Series V1._ = OzArk internal edits)	V1.0 BC author 5/11/17		
Draft V2.0 Report Draft for release to client (Series V2._ = OzArk and Client edits)	V2.0 BC includes client comments 24/11/17 V2.1 BC accepts all changes 24/11/17		
FINAL V3._once latest version of draft approved by client			
Prepared For	Prepared By		
David Rankin Environmental Scientist Umwelt (Australia) Pty Limited 75 York Street Teralba, NSW 2284	Ben Churcher Principal Archaeologist OzArk Environmental & Heritage Management Pty. Limited 145 Wingewarra Street (PO Box 2069) Dubbo NSW 2830 P: 02 6882 0118 F: 02 6882 6030 ben@ozarkehm.com.au		
<p align="center"><b>COPYRIGHT</b></p> <p align="center">© OzArk Environmental &amp; Heritage Management Pty Ltd 2017 and © Mangoola Coal Operations Pty Ltd 2017</p> <p align="center">All Intellectual property and copyright reserved.</p> <p>Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission.</p> <p>Enquiries should be addressed to OzArk Environmental &amp; Heritage Management Pty Ltd.</p>			

### **Acknowledgement**

OzArk acknowledge Traditional Owners of the area on which this assessment took place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

## CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Project Overview.....	1
1.2	MCCO Additional Project Area .....	6
<b>2</b>	<b>ARCHAEOLOGICAL CONTEXT .....</b>	<b>11</b>
2.1	Antiquity of Aboriginal occupation .....	11
2.2	Investigations within the region of the MCCO Additional Project Area .....	11
2.2.1	Great Northern Coal Project Bulk Sample Pit, Archaeological Survey (Witter 2002) .....	12
2.2.2	Proposed 66 kV Transmission Line, Denman to Mangoola Coal Mine (Umwelt 2008) .....	12
2.2.3	Proposed Relocation of 500kV Electricity Transmission Line, Mangoola Coal (Umwelt 2010).....	13
2.3	Investigations within the MCCO Additional Project Area .....	13
2.4	Previous salvage programs at Mangoola .....	18
<b>3</b>	<b>PREDICTIVE MODEL .....</b>	<b>19</b>
3.1	Background.....	19
3.2	Settlement strategies .....	19
3.3	Past land use .....	20
3.4	Previously recorded sites.....	20
3.5	Landform modelling .....	21
3.6	Previous studies .....	21
3.6.1	Upper Hunter Valley Aboriginal Heritage Baseline Study (ERM 2004).....	21
3.6.2	Aboriginal and Historical Cultural Heritage Assessment. Mangoola Coal Continued Operations Project Pre-feasibility Study (EMM 2016).....	22
3.7	Predictive model for the MCCO Additional Project Area .....	25
3.8	Research questions .....	27
<b>4</b>	<b>SURVEY METHODOLOGY .....</b>	<b>29</b>
4.1	Assessment approach .....	29
4.2	Background.....	29
4.2.1	Survey methodology.....	29
4.2.2	Test excavation .....	31
	<b>REFERENCES .....</b>	<b>32</b>



## FIGURES

Figure 1-1. Location of the MCCO Additional Project Area .....	3
Figure 1-2. Aerial showing the MCCO Additional Project Area, the MCCO Project Area and the currently approved disturbance area. ....	4
Figure 1-3. MCCO Additional Project Area: Conceptual Project Layout .....	5
Figure 1-4. Aerial showing the MCCO Additional Project Area .....	7
Figure 1-5. Map showing topographical and hydrological features of the MCCO Additional Project Area. ..	8
Figure 1-6. The MCCO Additional Project Area superimposed on a 1967 aerial image. ....	9
Figure 2-1. Examples of sites within the MCCO Additional Project Area. ....	16
Figure 2-2. Previously recorded sites within or adjacent to the MCCO Additional Project Area .....	17
Figure 3-3. Archaeological sensitivity of the MCCO Additional Project Area as mapped by EMM 2016. ...	24

## TABLES

Table 2-1. Previous archaeological surveys within the MCCO Additional Project Area. ....	14
Table 2-2. Site characteristics of previously recorded sites in the MCCO Additional Project Area. ....	15

## 1 INTRODUCTION

OzArk Environmental & Heritage Management Pty Limited (OzArk) has been engaged by Umwelt Australia Pty Limited (Umwelt) on behalf of Mangoola Coal Operations Pty Limited (Mangoola) to complete an Aboriginal archaeological values impact assessment for the Mangoola Coal Continued Operations Project (MCCO Project). Australian Cultural Heritage Management Pty Limited (ACHM) will prepare the Aboriginal Cultural Heritage Assessment Report (ACHAR). The Aboriginal archaeological values impact assessment will be an appendix to the ACHAR. The purpose of the assessment is to form part of an Environmental Impact Statement (EIS) being prepared by Umwelt to accompany an application for development consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the MCCO Project.

### 1.1 PROJECT OVERVIEW

Mangoola Coal Mine is an open cut coal mine located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman in the Upper Hunter Valley of NSW (**Figure 1-1**). Mangoola has operated the Mangoola Coal Mine in accordance with Project Approval (PA) 06\_0014 (as modified) since mining commenced at the site in September 2010.

The MCCO Project will allow for the continuation of mining at Mangoola Coal Mine into a new mining area to the immediate north of the existing operations. The MCCO Project will utilise the existing infrastructure, emplacement areas and equipment at Mangoola Coal Mine. The MCCO Project will extend the life of the existing operation providing for ongoing employment opportunities for the existing Mangoola workforce. The MCCO Project Area includes the existing approved Project Area for Mangoola Coal Mine and the MCCO Additional Project Area as shown on **Figure 1-2**.

The MCCO Project generally comprises:

- Open cut mining at up to the same rate as that currently approved (13.5 Million tonnes per annum (Mtpa) of run of mine (ROM) coal) using truck and excavator mining methods
- Mining operations in a new mining area located north of the existing Mangoola Coal Mine, Wybong Road, south of Ridglands Road and east of the 500 kV Electricity Transmission Line (ETL)
- Construction of a haul road overpass over Big Flat Creek and Wybong Road to provide access from the existing mine to the proposed Additional Mining Area
- Establishment of an out-of-pit overburden emplacement area
- Distribution of overburden between the proposed Additional Mining Area and the existing mine in order to optimise the final landform design of the integrated operation. The design

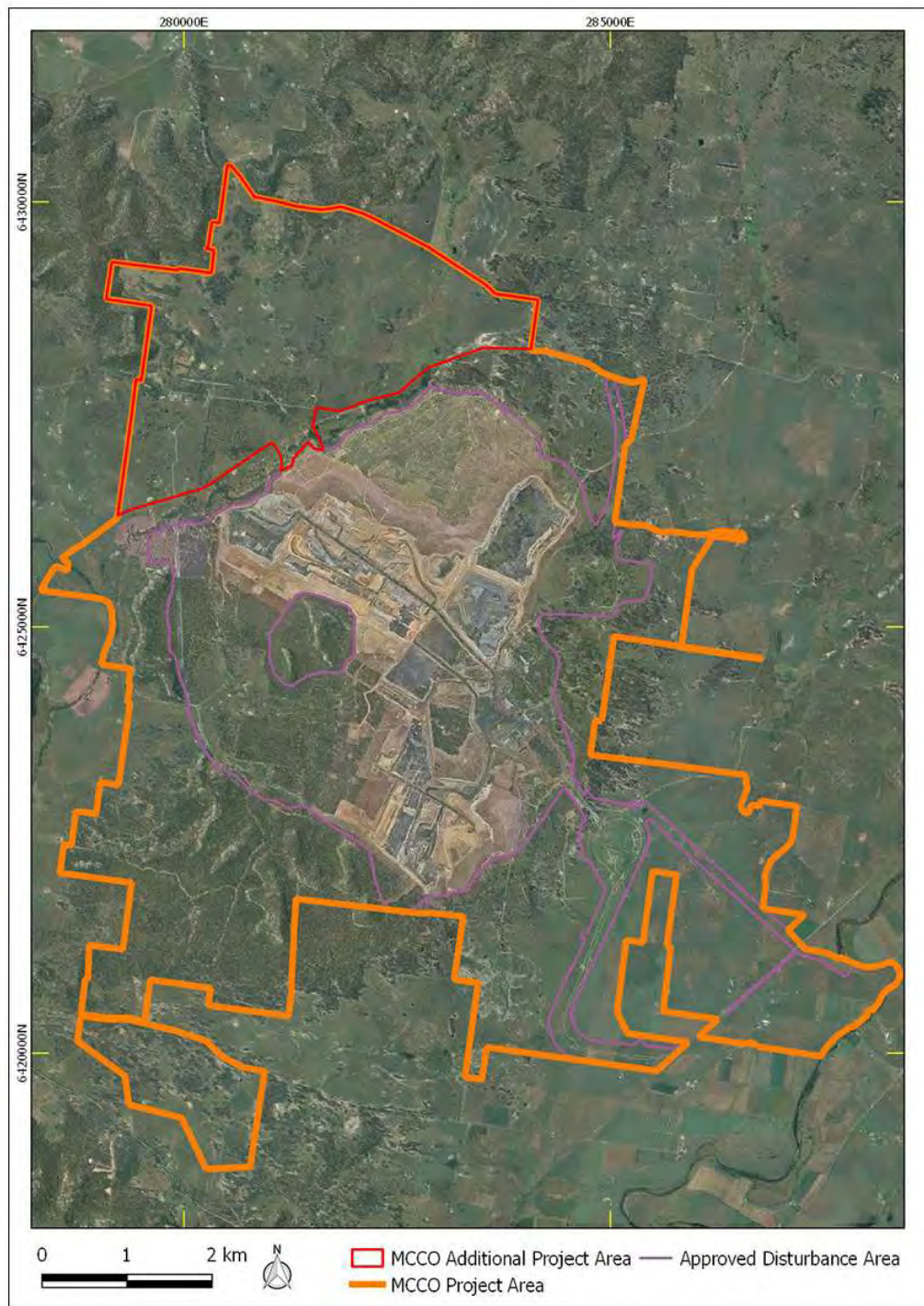
of the emplacement areas and final landform will be refined throughout the assessment process

- Realignment of a portion of Wybong Post Office Road
- The use of all existing or approved infrastructure and equipment for the Mangoola Coal Mine with some minor additions to the existing mobile equipment fleet
- Construction of a water management system to manage sediment laden water runoff, divert clean water catchment, provide flood protection from Big Flat Creek and provide for reticulation of mine water. The water management system will be connected to that of the existing mine
- Establishment of a final landform in line with current design standards at Mangoola Coal Mine including use of micro-relief consistent with the existing site
- Rehabilitation of the proposed Additional Mining Area using the same revegetation techniques as at the existing mine
- A likely construction workforce of approximately 120 persons. No change to the existing approved operational workforce
- Continued use of the mine access for the existing operational mine and access to/from Wybong Road, Wybong Post Office Road or Ridgeland Road to the MCCO Additional Project Area for construction, emergency services and ongoing operational environmental monitoring.

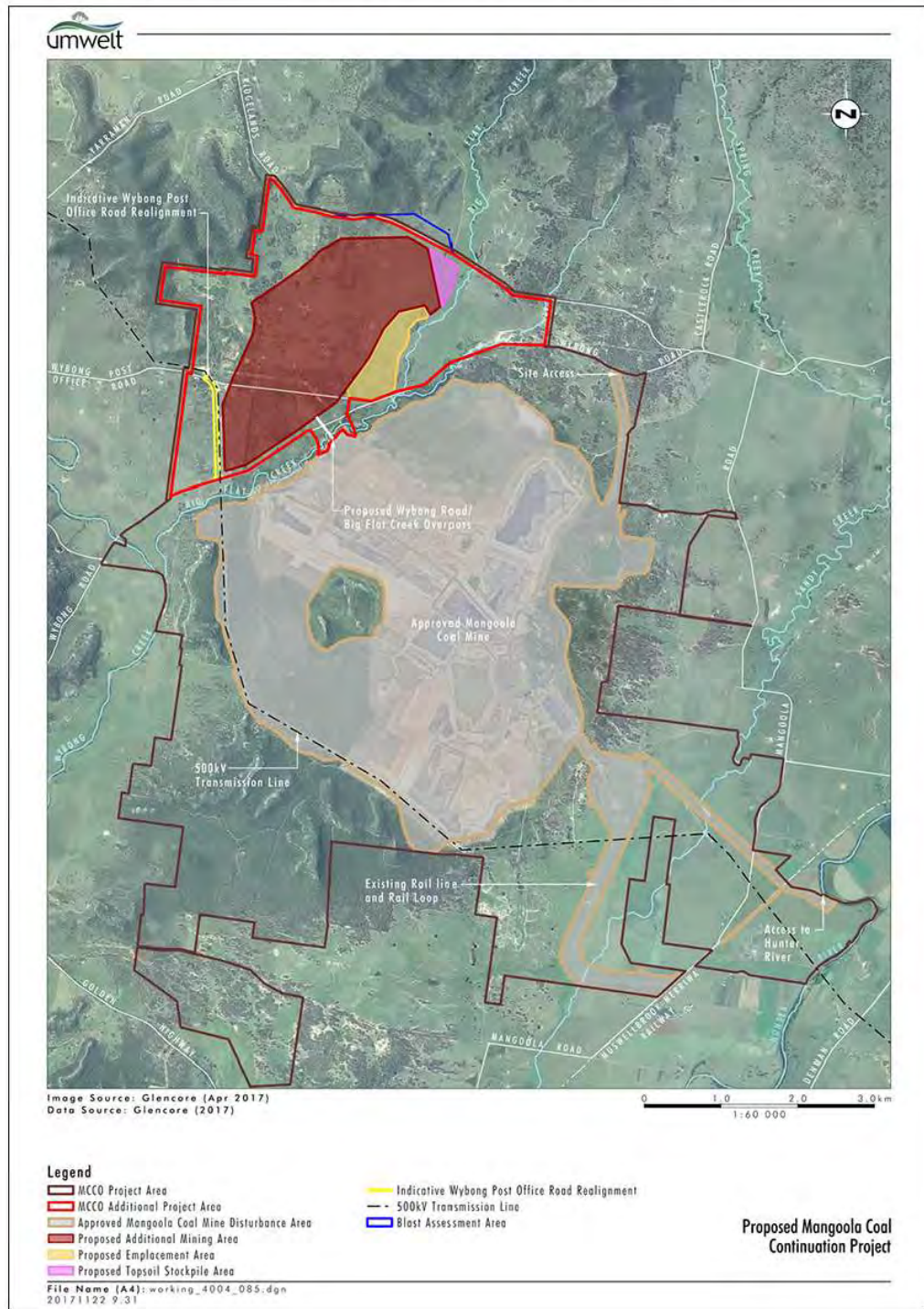
Figure 1-3 illustrates the key features of the MCCO Project. Those areas within the proposed features illustrated on Figure 1-3 are referred to as the Proposed Disturbance Footprint.

The map displays the MCO Project Area (blue outline) and the MCO Additional Project Area (red outline) within the Lake Umbagog watershed. The project areas are situated in the central and western portions of the watershed, near the towns of Munwellbrook and Amherst. The map includes a scale bar (0 to 10 km) and a north arrow.

**Figure 1-2. Aerial showing the MCCO Additional Project Area, the MCCO Project Area and the currently approved disturbance area.**





**Figure 1-3. MCCO Additional Project Area: Conceptual Project Layout**

## 1.2 MCCO ADDITIONAL PROJECT AREA

All proposed impacts related to construction and operation of the Project will be confined to the MCCO Additional Project Area shown on **Figure 1-4**. Further, based on an analysis of existing blast monitoring data collected by Mangoola and Terrock Blast Engineers a blast assessment radius offset from the mining area has been defined that will also be considered as part of the survey for sensitive features such as rock shelters. As such all archaeological survey will be confined to the MCCO Additional Project Area and the identified blast assessment area that falls outside of it as shown on **Figure 1-4**.

The MCCO Additional Project Area comprises approximately 1081.2 hectares (ha) located in largely cleared land to the north of the existing Mangoola operations.

The topography of the MCCO Additional Project Area is characterised by lower slopes, giving way to undulating hills and rocky outcrops to the north and west. Lower topographic areas are associated with drainage lines feeding Big Flat Creek to the south (**Figure 1-5**).

A dominant topographical feature in the surrounding landscape is the series of undulating wooded hills which occur outside and to the north of the MCCO Additional Project Area. These hills rise to a maximum height of approximately 360 metres (m) above sea level and are elevated approximately 200 m above the surrounding area.

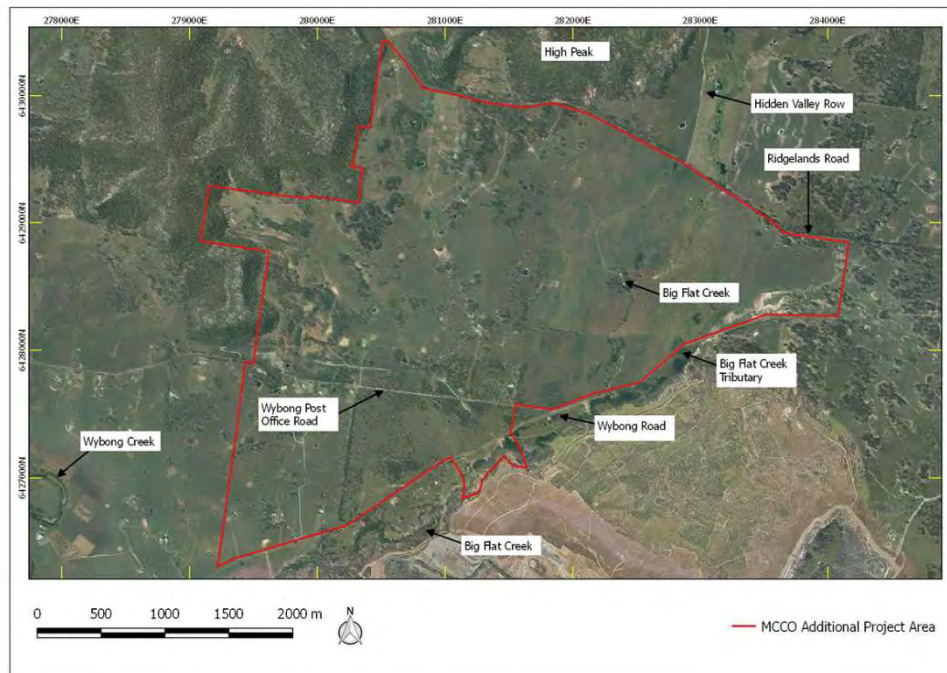
Most of the MCCO Additional Project Area is within the catchment of Big Flat Creek. Big Flat Creek drains south-westerly through the MCCO Additional Project Area before it converges with a major tributary and continues below the southern boundary of the MCCO Additional Project Area. The MCCO Additional Project Area also contains a number of unnamed tributaries that drain south and westerly into Big Flat Creek. Big Flat Creek drains south-westerly into Wybong Creek, which is a significant tributary of the Goulburn River. A small number of ephemeral creeks drain directly into Wybong Creek in the western portion of the MCCO Additional Project Area. The majority of local Aboriginal sites have been recorded in proximity to Big Flat Creek south of the MCCO Additional Project Area.

The MCCO Additional Project Area has been subject to agricultural land uses, including intensive grazing and pasture improvement. Remnant native vegetation is generally confined to watercourses, roadsides and areas of steeper topography that are not suitable for agricultural purposes. Historical land use may have caused the following:

- Changes in stream morphology
- Scouring, gulying and bank collapse to streams
- Mixing of artefacts in soils (especially if in ploughed areas)
- The increase in down slope movement of soil (colluvium) as a result of clearing.



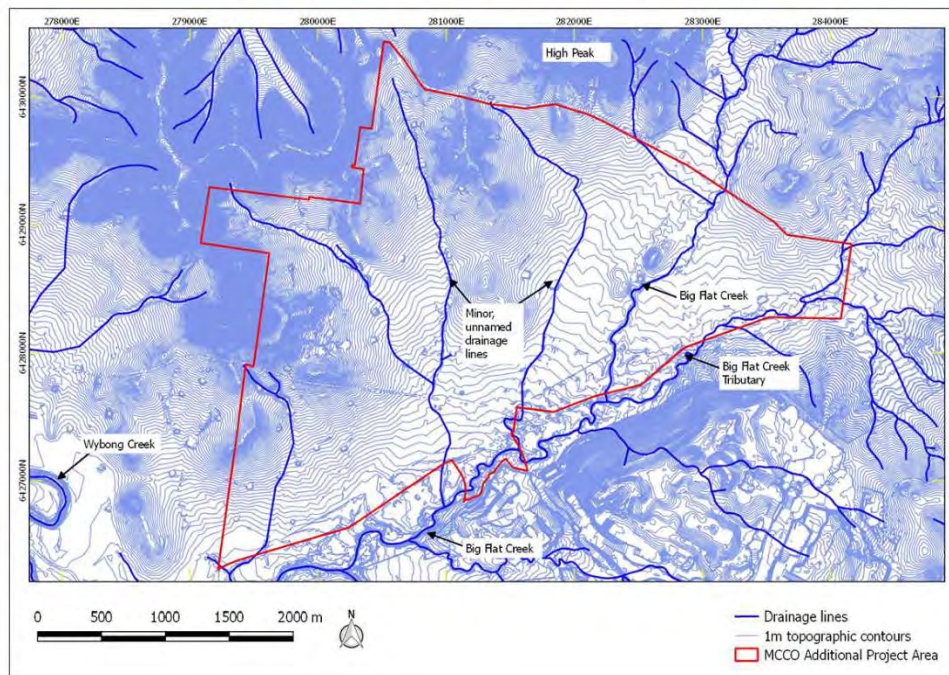
Figure 1-4: Aerial showing the MCCO Additional Project Area.



Aboriginal Cultural Heritage Survey Methodology: Mangoola Coal Continued Operations

7

Figure 1-5. Map showing topographical and hydrological features of the MCCO Additional Project Area.



Aboriginal Cultural Heritage Survey Methodology: Mangoola Coal Continued Operations

8

Figure 1-6. The MCO Additional Project Area superimposed on a 1967 aerial image.

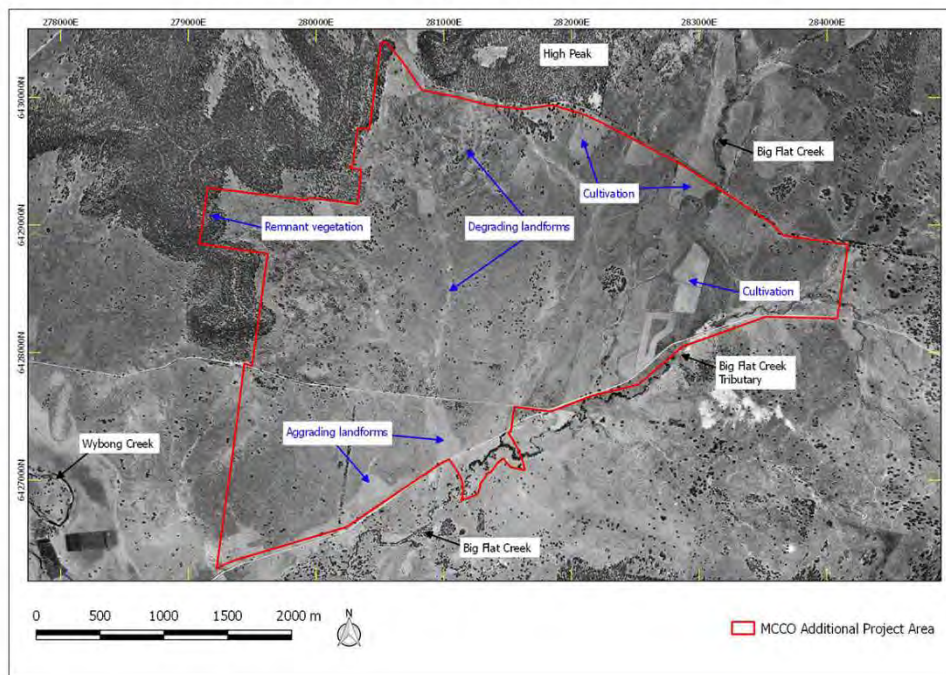


Figure 1-6 shows the MCCO Additional Project Area superimposed on to a 1967 aerial image. This imagery allows an examination of the types of impacts that have occurred to the landforms within the MCCO Additional Project Area as a result of European farming practices. These include:

- Extensive clearing of native vegetation. Apart from some small pockets of vegetation in the western portions, the entirety of the MCCO Additional Project Area has been cleared. This would suggest that certain site types, such as scar trees, will be extremely rare within the MCCO Additional Project Area. In addition, extensive clearing will have encouraged downslope movement of soils. As the MCCO Additional Project Area is generally sloping from north to south (see Figure 1-5), this would indicate that soils, as well as the artefacts that may have been within them, have accumulated in the southern portions of the MCCO Additional Project Area.
- Soil movement. As noted above, landforms in the north of the MCCO Additional Project Area are within degrading environments, while landforms in the south adjacent to Big Flat Creek are within an aggrading environment. The archaeological implications are that sites in the north may have been displaced or destroyed, while sites in the south are either buried or are representations of artefacts that have accumulated in these more low lying areas.
- Cultivation. The 1967 aerial shows substantial areas of the MCCO Additional Project Area under cultivation. While cultivation may not completely remove archaeological material from an area, it will, at least in the upper-most levels, severely disturb any archaeological deposits.
- Creek erosion. The 1967 aerial shows that erosion adjacent to creeks is not extensive. While drainage systems such as Big Flat Creek have become channelised (perhaps losing their former Chain of Ponds morphology), there is no evidence in the 1967 aerial of extensive gully erosion of the creek banks, or of sheet wash erosion adjacent to the creek. The exception to this is erosion evident in the east of the MCCO Additional Project Area along the major tributary to Big Flat Creek. The ephemeral drainage lines (see Figure 1-5) that flow generally north–south through the MCCO Additional Project Area, show evidence of sheet wash erosion in the basin of the drainage gully.

In summary, the impact of European farming practices on areas such as the MCCO Additional Project Area have led to a significant modification of the pre-1788 environment. This includes a marked change in vegetation cover, increased erosion and morphological changes to the local creeks. The impact of all these disturbances on the archaeological record is profound and any archaeological investigations of areas such as the MCCO Additional Project Area are inevitably examining a depleted and disrupted archaeological landscape.



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## 2 ARCHAEOLOGICAL CONTEXT

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### 2.1 ANTIQUITY OF ABORIGINAL OCCUPATION

The Aboriginal occupation of Australia begins prior to 40,000 BP (years before present) and possibly earlier than 50,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period, poor preservation of archaeological materials (particularly dateable organic materials) and significant coastline change over the past 18,000 years.

In 1986, Koettig undertook an archaeological survey between Glennies Creek and Singleton (cited in Umwelt 2003). Following that survey, Koettig carried out several excavations at six locations along Glennies Creek. Koettig considered artefacts found in Site SGCD 16 (about one metre deep in Unit B of on an old alluvial terrace) were 'markedly different' to artefacts recovered from the artefacts in Unit A. Her conclusion was formed on the basis of the raw material used, large number of cores, the large percentage of cortex remaining on artefacts and larger sizes of artefacts. Artefacts from Unit B were from volcanic rocks while those in Unit A were predominantly mudstone and silcrete. Later, a date of >20,200 BP was obtained from a hearth associated with the artefacts placing the site well into the Pleistocene.

### 2.2 INVESTIGATIONS WITHIN THE REGION OF THE MCCO ADDITIONAL PROJECT AREA

There have been numerous archaeological investigations in the local area with a small number undertaken in the MCCO Additional Project Area. The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (**Section 3**). This section refers to archaeological investigations in areas outside of, but close to, the MCCO Additional Project Area. **Section 2.3** refers to those investigations that were entirely or partially within the MCCO Additional Project Area and **Section 2.4** reviews the salvage programs that have taken place at Mangoola.

The previous investigations did not identify any specific socio-cultural heritage values unrelated to the Aboriginal sites identified. No historical connection has been identified specifically pertaining to the MCCO Additional Project Area and its surrounds that have been investigated. No declared Aboriginal places (under section 84 of the *National Parks and Wildlife Act 1974*) have been identified in the MCCO Additional Project Area or its surrounds.

Aboriginal cultural heritage values may be identified through further Aboriginal consultation concerning the MCCO Additional Project Area. These may relate to social, cultural or historic values associated with Aboriginal sites and objects or places with intangible values.

### **2.2.1 Great Northern Coal Project Bulk Sample Pit, Archaeological Survey (Witter 2002)**

Witter (2002) conducted an archaeological survey for the Great Northern Coal Project, located within the Approved Project Area boundary. The survey retraced an area covered by Aiken (1985), although the area was surveyed in greater detail and artefact scatters were defined and grouped into larger sites. As a result, nine sites containing a total of 144 artefacts were identified, being four artefact scatters and five isolated finds. The three largest sites identified were:

- Anvil Vale, which contained 79 artefacts on a creek terrace/pasture and included site #37-2-0509
- Big Flat Creek, which contained 24 artefacts on a creek/pasture and including site #37-2-0510. Despite its name, this site is located 1.3 km south of Big Flat Creek on a tributary to Big Flat Creek
- Clarks Gully, which contained 31 artefacts on tributary flats, pasture and woodland.

Witter discusses two other sites of interest beyond the larger site groupings. One was a small microblade workshop (EWA 19) located in a small scald of the valley bottom north of Big Flat Creek (the site is located approximately 110 m outside the MCCO Additional Project Area). This workshop is isolated and consisted of five silcrete flakes, four of which were blades. Witter suggests that the site may represent a 'quick repair event' servicing backed blade tools when away from the camp. In addition, there was a small elouera of orange chert which was found on the foot-slopes below Anvil Hill (located 2 km south of the MCCO Additional Project Area in an area that is not currently mined); this was assessed as an uncommon and interesting artefact type manufactured from unusual stone material. It was described as part of a hafted flake tool and had probably been transported extensively.

### **2.2.2 Proposed 66 kV Transmission Line, Denman to Mangoola Coal Mine (Umwelt 2008)**

Umwelt was commissioned to undertake an Aboriginal heritage assessment of a proposed 66kV transmission alignment to connect the existing Denman substation and the Mangoola Coal Mine.

Following completion of the survey, a review of the proposal identified that three poles (Poles 53, 54 and 63) were within recorded archaeological sites and areas, two poles (Poles 63 and 64) were within 5 m of recorded sites, two poles (Poles 52 and 57) were located within 20 m of recorded sites, and that heavy vehicle movement over site SC48 would be required. To reduce the extent of impact associated with the project, Energy Australia subsequently relocated three poles (Poles 52, 53 and 63) to avoid direct impacts to archaeological sites. However, site SC48 and the associated area of archaeological potential (Area #1) could not be avoided as the site/area was approximately 420 m in length and the maximum pole span for the transmission line was 150 metres. Opportunities for alternative alignments to avoid these sites were

investigated, however, there was no practical alternative and impacts to Site SC48 and Area #1 were unavoidable. These impacts were subject to an Aboriginal Heritage Impact Permit (AHIP) application and salvage program (see **Section 2.5**).

### **2.2.3 Proposed Relocation of 500kV Electricity Transmission Line, Mangoola Coal (Umwelt 2010)**

Umwelt was engaged by Mangoola, on behalf of TransGrid, to undertake the necessary environmental assessments associated with the relocation of a 500kV powerline. This project was to improve the efficiency of mining at Mangoola as it was proposed to remove an existing 500kV powerline that bisected the site and to relocate the powerline to a route within the southern and western boundaries of the Approved Project Area's disturbance area.

Two sections of the relocated powerline and five associated designated access tracks were outside the Approved Project Area's disturbance area and were the subject of the Umwelt assessment. Fourteen sites (SC56, SC57, BFC69 to BFC73 and SC60 to SC66) were located within the assessment areas and consisted of five isolated finds and nine artefact scatters containing a total of 166 artefacts. The largest artefact scatter (SC56) contained 49 artefacts, followed by SC57 (36 artefacts) and BFC72 (31 artefacts). No areas of potential archaeological deposit (PAD) were identified in association with the recorded sites or any other portion of the assessment areas.

A total of 15 new Aboriginal archaeological sites (BFC74 to BFC88) were recorded within a Habitat Enhancement Area that was inspected to evaluate its suitability as a cultural heritage offset. The sites consisted of six isolated finds and ten artefact scatters (including BFC49) containing a combined total of 44 artefacts. The largest artefact scatter was BFC75 (11 artefacts), followed by BFC80, BFC81 and BFC87, all of which contained five artefacts each. No areas of PAD were identified in association with the recorded sites or any other portion of the Habitat Enhancement Area. Ultimately it was assessed that the Habitat Enhancement Area lacked archaeological values of suitable significance to qualify it as a cultural heritage offset.

Unavoidable impacts to Aboriginal cultural heritage were managed under a Cultural Heritage Management Plan (CHMP) that provided the methodology for the salvage of certain sites (see **Section 2.4**).

## **2.3 INVESTIGATIONS WITHIN THE MCCO ADDITIONAL PROJECT AREA**

There have been numerous archaeological investigations in the local area with a small number undertaken in the MCCO Additional Project Area itself (**Table 2-1**). The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (see **Section 3.7**). The most

applicable survey was by EMM Consulting Pty Limited (EMM) in 2016 as part of a pre-feasibility study for the MCCO Project (EMM 2016).

**Table 2-1. Previous archaeological surveys within the MCCO Additional Project Area.**

Author	Year	Project	Results	Within the MCCO Additional Project Area?
Jill Ruig	1993	Fibre optic cable route Manobalai to Castle Rock	An archaeological survey identified 35 artefacts in five site locations. Eight artefacts were retouched flakes. The dominant raw material was mudstone (25 of the 35) with silcrete (8) and quartz (1) also recorded. Most of the sites (AHIMS #37-2-0738) had low cultural, education and scientific significance and one site (#37-2-0742) had moderate significance due to a higher than average artefact density (1 artefact per 15m <sup>2</sup> ).	Yes: in the northern portions.
Umwelt	2006	Anvil Hill Project	In 2006 Umwelt conducted a survey of the Approved Project Area's disturbance boundary and its surrounds, and Aboriginal Cultural Heritage Offset Areas (ACHOAs). A total of 173 sites were identified with 69 sites in the Approved Project Area's disturbance area, 98 in the ACHOAs and six where no impacts would occur. All rock shelter sites were within ACHOAs. The surveys indicated repeated and long term occupation related to reliable watercourses. High density areas were localised at the confluences of creeks (such as the confluence of Wybong and Big Flat Creek).  The site distributions were divided into the catchment areas of Anvil Creek (44 sites), Big Flat Creek (49 sites), Clarks Gully (18 sites), Sandy Creek (14 sites) and Wybong Creek (48 sites).	Yes: in the area where the proposed Wybong Road/Big Flat Creek overpass.
Umwelt	2014a	Works conducted as part of the 500kV powerline relocation (PA 10_002 Modification 4)	An Aboriginal Cultural Heritage Management Plan (ACHMP) was prepared as part of PA 10_002 (referred to as MOD4 this approval was specifically for the construction of a 500 kilovolt (kV) powerline and was not a modification to PA_06_0014 under which Mangoola operates). The ACHMP specified management measures for sites within the proposed powerline and for sites subject to impacts from the dismantling of the existing powerline. This included demarcating sites to be avoided, temporary and permanent collection of sites within the proposed and existing 500kV powerline and salvage excavations.  In 2012, a survey team inspected an existing 500kV powerline north of Wybong Road (which identified sites BFC97-100). Site BFC98 was permanently salvaged.  Site BFC98 within the proposed disturbance area for the Wybong Road/Big Flat Creek overpass was subject to temporary surface collection during the dismantling of the existing powerline. Although the nine artefacts were returned to the site following the completion of works, the site is listed as 'partially destroyed' with the Aboriginal Heritage Information Management System (AHIMS).	Yes: portions north of Wybong Road.
EMM	2016	Pre-feasibility study for the MCCO Project	EMM conducted an opportunistic archaeological field survey in an indicative project footprint and its surrounds from 15 to 19 September 2014. This indicative project footprint included large areas of the MCCO	Opportunistic survey over large areas of the MCCO Additional Project Area.

Author	Year	Project	Results	Within the MCCO Additional Project Area?
			Additional Project Area including the indicative connecting corridor between the Approved Project Area and the MCCO Additional Project Area where it crosses the ACHOA.  The survey recorded 38 sites (which, with the 20 sites previously recorded in the MCCO Additional Project Area, make 58 sites in total).	

As a result of these previous assessments, there are 58 Aboriginal sites that have been recorded within or immediately adjacent to the MCCO Additional Project Area. **Table 2-2** displays the site characteristics of the 58 previously known sites within or closely adjacent to the MCCO Additional Project Area.

**Table 2-2. Site characteristics of previously recorded sites in the MCCO Additional Project Area.**

Site type	Frequency
Artefact scatter	26
Isolated artefact	22
PAD	3
Artefact scatter with PAD	2
Rock shelter with PAD	5

Of the 58 sites, 52% (30) occur within 50 m of a watercourse. These sites are typically artefact scatters and isolated identified on eroding creek banks and spurs and elevated flat areas overlooking watercourses. This pattern may be partly the result of a sampling bias as most of the EMM 2016 field survey transects (which recorded the bulk of the sites in the MCCO Additional Project Area) were confined to 50 m of a watercourse which were predicted to have the highest archaeological sensitivity. There is a significant drop-off in site frequency over 100 m from watercourses with only 16 sites identified at distances greater than 100 m of watercourses. Of these 16 sites over 100 m from watercourses; nine are isolated finds, two are artefact scatters and the remaining five sites comprise rock shelters with PAD.

**Figure 2-1** illustrates an example of some of the sites previously recorded in the MCCO Additional Project Area and **Figure 2-2** illustrates the location of the 58 previously recorded sites within or adjacent to the MCCO Additional Project Area.



Figure 2-1. Examples of sites within the MCCO Additional Project Area.

	
<p>1. BFC126 artefact scatter adjacent to a tributary to Big Flat Creek.</p>	<p>2. <i>In situ</i> artefacts at BFC126.</p>
	
<p>3. BFC136 artefact scatter located adjacent to an unnamed drainage line in the northwest of the MCCO Additional Project Area.</p>	<p>4. Artefacts recorded at BFC136.</p>
	
<p>5. A rock shelter with PAD recorded at BFC128 in the west of the MCCO Additional Project Area.</p>	<p>6. A rock shelter with PAD recorded at BFC129 in the west of the MCCO Additional Project Area.</p>

Previously recorded sites ☐ MCCO Additional Project Area





## 2.4 PREVIOUS SALVAGE PROGRAMS AT MANGOOLA

All sites within the Approved Project Area disturbance boundary at Mangoola were subject to salvage in a program of works conducted between September and November 2008 (Umwelt 2014b). A total of 132 sites were subject to salvage over the course of this program, which included:

- Surface collection of 107 artefact scatter/isolated artefacts located within the approved disturbance boundary (or which extended across the project disturbance boundary)
- Surface collection and grader scrapes at 23 artefact scatter/isolated artefact sites
- Geomorphological investigation of site AC13 and Clarks Gully
- Surface collection, test excavation and subsequent subsurface salvage (including archaeological excavation and grader scrapes) at site AC13
- Salvage of a scarred tree (site SC-ST-01).

Following a modification to PA 06\_0014 (referred to as MOD2), additional salvage works were undertaken in relation to the construction of a pipeline from the Hunter River. This involved the surface collection of site SC03 and the completion of geomorphic excavations at three locations within the Hunter River floodplain. The outcomes of these works are reported in Umwelt 2012.

In relation to works outside the Approved Project Area but directly associated with the operation, Mangoola Coal Operations was granted an AHIP #1110275 (AHIMS reference #3220) by the NSW Office of Environment and Heritage (OEH) in relation to works associated with the construction of a new 66kV powerline extending from Denman to the Approved Project Area. In accordance with the requirements of AHIP #1110275, surface collection and subsurface salvage were undertaken within the sections of site SC48 as detailed in Umwelt 2011.

In 2012, project approval (PA 10\_0002) was issued to TransGrid in relation to the relocation of a section of the Bayswater to Mt Piper 500kV powerline that bisected the Approved Project Area. The conditions of PA 10\_0002 required the development of a CHMP that incorporated the management of Aboriginal cultural heritage within the PA 10\_0002 approval area. In accordance with this CHMP, 10 sites (SC60-66, 91–93) have been subject to surface collection and cultural salvage activities have been undertaken at three tower locations. Temporary surface collections were also conducted within the SC10 Management Zone, at site BFC96 within the Big Flat Creek ACHOA and at site BFC98 in the existing powerline easement, with artefacts to be returned to these locations following the completion of construction works (Umwelt 2014a).

In summary, a total of 149 sites at Mangoola have been subject to salvage activities and within the MCCO Additional Project Area one site has been completely salvaged and two sites have been partially salvaged. All of these works have been conducted in accordance with the requirements of relevant management plans and approvals.

### 3 PREDICTIVE MODEL

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#### 3.1 BACKGROUND

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rock shelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport: both over short and long time scales or (b) the historical impacts associated with the introduction of European farming practices including: grazing and cropping; land degradation associated with exotic pests such as goats and rabbits and the installation of farm related infrastructure including water-storage, utilities, roads, fences, stockyards and residential quarters. Scarred trees may survive for up to several hundred years but rarely beyond.

#### 3.2 SETTLEMENT STRATEGIES

The large number of archaeological studies undertaken within the vicinity of the MCCO Additional Project Area provides information to obtain a sound understanding of the nature and distribution of archaeological sites within the area. Although there is some conjecture about the relationship between stream order, site numbers and densities, the general pattern is that the majority of sites are present within 30 m of watercourses (Dean-Jones 1992: 26–27; AMBS 1997: 29). Although sites are present in locations at a greater distance from water, these sites are limited in terms of both number and size, constituting a lower density scatter than is found along the creek lines (Dean-Jones 1992: 24; ERM 1999: 22–23). The majority of sites are small, with larger sites typically found in association with permanent watercourses. Reduced visibility has been proffered as an explanation for the higher number of sites and artefacts present along the more heavily eroded and less vegetated minor watercourses as compared to major creeks (Umwelt 2004: 7.7; ERM 1999: 84).

### 3.3 PAST LAND USE

Crucial for the preservation of archaeological deposits is the history of past land use in a particular area. In particular, the European history of the Hunter Valley lowlands, where the MCCO Additional Project Area is located, is a stark example of historic land mismanagement leading to wide-spread erosion as the dispersible soils were exposed to rain.

An analysis of aerial photography of the MCCO Additional Project Area 50 years ago in 1967 (see **Section 1.2** and **Figure 1-6**) shows that there is very little tree cover within the MCCO Additional Project Area and evidence of sheet wash erosion with the majority of the area impacted either by degrading or aggrading factors. The 1967 image shows de-vegetated creek lines with noticeable gully erosion within the channel (channelisation) and, in places, extensive sheet wash erosion at their margins.

Such widespread impacts have undoubtedly affected the archaeological landscape in that many tens of centimetres of topsoils have been removed from areas such as the MCCO Additional Project Area, along with any archaeological deposits they may have contained. With such widespread soil movement it is also important to remember that accumulations of artefacts that may be termed a 'site' today may have, in fact, been washed into that location during the historic period and bear no relationship to past Aboriginal occupation patterns in the area.

### 3.4 PREVIOUSLY RECORDED SITES

Due to the history of archaeological investigation in the vicinity of the MCCO Additional Project Area, there have been a number of sites recorded either within the MCCO Additional Project Area, or in close proximity. 58 sites remain extant within the MCCO Additional Project Area as one of the sites (BFC98) has been previously salvaged.

As discussed in **Section 2** and below in **Section 3.5.2.2**, the results of previous investigations would suggest that:

- The most common site type will be stone artefact sites; either low density artefact scatters or isolated finds
- Culturally modified trees will be extremely rare due to the level of historical clearing and the fact that they are a regionally rare site type
- Grinding grooves will be unlikely to occur in the MCCO Additional Project Area as the major creek lines have been subject to previous assessment and it would be expected that these site types would have already been recorded
- Other site types such as burials or stone arrangements will be very rare due to the long-term agricultural disturbances that have occurred in the MCCO Additional Project Area
- Rock shelters are possible in the west of the MCCO Additional Project Area. However, while the MCCO Additional Project Area contains five rock shelters with PAD, the veracity of there being PADs associated with these shelters will be further examined during this



investigation as the photographs tend to indicate that PADs would be unlikely at such rock shelters (see **Figure 2-1**).

### 3.5 LANDFORM MODELLING

The MCCO Additional Project Area is entirely contained within lower slope landforms between 280 m and 140 m in altitude (see **Figure 1-5**). Generally the land is sloping towards the south and is part of the Big Flat Creek catchment. In the northern and western portions of the MCCO Additional Project Area there are localised ridges with some associated steeper slopes, however, generally the MCCO Additional Project Area has a relatively gentle gradient.

Hydrological resources are generally limited to Big Flat Creek along the southern boundary of the MCCO Additional Project Area (see **Figure 1-5**).

As such there are a variety of topographic features within the MCCO Additional Project Area that would have encouraged past Aboriginal occupation; namely:

- The elevated sandstone landforms in the north and west of the MCCO Additional Project Area have the capability to provide rock shelters for habitation and/or ceremonial purposes
- The landforms adjacent to Big Flat Creek have the capability of providing elevated landforms adjacent to water: landforms recognised in the area as having archaeological sensitivity.

### 3.6 PREVIOUS STUDIES

#### 3.6.1 Upper Hunter Valley Aboriginal Heritage Baseline Study (ERM 2004)

ERM (2004) undertook a review of the archaeology in the Upper Hunter Valley on behalf of Upper Hunter Aboriginal Heritage Trust. Following is a number of ERM's conclusions about archaeological sites in the Upper Hunter Valley of relevance to this assessment:

- Artefact assemblages will typically be comprised of flaked stone with a component associated with the manufacture of backed artefacts. Backed artefacts typically make up less than 2 per cent (and up to 5 per cent in rare cases) of an assemblage
- Evidence of backed artefacts is generally found wherever large numbers of artefacts have been recorded
- Cores and flakes associated with backed artefact manufacture typically show evidence of platform modification to increase platform angles. This modification is sometimes referred to as faceting, and is typical of open site assemblages between Singleton and Muswellbrook
- The backed artefact component may typically include a larger proportion of asymmetric, elongate (Bondi point) forms and a smaller proportion of symmetric (geometric microlith) forms in the same assemblage

- Eloueras occur occasionally and sometimes exhibit use-wear chipping and polishing along the chord
- Artefact assemblages have, on rare occasions, included small grindstones or fragments thereof, and ground-edge hatchet heads made on flat ovate water rolled small cobbles
- Hearths, comprising tight concentrations of heat-retainer stones clearly distinguishable from the natural environment are rare
- Sites along creek lines have potential for subsurface archaeological deposit. Topsoil is often quite deep, commonly between 100 and 300 millimetres (mm)
- The small numbers of artefacts found on slopes and ridge crests generally do not allow identification of particular activities, but do provide evidence for occupation of these areas and at the very least transient movement over, and use of, all parts of the landscape
- In areas close to the Hunter River (very likely to have been the major foci of occupation) alluvial deposits may have buried sites, or periods of flooding may have eroded and displaced archaeological material. Nevertheless excavations at a number of sites indicate that high density subsurface assemblages may occur in this context
- Sites on or within colluvial deposits are also rare, however, they do occur and may represent stratified cultural deposits providing evidence of chronological change
- Archaeological sites other than artefact scatters or isolated artefacts are not common
- Quarry sites have been identified where silcrete outcrops; however, the vast majority of raw material used in the manufacture of stone artefacts would have been derived (quarried/collected) from the Hunter River
- Axe-grinding grooves often occur where suitable sandstone is located in association with water or a creek line
- Scarred trees are rare, presumably because most trees that may be old enough to have been scarred have been cleared or died naturally (and rotted away or been burnt in fires)
- Art sites, ceremonial sites or Bora grounds are also rare and are either deteriorating or can no longer be located.

### **3.6.2 Aboriginal and Historical Cultural Heritage Assessment. Mangoola Coal Continued Operations Project Pre-feasibility Study (EMM 2016)**

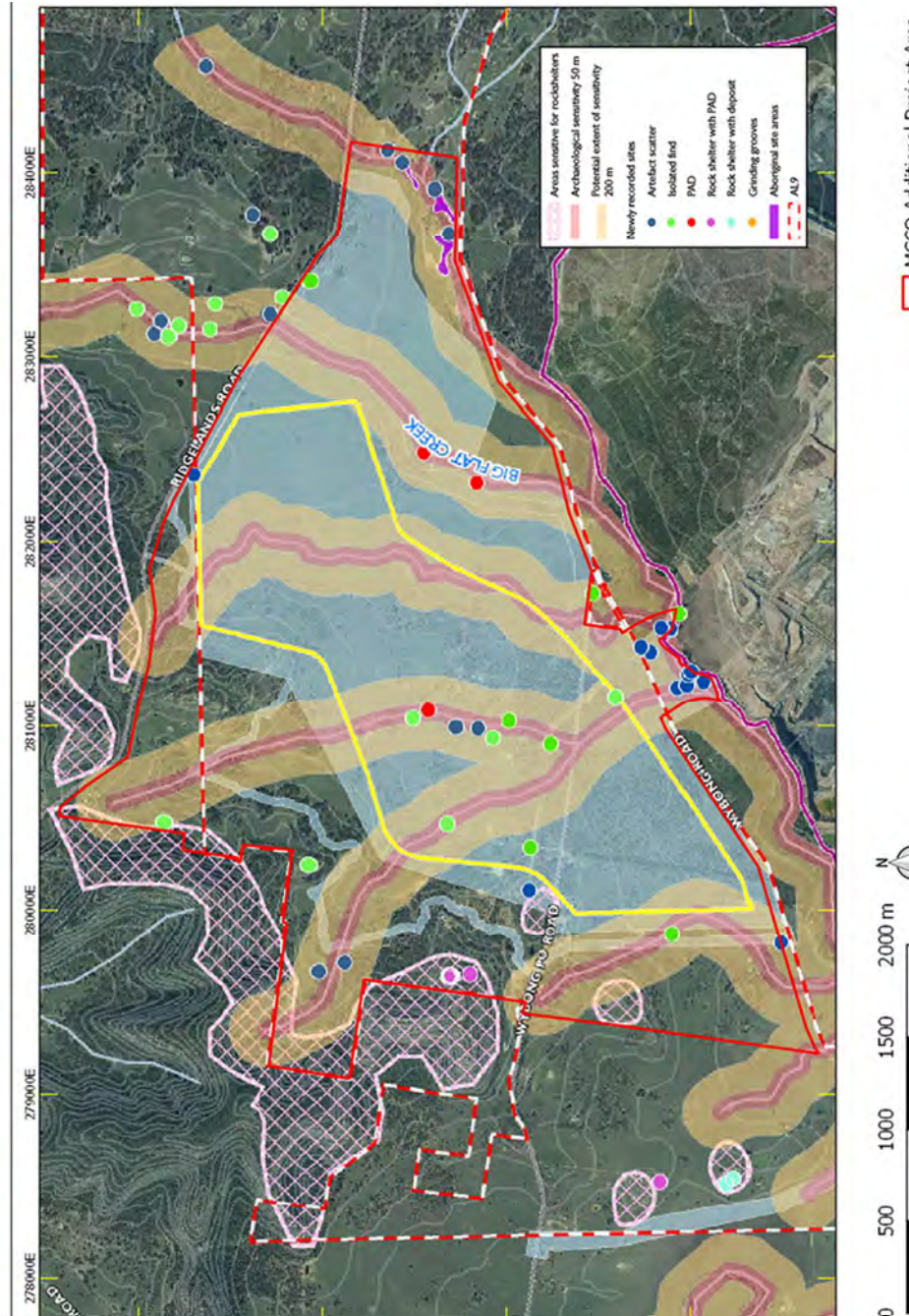
Based on previous reports and Aboriginal site data contained on AHIMS, the EMM 2016 study concluded that the following site characteristics are likely to occur in the MCCO Additional Project Area:

- Stone artefact sites (ie artefact scatters and isolated finds) dominate the archaeological record of this area, accounting for over 90% of all known sites in the immediate area
- Most artefact scatters contain less than 10 artefacts. Scatters with over 50 artefacts are uncommon

- Site types other than artefact scatters and isolated finds are poorly represented in the local area and restricted to rock shelters, grinding grooves and scarred trees
- The dominant raw material for stone artefact production in the area is indurated mudstone/tuff followed by silcrete. Both raw materials were sourced from gravel bars and/or terraces associated with the Hunter and/or Goulburn Rivers
- Stone artefact assemblages are dominated by flake and non-flake debitage. Retouched implements are comparatively rare in the local area
- Potential archaeological deposits (PADs) are primarily identified near watercourses on elevated, level to gently inclined landforms with good outlook over the surrounding landscape
- Rock shelters occur along the sandstone escarpments that surround the valleys below.

EMM 2016 mapped the archaeological sensitivity of the MCCO Additional Project Area and this is reproduced on Figure 3-3. As can be seen, the areas where EMM predict rock shelters to be located are restricted to small areas in the west of the MCCO Additional Project Area. Other than the areas of sensitivity related to this site type, other archaeologically sensitive areas are confined to the drainage lines within the MCCO Additional Project Area with the most sensitive areas being within 50 m of drainage lines and a general archaeological sensitivity within 200 m of waterways.

Figure 3-1. Archaeological sensitivity of the MOCO Additional Project Area as mapped by EMM 2016.



### 3.7 PREDICTIVE MODEL FOR THE MCCO ADDITIONAL PROJECT AREA

- Isolated finds may be indicative of: random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or sub-surface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
  - As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the MCCO Additional Project Area. It is noted in **Section 3.6** that isolated finds are commonly recorded in the vicinity of the MCCO Additional Project Area.
- Open artefact scatters are here defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short or long term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools, but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

- As a majority of the MCCO Additional Project Area is within undifferentiated sloping landforms distant to permanent water, this site type is not predicted to be common. However, within 50 m of drainage features this site type is possible. The high degree of impact from past agricultural practices (see **Figure 1-6**) in the MCCO Additional Project Area will probably mean that the scatter has become displaced. It is likely that any sites associated with landforms within the MCCO Additional Project Area are likely to have a low artefact density and a low complexity of tool types as the sites are either one-off events or only infrequently used. It is noted that the MCCO Additional Project Area already has a number of artefact scatters recorded by investigations over the years. This leads to the conclusion that all larger sites have probably been previously recorded and that the MCCO Additional Project Area will probably not record more large sites. The evidence of past salvage activities in the vicinity of the MCCO Additional Project Area (**Section 2.4**) show that artefact scatters in the area tend to have a low artefact density.



- Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed as a consequence of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting or bark removal. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any particular example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently the distinction between European and Aboriginal scarred trees may not be clear.
  - Due to the near-total clearance of trees from within the MCCO Additional Project Area (see **Section 1.2**), this site type is not predicted to occur. It is also noted that this site type is very rare at a regional level due to historical tree clearance.
- Quarry sites and stone procurement sites typically consist of exposures of stone material where evidence for human collection, extraction and/or preliminary processing has survived. Typically these involve the extraction of siliceous or fine grained igneous and meta-sedimentary rock types for the manufacture of artefacts. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations.
  - This site type could be recorded within the MCCO Additional Project Area should suitable rock outcroppings be available.
- Burials are generally found in soft sediments such as aeolian sand, alluvial silts and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.
  - Although it is possible that this site type could be found within the MCCO Additional Project Area, it is considered a rare site type especially given the disturbance that has occurred within the MCCO Additional Project Area.
- Rock shelters were utilised in the past for both habitation and ceremonial purposes. The term 'rock shelter site' refers to rock shelters/rock overhangs that contain evidence such as stone artefacts and/or bones and/or plant remains (from meals eaten at the site) and/or hearths (fireplaces). Most rock shelter sites are secular in nature, however, those that also contain rock art or engravings are often believed to be non-secular in nature. The term 'rock art site' generally refers to Aboriginal ochre paintings or ochre or charcoal drawings located on a rock slab (generally in a sheltered place like the floor of a cave or rock shelter), boulder, cliff-face, cave or rock shelter wall or roof, or wall of a rock overhang. The majority of rock art sites are found in positions that are sheltered from the elements. This observation, however, is probably biased to some extent, as rock art would not

preserve well in open positions. Rock art sites are generally believed to be non-secular in nature.

- Rock shelters have been recorded in the MCCO Additional Project Area, however, none are associated with evidence of Aboriginal occupation. From the evidence available at a desktop level (i.e. photographs on site cards), it would appear that none of the recorded rock shelters have a morphology to enable archaeological deposits to form and be retained. As such, rock shelters are contained within the MCCO Additional Project Area but whether or not they contain evidence of Aboriginal occupation remains to be determined. No rock art sites have been recorded in the vicinity of the MCCO Additional Project Area and as the rock shelters within the MCCO Additional Project Area have been recently inspected (EMM 2016), it is unlikely that rock art sites will be discovered in the MCCO Additional Project Area.

An examination of the landforms within the MCCO Additional Project Area (**Section 3.5**) indicate that the northern portions of the MCCO Additional Project Area is in a degrading environment where soils have been moved from the slopes towards the creek systems in the south where aggrading landforms are evident. This would have the effect of displacing or impacting archaeological deposits had they existed in the north of the MCCO Additional Project Area. Landforms adjacent to Big Flat Creek are in an aggrading environment. This may mean that archaeological deposits may have become buried, or mixed with objects, such as artefacts, being washed down from adjoining hill slopes. Additionally, given the changes in hydrology within the area it is possible that the bed of Big Flat Creek has shifted in historic times, further impacting and disturbing the small areas of aggrading landforms adjacent to the creek.

### 3.8 RESEARCH QUESTIONS

A number of research questions can meaningfully be applied to the investigation of the MCCO Additional Project Area. These research questions include:

- What resources were available to the Aboriginal people using the MCCO Additional Project Area (food, stone and water)?
- How do the artefact assemblages from the sites along the slopes and ridge crests in the MCCO Additional Project Area differ from sites that are located along Big Flat Creek?
- What tasks were Aboriginal people undertaking at the sites?
- Did the Aboriginal people use the MCCO Additional Project Area at any particular time of the year?
- Are there hearths in the area?
- If there are hearths, do they contain remains (animal/plant) that may indicate what people were cooking/eating?
- Are there burials in the area?

- Is there evidence to suggest that Aboriginal people were using the area earlier than the mid to late Holocene?
- Can dates be obtained for the Aboriginal use of the area?
- What resources were transported to the area and where?

The survey methodology set out in **Section 4** will be framed to help answer these questions; should sites of sufficient significance be encountered within the MCCO Additional Project Area. However, based on the results of previous assessments (**Section 3.6**), it not expected that the MCCO Additional Project Area will contain sites of sufficient significance to help answer those research questions that require a robust data set.

## 4 SURVEY METHODOLOGY

### 4.1 ASSESSMENT APPROACH

The Aboriginal cultural heritage assessment of the MCCO Additional Project Area will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). The field inspection will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011).

### 4.2 BACKGROUND

The following archaeological methodology is based on the understanding that portions of the MCCO Additional Project Area have been previously surveyed and, in some areas, salvaged as a result of past archaeological assessments and works related to mining approvals. There is, therefore, significant knowledge for much of the MCCO Additional Project Area regarding the likelihood of further unidentified Aboriginal objects or sites. However, the most extensive previous survey of the MCCO Additional Project Area was the 2014 EMM survey (see Section 2.3) and this was opportunistic and took place without the assistance of the Aboriginal community. As such, while data from previous reports, site cards and permits will be used to interpret the landscape if ground surface visibility is poor, the entire MCCO Additional Project Area will be systematically surveyed by pedestrian transects to ensure that the archaeological characteristics of the MCCO Additional Project Area are understood.

All survey will be undertaken with the assistance of Registered Aboriginal Parties (RAP)/Knowledge Holder representatives. Apart from their valuable experience in recognising and recording archaeological sites, the RAP/Knowledge Holder representatives will be able to acquaint themselves with the MCCO Additional Project Area in order to inform their cultural value assessment of the MCCO Additional Project Area. Any cultural values relating to the MCCO Additional Project Area will be captured by the OzArk archaeologist (if such information is provided during the survey) and included in the ACHAR that will be developed by ACHM following the survey.

#### 4.2.1 Survey methodology

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004).

Field survey will, wherever possible, be conducted in transects of 50 m intervals (with up to six recorders spaced five metres apart). If field conditions do not allow straight transects, some areas may be investigated more opportunistically where exposures and/or vegetation allow.

If areas have significant levels of ground cover and pedestrian survey is considered by the archaeologist and RAP/Knowledge Holder representatives to yield no results, then assessment

will be made, based in part on knowledge gained from past archaeological research in the area, of the potential of the area to have Aboriginal artefacts present.

It should be noted that the aim of any archaeological survey is not to locate each and every artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within a study area are known. Therefore the aims of the survey will be to:

- Reinspect the location of all 58 previously recorded sites within the MCCO Additional Project Area so that their current condition and scientific heritage values can be assessed
- Conduct pedestrian transects across all landforms in the MCCO Additional Project Area so that their archaeological potential can be determined
- Evaluate whether the predictive model set out in Section 3.7 is valid
- Determine if the research questions set out in Section 3.8 can be answered
- Determine if any portions of the MCCO Additional Project Area require test excavation in order to understand the archaeological potential at a particular location
- Undertake sufficient assessment in order to satisfy Sections 2.2, 2.4 (as it pertains to scientific values), 2.5, 2.6, and 2.7 in the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011)
- Collecting sufficient data so that the results can be presented in an ACHAR as set out in Section 3 in the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011)
- Undertaking survey and record keeping to satisfy Requirements 1–13 of the Code of Practice.

The field assessment will be undertaken over the entire MCCO Additional Project Area and will also cover the blast assessment area that falls outside this. The primary focus of investigations within the blast assessment area will be to determine whether rock shelters will be impacted by blast related vibrations. The known rock shelters in the west of the MCCO Additional Project Area are greater than 500 m from the proposed pit shell and should not be impacted by blast vibrations.

The field assessment will also include the re-visiting and re-recording of any previously recorded sites within 100 m of the MCCO Additional Project Area to ensure that the site does not extend into areas where proposed impacts are to occur.

It is envisioned that fieldwork for the survey would be completed in two weeks by two teams of surveyors working concurrently. Each team would consist of two archaeologists and up to four RAP/Knowledge Holder representatives.



#### **4.2.2 Test excavation**

It is possible that the survey may identify landforms where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, the test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.

## REFERENCES

- Aiken 1985                      Aiken, G. An Archaeological Survey of the Bayswater to Mt. Piper Transmission Line. An unpublished report to the NSW National Parks and Wildlife Service by ANU Archaeological Consultancies.
- AMBS 1997                      Australian Museum Business Services. *Archaeological test Excavations of Aboriginal Sites at Bettys Creek Mt Owen Mine, Hunter Valley, NSW. Vol. 1–4.* Report for Mt Owen Mine, BHP Coal Australia.
- Burke & Smith 2004            Burke, H. and Smith, C. 2004. *The Archaeologist's Field Handbook*, Blackwell, Oxford.
- Dean-Jones 1992              Dean-Jones, P (Resource Planning Pty Ltd). *Archaeological Report Subsurface Analysis Swamp Creek, Mount Owen Mine Site.* Report to Hunter Valley Coal Corporation Pty.
- DECCW 2010                  DECCW. 2010. *Code of Practice for the Investigation of Aboriginal Objects in New South Wales.* Department of Environment, Climate Change and Water, Sydney.
- EMM 2016                      EMM Consulting Pty Limited. *Aboriginal and Historical Cultural Heritage Assessment. Mangoola Coal Continued Operations Project Pre-feasibility Study.* Report for Glencore Coal Assets Australia.
- ERM 1999                      ERM Mitchell McCotter Pty Limited. *Ravensworth East Mine Environmental Impact Statement.* Report for Peabody Resources Limited.
- ERM 2004                      ERM Environmental Resources Management Australia Pty Ltd. *Upper Hunter Valley Aboriginal Heritage Baseline Study.* Report Prepared for the Upper Hunter Aboriginal Heritage Trust.
- OEH 2011                      Office of Environment and Heritage. 2011. *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales.* Department of Environment, Climate Change and Water, Sydney.
- Ruig 1993                      Ruig, J L. *An Archaeological Survey of the Proposed Optic Fibre Cable Route from Manobalai to Castle Rock, Upper Hunter, NSW.* Prepared for Telecom Australia.
- Umwelt 2003                  Umwelt (Australia) Pty Limited. *Survey and Assessment of Impact on Aboriginal Cultural Heritage and Archaeological Values, Main Creek, Hunter Valley, NSW.* Report for Glennies Creek Coal Management Pty Limited.

Umwelt 2004	Umwelt (Australia) Pty Limited. <i>Survey of Aboriginal Archaeology in the Area of the Proposed C-Pit Extension and Overburden Dump, Eastern Rail Pit, Bettys Creek Diversion Canal and Dam, and Glendell to Mount Owen Haul Road. Mount Owen Mine, near Hebdon, NSW.</i> A Report to Hunter Valley Coal Corporation.
Umwelt 2006	Umwelt (Australia) Pty Limited. <i>Aboriginal Archaeological Assessment – Anvil Hill Project.</i> Anvil Hill Project Environmental Assessment. Prepared for Centennial Hunter Pty Limited.
Umwelt 2008	Umwelt (Australia) Pty Limited. <i>Aboriginal Heritage Assessment of Proposed 66 kV Transmission Line, Denman to Mangoola Coal Mine, NSW.</i> Report for EnergyAustralia.
Umwelt 2010	Umwelt (Australia) Pty Limited. <i>Aboriginal Cultural Heritage and Archaeological Assessment – Proposed Relocation of 500kV Electricity Transmission Line, Mangoola Coal.</i> Report for Xstrata Mangoola Pty Limited and TransGrid.
Umwelt 2011	Umwelt (Australia) Pty Limited. Cultural heritage works conducted under AHIP#3220/110275, Denman to Mangoola 66kV Transmission Line. Report for Xstrata Mangoola Pty Limited.
Umwelt 2012	Umwelt (Australia) Pty Limited. <i>Hunter River Pipeline Aboriginal Cultural Heritage Salvage.</i> Report for Xstrata Mangoola Pty Limited.
Umwelt 2014a	Umwelt (Australia) Pty Limited. <i>Report on cultural heritage works conducted as part of PA 10_002, ETL relocation at Mangoola Coal.</i> Report for Transgrid/Mangoola Coal.
Umwelt 2014b	Umwelt (Australia) Pty Limited. <i>Mangoola Coal Aboriginal Archaeological Salvage Program.</i> Report for Mangoola Coal Operations Pty Limited.
Witter 2002	Witter, D. <i>Great Northern Coal Project Bulk Sample Pit Archaeological Survey.</i>

### 11.3.6 Archaeological Survey 28 Day Review Feedback from RAPs

Group/Organisation	Abbreviation	Contact Person	Agree with Methodology	Methodology Comment
A1 Indigenous Services	A1	Carolyn Hickey	Yes	22/1/18 - Glencore received verification via phone call
AGA Services	AGA	Ashley, Gregory & Adam Sampson	Yes	"Cacatua and AGA Services has discussed the Mangoola Coal continued Operations Project Survey methodology that was forwarded at our last meeting. Both AGA Services and Cacatua are in support of the information that was forwarded."
Amanda Hickey Cultural Services (AHCS)	AHCS	Amanda Hickey	Yes	22/1/18 - Glencore received verification via phone call
Cacatua General Services	CGS	George & Donna Sampson	Yes	22/1/18 - Glencore received verification via phone call From email: "Cacatua and AGA Services has discussed the Mangoola Coal continued Operations Project Survey methodology that was forwarded at our last meeting. Both AGA Services and Cacatua are in support of the information that was forwarded."
Devine Diggers Aboriginal Cultural Consultants	DD	Deidre Perkins	Yes	22/1/18 - Glencore received verification via phone call
Didge Ngundawal Clan (DNC)	DNC	Paul Boyd & Lillylea Carroll	Yes	"Didge Ngundawal Clan are happy for the approvals to go ahead and totally agree with the methodology. DNC has plenty of experience in all parts of fieldwork and has worked with nearly all archaeologists."
Gomery Cultural Consultants	GCC	David Horton	Yes	(verbally acknowledge agreement)
Gringai Aboriginal Corporation	GAC	Gregory Heard	Yes	"I would like to send in expression of interest for the above said project. I agree with the methodology and would like to be involved in all areas of the project."
Hunter Traditional Owner Environmental Management Service	HTO	Paulette Ryan	Yes	Comments primarily relating to Salvage activities. "...regarding the methodology, can we put that all artefacts coming out of the site go in to the buckets as this is a cultural matter as we would like to handle artefacts before they are bagged) this has been a problem in the past everything else seem fine"
Jarban & Mugrebea	JM	Uncle Barry French	Yes	22/1/18 - Glencore received verification via phone call
Lower Hunter Aboriginal Incorporated	LHAI	David Ahoy	Yes	"On behalf of LHAI I agree with the draft ACHSM and have no further comments to add."
Murra Bidgee Mullangari Aboriginal Corporation	MBM	Ryan & Darleen Johnson (Carroll)	Yes	"I have read the Draft methodology review and the approach to the protocols for the management of sensitive cultural information for the above project. I endorse the proposed approach and method recommendations by Ozark Environmental & Heritage Plan."
Ungooroo Aboriginal Corporation	UAC	Taasha Layer	Yes	22/1/18 - Glencore received verification via phone call
Wallangan Cultural Services	WCS	Maree Waugh	Yes	22/1/18 - Glencore received verification via phone call
Widescope Indigenous Group Pty Ltd	WIG	Steven & Donna Hickey	Yes	"I agree with Methodology."
Wonn 1 Contracting (Kauwal)	W1	Arthur Fletcher	Yes	"We wish to advise that we are in agreement with the draft methodologies and forward to be included in the future fieldwork."
		Stephen Talbot	Yes	As discussed, I agree with the methodology however, community should be given the opportunity to identify significant areas. I would like to be given the opportunity to be involved in all phases of works.
Wanaruah Local Aboriginal Land Council	WLALC	Noel Downs	Yes	WLALC response to the MCCO draft survey methodology. Under section 2.2 WLALC would like to add: <ul style="list-style-type: none"> <li>There is believed to be a bora ground near the current location of the Yarraman holiday stay. This bora's extents could be several kilometres it has not been studied. It could be linked to the Anvil Hill complex and Skull rock.</li> <li>Skull Rock formation has not rated a mention, this is of concern. It would have been of significance as an odd geological formation therefore a gift from the creator.</li> <li>There were many micro blades found during the Mangoola study, excavations and salvages. This is believed by the community to show the area is potentially linked to a</li> </ul>

				<p>scarification area in the vicinity.</p> <ul style="list-style-type: none"> <li>• There are reports of a water spring in a cave. Although often linked to evil places there is no local knowledge on whether it was considered such or if it was a women's site.</li> </ul> <p>Under Section 3.8: Additional research questions.</p> <ul style="list-style-type: none"> <li>• What did the environment/ landscape look like prior to settlement? What historical records are there to describe the area at the time of settlement?</li> <li>• What historical records are held by NSW State Library, National Archive, Universities, Local residents and Local Historical societies relating to the area that may have information about the local Aboriginal people in the area. We know the Marowancal were over near Denman on the Eastern side of the Hunter River, were these the same people or were these Tooloopikilal, the Gundical (the Gundical are possibly from over near Gunda and describing the Tullong and Murrain Clans) or the Paninipikilal?</li> <li>• Do these records detail local Aboriginal Place Names?</li> <li>• What 3D landscape mapping of the area can be completed prior to any destruction?</li> </ul> <p>And Finally:</p> <ul style="list-style-type: none"> <li>• What methodologies are to be implemented to protect the wetland aquifer?</li> <li>• The methodology for the survey is to include 100% Coverage,</li> <li>• In areas where visibility is restricted there is to be a Maintenance burn and a revisit to the areas concerned.</li> <li>• Survey and Test excavations will inform further research design and management of sites and landscape.</li> </ul>
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### 11.3.7 Example letter - Archaeological Survey Invitation

## MANGOOLA OPEN CUT --- GLENCORE

19 January 2018

Uncle Barry French  
Jarban & Mugrebea  
12 Haydon StreetAddress  
Muswellbrook NSW 2333

Dear Uncle Barry

***Re: Mangoola Coal Continued Operations Project Archaeological Survey – Fieldwork Details***

#### Introduction

Thank you again for registering your expression of interest to be consulted in relation to the Aboriginal archaeological values impact assessment for the Mangoola Coal Continued Operations (MCCO) Project. Further to previous correspondence, we would like to confirm that the Aboriginal Archaeological Assessment – field survey component is now scheduled to occur weekdays between **5<sup>th</sup> February – 16<sup>th</sup> February 2018**. This provides an opportunity to participate in the field survey component of the assessment.

It is noted that in accordance with Section 3.4 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*, consultation should not be confused with employment. In this regard, a rostered fieldwork schedule will be developed for the field assessment and participants will be reimbursed for their time. If you would like to participate in the field assessment please complete the attached *Field Worker Application*.

Ongoing consultation will continue for the duration of the MCCO Project and the offer to all Registered Aboriginal Parties (RAPs) or knowledge holders remains if you would like to visit the MCCO Project Area or provide information associated with Aboriginal objects or places of cultural value at any stage to please contact Mangoola representatives to arrange a visit. In addition, following the completion of the field assessment correspondence will be distributed associated with upcoming Cultural Values Workshops.

#### Fieldwork Details

The following information is provided for those RAPs who would like to participate in the fieldwork activities. Depending on the final number of participants, a rostered fieldwork schedule will be developed. We will contact you to confirm your allocated days.

#### General

Work Period:	Weekdays between 5 <sup>th</sup> - 16 <sup>th</sup> February 2018 (weather dependent)
Work Hours:	8:30 am on 5 <sup>th</sup> February 2018 (for this date only) 7am to 3pm (remaining days)
Meeting Location:	Mangoola Open Cut Administration Office (transport to survey site will be provided)
Access to Site:	All fieldwork participants are required to complete a Visitors Induction located at the Main Administration Office  All fieldwork participants are required to sign on and off daily at the Main Administration Office

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**Rates:** Payment for a Field Worker is based on an hourly rate of \$68.75. Day rate capped at \$550 plus travel allowance

Payment for an Assistant Field Worker is based on an hourly rate of \$41.25. Day rate capped at \$330 plus travel allowance

Payment for a full day's work of 8hrs equals day rate plus \$50 travel, totalling \$600 for a Field Worker and \$380 for an Assistant Field Worker

### Safety Requirements

All fieldwork participants must ensure they have the following personal protective equipment and personal items:

- Hi-Vis long sleeved shirt and trousers
- Protective eyewear/sunglasses
- Boots with ankle support
- Gloves
- Wide brimmed hat and sunscreen
- Hard hat (may be required at times)
- Drinking Water (additional bottled water will be available)
- Lunch and morning/afternoon tea

### Site Restrictions and Expectations

Mangoola is a Glencore managed site and all fieldwork participants should note:

- Smoking is not permitted anywhere on site or within the MCCO Project Area
- Mangoola is a zero alcohol site and all employees and contractors are required to complete a BAC prior to entry.
- Mobile phones or other electronic devices are not permitted onsite. If required, and subject to a genuine reason, a Mobile Phone and Portable Electronic Device Authorisation should be completed and signed by an appropriate Mangoola representative prior to use.

### Way Forward

In order to confirm your participation in the fieldwork, please complete the *Field Worker Application Form* (3 pages) and the *Vendor Application* provided at the end of this letter. Please note specific documentation are also required to set you up as a Vendor with Mangoola Coal so reimbursements can be processed appropriately. Completed forms and supporting documentation should be provided to myself at the details below by **29 January 2018**.

If you have any questions, please contact me to discuss.

Kink Regards,



Lori Dennen-King  
Project Approvals Officer  
Mangoola Coal – A Glencore managed company  
Email: [Lori.Dennen-King@glencore.com.au](mailto:Lori.Dennen-King@glencore.com.au)  
Phone: (02) 6549 5520

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## GLENCORE

### Mangoola Coal Continued Operations Project Aboriginal Cultural Heritage Assessment

#### *Field Worker Application Form*

<b>Part 1 – Details of Applicant</b>	
<b>Note:</b> Details provided on this form will be provided to your nominated Field Work Service Provider.	
<b>Name and Contact Details</b>	Name: _____ Residential Address: _____ _____ _____ Phone Number: _____ Mobile Number: _____ Email address: _____
<b>Position applied for (Tick one box)</b>	Field Worker <input type="checkbox"/> Assistant Field Worker <input type="checkbox"/>
<b>If selected for this role, which organisation would you represent?</b>	..... Insert name of your preferred Field Work Service Provider.
<b>Do you identify as a Gomerai Aboriginal person?</b>	Yes / No (Please circle)
<b>Part 2 – Qualifications and Training</b>	
<b>Qualifications and training.</b> (attach documentation as required)	I have the following qualifications or training that may assist with archaeology fieldwork: OEH or other relevant site / artefact recognition training: _____ Archaeology Qualifications: _____ Current First Aid Certificate: YES / NO 4WD Training: _____ Other: _____
<b>Part 3 – Experience</b>	

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<p><b>Experience</b></p> <p>To support your application for employment, please list any previous Aboriginal archaeological Field Worker experience.</p> <p>Please provide the name of the Project and the type of field work undertaken.</p> <p>A minimum of 60 days field work experience is required for a Field Worker position.</p> <p>Assistant Field Workers do not need to provide evidence of 60 days of experience.</p> <p>Attach additional pages if required.</p>	<p>Project: _____ Date _____</p> <p>Archaeologist: _____</p> <p>Fieldwork activities undertaken by myself included:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Project: _____ Date _____</p> <p>Archaeologist: _____</p> <p>Fieldwork activities undertaken by myself include:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Project: _____ Date _____</p> <p>Archaeologist: _____</p> <p>Fieldwork activities undertaken by myself include:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Project: _____ Date _____</p> <p>Archaeologist: _____</p> <p>Fieldwork activities undertaken by myself include:</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p><b>Part 4 - References</b></p>	
<p>Please provide the name and contact details of one or more archaeologists who can be contacted as a referee regarding your previous archaeological field work experience.</p>	<p>I give permission for the following people to be contacted as a referee to support my application:</p> <p>Name: _____</p> <p>Contact details: _____</p> <p>Name: _____</p> <p>Contact details: _____</p>

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Part 5 – Fitness, Comprehension and Insurances	
	Sign Initials
I am generally fit for outdoor fieldwork activities and have no medical illness or injury that would prevent my involvement	
I have read and understood the requirements to participate in the field assessment	
<p style="text-align: center;">I certify that the information provided on this form is true and correct.</p> <p style="text-align: center;">Print Name: _____</p> <p style="text-align: center;">Signed: _____</p> <p style="text-align: center;">Date: _____</p>	



# MANGOOLA OPEN CUT

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## ***Vendor Application Form***

<b>COMPANY NAME:</b>		
<b>PHYSICAL STREET ADDRESS:</b>		
<b>POSTAL ADDRESS:</b>		
<b>PHONE</b>		
<b>FAX</b>		
<b>EMAIL</b>		
<b>CONTACT NAME</b>		
<b>COMPLETE LEGAL NAME OF COMPANY:</b>		
<b>ABN:</b>		
<b>FULL BANK DETAILS (must be provided on Company letterhead)</b>		
<b>INSURANCES (copy of current policies must accompany this form)</b>		
Workers compensation <i>(only required if you have employees)</i>	YES	NO
Public Liability	YES	NO
<p style="text-align: center;">I certify that the information provided on this form is true and correct.</p> <p style="text-align: center;">Print Name: _____</p> <p style="text-align: center;">Signed: _____</p> <p style="text-align: center;">Date: _____</p>		

**11.3.8 Archaeological Survey Participants**

Group	05-Feb-18	06-Feb-18	07-Feb-18	08-Feb-18	09-Feb-18	12-Feb-18	13-Feb-18	14-Feb-18	15-Feb-18	16-Feb-18
<b>PCWP</b>	Mary Franks	Mary Franks		Mary Franks	Mary Franks		Mary Franks	Mary Franks	Mary Franks	Mary Franks
	John Phillips	John Phillips	John Phillips	John Phillips	John Phillips	John Phillips	John Phillips	John Phillips	John Phillips	John Phillips
<b>WNAC</b>	Maree Waugh	Maree Waugh	Maree Waugh	Maree Waugh	Maree Waugh	Maree Waugh	Maree Waugh	Maree Waugh	Maree Waugh	Maree Waugh
		Luke Hickey	Luke Hickey	Luke Hickey	Luke Hickey	Luke Hickey	Luke Hickey	Luke Hickey	Luke Hickey	Luke Hickey
<b>HVAC</b>	George Sampson	Colleen Stair	Paul Boyd	Shaun Carroll	Shaun Carroll	Cliff Johnson	Cliff Johnson	Dave Horton	Cliff Johnson	Cliff Johnson
	Ashley Sampson	George Sampson	Jeffery Matthews	Jenny Chambers		Allen Paget	Krystal Saunders	Jenny Chambers	Allen Paget	Krystal Saunders
	Paul Boyd	Ashley Sampson	Jade Jones	Jade Jones						
<b>Gomeroi</b>	Wayne French	Wayne French	Wayne French	Wayne French	Wayne French	Wayne French	Wayne French	Wayne French	Wayne French	Wayne French
					Allan Talbot	Allan Talbot	Allan Talbot	Allan Talbot	Allan Talbot	Allan Talbot

### 11.39 OzArk Archaeological Survey Summary

#### MANGOOLA COAL CONTINUED OPERATIONS

#### PRELIMINARY ARCHAEOLOGICAL ASSESSMENT SUMMARY

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A RETOUCHE CHERT FLAKE RECORDED ALONG BIG FLAT CREEK.

The archaeological survey of all areas likely to be impacted by the proposed Mangoola Coal Continued Operations (MCCO) Project was successfully completed from 5 to 16 February 2018.

The following summary is designed to inform all Registered Aboriginal Parties (RAPs) and Knowledge Holders of the preliminary results of the two week survey. Precise detail on the location and nature of recorded archaeological sites will be included in the draft archaeological report.

The survey area was assessed by two independent teams, each consisting of two archaeologists from OzArk Environmental & Heritage Management and up to four representatives of the RAPs/Knowledge Holders. The weather for the survey was fine and hot. The prolonged dry period preceding the survey provided the teams with excellent ground surface visibility (**Figure 1**).



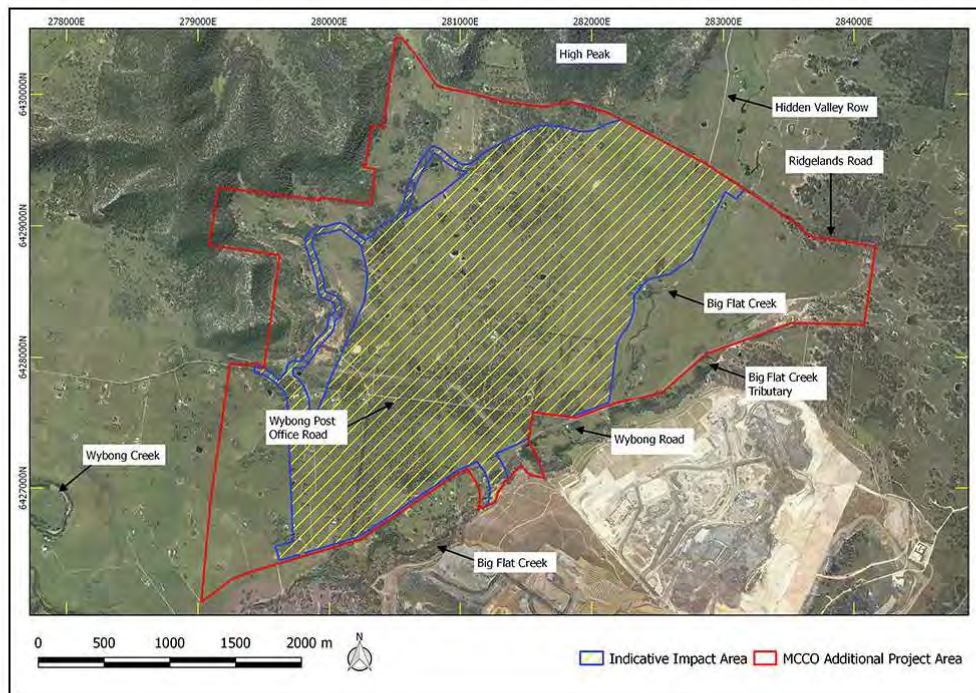
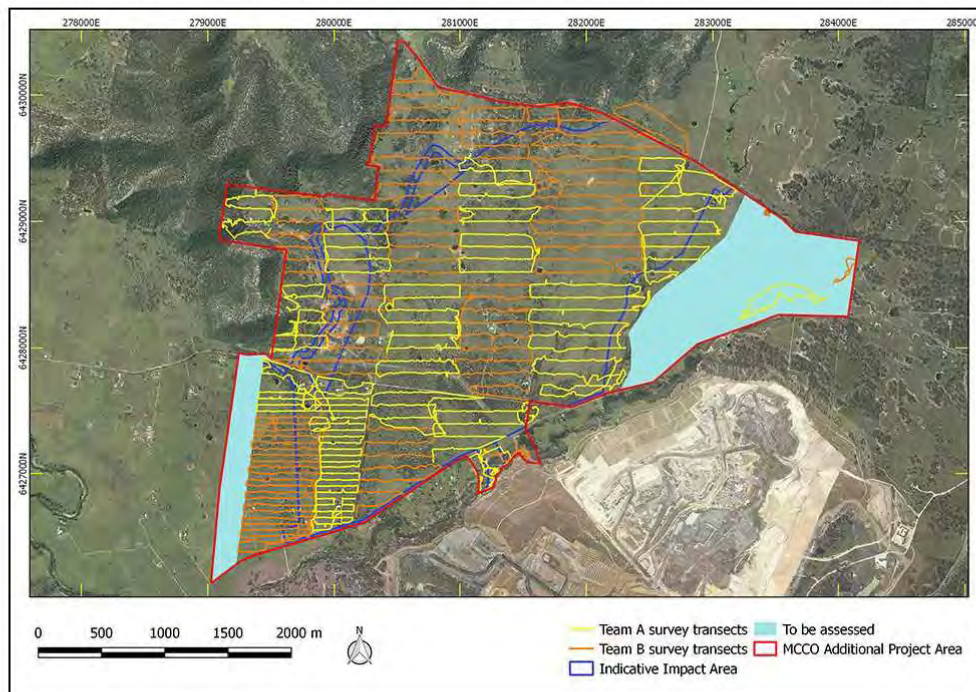
**FIGURE 1**  
A TYPICAL SCENE  
FROM THE SURVEY  
SHOWING  
SURVEYORS  
TRAVERSING  
GENERALLY FLAT,  
PARCHED,  
LANDFORMS WITH  
EXCELLENT GROUND  
SURFACE VISIBILITY.

All disturbance arising from the MCCO Project will be located to the west of Big Flat Creek (**Figure 2**). The major components of the MCCO Project include an open cut pit (Proposed Additional Mining Area), overburden emplacement area, soil stockpiles, drainage and water management infrastructure, road realignment and an overpass across Big Flat Creek.

The February survey concentrated on landforms to the north and west of Big Flat Creek where the MCCO Project disturbance will be located (**Figure 3**). To the east of Big Flat Creek, approximately 126 hectares remains unassessed and approximately 35 hectares remain unassessed in the west of the MCCO Additional Project Area (**Figure 4**). These areas will be subject to survey in May 2018 so that the entirety of the MCCO Additional Project Area is fully assessed.

The survey began in the southwest corner of the MCCO Additional Project Area and was undertaken in transects spaced 50 metres apart. Due to the nature of the landforms (generally flat landforms distant to permanent water), as well as the excellent ground surface visibility, it was decided to increase the transect spacing to a 100 metres for the remainder of the survey. With up to six surveyors in each team spaced 10–15 metres apart, each transect covered approximately 100 metres, and as a result, the survey area was assessed in detail.



**FIGURE 2. AERIAL SHOWING THE INDICATIVE IMPACT AREA WITHIN THE MCCO ADDITIONAL PROJECT AREA.****FIGURE 3. AERIAL SHOWING THE SURVEY TRANSECTS WITHIN THE MCCO ADDITIONAL PROJECT AREA.**

### Summary of survey results

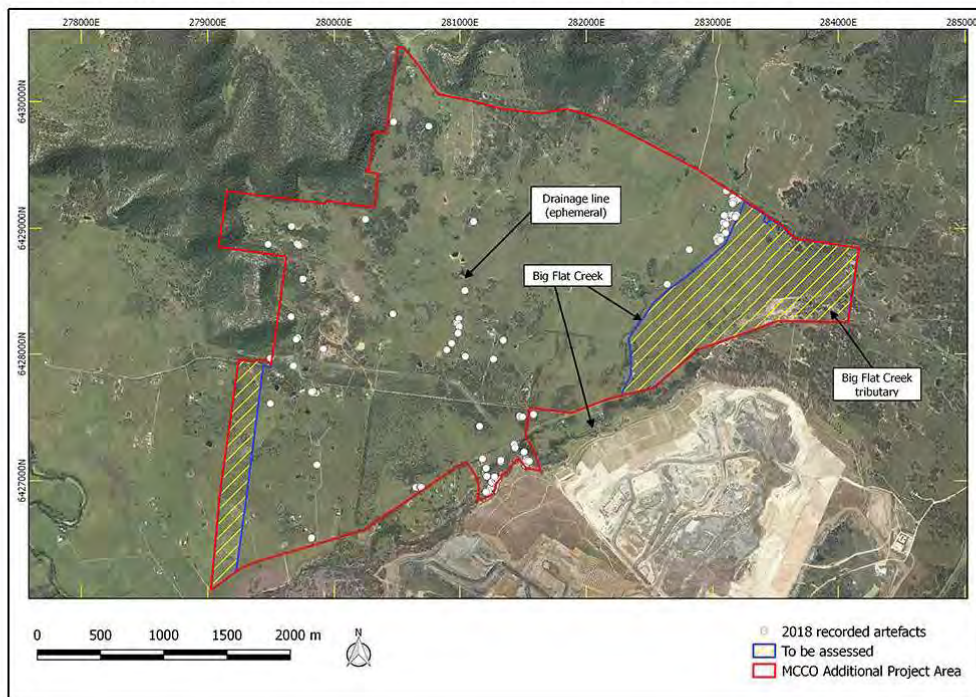
The survey only recorded artefact scatters and isolated finds. No other site type, such as modified trees, were recorded. At present the survey of the MCCO Additional Project Area has not been fully completed so the number of sites recorded has not yet been finalised. It is likely that a number of the recorded artefacts shown on **Figure 4** will be associated with some of the previously recorded sites that have been recorded in the MCCO Additional Project Area.

As shown in **Figure 4** the survey did not record a large number of sites and the majority of recorded artefacts cluster into two areas:

- Landforms associated with Big Flat Creek both in the south-centre and the northeast of the MCCO Additional Project Area; and
- Landforms associated with an ephemeral drainage line in the centre of the MCCO Additional Project Area.

Outside of these areas, the recordings of artefacts, in spite of the excellent visibility, was sporadic and at a very low density.

**FIGURE 4. AERIAL SHOWING THE SURVEY RESULTS WITHIN THE MCCO ADDITIONAL PROJECT AREA.**



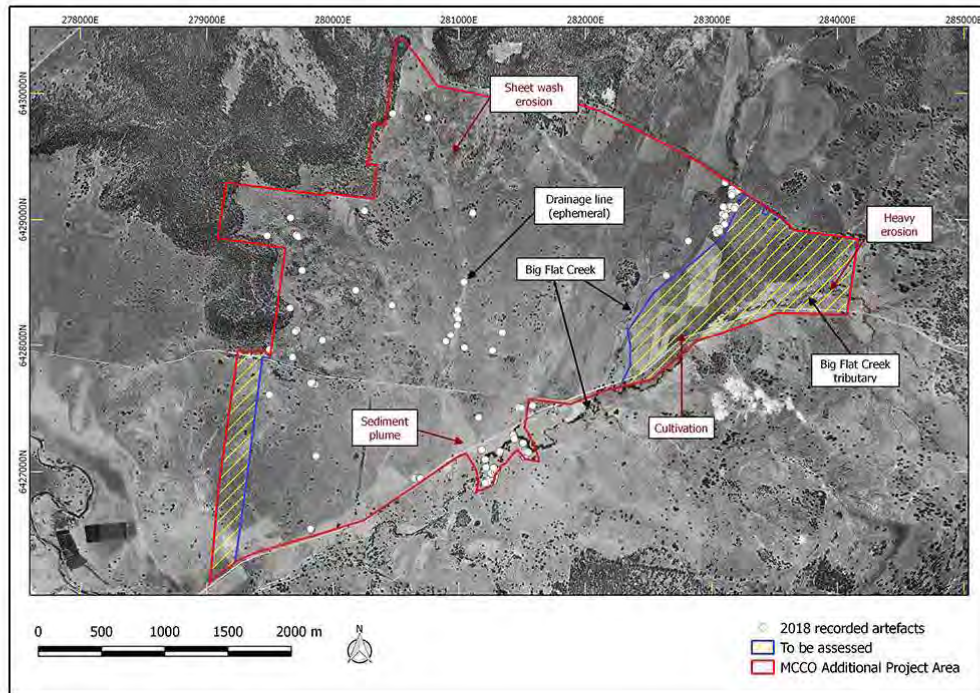


### **Analysis of the results of the survey**

Regarding the results of the survey overlying the 2018 findings on a 1967 aerial is illustrative (Figure 5). The view of the MCCO Additional Project Area 51 years ago shows:

- The low density of artefact recordings in the far west of the MCCO Additional Project Area may be associated with the topography (i.e. this area is an ecotone or a transition area where two ecological communities—the environment associated with flat landforms to the east and the environment of the escarpment landforms to the west—meet and interact). Alternatively, from the evidence in Figure 5 this area was left slightly wooded and was perhaps less disturbed than other areas. This may mean that more of the general background of artefacts that exist in most landforms may remain in this area rather than having been removed by erosion.
- The artefact recordings in the central drainage feature are likely not to be in their original location as there is ample evidence of wide-spread erosion in this system. This includes an extensive sediment plume as it nears Big Flat Creek and an extensive area of sheet wash erosion in its northern reaches. This would indicate that the recorded artefacts have probably been moved to their find location by water movement.
- The artefact recordings associated with Big Flat Creek are likely to be in, or close to, their original location as there is little evidence of widespread erosion in the vicinity of the clusters of artefact recordings.
- The area along the tributary to Big Flat Creek (Figure 4) is likely to have been subject to historical disturbance associated with agricultural practices due to ample evidence of widespread erosion in this south-eastern corner of the MCCO Additional Project Area.
- At least half of the currently unassessed area (Figure 4) has been historically cultivated. Areas of cultivation also exist on the western bank of Big Flat Creek within the currently assessed area. Despite thorough survey, no artefacts were recorded in these previously cultivated landforms and it is likely that the formerly cultivated landforms in the currently unassessed area will also be poor preservers of Aboriginal cultural heritage. It should be noted that the cluster of recorded artefacts along the northern reach of Big Flat Creek within the MCCO Additional Project Area are in landforms that have not been cultivated.

Figure 5. Aerial showing the survey results overlain on a 1967 aerial.



### **Conclusions**

The two week survey program successfully completed the major objective of thoroughly surveying all landforms where proposed impacts associated with the MCCO Project will be located. This phase will be supplemented by additional survey in May 2018 that will assess the remaining currently unassessed portions of the MCCO Additional Project Area.

Generally the surveyed landforms were distant from permanent water (Big Flat Creek is unlikely to have been a permanent system in the vicinity of the MCCO Additional Project Area) and were flat to gently sloping. In the west of the survey area steeper topography was surveyed but generally the escarpments that can be seen in aerial photography are located either west or north of the MCCO Additional Project Area. Nevertheless, there are five previously recorded rock shelters with potential archaeological deposit (PAD) recorded in the very west of the MCCO Additional Project Area. All shelters were visited by the survey team but none revealed evidence of past occupation on the surface. While this does not preclude PADs, the form and location of the shelters did not suggest that any PADs present are likely to be deep or extensive.

It is envisioned that there will be a test excavation program to help better understand the archaeological characteristics of the MCCO Additional Project Area at one location:

- There is one registered PAD in the centre of the MCCO Additional Project Area associated with the ephemeral tributary to Big Flat Creek discussed above. As no surface artefacts were noted at this location during the assessment, test excavation will demonstrate if the area is indeed a PAD.

A separate test excavation methodology has been prepared and accompanies this summary setting out the location and methodology of the proposed investigation.

OzArk would like to thank all participants in the survey. Although the assessment occurred during a very hot period of the year, all involved maintained a professional attitude that ensured that the MCCO Additional Project Area was robustly and systematically inspected.

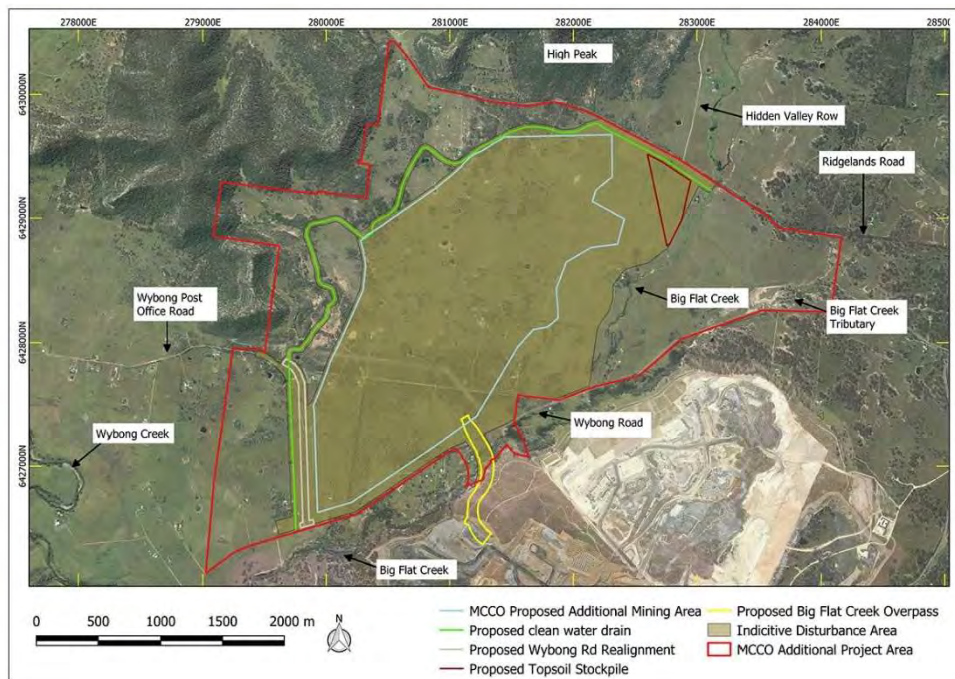
Ben Churcher  
Principal Archaeologist: OzArk EHM



## 11.3.10 OzArk Archaeological Survey Summary Presentation

## Mangoola Coal Continued Operations (MCCO) Project

### Archaeological Survey Summary







### Survey

- 5-16 February 2018 (10 days)
- 2 x teams (each team = 4 RAPs and 2 Archaeologists)
- RAP participation from representatives of the PCWP, WNAC, HVAC and the Gomeroi

### Still to come

- Test Excavation: 15 May 2018
- Additional survey: 16-18 May 2018 (3 days)

### Findings

67 sites in the MCCO Additional Project Area

- 23 newly recorded sites
  - 14 Isolated Finds, 9 Artefact Scatters
- 44 previously recorded sites

### Known site types

- 33 Artefact scatters
- 26 Isolated Finds
- 5 Shelters with PAD
- 3 PADs



### Hilly to undulating country







Flat/gentle gradient country



Big Flat Creek







Ground surface visibility







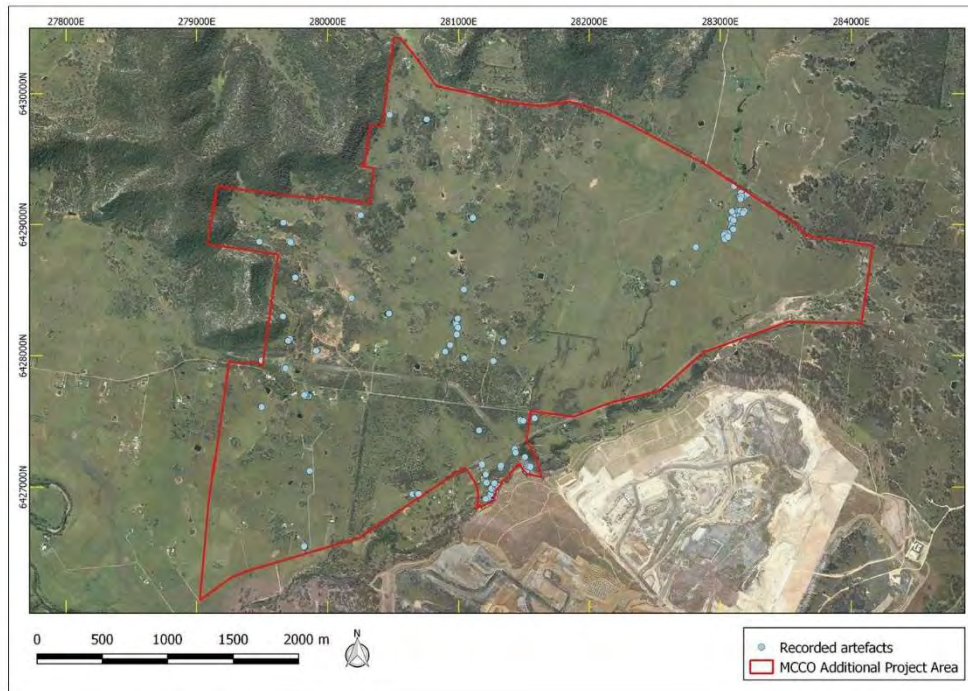
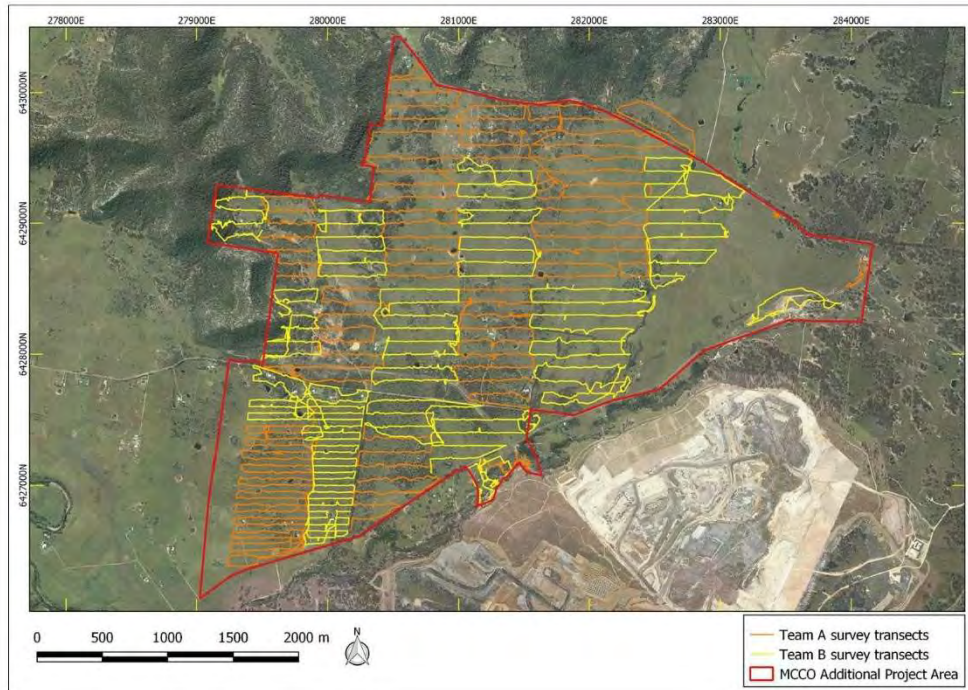
### Artefact Scatters

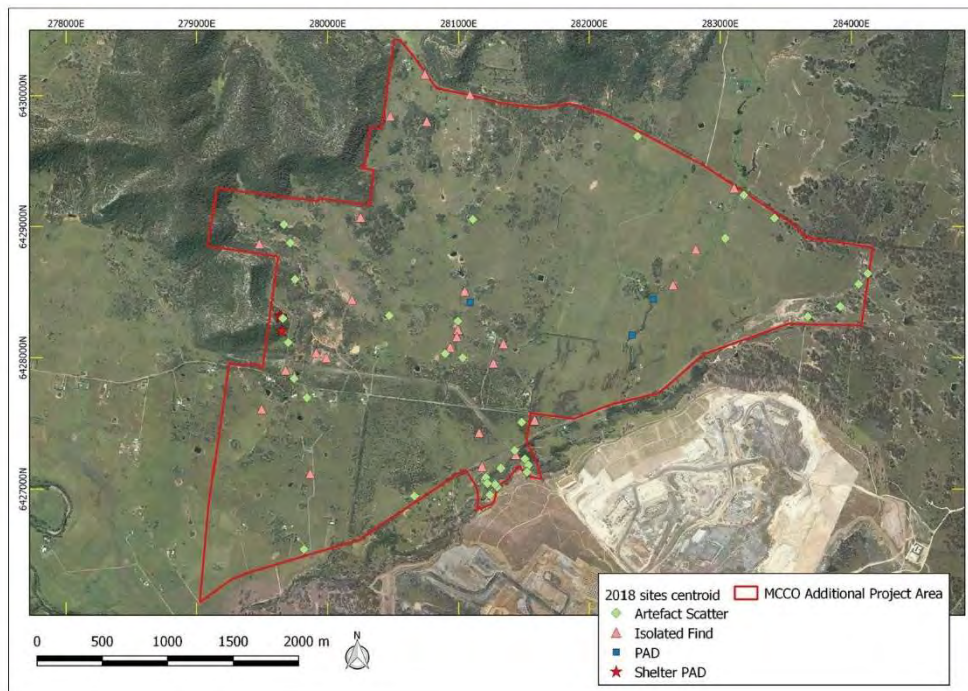


### Shelters

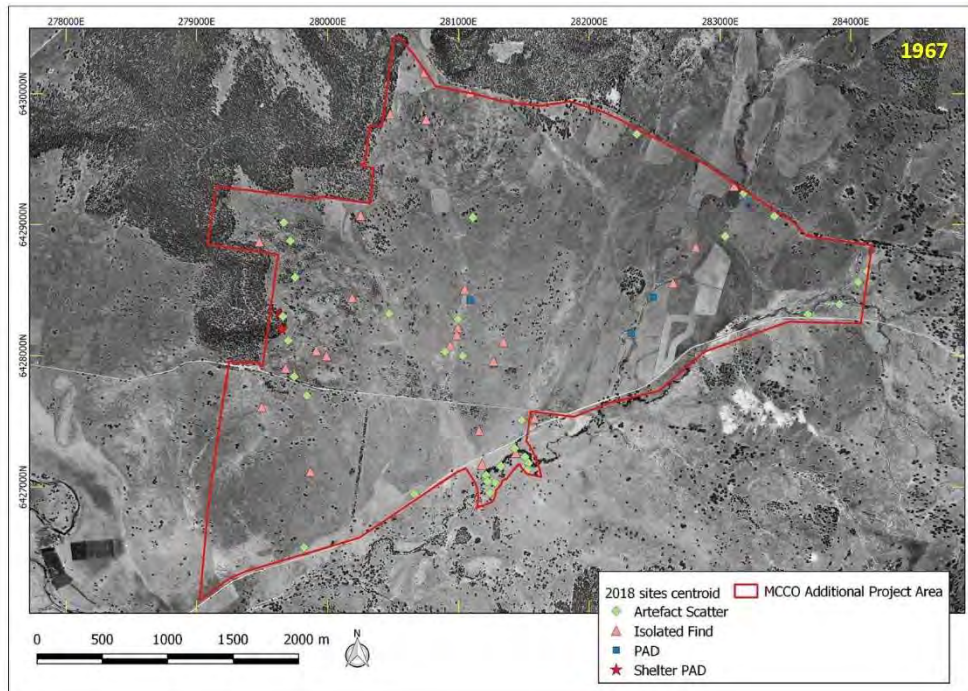
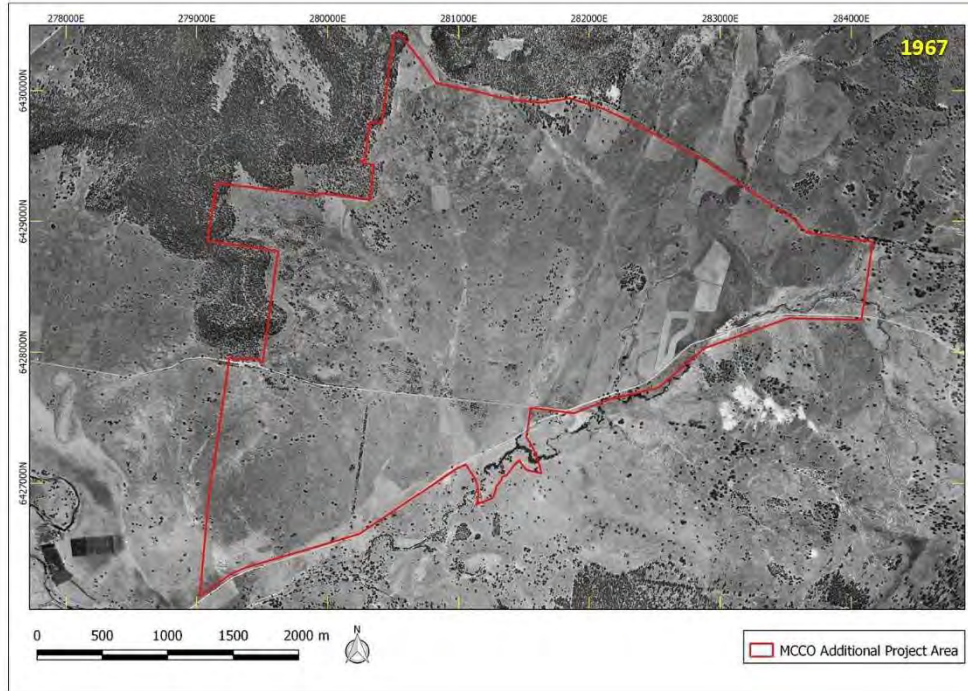


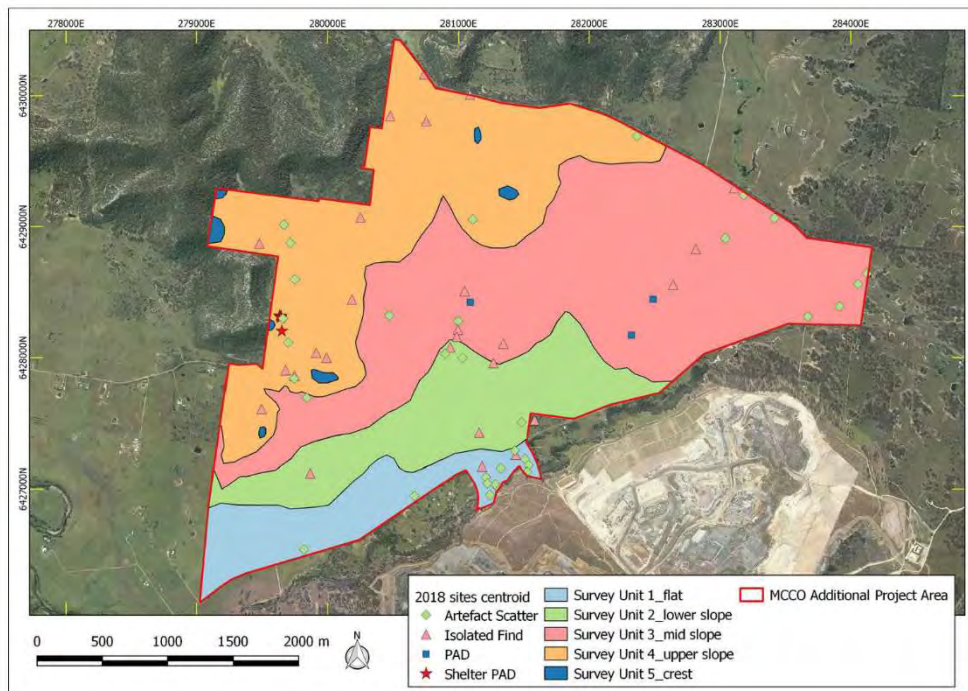
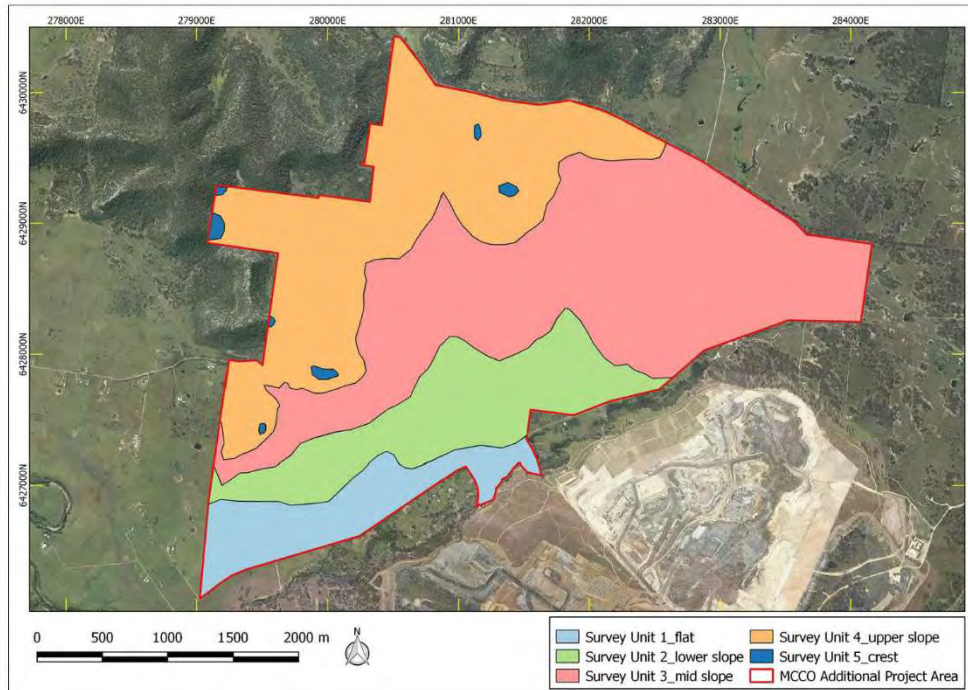
















Test Excavation @ Site BFC114A



### 11.3.11 Example Letter inviting RAPs to First Cultural Values Workshop and Site Tour

# MANGOOLA OPEN CUT GLENCORE

16 April 2018

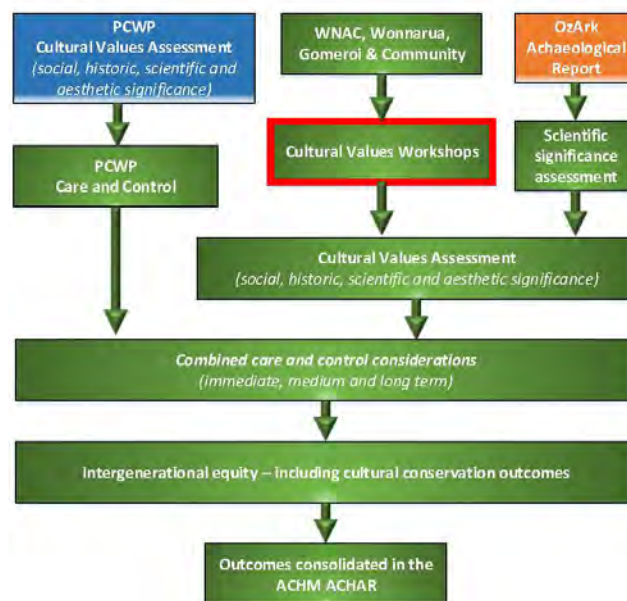
Dear RAP;

***Re: Mangoola Coal Continued Operations Project – Cultural Values Workshops***

#### Introduction

Thank you again for your ongoing involvement in regards to the Aboriginal archaeological values impact assessment for the Mangoola Coal Continued Operations (MCCO) Project. As an update, the MCCO Project Aboriginal Cultural Heritage Field Survey was completed between the 5<sup>th</sup> – 16<sup>th</sup> February 2018 in collaboration with OzArk Archaeologists and MCCO Project Registered Aboriginal Parties (RAPs). In addition to OzArk's assessment, the MCCO Project Aboriginal Cultural Heritage Assessment Report (ACHAR) is also now being prepared by Australian Cultural Heritage Management. Figure 1 below outlines how the ACHAR integrates with the overall Aboriginal cultural assessment being completed for the MCCO Project.

A significant component which provides important contributions into the ACHAR is the undertaking of Cultural Values Workshops particularly associated with capturing the values associated with the MCCO Project Area. These Cultural Values Workshops have now been scheduled and this correspondence provides you with further information in this regard.



**Figure 1 Integrated ACHAR Approach**

PO Box 495, Muswellbrook, NSW 2333  
Wybong Road, Muswellbrook, NSW 2333  
T + 61 2 6549 5500 F + 61 2 6549 5655 [www.glencore.com](http://www.glencore.com)  
Mangoola Coal Operations Pty Ltd ABN 54 127 535 755

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## Cultural Values Workshops

Cultural Values Workshops have now been scheduled for the MCCO Project. Separate workshops will be conducted to enable knowledge holders and members of the Aboriginal community the opportunity to participate in a smaller, more personalised, forum. Please see the details below providing information as to the arrangements for your Cultural Values Workshop.

### Indicative Itinerary

#### **Cultural Values Workshop Date – Wednesday, 9<sup>th</sup> May 2018**

7:00am	Meet at the Mangoola Open Cut Administration Office ( <i>log-on required</i> )
7:15am – 7:45am	Survey Results Overview (Ben Churcher – OzArk)
7:45am – 8:00am	Board bus in Mangoola carpark for site tour
8:00am – 9:30am	Site tour of the MCCO Project Area
9:30am – 11:00am	Cultural Values workshop and discussions ( <i>morning tea available</i> )
11:00am – 11:30am	Lunch ( <i>provided</i> )
11:30am	Log-off site ( <i>required</i> )

### Participation Reimbursement

We appreciate your attendance and acknowledge the time required to participate. Accordingly, you will be reimbursed for your attendance based on a half days work plus travel expenses. Invoicing will be facilitated via your previously nominated supplier.

### Attendance Registration

To confirm your attendance at the Cultural Values Workshop please **RSVP by Friday 27 April 2018** to:

**Contact:** Lori Dennen-King (Project Approvals Officer)  
**Email:** lori.dennen-king@glencore.com.au  
**Phone:** (02) 6549 5520

### General Information

The following information provides additional information for participants who would like to attend the Cultural Values Workshop.

**Meeting Location:** Mangoola Open Cut Administration Office

**Access to Site:** All participants are required to complete a Visitors Induction located at the Main Administration Office

All participants are required to sign on and off daily at the Main Administration Office

Smoking is not permitted anywhere on site or within the MCCO Project Area

Mangoola is a zero alcohol site and all employees and contractors are required to complete a BAC prior to entry.

Mobile phones or other electronic devices are not permitted onsite.

# GLENCORE

## PPE Requirements

Please ensure you bring the appropriate personal protective equipment (including long pants and hard hat) to enable a tour of the MCCO Project Area.

## **Way Forward**

As mentioned above, if you would like to participate in the MCCO Project Cultural Values Workshop please provide your RSVP to Lori Dennen-King by Friday 27 April 2018. We will then contact your previously nominated supplier to confirm your attendance and to permit invoicing.

If you have any questions, please feel free to contact me via the details provided below. Look forward to seeing you at the Workshop.

Kind Regards,



Jason Martin

Project Approvals Manager

Email: [Jason.martin@glencore.com.au](mailto:Jason.martin@glencore.com.au)

Phone: (02) 6549 5577



### 11.3.12 Cultural Values Workshop One Information



#### Workshop Agenda

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- Introductions and General Site Information
- MCCO Project and Assessment Update
- Field Survey Results Overview (Ben Churcher, OzArk)
- Site Tour of the MCCO Project Area
- Cultural Values Workshop and Discussions (Shaun Canning, ACHM)

## General Overview

- Commenced operations 2010 under PA 06\_0014.
- Modern Open Cut Truck and Shovel thermal coal mine
- Licenced to produce up to 13.5Mt of ROM coal for both domestic and export markets
- **Current Statistics**
  - Current workforce - 294 people FTE
  - Royalties Paid 2016 - \$48M
  - Wages Paid 2016 - \$43M
  - Expenditure on goods and services 2016 - \$138M
  - VPA payments 2016 \$1.4M
- Land ownership -10,199 ha
  - » 3,030 ha Biodiversity offsets
  - » 2,293 ha for mining and infrastructure
  - » 4,876 ha used grazing



GLENCORE 3

## Geology

### Target Seams:

*Great Northern Seam (GN)*

*Fassifern Seam (FFU/FFL)*

*Upper Pilot A Seam (UPA)*

*Upper Pilot B Seam (UPB)*

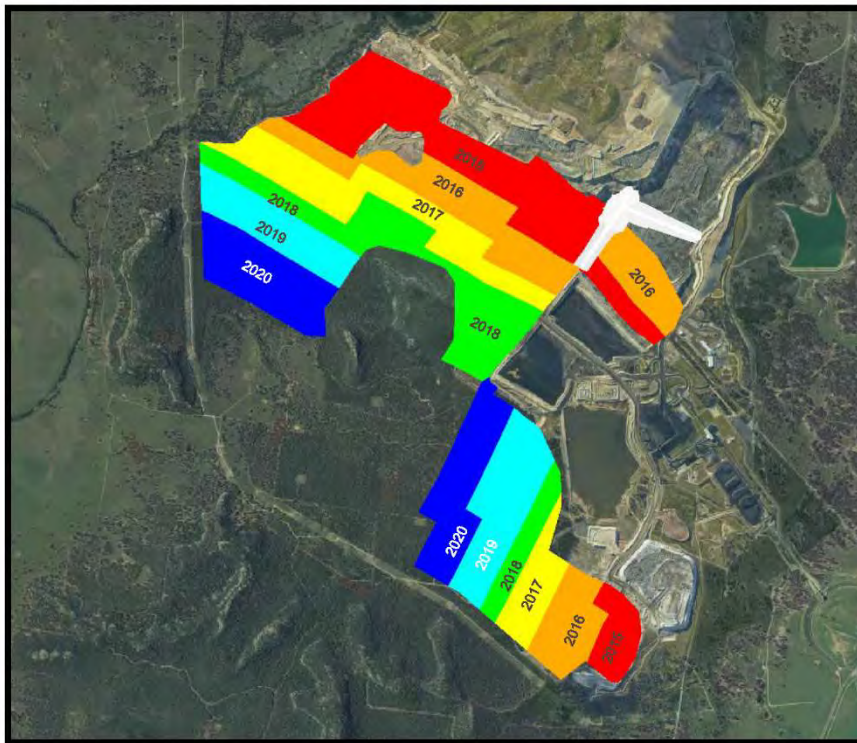
*(where economic)*



GLENCORE 4



## Current Mine Plan



- Average remaining ROM strip ratio is 3:1
- Strip ratio ranges from 2:1 to 5:1
- Average 76% yield
- Current mine life to 2024, approval to 2029

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5

## Mine Rehabilitation

- Considered industry best practice
- Progressive rehabilitation
- Geofluid natural landform design
- Landform designs complemented with establishment of specific vegetation to reflect natural environment
- Endemic seed supply used in rehabilitation – collected from offset areas

Tree standing for early habitat creation

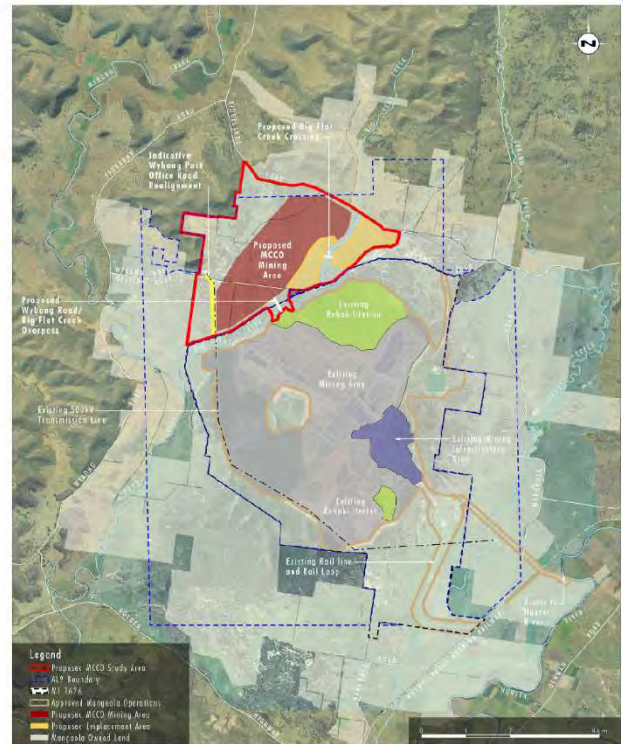


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6

## Mangoola Coal Continued Operations Project

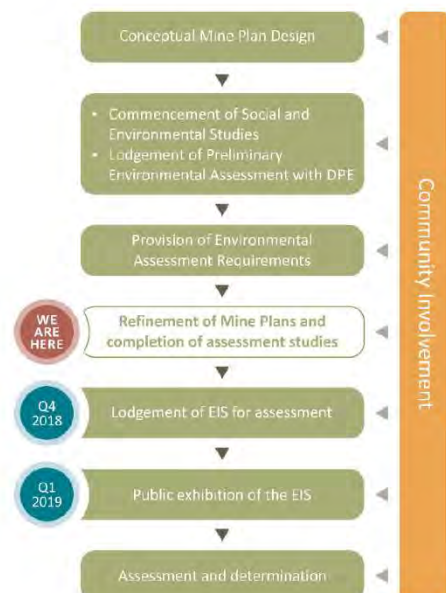
- Exploration within AL9 has identified a viable coal resource
- Key aspects of the MCCO Project include:
  - Approximately 50 million tonnes of coal
  - Construction of an access road bridge over Wybong Road, to allow the road to remain open
  - Re-alignment of a portion of Wybong Post Office Road
  - Construction of water management infrastructure
  - Continued employment for our workforce (300 people), predominately from the local area
  - Same open cut methods/equipment and approved maximum rates of coal extraction will not change
  - Continued use of all other existing Mangoola infrastructure.
  - Continued use of natural landform and micro relief rehabilitation



GLENORE 7

## Environmental Impact Statement

- Preliminary investigations and pre feasibility assessment completed for the MCCO Project
- Numerous technical assessments are now underway associated with the preparation of an Environmental Impact Statement (EIS)
- The EIS will include the preparation of Aboriginal Archaeology and Cultural Heritage Assessment
- Draft assessments will be distributed to Registered Aboriginal Parties for review and comment
- Final assessment to be included in the EIS with a targeted submission date to the NSW Government of Q4 2018



GLENORE 8

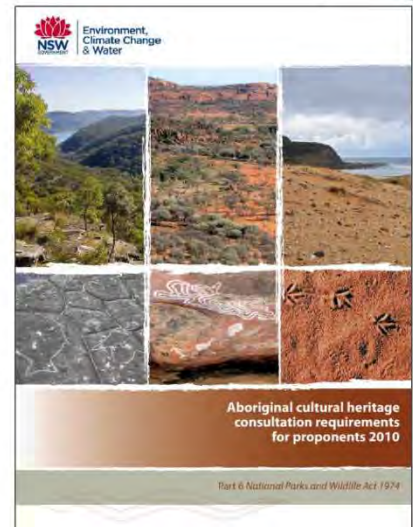


## Aboriginal Stakeholder Consultation Update

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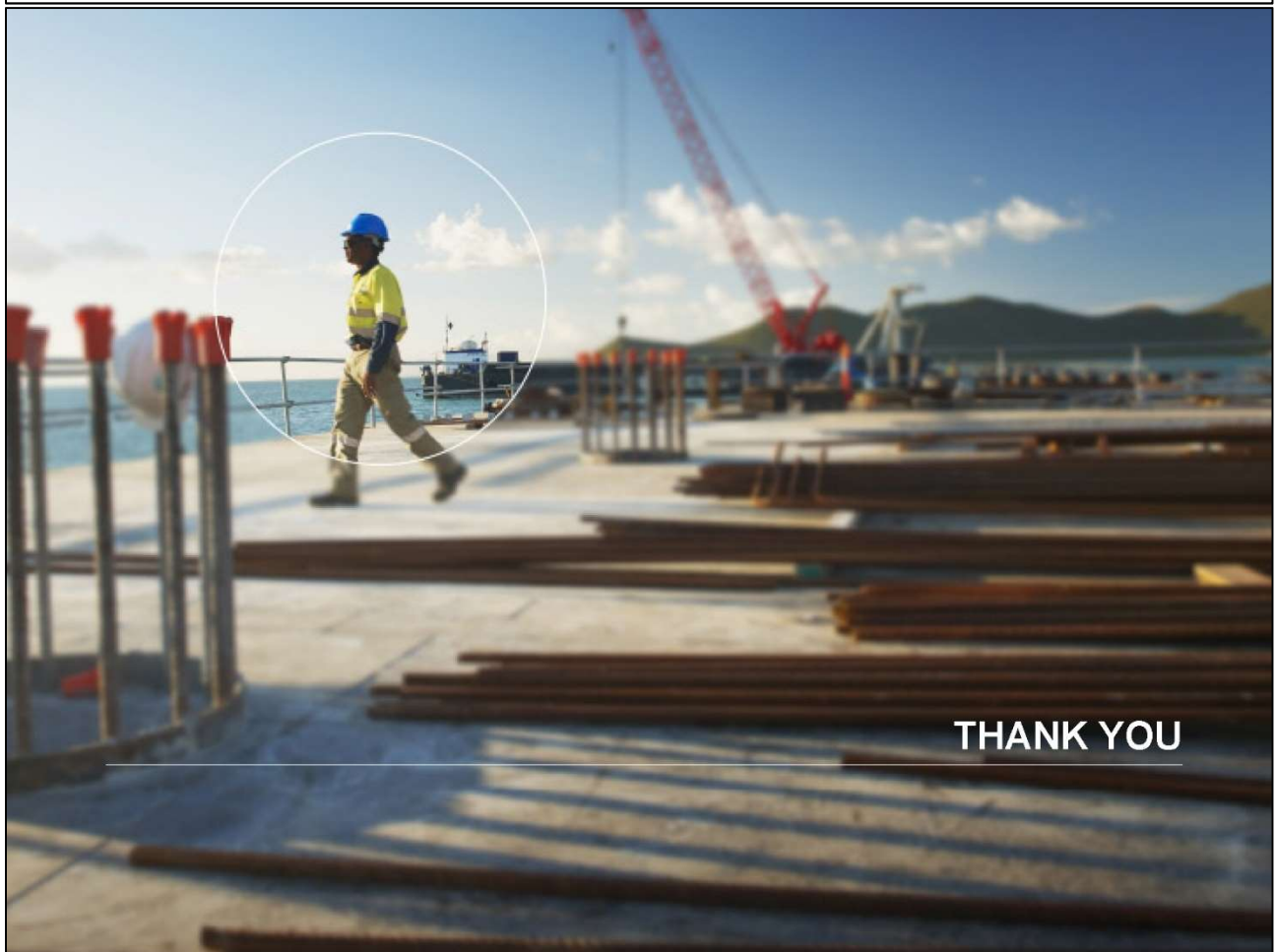
### • Consultation Update

- Consultation is conducted in accordance with the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirement for Proponents 2010*.
  - » **Stage 1** – Notification of project proposal and registration of interests (complete)
  - » **Stage 2** – Presentation of information about the proposed project – (complete)
  - » **Stage 3** – Gathering information about cultural significance – (ongoing)
  - » **Stage 4** – Review of draft cultural heritage assessment report – July/August 2018
- 36 groups / individuals have registered their interest in participating in the cultural heritage consultation and related works for the MCCO Project.



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9



**11.3.13 Cultural Values Workshop One - Agenda****9-10 May 2018 - Morning Session**

7:00am	Meet at the Mangoola Open Cut Administration Office (log-on required)
7:15am - 7:45am	Survey Results Overview (Ben Churcher – OzArk)
7:45am – 8:00am	Board bus in Mangoola carpark for site tour
8:00am – 9:30am	Site tour of the MCCO Project Area
9:30am – 11:00am	Cultural Values workshop and discussions (morning tea available)
11:00am – 11:30am	Lunch (provided)
11:30am	Log-off site (required)

**9-10 May 2018 - Afternoon Session**

12:30pm	Meet at the Mangoola Open Cut Administration Office (log-on required)
12:45pm – 1:15pm	Lunch (provided)
1:15pm – 1:45pm	Survey Results Overview (Ben Churcher – OzArk)
1:45pm	Board bus in Mangoola carpark for site tour
2:00pm – 3:30pm	Site tour of the MCCO Project Area
3:30am – 5:00pm	Cultural Values Workshop and discussions (afternoon tea available)
5:00pm	Log-off site (required)

**11.3.14 Cultural Values Workshop One - Attendees****Group 1 - 9 May 2018 (7:00am - 11:30am)**

Group/Organisation	Participating Representative
Didge Ngunawal Clan (DNC)	Paul Boyd
Ungooroo Aboriginal Corporation	Allen Paget
Hunter Valley Aboriginal Corporation	Cliff Johnson
Aboriginal Native Title Consultants	Margaret & Joh Matthews
Cacatua General Services	George Sampson
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson
Gomery Cultural Consultants	Gay Horton*
Muragadi Heritage Indigenous Corporation	Shaun Carroll
AGA Services	Gregory Sampson
JLC Cultural Services	Jenny-Lee Chambers
Crimson-Rosie	Colleen Stair

**Group 2 - 9 May 2018 (12.30pm-5.00pm)**

Group/Organisation	Participating Representative
Jarban & Mugrebea	Les Atkinson
Gomeroi Namoi Traditional Owners	Stephen Talbot
Jarban & Mugrebea	Barry French
Jarban & Mugrebea	Wayne French

**Group 3 - 10 May (7.00am-11.30am)**

Group/Organisation	Participating Representative
Culturally Aware	Tracey Skene
Wonnarua Nation Aboriginal Corporation	Laurie Perry
Wonn 1 Contracting (Kauwul)	Arthur Fletcher
Upper Hunter Wonnarua Council Inc Wonnarua Elders Council (WEC)	Rhoda Perry
Wonnarua Elders Council (WNAC)	Georgina Berry
Wonnarua Elders Council (WNAC)	Richard Edwards
Wonnarua Elders Council (WNAC)	Garry Reilly
Wonnarua Elders Council (WNAC)	Sandra Miller
Wonnarua Elders Council (WNAC)	Rae Reed
Wonnarua Elders Council (WNAC)	Kerry Phillips
Wonnarua Elders Council (WNAC)	James Wilson-Miller
Wonnarua Elders Council (WNAC)	Paul W Hinton

**Group 4 - 10 May (12.30pm-5.00pm)**

Group/Organisation	Participating Representative
No Attendees	



## 11.3.15 Example Letter inviting RAPs to Second Cultural Values Workshop

# MANGOOLA OPEN CUT

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## GLENCORE

30 August 2018

Dear MCCO Registered RAP;

***Re: Mangoola Coal Continued Operations Project – Invitation to Cultural Values Workshop Session 2***

**Introduction & Project Update**

Thank you again for ongoing involvement in relation to the Aboriginal Archaeological Values Impact Assessment for the Mangoola Coal Continued Operations (MCCO) Project.

As you are aware, the Aboriginal Cultural Heritage Field Survey was completed between the 5<sup>th</sup> – 16<sup>th</sup> February 2018 and 16<sup>th</sup> – 18<sup>th</sup> May 2018. A small test excavation program was also conducted and completed on 15<sup>th</sup> May 2018.

Both assessments have been prepared in collaboration with OzArk Archaeologists and MCCO Project Registered Aboriginal Parties (RAPs). In this regard, a draft *Aboriginal Archaeological Impact Assessment* (AAIA) report is currently being prepared by OzArk and a copy will be mailed out to you for review and comment in the coming weeks.

**Cultural Values Workshop Session 2**

In addition to the field surveys completed to date, the first of the cultural values workshop sessions were held during May 2018 with assistance from Dr Shaun Canning from Australian Cultural Heritage Management (ACHM).

A further Cultural Values Workshop is now scheduled for **Thursday, 20<sup>th</sup> September 2018** to enable additional opportunity to participate in roundtable discussions regarding cultural knowledge or values you may wish to provide.

Please see further details below regarding the arrangements for the upcoming Cultural Values Workshop.

PO Box 495, Muswellbrook, NSW 2333  
Wybong Road, Muswellbrook, NSW 2333  
T + 61 2 6549 5500 F + 61 2 6549 5655 www.glencore.com  
Mangoola Coal Operations Pty Ltd ABN 54 127 535 755

# GLENCORE

## Meeting Date, Location and Details

**Workshop Date:** Thursday, 20<sup>th</sup> September 2018  
**Location:** Upper Hunter Conservatorium of Music (UHCM) – Colvin Room  
 80 Bridge Street – Campbell's Corner, Muswellbrook  
**Time:** 8:30am to 12:00pm  
**Service:** Lunch and morning tea will be provided (*please indicate if you have any special dietary requirements*)

## Participation Reimbursement

We appreciate your attendance and acknowledge the time required to participate. Accordingly, you will be reimbursed by your previously nominated supplier (HVAC) for your attendance based on a half days work (\$275) plus travel expenses (\$50), totalling \$325.

## Attendance Registration

To confirm your attendance at the Workshop, please **RSVP by 10 September 2018** to:

**Contact:** Lori Dennen-King (Project Approvals Officer)  
**Email:** [lori.dennen-king@glencore.com.au](mailto:lori.dennen-king@glencore.com.au)  
**Phone:** (02) 6549 5520

## Way Forward

If you would like to participate in the MCCO Project Cultural Values Workshop, please provide your RSVP to Lori Dennen-King by Monday, 10 September 2018. We will then contact your previously nominated supplier to confirm your attendance and to permit invoicing.

If you have any questions, please feel free to contact me via the details provided below. I look forward to seeing you at the Workshop.

Kind Regards,



Jason Martin  
 Project Approvals Manager  
 Email: [Jason.martin@glencore.com.au](mailto:Jason.martin@glencore.com.au)  
 Phone: (02) 6549 5577

### 11.3.16 Cultural Values Workshop Two Information



#### Welcome to Country

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- *We acknowledge all Aboriginal people of this land and pay our respects to those past and present*

## Workshop Agenda

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- Introductions and General Information
- MCCO Project Update
- Aboriginal Archaeological Impact Assessment Update
- Cultural Values Workshop and Discussions (Dr Shaun Canning, ACHM)

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 GLENORE 3

## General Overview – Mangoola Coal Mine

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- Commenced operations in 2010 under PA 06\_0014.
- Open Cut Truck and Shovel thermal coal mine
- Licenced to produce up to 13.5Mt of ROM coal for both domestic and export markets
- Rehabilitation is considered industry leading practice. Endemic seed supply collected from offset areas
- Land ownership -10,199 ha
  - » 3,030 ha Biodiversity offsets
  - » 2,293 ha for mining and infrastructure
  - » 4,876 ha used grazing
- Coal mining anticipated to be exhausted in approximately 2025




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 4



## Mangoola Coal Continued Operations Project

1

- Key aspects of the MCCO Project include:
  - Approximately 50 million tonnes of coal
  - Continuation of mining through to approximately 2030
  - Construction of an access road bridge over Wybong Road, to allow the road to remain open
  - Re-alignment of a portion of Wybong Post Office Road
  - Construction of water management infrastructure
  - Continued employment for our workforce (300 people), predominately from the local area
  - Same open cut methods/equipment and approved maximum rates of coal extraction will not change
  - Continued use of all other existing Mangoola infrastructure.
  - Continued use of natural landform and micro relief rehabilitation

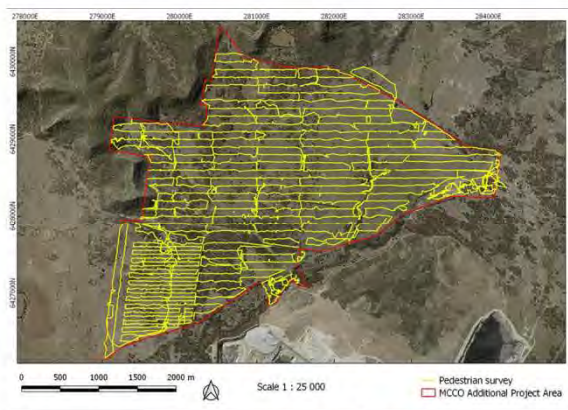


GLENCORE 5

## Aboriginal Archaeology Impact Assessment (AAIA)

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- Assessments conducted by OzArk archaeological team
  - Assistance from Registered Aboriginal Parties
- Surface investigations of Project Area
  - 5-16 February 2018 (10 days)
    - 2 x teams (each team = 4 Aboriginal community members and 2 Archaeologists)
  - Additional survey: 16-18 May 2018 (3 days)
    - 1 x team
  - Survey included re-assessment of previously recorded/registered sites



Surface Investigation Transects

GLENCORE 6



1



Hilly to undulating country



GLENORE

1



Flat/gentle gradient country



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Big Flat Creek



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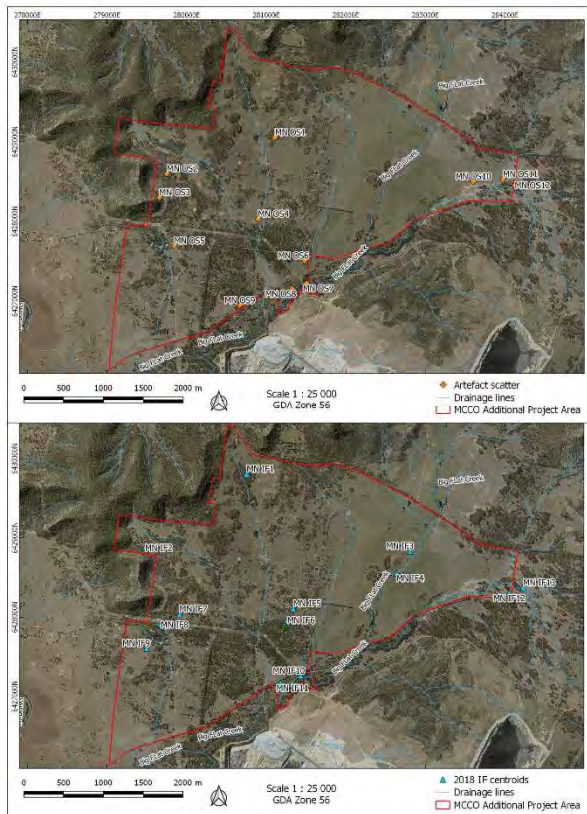
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Ground surface visibility



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## Aboriginal Archaeology Impact Assessment (cont.)

### Findings

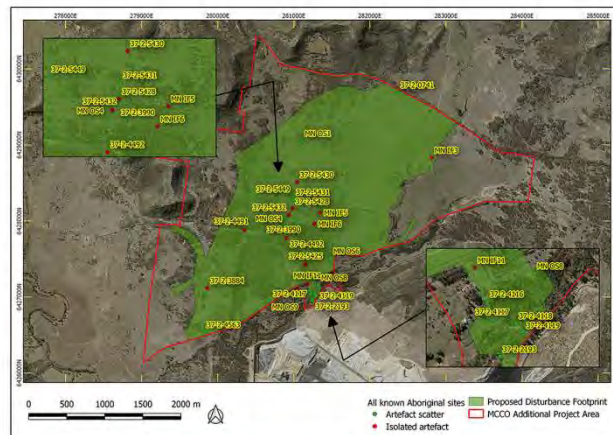
- 73 sites in the MCCO Additional Project Area
  - 24 newly recorded sites
    - 12 Isolated Finds, 12 Artefact Scatters
  - 49 previously recorded sites
- Of these 73 sites, 25 are located within the Proposed Disturbance Footprint

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## Aboriginal Archaeology Impact Assessment (cont.)

### Surface survey results -

- 25 sites found within the Proposed Disturbance Footprint
- Areas identified consisted of artefact scatters and isolated finds
- Majority (92%) of sites identified within proposed disturbance footprint were assessed as low scientific significance
- Two sites (8%) have either low-moderate or moderate scientific significance



Sites Within the Proposed Disturbance Footprint

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12



## Aboriginal Archaeology Impact Assessment (cont.)

1

### Subsurface investigation (test excavation)

- 1 site, previously recorded as a PAD site, fell within the disturbance footprint
- Test excavation undertaken on 15 May 2018
- A single artefact was recorded as a result of the excavation
- The test excavation at BFC114a demonstrated that the potential archaeological deposit (PAD) is 'not a site'



Test Excavation Site

GLENORE 13

## Aboriginal Archaeology Impact Assessment (cont.)

1



Scale 1 : 1 000

▲ Site AHIMS coordinates  
■ Test excavation square  
— Unnamed drainage line



GLENORE 14

## Aboriginal Archaeology Impact Assessment (cont.)

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Test Excavation - Site BFC114a



GLENORE 15

## Aboriginal Archaeology Impact Assessment (cont.)

1



Test Excavation @ Site BFC114A



GLENORE 16

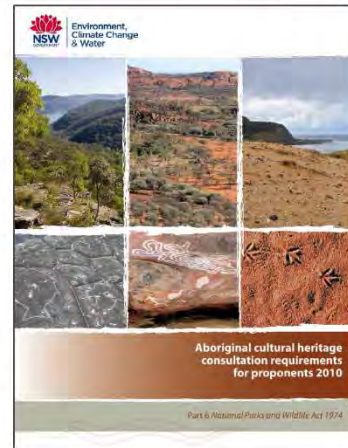


## Aboriginal Stakeholder Consultation Update

1

### • Consultation Update

- 36 groups / individuals have registered their interest in participating in the cultural heritage consultation and related works for the MCCO Project
- Consultation is conducted in accordance with the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirement for Proponents 2010*:
  - » **Stage 1** – Notification of project proposal and registration of interests **(complete)**
  - » **Stage 2** – Presentation of information about the proposed project – **(complete)**
  - » **Stage 3** – Gathering information about cultural significance – **(current - cultural values workshops)**
  - » **Stage 4** – Review of draft cultural heritage assessment report



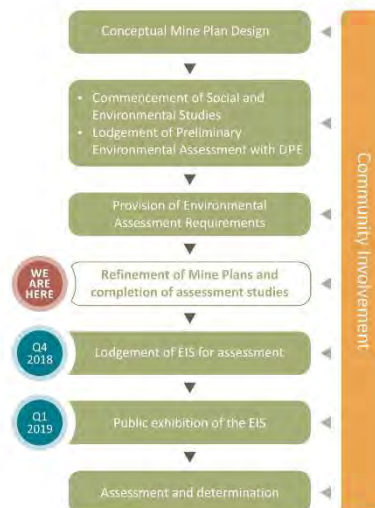
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## MCCO Project - Environmental Impact Statement

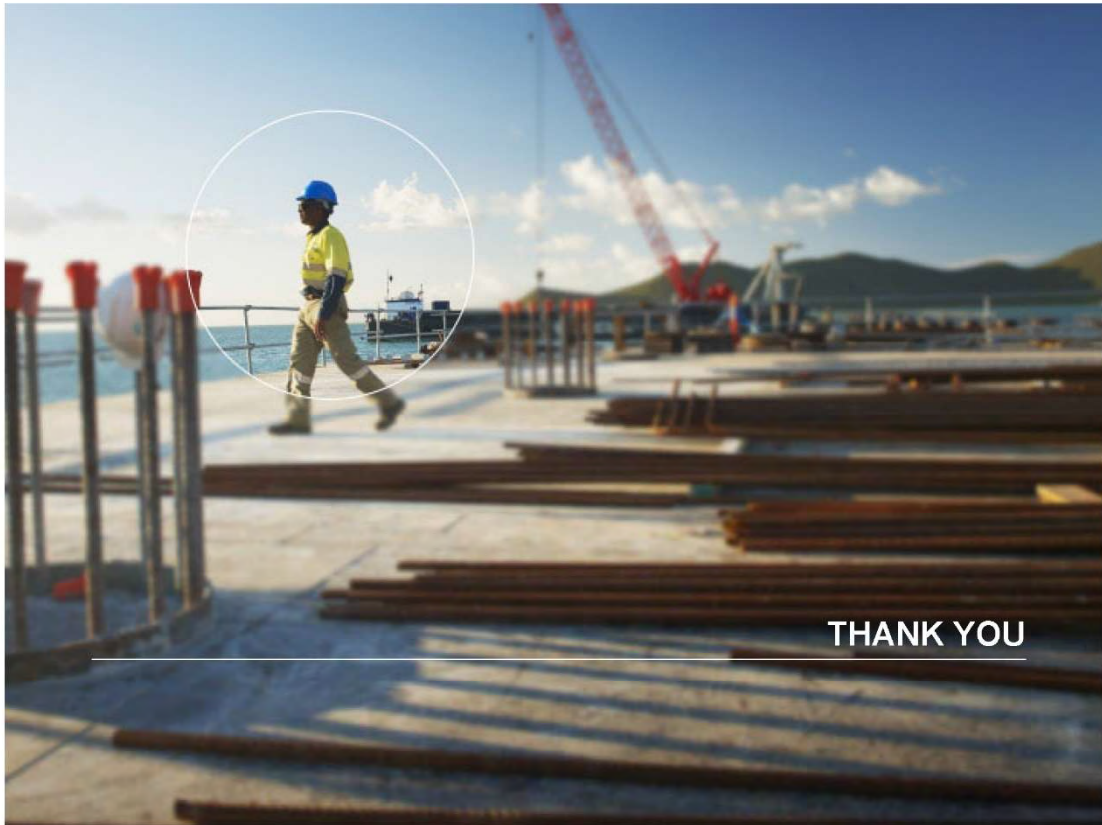
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- Technical assessments are now underway associated with the preparation of an Environmental Impact Statement (EIS)
- The EIS will include the preparation of Aboriginal Archaeology and Cultural Heritage Assessment Report/s consisting of:
  - » Aboriginal Cultural Values Assessment Report (ACHM)
    - *Aboriginal Archaeology Impact Assessment (OzArk)*.
- **Next Step** - Draft report will be distributed to Registered Aboriginal Parties for review and comment (October 2018)
- Final assessment to be included in the EIS with a targeted submission date to the NSW Government of Q4 2018
- EIS to be placed on Public Exhibition in Q1 2019



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18



## 11.3.17 Cultural Values Workshop Two - Questionnaire

Cultural Values	What can projects do to make up for the loss of country?	
Cultural Values	Are the post-settlement places in the project area important to you?	
Reconciliation	What do you think projects should consider to assist the reconciliation process?	
Cumulative impact	Can you tell us what you think the cumulative impacts of this project might be?	
Cultural Heritage Protection	Is the protection of cultural heritage places important to you?	YES <input type="checkbox"/>  NO <input type="checkbox"/>  Why?
Cultural Heritage Protection	How could cultural heritage places be mitigated if protection is not an option?	

Intergenerational Equity	What types of programs do you think are important to Wonnarua people to create intergenerational equity opportunities?	Education <input type="checkbox"/> Equity..... <input type="checkbox"/> Capacity Building <input type="checkbox"/> Training <input type="checkbox"/> Site Conservation Works <input type="checkbox"/> Business Opportunities..... <input type="checkbox"/> Offsets <input type="checkbox"/> All of the Above <input type="checkbox"/>
Intergenerational Equity	What specific education programs would you like to see?	
	What specific capacity building programs would you like to see?	
	What specific training programs would you like to see?	
	What specific site conservation programs would you like to see?	

	What specific business opportunities would you like to see?	
	How do you think equity can be created during the project(s)?	
<b>Other Matters</b>	What other matters do you think should be addressed by this process as part of the Glendell or Mangoola Projects?	

#### Aboriginal Cultural Values Workshops

NAME:.....

DATE:.....

The purpose of this form is for you to write down any values or recommendations that you would like to see considered for incorporation in the Aboriginal Cultural Heritage Assessment Report for the project. The form is divided into several themes and topics.

The main purpose of the workshop is to define and describe the cultural values of the project area. Cultural values is the term used to describe how individuals value and are attached to a particular place. These values may cover a range of feelings, emotions and values.

**Project:** Mangoola Continued Operations Project

Topic / Theme	Question	Your Answer
<b>Cultural Values</b>	Do you or your family have any specific cultural knowledge or values that you would like to share regarding the project area?  Please tell us what those values are in the column to the right.	
<b>Cultural Values</b>	If you answered NO, to the question above, do you know anyone who does hold knowledge or values over the project area?	
<b>Cultural Values</b>	Are you satisfied that the archaeological assessment undertaken for the project is comprehensive and fit for purpose?	
<b>Cultural Values</b>	What are the most important parts of the landscape to Aboriginal people?	

**11.3.18 Cultural Values Workshop Two - Attendees****Group 1 - 17 September 2018 (8:30am - 12:00pm)**

Group/Organisation	Participating Representative
Jarban & Mugrebea	Les Atkinson
Jarban & Mugrebea	Barry French
Jarban & Mugrebea	Wayne French

**Group 2 - 17 September 2018 (12:30 pm - 4:00pm)**

Group/Organisation	Participating Representative
Ungooroo Aboriginal Corporation	Allen Paget
Hunter Valley Aboriginal Corporation	Rhonda Griffiths
Aboriginal Native Title Consultants	Margaret & John Matthews
Cacatua General Services	Cassie Lee
Gomery Cultural Consultants	David Horton
AGA Services	Adam Sampson
JLC Cultural Services	Jenny-Lee Chambers
Crimson-Rosie	Colleen Stair
Yinarr Cultural Services	Kathleen Steward-Kinchela
Wanaruah Local Aboriginal Land Council	Noel Downs

**Group 3 - 18-19 September 2018 (8:30am - 4:00pm)**

Group/Organisation	Participating Representative
Culturally Aware	Tracey Skene
Wonnarua Nation Aboriginal Corporation	Laurie Perry
Wonn 1 Contracting (Kauwul)	Arthur Fletcher
Upper Hunter Wonnarua Council Inc Wonnarua Elders Council (wec)	Rhoda Perry
Wallangan Cultural Services	Maree Waugh
Wonnarua Elders Council (WNAC)	Georgina Berry
Wonnarua Elders Council (WNAC)	Richard Edwards
Wonnarua Elders Council (WNAC)	Garry Reilly
Wonnarua Elders Council (WNAC)	Sandra Miller
Wonnarua Elders Council (WNAC)	Kerry Phillips
Wonnarua Elders Council (WNAC)	James Wilson-Miller
Wonnarua Elders Council (WNAC)	Alice Hinton-Bateup
Wonnarua Elders Council (WNAC)	Lee Hinton
Wonnarua Elders Council (WNAC)	Kevin Hinton
Wonnarua Elders Council (WNAC)	Paul Hinton
Wonnarua Elders Council (WNAC)	Tom Miller
Wonnarua Elders Council (WNAC)	Maxine Conaty
Wonnarua Elders Council (WNAC)	Noelene Bell
Wonnarua Elders Council (WNAC)	Lee Perry
Wonnarua Elders Council (WNAC)	Patricia Burns



**Group 4 - 20 September 2018 (8:30am - 12:00pm)**

<b>Group/Organisation</b>	<b>Participating Representative</b>
Hunter Valley Cultural Services	Mick Stair
Wattaka Wonnarua Cultural Consultants Services	Andrew Horton

11.3.19 Workshop Two Questionnaire Responses

Topic/Theme	Question	Respondent 1	Respondent 2	Respondent 3	Respondent 4	Respondent 5	Respondent 6	Respondent 7	Respondent 8	Respondent 9	Respondent 10	Respondent 11	Respondent 12	Respondent 13	Respondent 14	Respondent 15	Respondent 16	Respondent 17	Respondent 18	Respondent 19	Respondent 20	Respondent 21	Respondent 22
Cultural Values 1	Do you or your family have any specific cultural knowledge or values that you would like to share regarding the MCCO Additional Project Area (e.g. cultural values, historic values, scientific and/or aesthetic values)?	My family's connection to this land goes back many generations. The land is the lifeblood of all of us and flows through us.	Yes.	We do have cultural knowledge and connections to this area. Our families lived and worked on this land.	As part of my role as an Aboriginal site worker, to me cultural values are high, same with the historic values.		Only what my Mother and Grandmother and my other Uncle.	Cultural, scientific.	Cultural, ie Gringai/Wonnarua , settler history in general. These aspects are important in disseminating knowledge to 'mines' for future mining developments.	As you should know land is very important as we believe we belong to the land. Changes to the land is changes to our culture. My great great grandmother walked the land free.	Family ancestral members roamed around this area which includes Sarah Madoo and her children and grandchildren.	The LALC hold cultural knowledge for this area. Place names. Some information about the family clan group. Whose country it was. This group was moved from the area in the 1850s to (the crossing) before being dispersed to Breza and St Clair in 1860s.	I have limited knowledge of Wonnarua lands as I'm a Gomerioi person. But I have an Aunt that lives and well-known Aunty Margrett Matthews.		All good.			Eatens Family. Mainly song line.	Extended family knowledge passed down from elders. The edge of song line.	Extended family knowledge passed down from elders.	Have walked the land and have family associated with the land.	Yes family have connection to the land, by working, cultural connections (homestead).	
Cultural Values 2	If you answered no, to the question above, do you know anyone who does hold knowledge or values over the protected area?		Jimi Miller.				Yes. My Elders of Wonnarua Nation, of the knowledge that they hold, re: Wonnarua People, that have been passed down by my Grandmother and other close relatives.	Yes, I do. Victor Penny, Laurie Perry James Miller.	There are many cultural Knowledge Holders whose knowledge of history, heritage and cultural value vary. Please be aware of these concerns.	Most of our Wonnarua people/families and some have more knowledge, e.g. Jimmy can speak our language in its true form, others know of sites.	Yes. Family members.	The Wedgetail Eagle was the clan totem. Milyane/Wanthala .						(Respondent ticked this box)	(Respondent ticked this box)	Yes.			
Cultural Values 3	Are you satisfied that the archaeological assessment undertaken for the project is comprehensive and fit for purpose?	If I knew to what extent the assessment was completed I could comment better. But I must ask how deep the assessment was done.	Yes.	I am dissatisfied with some archaeologists on some project.	Mostly, but more cultural values should be understood, heard and respected. Hopefully this should happen as soon as possible.	Yes.	Of no concern to me, as a lot of our artefacts have been moved - relocated to other areas due to soil erosion and changing weather patterns, storms producing floods that have moved some.	No. because there is new technology that exists today which can verify in depth if artefacts are there?	As long as Indigenous interpretations are included, I see no problem.	Depends on who the archaeologist is working for.	Not really, still a feeling of loss.	Would like to see a lot more work done researching local historical records to fill in gaps and/or confirm existing knowledge.	No. Should have been more test pits over other parts of the landscape.		Free land.		Yes survey wise but not the test pitting.	(Respondent ticked this box)	Yes, it is comprehensive .	Yes.	Would like to have more impact and a say in where the excavation pits are dug.	No on scientific level, yes but on a cultural level it should have had a separate cultural report this would have saved us doing this questionnaire, allowed. Traditional owners to have more input from beginning of assessment allowing us to choose the archaeologist.	
Cultural Values 4	What are the most important parts of the landscape to Aboriginal people?	For me the Hunter River, Redonberry Hill and St. Clair hold significant importance.		Being able to walk over, around, the land is a very important part of our real connection to land and our families.	All the landscape including flora and fauna, mother earth and water.	All country in important.	All found in the Hunter Valley is important to me... it is part of my Aboriginal Identity.	The land itself, rehabilitation restored back to its original landscape.	Redbourneberry Hill, Hunter River, St Clair, and Glennies Creek.	The whole its our land and its going to be torn up for money not for the betterment of Wonnarua families.	Water ways, sites of significance land/water ways.	All of it. Mostly those where people hunter gathered, slept, educated and entertained. Water ways and habitat for staples, e.g. possum, eels, water rush, grasses.	Creeks, rock shelters and terrace for knapping places where people hunted, fished and cultural gatherings.				Waterways.	Shelters.	Shelter used for weather	Rivers, creeks, shelters.	The whole land itself Everything. It all tells a story of our people.	The whole landscape is important to us it holds spiritual and cultural connections. It leaves behind our ancestors' artefacts that therefore show connection of them being on the landscape. It plays hand in hand with the associated cultural landscape that overall tell the story of the landscape.	
Cultural Values 5	What recommendations in relation to migration should Glencore consider in relation to the potential impacts of the Project?	To ensure future generations can appreciate the natural environments and their connection to it.			Resources of all descriptions and 24-hour access. Help for elders and families.	Mining activities destroy country. Nothing can be done - country is destroyed.	None.	All of the above.	Mitigating truthfully with local designated Indigenous community by investigating program whereby positive outcomes will benefit all concerned. Training in most areas of employment, education, training and identified Indigenous positions.	Reimbursement to the Wonnarua families WNAC members and it should not be a spit in the bucket	Loss/homestead re. our family ancestry.	Cultural protection areas need to be formalized. Wybong and Big flat Creek. 100-200m either side for sight at that owned by Mangoola.	Compensation or try to move around sites to harm or impact specific sites, creeks, rivers and grasslands.	Nil.			Funds made available for cultural education of the immediate community of the impact the project causes.	Management control.	That shelters protected, by blasting. Salvage of all artefacts.	All artefacts to be salvages in the impact area.	To listen to us more and not treat us like idiots.	If the landscape is in harm's way and all precautions have been exhausted and that there is no way of protecting it then mitigation method of having compulsory input by from beginning being part of decision making. By taking more voluntary steps to improve relations with communities.	Repatriation to within project areas.
Cultural Values 6	Are post-settlement/European heritage places important to you? If so, how?	Yes, they created the built environment we live in today, it signifies our modern history and deserves to be respected.		Yes, most definitely. Because of family connections, family environment and a workplace.	Yes they are and always because its part of us and I acknowledge time has changed and we have to accept and adopt.	White settlement is only of value where Koori participation in involved.	Anything to do with European takeover of Wonaarua Land situated in the Hunter Valley is not important to me.	No, not really.	Yes! Many post contact, culture clash buildings do have special significance with certain Indigenous groups, not all, i.e. Bowman's Cottage, St Clair Mission, church, school, etc.	No Europeans don't hold our culture to any value and they should. Only place our ancestors used e.g. Ravensworth Homestead.	No not really.	As it applies to the ongoing history of Aboriginal people. Jimmy Blacksmith lived through this area.	Yes, it should be Wonnarua and Gomerioi.				Yes of course its still our history even though it can sometimes be painful.	N/A.	None.	No.	Yes, it has a connection with us.	Yes, some areas such as homestead hold importance to us as it is connected to our stories of the land, oral history, etc.	
Cumulative Impact	Can you tell us what you think the cumulative impacts of this project might be?			Destruction of our land mass. But there is still cultural	Positive: Potentially training and employment in many	Loss of country. Loss of wildlife. Loss of connection	Just the long term affects that result in the health of	Loss of identity.	All positive outcomes of this project should benefit all associated with it.	Trying to employ Aboriginal workers. Pay WNAC. Infighting of Wonnarua people	Loss/flora/fauna/land/river system.	Further destruction and impact to the cultural landscape.	More destruction to culturally significant.				Mainly environmental for animals and local communities		Loss of sites for educational purposes. Already low in this	Loss of sites.	Broken spiritual connection, sadness seeing the	Our culture is inextricably linked to the environment and that any	

				values associated with this land.	fields, looking after elders. Targeted employment for Aboriginals and their families. Negative: Environmental and health concerns.	to country.	Wonnarua People especially affecting our elders that are still living on this land.		Patterns of reciprocity should at all times be adhered to on equal terms.	and non-Wonnarua people.							health wise. Culturally the whole Mangoola project has significantly destroyed a large part of the cultural landscape.		case.		process happen.	impact to our cultural sites and landscape is like taking a page out of oral history stories.	
Cultural Heritage Protection A	Is the protection of cultural heritage places important to you?	Yes. To ensure that our future generations have access to and understand their heritage.		Yes. Keeping our C/H - Histories, storyline, and songs.	Yes. For our future generations and us. To be as healthy and our value to the community.	Yes. Spiritual identity.	Yes. All cultural heritage to do with Wonnarua Nation on Wonnarua Land is important to me.	Yes.	Yes. There are sites which are shared sites. Glennies, Bowmans Creeks, St Clair, a relocated Bowmans Cottage.	Yes. We need them to keep our culture alive.	Yes. Keep them intact for our future generations.	Yes. Stupid question.	Yes. Cultural landscape.	Yes.	Yes.	Yes.	Yes. Because it is a part of our cultural history, destroying the cultural heritage sites would be equivalent to burning history text books. It would be erasing our cultural history of these sites are destroyed.	Yes. Important.	Yes. We have lost a significant amount over time all places are significant to my people.	Yes. All sites are important to Aboriginal people.	Yes. Because our culture should be respected a lot more than it is now.	Yes. It is our culture and connection to the land our grass roots to our ancestor's past.	
Cultural Heritage Protection B	What protection options are necessary, if any?			Safe guarding our artefact material. Look at a keeping place. Look at lease of land owners to protect the artefacts.	Are our voices truly being heard in a respectful way from governments including local, state, government?	Once mining destroys it is gone.	The area of land known as 'Redbourneberry Hill/Reserve' situated just on the outskirts of Singleton.	I can't do too much about it?	A surety of mines, that ongoing projects are protected by ongoing strategies which benefits local community more, if mining interest are wound down!!	Fenced off. Moved to WNAC land e.g. St Clair.	Cultural camps for our children, grandchildren and great grandchildren.	Cultural burning is effective for hazard reduction as well as rehabilitation. Sustainability of water ways and habitat to continue the local cultural resources. 100-200m either side of creeks. Cultural management practices.	Cultural and heritage information.				Fencing. Educating the Mangoola employees about Aboriginal culture and sites, so no harm accidentally occurs. Monitoring of sites to ensure ongoing protection. Signs being put up reminding Mangoola employees that this specific area is protected and it is not to be disturbed.	Fence to protect.	That all site be protected or freed. Free to be salvaged as management of RAPS.	Fencing.	To be part of the process from start to finish.	Maybe by having a small panel of knowledge holders sitting alongside Glencore on decision making of the land they propose to mine and having the right to have report of what happens to their cultural land.	
Mitigation I	How could cultural heritage places be mitigated if protection is not an option?			If protection and safe guards are not in place.	On a prorata of 2:1 of land area, the places should be nominated and identified by the people as highly significant places to be protected and mitigated forever.	A facility under the guidance of the Wonnarua elders, to preserve and display cultural artefacts uncovered.	Consultation with the Mine's People, to try and achieve the best outcome for my people.	Out the window.	Relocation of post contact heritage structures must be considered at all costs.	We should go to the OEH, DPE local council, State and Commonwealth government ministers.	Compensate to retain cultural integrity.	Investment into Aboriginal community education. The Upper Hunter needs an Aboriginal community controlled cultural education unit.	Fencing and back burning grasses. Cultural courses, care and control.				Education. Access sites.	Relocate artefacts to area for education purposes. Education for all.	Slavage, offset areas.	To record and keep all our cultural information.	Having the right to thoroughly retrieve all cultural information from the landscape and document it on a cultural perspective.		
Mitigation II	What types of programs do you think are important to Wonnarua people to create intergenerational equity opportunities?	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets.	Education. Capacity building. Training. Site conservation works. Business opportunities . Offsets.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets. School-based scholarships, culture workshops.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets. Health.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities .	Education. Training. Business opportunities.	Education. Capacity works. Training. Site conservation works.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Outcomes.	Education. Equity. Capacity building. Training. Site conservation works. Offsets. Plus reunions, health cont., cultural identity and language revival, permanent work/ employment, youth cultural camps, Elders cultural camps, scholarships outside mining, e.g. teachers, doctors, etc.	Education. Equity. Capacity buildings. Training. Site conservation works. Business operations. Offsets. To keep our people up to date with technology. Scholarships outside mining. Help us replant with Indigenous plants. Cultural and arts, visual communication.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets. (Responder also crossed out 'Wonnarua', and noted in its place: Aboriginal who managed this area. Wonnarua is one of many languages spoken not necessarily the main language.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets. Funds for Aboriginal kids (especially boys) education focusing on different ways of learning the government curriculum which our kids struggle greatly with. Funds to set up an Aboriginal health care center in Muswellbrook. Part fund the AMS and replicate in Muswellbrook. (This is what is most important to me).	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities . Offsets.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities . Offsets.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities. Offsets. Giving community to utilise their skills and work on building partnership with Glencore.	
Mitigation III	What specific education programs would you like to see?			School programs. Language programs. Archaeological site training.	Need job specific training and qualifications with a demand so that there in always working opportunities. Minimum 12	Care and control? Specific signed agreement for fund, management and reporting. Integration Equity:	Integration equity.	Care and control? Training for kids.	Care and control? Care and control, before and post of potential mining interests. Intergeneration equity for perpetuity	Care and control? Computers, scholarships outside of mining, arts, sports, small business, exclusion within language, technology, schools.	Care and control? Elder of the nation keeping up with systems technology and training. Cultural camps. Sports at high level.	Care and control? Cultural engagement. (respondent ticked Integration Equity)	(Respondent ticked care and control and integration identity).				Funds towards the girls Academy program at Muswellbrook. Funds towards PCYC programs for young Indigenous Australians.	Care and control? Training.	Care and control? Access to all artefacts, all sites, important trails.	(Respondent ticked care and control and integration identity).	Care and control? And conservation museum for artefacts.	Care amd control? Conservation and land-horticulture programs, management ecology, GIS program learns mapping. Integrating	

Mangoola Coal Continued Operations Project

					months employment to get on their feet.	Funding for research to reconnect.																equity: Working with Indigenous people on cultural camps beyond program and community.	
	What specific capacity building programs would you like to see?	Training and employment quotas to assist in social equity and ensuring future generations are adequately skilled to succeed.		Business - start up.	As above.	Identified sporting skills should be financially assisted.		Education.	Realistic policy developments which foster and nurture realistic outcomes.	Language W/S to our children before our Knowledge Holders pass. Same as our Cultural Land to refurbish the fauna that has been lost with all the mining going on.	Juvenile justice, working with children programs. Cultural healing.	Cultural education unit to deliver up to Cert. 2 level. Courses to engage community \$2 million over 3-4 years.	Aboriginal health, dentist, local Aboriginal housing buildings.				Funding for Aboriginal housing to help local families and employment opportunities.	(Respondent ticked this box)	Training opportunities, employment of Aboriginal people in all aspects, operations.	Develop skills training Aboriginal mentors.	Working together and building partnerships.	Building relationship with community on a business level. Opportunity of John Ventures with community. Working with health, issues, mental health domestic violence, holding or being part of forums on a sponsorship level.	
	What specific training programs would you like to see?	Small business management and mentoring. Full time traineeships and apprenticeships . University internships and graduate programs. High school work experience program.		Training in: technology programs, cultural workshop.	Rehab of mine sites - machine operators. Specific to needs of company.	Identify individual's skills and interest develop work experience, training programs.	Anything to do with our youth in their sporting abilities and job training.	All of the above.	Mining related positions for apprentices and young adults, full funded from mining coffers. Indigenous projects coordinators, for mining interests.	Business. Language. Cultural camps. Scholarships. Arts. Technology. Understanding our fauna as the old people did. Scholarships r.e. HECS.	Language (Wonnarua/Gringai)	3-5 Aboriginal apprenticeships each year for people who live locally and went to school here.	Cultural and awareness care and control training.				More apprenticeships and traineeships specifically for all Aboriginal age groups. Skill building programs for young people (15-25?) to build skills that are essential to be employed.	(Respondent ticked this box)	Employment of mentors, assistance in training.	Traineeships. Apprenticeships .	School based traineeships and scholarships.	School based traineeships, apprenticeships , scholarships, language and culture programs, learning apps - culture - land etc.	
	What specific opportunities would you like to see in relation to business development?	Indigenous businesses to be able to utilise a financial committee for the duration of a contract to purchase plant equipment, etc. Diploma/Cert IV Small Business Management to ensure the potential businesses are adequately skilled and competent in all facets of business and are able to manage their business interests.		Set up business in arts shop. Tourism business. Youth programs.	Respect. Training and jobs. Creating opportunities where there is a demand.	The opportunity to undertake courses in business management.		Small businesses take Aboriginal trained youth workers.	Small business enterprises associated with mining concerns, ie truck driving, fencing, land regeneration, machine operators, surveying assistants, etc.	WNAC to be greater, rework/employment WNAC to continue to be here longer than the mines. WNAC to continue our culture and language. Giving land to grow plants from Wonnarua Lands.	Development management skills with Wonnarua Nation members. Bail houses for Koori kids, cultural camps for more days.	Support for start ups and ongoing mentoring.	More locals trained in business.					Continue in training.	Continue through, training, in contracts for fencing, horticultures.	Fencing contracts, tree planting.	Support and training for our people, and to become self supportive.	Assistance in helping community set up their business by leasing office space and paying the lease for 12 months until business builds up contracts, etc. Putting the community through business counsel and building their Governance education up, or either putting up a fund for community to tap into to.	
Other Matters	What other matters do you think should be addressed by this process as part of the Project?			Need correctional services and assistance. Work rehabilitation employment. Up-skilling for the workforce.	Meeting with WEC with appropriate Glencore management on an agreed timeframe and appointment. The Aboriginal community should be a part of the process from day one, from initial start of the process, dealing with flora and fauna, surveying, etc, for site protection.			Educate our youth, educate our elders. Small business management skills, safe houses for youth on being released from internment.	Cross cultural training for mining personnel in local history, culture and heritage of affected groups, developed, structured and delivered by local Elders or persons of knowledge. Recognising the groups who are real Traditional Owners and supporting their interest. Tell governments that only designated owners of country are the ones we will engage with and no other.	The most important is remuneration to WNAC and that it is well and truly appropriate in regards to what the mines will make over the year they are operating.	1. More days together as Wonnarua families. 2. Art and cultural practice for Wonnarua families. 3. Health and wellbeing for Wonnarua children. 4. Application for language online. 5. Top up WNAC's education and health program to cover more programs.	Treaty/gap closing. Cultural landscape protection. Wybong Creek along the length owned by Mangoola. 100-200m either side.	Make sure things get addressed and do recommendation s of going forward.				Getting rid of the umbrella agreement. Actions being taken to improve protection of sites.	Ongoing consultation.	Ongoing meetings with Glencore and ongoing consultations.		Training - education. Mental health. Sprt. Cultural camps. Cultural healing. Cultural awareness.	Sponsorship of community attends high cost conference that relates to indigenous people: AAA conference, mining conference, health and wellbeing conference, domestic violence conference, homeless conference, (Naidoc?) Awards, more involvement in (Naidoc?) community events on a sponsorship level, assisting financially in research on Aboriginal issues, youth and elders events, sporting, Elders events in community, health forums, mental health forums, drug and alcohol forums, cultural program, working with elders on youth programs	Repatriation of artefacts, access to areas where artefacts are repatriated to, length of time it takes to access mines to visit sites.



[illegible]

### 11.3.20 Archaeological Test Excavation Methodology



ARTEFACT RECORDED ADJACENT TO BIG FLAT CREEK DURING THE 2018 SURVEY.

## ARCHAEOLOGICAL TEST EXCAVATION METHODOLOGY

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Mangoola Coal Continued Operations Project  
April 2018

Prepared by  
OzArk Environmental and Heritage Management Pty Ltd  
for Mangoola Coal (Glencore)



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## CONTENTS

1	Introduction .....	1
1.1	Preamble .....	1
1.2	Background to the Test Excavation Program .....	1
1.3	Code requirements for the Test Excavation Program .....	2
2	The MCCO Additional Project Area .....	4
3	Background to the Test Excavation Program .....	7
3.1	Archaeological Context .....	7
3.2	Background to the Test Excavation Methodology .....	11
4	Proposed Methods .....	14
4.1	Purpose of the Test Excavation Program .....	14
4.2	Sampling Strategy .....	14
4.2.1	Sampling strategy compliance with the Code: Requirement 16 .....	16
5	References .....	19

## FIGURES

Figure 2-1.	The MCCO Additional Project Area. Indicative impacts and landscape features. ....	4
Figure 2-2.	The MCCO Additional Project Area. Landscape zones and archaeological recordings. ....	5
Figure 2-3.	The MCCO Additional Project Area overlain on a 1967 aerial image .....	6
Figure 3-1.	The MCCO Additional Project Area showing all previously recorded sites. ....	8
Figure 3-2.	View of BFC114a in 2018. ....	13

## TABLES

Table 3-1.	Details of previous salvage activities within the MCCO Additional Project Area. ....	8
Table 3-2.	Summary of manual salvage excavation at AC13. ....	9

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## 1 INTRODUCTION

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### 1.1 PREAMBLE

OzArk Environmental & Heritage Management (OzArk) would like to acknowledge the Traditional Owners of the area—the Wonnarua and Gomeroi peoples—and pay respect to their cultural heritage, beliefs and continuing relationship with the land.

We pay respect to the Elders, both past and present, for they hold the memories, traditions, culture and hopes of Aboriginal people in the area.

### 1.2 BACKGROUND TO THE TEST EXCAVATION PROGRAM

Mangoola Coal Mine is an open cut coal mine located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman in the Upper Hunter Valley of NSW. Mangoola has operated the Mangoola Coal Mine in accordance with Project Approval (PA) 06\_0014 (as modified) since mining commenced at the site in September 2010.

The Mangoola Coal Continued Operations (MCCO) Project (the MCCO Project) will allow for the continuation of mining at Mangoola Coal Mine into a new mining area to the immediate north of the existing operations. The Project will extend the life of the existing operation providing for ongoing employment opportunities for the existing Mangoola workforce.

Mangoola Coal Operations Pty Limited (the proponent) is currently in the process of preparing an Environmental Impact Statement (EIS) for the MCCO Project which involves the development of an Aboriginal and Cultural Heritage Impact Assessment (ACHA).

As part of the ACHA, OzArk have been engaged to undertake the archaeological assessment of the areas that will be potentially impacted by the MCCO Project. The surface archaeological assessment has already been completed over the majority of proposed impact areas of the MCCO Additional Project Area during February 2018. Additional surveys are planned for May 2018 for areas outside of the impact areas to complete the assessment coverage.

As a result of the surface archaeological assessment of the MCCO Additional Project Area, one location has been identified that requires subsurface test excavations in order to determine the integrity and/or extent of sites recorded during the field assessment.

This document sets out the proposed methodology for the test excavation and follows the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* under Part 6 *National Parks and Wildlife Act 1974* (NPW Act; Code of Practice).

### 1.3 CODE REQUIREMENTS FOR THE TEST EXCAVATION PROGRAM

The Code of Practice lists a number of requirements pertaining to test excavation. These requirements are enumerated below and further information pertaining to these requirements follow in subsequent sections of this document.

**Requirement 14** (Test excavation which is not excluded from the definition of harm):

*Sub-surface investigation will not be excluded from harm where they are carried out in the following areas:*

- *in or within 50m of an area where burial sites are known or are likely to exist*
- *in or within 50m of a declared Aboriginal place*
- *in or within 50m of a rock shelter, shell midden or earth mound*
- *in areas known or suspected to be Aboriginal missions or previous Aboriginal reserves or institutes*
- *in areas known or suspected to be conflict or contact sites.*
  - The test excavation location is not located within the vicinity of the items listed under Requirement 14 of the Code.
- **Requirement 15a** (Consultation): As the proposed archaeological test excavation program is part of the MCCO Project, consultation has been ongoing with the Registered Aboriginal Parties (RAPs) and has been completed to the stage described in subclause 80C (6) of the *National Parks and Wildlife Regulation 2009* (NPW Regulation).
- **Requirement 15b** (Test excavation sampling strategy): This document sets out the proposed sampling strategy for the test excavation program.
- **Requirement 15c** (Notification):
  - *the location of the proposed test excavation and the subject area.*
    - This document sets out the proposed location of the test excavation program.
  - *the name and contact details of the legal entity with overall responsibility for the project.*
    - Mangoola Coal Operations Pty Limited, PO Box 495. MUSWELLBROOK NSW 2333
  - *the name and contact details of the person who will be carrying out the test excavations where this is different to the legal entity with overall responsibility for the project.*
    - OzArk Environmental & Heritage Management, 145 Wingewarra St, DUBBO, NSW, 2830



- *the proposed date of commencement, and estimated date of completion, of the test excavations.*
  - Anticipated Commencement: 15/05/18
  - Anticipated Completion: 15/05/18

Weather permitting, the projected period for the excavation is one day.
- *the location of the temporary storage location for any Aboriginal objects uncovered during the test excavations.*
  - Aboriginal objects recovered during the excavations will be temporarily housed in a locked container at 21 Agnes Ave, CRESTWOOD, NSW, 2620 (OzArk branch office) for analysis. Following analysis the artefacts will be stored in a locked container at the Mangoola Coal Mine until such time as a Care Agreement is reached between an individual or organisation and the Office of Environment and Heritage (OEH). If no analysis is required (i.e. all analysis is completed in the field), the artefacts will go directly to a locked container at Mangoola Coal Mine.
- **Requirement 16a (Test Excavation):** The test excavation program will adhere to Requirement 16a of the Code as set out in this document (see **Section 4.2**).
- **Requirement 16b (Objects recovered during test excavations):** Aboriginal objects recovered during the excavations will be temporarily housed in a locked container at 21 Agnes Ave, CRESTWOOD, NSW, 2620 (OzArk branch office) as the objects undergo analysis. Following analysis they will be stored in a locked container at Mangoola Coal Mine. If no analysis is required (i.e. all analysis is completed in the field), the artefacts will go directly to a locked container at Mangoola Coal Mine until such time as a Care Agreement is reached between an individual or organisation and OEH.
- **Requirement 17 (When to stop test excavations):** the test excavation program will adhere to the requirements set out in the Code: *Any test excavation carried out under this requirement will cease when suspected human remains are encountered; or when enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.*

The test excavation methodology for the Project was written by Ben Churcher (Principal Archaeologist, OzArk)

## 2 THE MCCO ADDITIONAL PROJECT AREA

Figure 2-1 shows the proposed MCCO Additional Project Area and the main impacts that are proposed for this area. The MCCO Additional Project Area covers approximately 1050 hectares (ha) and is the area in which all proposed impacts associated with the Project will be contained within (impact footprint). For the purposes of this investigation it is assumed (as a worst case) that all areas within the MCCO Additional Project Area will be impacted by the proposed Project apart from approximately 138 ha located to the east of Big Flat Creek where no Project elements are proposed.

For convenience, the MCCO Additional Project Area can be divided into two main areas: hilly terrain and flat terrain. These contiguous areas can be briefly characterised as follows:

- **Hilly terrain:** Approximately 335 ha or 32 per cent of the MCCO Additional Project Area consists mostly of elevated landforms (upper slopes and crests) and is predominantly located in the west of the Study Area. This topography contains steep slopes in places but is more generally characterised by moderate slopes and ridge lines. This region currently supports an open woodland of regenerated trees with very few mature trees. Rock outcrops are common and in places, particularly in the far west, the lower reaches of escarpments are included in the MCCO Additional Project Area. Soils tend to be very thin due to soil loss when this area was historically cleared of vegetation.
- **Flat terrain:** Approximately 715 ha or 68 per cent of the MCCO Additional Project Area consists of flat terrain or gently undulating terrain (flat, lower slope and mid slope landform units). This terrain contains the only named waterway within the MCCO Additional Project Area: Big Flat Creek. However, Big Flat Creek is not a developed waterway in the MCCO Additional Project Area and there are few landforms that could be characterised as 'drainage landforms' (i.e. creek flats/floodplains). The majority of this landscape zone is currently cleared and either consists of grass paddocks or small stands of regenerating woodland. Soil depths are variable and it is only in the south of the MCCO Additional Project Area adjacent to Big Flat Creek where aggrading conditions have allowed some soil depth to accumulate.

Figure 2-2 shows the major topographic zones of the MCCO Additional Project Area overlain with the results of archaeological investigations in the area including the current 2018 assessment. This figure indicates:

- The majority of Aboriginal sites/artefacts have been recorded in close association with waterways;
- In flat, lower slope or mid slope landforms, sites/artefacts are rarely recorded away from waterways; and
- Upper slope landforms do record a low density and diffuse scatter of sites/artefacts, presumably associated with the ecotone or a transition area where two ecological communities—flat landforms to the east, escarpment landforms to the west—meet and interact.

**Figure 2-1. The MCCO Additional Project Area. Indicative impacts and landscape features.**

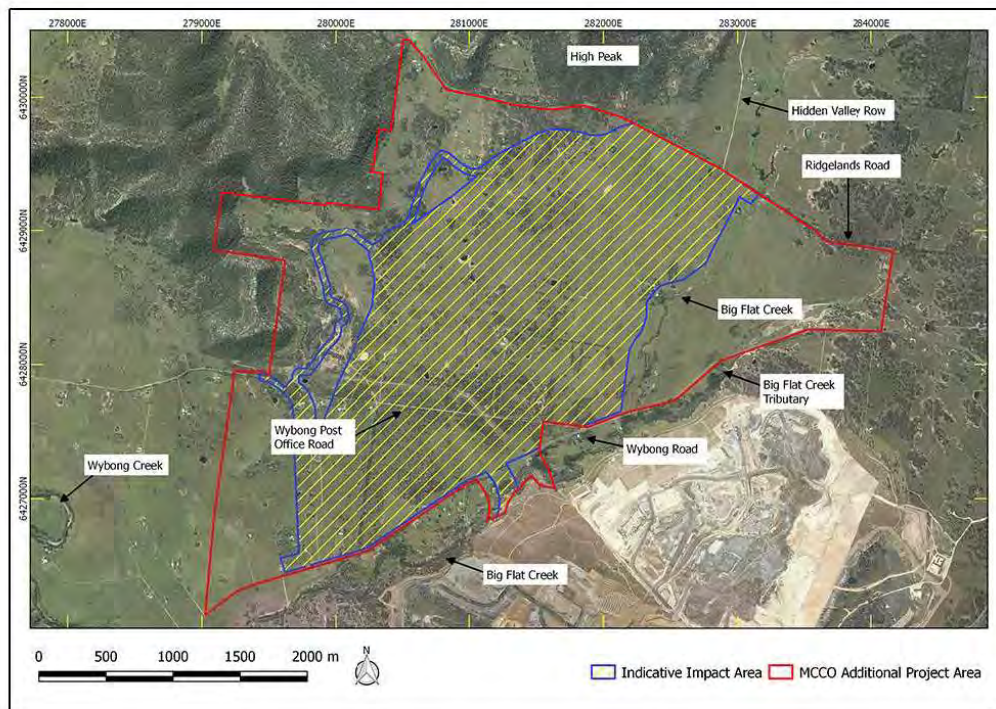
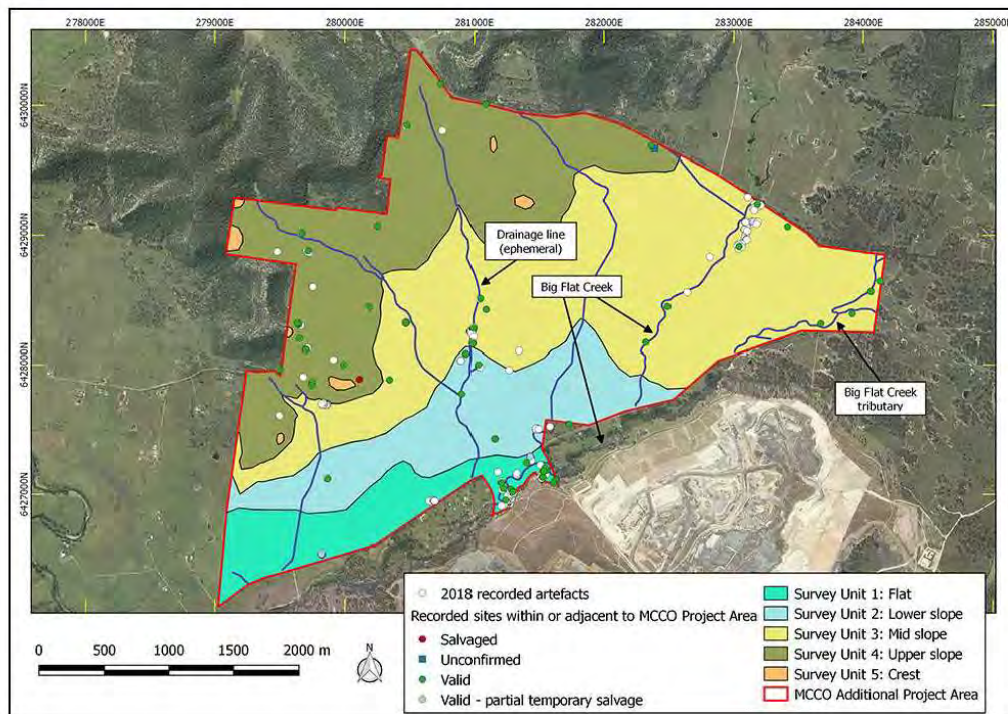


Figure 2-2. The MCCO Additional Project Area. Landscape zones and archaeological recordings.



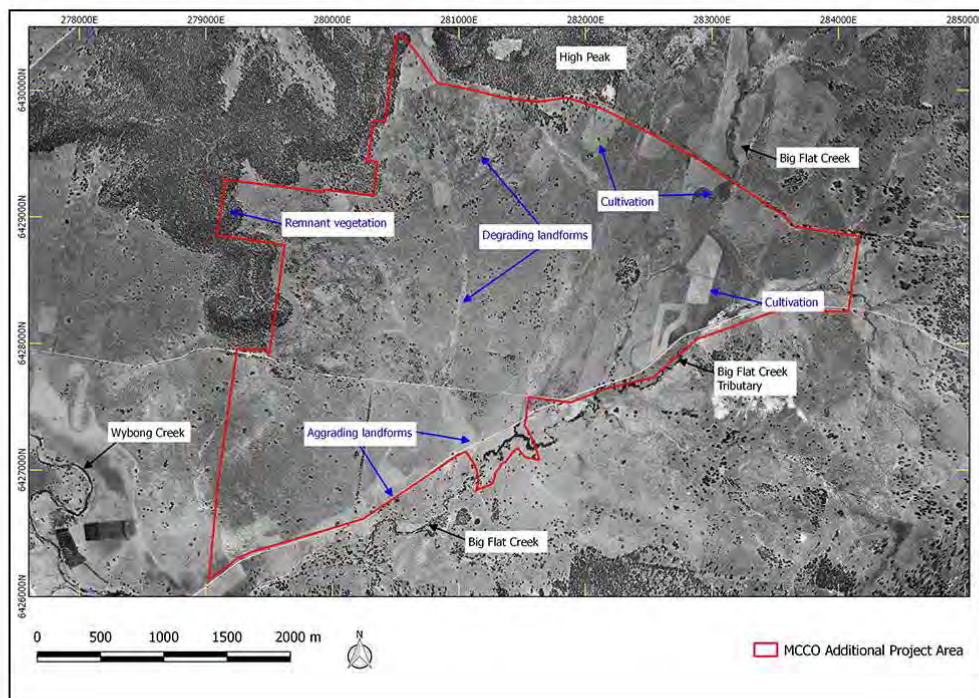


The MCCO Additional Project Area has been affected by a high degree of disturbance over the past 200 years, primarily as a result of the agricultural history of the region.

Overlaying the MCCO Additional Project Area on a 1967 aerial (Figure 2-3) displays the following landscape features:

- Extensive vegetation clearing has occurred;
- Stands of vegetation are extant only in isolated pockets in the west of the MCCO Additional Project Area;
- Big Flat Creek displays a channel morphology and signs of extensive erosion; and
- There are large areas of sheetwash exposures in the north of the MCCO Additional Project Area.

**Figure 2-3. The MCCO Additional Project Area overlain on a 1967 aerial image.**



### 3 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The test excavation program follows an extensive program of surface survey across areas that will be potentially impacted by the MCCO Project. The Aboriginal heritage surface survey commenced on 5 February 2018 and included 10 days of assessment. The assessment consisted of full pedestrian assessment of potentially impacted areas.

The results of the Aboriginal heritage assessment will be contained in the forthcoming ACHA that will provide full details of all sites recorded.

The results of the current proposed test excavation will also form part of the ACHA and will help inform the mitigation and management options for the MCCO Project.

#### 3.1 ARCHAEOLOGICAL CONTEXT

The MCCO Additional Project Area has been subject to some Aboriginal archaeological survey and assessment in the recent past resulting in the recording of multiple Aboriginal sites.

Based on current information from the OEH managed Aboriginal Heritage Information Management System (AHIMS) database, 58 Aboriginal sites have been recorded within or immediately adjacent to the MCCO Additional Project Area. This total comprises 26 artefact scatters, 22 isolated finds, three potential archaeological deposit (PAD) and two artefact scatters with PAD and five rock shelters with PAD.

Of these 58 sites, six have not been registered with AHIMS, one has been salvaged, two have been partially salvaged and one is 'unconfirmed' as the site data is ambiguous (Figure 3-1).

During the course of the survey all valid and partially valid sites were revisited and the majority recorded currently visible artefacts. This is likely due to the fact that the majority of sites were recorded within the past few years and therefore there has been less time for natural impacts to occur at the sites. At those sites where there were no visible surface artefacts, possible explanations include:

- The sites have a low artefact density and it is therefore easier to understand that a low number of artefacts could be obscured whereas larger, more-dense artefact sites would retain a surface manifestation; and
- The high degree of water movement in some areas that has probably removed artefacts from their find location. This reinforces how dynamic any landscape is and how difficult it is to re-locate low density sites after a passage of time.



**Figure 3-1. The MCCO Additional Project Area showing all previously recorded sites.**

There have not been any previous subsurface investigations within the MCCO Additional Project Area and the small amount of archaeological salvage that has occurred has been restricted to surface collections of visible artefacts (Table 3-1). As such, very little information on the nature of subsurface archaeological deposits within the MCCO Additional Project Area is known.

**Table 3-1. Details of previous salvage activities within the MCCO Additional Project Area.**

AHIMS ID	Site name	Mangoola Coal status	Notes
37-2-4109	BFC96	Valid - partial temporary salvage	Umwelt 2014b: 5 records that nine artefacts were collected, stored for safekeeping, and returned to the site on 31/7/14 during works to dismantle the 500kV electricity line approved under PA 10_002. Table 3.1 in Umwelt 2014b records that there were eleven artefacts at BFC96 that were managed in this way. Whether nine or eleven, the site has been disturbed by this activity but all artefacts are back at their original find location. There are no details of the artefacts managed this way at BFC96 in Umwelt 2014b. The 2018 inspection recorded a number of surface artefacts at the site.
37-2-4490	BFC98	Salvaged	BFC98 was permanently salvaged (surface collection) during works to dismantle the 500kV electricity line approved under PA 10_002. The recorded artefact at BFC98 is provided in Umwelt 2014b: Appendix 1 – a quartzite pebble core. The 2018 inspection recorded no further surface artefacts at the site.
37-2-4563	BFC102	Valid - partial temporary salvage	Umwelt 2014b: 12 notes that the site was recorded as a result of inspections around T28 during works to dismantle the 500kV electricity line approved under PA 10_002. The report and the site card do not mention any impact (i.e. excavation) at the site. AHIMS records the site as 'valid'. However, in Umwelt 2014b: Appendix 1 there is a record of five artefacts being recorded in excavation squares at particular spit depths. This implies that these artefacts were recovered from a cultural salvage.

AHIMS ID	Site name	Mangoola Coal status	Notes
			Artefacts recorded were four flakes and one broken flake manufactured from a range of raw materials: mudstone (n=2), silcrete (n=1), chert (n=1) and quartz (n=1). Therefore the data held by Mangoola Coal is correct and BFC102 is a 'partially valid' site. The 2018 inspection recorded a number of surface artefacts at the site.

An examination of Umwelt's investigations at site AC13 (37-2-2253) located approximately 3.5 km south of the MCCO Additional Project Area (Umwelt 2014a) can be examined to gain an appreciation of previous archaeological investigations that included a large subsurface component.

During late 2008, a total of over 250 square metres (surface area) was excavated at AC13 during a test excavation program located on either side of Anvil Creek. These investigations resulted in the recovery of over 9,000 artefacts. Artefact densities were variable, ranging from a low of 16.5 artefacts per surface square metre to a high of 53 artefacts per surface square metre. Artefact distribution within each area was also variable, with some clustering of artefacts within adjoining squares, possibly indicating the presence of some activity areas. During sub-surface investigations, it became apparent that geomorphic factors heavily influenced the nature of deposits, with clear evidence of both recent deposition of alluvial sediments and earlier deposition of point bar/channel deposits such that they have had time to form an A1/A2 soil profile that has subsequently eroded. The inference being that recorded artefacts were subject to a degree of water transport. These artefacts may represent a mix of those that have been transported relatively long distances from their place of initial deposition (and therefore have lost all context) and those that have only travelled relatively short distances (and therefore may retain association with artefacts from related events). Umwelt concluded that all excavations within site AC13 reflected the statement by geomorphologist Peter Mitchell that the '*artefacts are confined to a bio-mantle, none of them can be placed in a reliable temporal context and no material suitable for dating has been recovered*'.

Following further discussions and site visits, it was decided that salvage excavations should occur at six locations at AC13. This resulted in the excavation of 245.5 square metres and the recovery of a further 8,687 artefacts (Table 3-2).

**Table 3-2. Summary of manual salvage excavation at AC13.**

Excavation area	Square metres excavated	Maximum depth of deposits (cm)	Notes
Excavation Area 37	71	3.5–16	A total of 3,062 artefacts were recovered, with the majority of these present within spit 2, which was the average maximum depth of excavation within this area. The distribution of artefacts was continuous across the excavation area, with some notable increases in artefact concentration associated with some squares.
Excavation Area 46	20	2–6	A total of 345 artefacts were recovered from this area, with the majority located in Spit 1. This reflects the shallow depth of remnant soil profile within this

Excavation area	Square metres excavated	Maximum depth of deposits (cm)	Notes
			excavation area rather than any level of stratigraphic separation. There is a small concentration of artefacts that peaked in square Y which is surrounded by depressions within the B soil horizon associated with former tree roots, which may in part explain this concentration.
Excavation Areas 47 and 48	32.5	4–16	A total of 535 artefacts were recovered from Areas 47 and 48, with over half of these located within square 48F. There were no anomalies (such as depressions in the B horizon or former tree roots) that could account for increased accumulation of artefacts within this square. With the exception of the expanded test pit 48, all other squares within this area contained relatively low numbers of artefacts.
Excavation Area 113	10	4–120	A total of 170 artefacts were recovered from this excavation area, with no squares containing more than 35 artefacts.
Excavation Area 121	76	3–36	The soil profile at squares EB, EC, EG and EI showed that a deep, infilled former channel of Anvil Creek passed through Excavation Area 121. It was also identified that the deposits within Area 121 were alluvial in nature (although had aged sufficiently in sections to form a duplex soil profile) and that the majority of artefacts within this excavation area had been subject to some level of alluvial transport.  A total of 4,028 artefacts were recovered from this area, with the majority of these artefacts located within Spits 1 and 2 (up to 10 centimetres in depth) but smaller numbers of artefacts present through to Spit 5.
Excavation Area 151	36	7–50	A total of 892 artefacts were recovered from this excavation area, with the majority of these artefacts located in spits 2 and 3 (up to 15 centimetres in depth). Almost one quarter of recovered artefacts were located within square F, which was not associated with any notable depressions or variations within the soil profile.

The archaeological investigations at AC13 suggested:

- AC13 is associated with a section of Anvil Creek that has been significantly impacted by post-European land use. Despite this, there is evidence that a 'chain-of-ponds' formation existed in this section of Anvil Creek and thus water resources would have been available for longer periods of time. This is further supported by the presence of two former wells, which indicates that water resources in this area were sufficient that non-Aboriginal people justified the investment of time and resources in the excavation of wells;
- The section of Anvil Creek containing AC13 was relatively dynamic, with clear evidence of both recent deposition of alluvial sediments and earlier deposition of point bar/channel deposits such that they have had time to form an A1/A2 soil profile that has subsequently eroded;
- The test excavation program indicated that the sub-surface distribution of artefacts was not continuous, with artefacts absent from over 50 per cent of test pits and only eight test pits containing more than 10 artefacts;
- Artefact distribution within the areas subject to further salvage excavation was also variable, with some clustering of artefacts within adjoining squares, possibly indicating the presence of some activity areas; and

- Artefact densities were also variable between excavation areas.

As a result of these investigations, the following broad conclusions of the archaeological characteristics at Mangoola can be made:

- Archaeological deposits at Mangoola are shallow, probably due to soil loss following vegetation removal during the early agricultural phases of the location's history;
- There was evidence at AC13 of disruption to archaeological deposits from 'water movement' to the extent that little confidence can be placed as to the original depositional location of artefacts and this is likely to be replicated elsewhere at Mangoola; and
- While large numbers of artefacts were recorded at AC13, this probably represents a concentration of artefacts that have been washed into the area in the past 200 years, rather than representing an *in situ* site with a high artefact density.

### 3.2 BACKGROUND TO THE TEST EXCAVATION METHODOLOGY

The 2018 OzArk assessment of the MCCO Additional Project Area has reached the following preliminary conclusions at this stage of the archaeological investigations:

- There are few landforms within the MCCO Additional Project Area that displayed high archaeological potential because there are only limited areas associated with permanent waterways;
- Previous archaeological assessments, as well as the 2018 assessment, concluded that landforms located away from Big Flat Creek are likely to only record sites with a low artefact density;
- Sites within the MCCO Additional Project Area are likely to be displaced due to the area's agricultural history that has encouraged erosion leading to degradation in some areas, and aggradation in others; and
- The 2018 assessment occurred during a very dry period that provided excellent ground surface visibility across most of the MCCO Additional Project Area. The lack of ground cover vastly increased the survey efficacy of the assessment and gave increased confidence in determinations of the archaeological potential of landforms.

As a result, locations initially considered for the test excavation program were limited to:

- Five previously recorded rock shelters with PAD where no surface artefacts were recorded in 2018;
- Three previously recorded locations where the site designation is PAD and where no surface artefacts were recorded in 2018; and
- Areas along Big Flat Creek where the Big Flat Creek overpass is proposed to be located.

However, most of these locations have not been included in the test excavation program for the following reasons:

- Requirement 14 of the Code of Practice states that test excavation is not permissible 'in or within 50 m of a rock shelter, shell midden or earth mound' (Section 1.3). As such, while it would be of archaeological interest to precisely determine the nature of the deposits within these recorded shelters, any such investigation, if required, will have to occur under an approved *Aboriginal Cultural Heritage Management Plan* (ACHMP) following Project approval. Further investigation would be required if it is considered that these shelters could be impacted by indirect impacts such as vibrations from blasting;
- Two of the three previously recorded PADs within the MCCO Additional Project Area are located outside of areas where impacts are currently planned. As these locations are unlikely to be impacted, it was decided that it would be best practice not to impact these locations unnecessarily; and
- The areas along Big Flat Creek where the Big Flat Creek overpass is proposed to be located crosses an area that has been identified in the existing Mangoola ACHMP as an Aboriginal Cultural Heritage Offset Area (ACHOA). Until approval for the overpass corridor to be constructed in this portion of the ACHOA is consented, it is felt that it would be best practice not to disturb these locations at this stage. Further consideration and recommendations in this regard will be included in the draft ACHA for consultation with the MCCO Project RAPs and Knowledge Holders.

While the rock shelters and areas within the ACHOA are excluded from the test excavation program, they will be further investigated; but only at a time following Project approval, should this occur. Any requirements for further excavations will be described in detail in the updated ACHMP to be developed for the MCCO Project and prepared in consultation with the RAPs, knowledge holders and OEH.

As such, there is only one location remaining that requires test excavation: BFC114a (37-2-5429, 37-3-5389<sup>1</sup>). This site, registered with AHIMS as a PAD, recorded no surface artefacts at the time of the 2018 survey and therefore the precise nature of this site is unknown (Figure 3-2). It is also located within the MCCO Project Disturbance Boundary and would be impacted should the Project be approved.

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<sup>1</sup> Many sites in the MCCO Additional Project Area have duplicate AHIMS numbers as they have been entered into AHIMS twice. OzArk is trying to get this rectified with AHIMS.



**Figure 3-2. View of BFC114a in 2018.**



## 4 PROPOSED METHODS

### 4.1 PURPOSE OF THE TEST EXCAVATION PROGRAM

The purpose of the test excavation program is to understand more completely the nature of the sub-surface material within the proposed Disturbance Boundary. Data obtained from the test excavation program will inform the mitigation and management options in the forthcoming ACHA.

The aims are therefore to:

1. Establish the extent and nature of the sub-surface archaeological deposits at the site;
2. Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the site; and
3. Develop, in consultation with the RAPs, an informed management strategy for the site to assist in mitigating the proposed impacts.

Excavations undertaken as per the Code do not require an Aboriginal Heritage Impact Permit (AHIP) under the NPW Act.

### 4.2 SAMPLING STRATEGY

The excavation program will be undertaken by archaeologists and representatives of RAPs and will include the following aspects:

1. One area will be investigated by the test excavation program: site BFC114a.
2. The location for the proposed test excavation program is provided in Figure 3-1.
3. Prior to any excavation, the site will be recorded via digital photography.
4. A minimum of six 0.5m x 0.5m excavation squares will be excavated although the methodology allows for additional squares to be excavated should the results indicate that this is warranted. The excavation squares will be positioned so as a valid sample of the impact area is obtained so that the archaeological values of the area can be characterised.
5. Initial excavation squares will be excavated in 5cm spits to determine whether archaeological stratigraphy is present. If not, spit size will be increased to 10cm. If archaeological stratigraphy is present, this will be used rather than spits.
6. The excavated material from all pits will be sieved on site using dry sieving through nested sieves of 6–8mm and 2.5–3.5mm mesh (which is considered to satisfy the 5mm aperture wire-mesh sieve requirement).
7. Each excavator (by hand) will be responsible for sieving the deposit from their excavation square, retrieving the artefacts and, in conjunction with the supervising archaeologist, correctly recording their provenance. There could be some room for assistance with the

sieving but a self-contained approach is preferable. Deposits will be sieved on to tarpaulins and the spoil used to backfill the excavation square.

8. A standard excavation recording form will be used for each excavation square. Details will include; date, site recorder, spit number and depth, description of finds, description of soil, sketch plan of excavation (if relevant to show structure), end of spit levels, soil pH (when necessary or appropriate) and a bucket tally.
9. It is envisioned that the excavation crew will consist of two archaeologists and four cultural heritage field workers. The excavator of each excavation square, in conjunction with the supervising archaeologist, will be responsible for ensuring any forms are correctly completed. It will be the site archaeologist's responsibility to perform all photographic tasks, undertake any planning and section drawing if required and to ensure that a correct location of each excavation square is maintained.
10. Given that the work will be reasonably physical, all persons participating on the test excavation program should be aware of this and be 'fit for work'.
11. If intact archaeological deposits or archaeological features are encountered, then additional archaeological excavation squares may be excavated to ensure documentation of any features and/or retrieval of artefacts and other relevant archaeological material. A feature would include a high density of artefacts within a square, or a square containing rare or unusual artefacts (such as artefacts constructed from a stone type rarely represented in the area or less-common tool forms such as ground edge axes, hammerstones etc), or other signs of human occupation i.e. ground ovens/hearths or charcoal concentrations.
12. If appropriate (i.e. intact archaeological stratigraphy is recorded) section drawings will be completed for appropriate excavation square. If no archaeological stratigraphy is recorded then digital photographs shall be taken of a representative section of each excavation square and a suitably representative drawing made of the excavation square section to show the soil profile.
13. Analysis of all excavated lithics will be made in order to determine the site's characteristics and to enable the site to be compared with other sites in the region. Analysis will also assist in determining what type of activities the Aboriginal people carried out at the site and their relationship with local resources (fauna, flora, water and stone). All artefacts will be analysed and selectively photographed. If charcoal from a secure context is obtained, it may be sent to a laboratory for C14 dating (subject to proponent's agreement).
14. Select faunal remains, if recovered, will be analysed by a fauna specialist. Remnant shell and bone fragments may assist in determining what foods Aboriginal people may have eaten at the specific site and may elucidate possible foraging strategies. In conjunction with

*in situ* stone tools, bone/shell fragments may also provide evidence of specific usage of stone tools for food processing.

15. Artefacts will remain in the care of OzArk until such time as the analysis is complete. Every effort will be made to analyse artefacts on-site to ensure that the artefacts do not have to leave the Mangoola Coal Mine. However, in the case of large artefact numbers or artefacts requiring further research, it may be necessary to take artefacts off-site. If taken off-site, the artefacts would be the responsibility of OzArk and every effort would be made to return all artefacts to the Mangoola Coal Mine as quickly as is possible. At the completion of analysis (whether on-site or off-site) artefacts will be returned to the Mangoola Coal Mine where they will be kept in a locked location until point 17 below is enacted.
16. The results of the test excavation program will inform the forthcoming ACHA. Excavation results will be used to advise further courses of action in relation to the management and mitigation options for the MCCO Project.
17. Once all salvage activities for the MCCO Project are complete (should the MCCO Project be approved), artefacts will be amalgamated and their ultimate fate will be subject to a Care agreement between an individual or organisation and OEH.

#### **4.2.1 Sampling strategy compliance with the Code: Requirement 16**

- 1 *Test excavation units must be placed on a systematic grid appropriate to the scale of the area—either PAD or site—being investigated e.g. 10m intervals, 20m intervals, or other justifiable and regular spacing.*
  - The sampling strategy outlined in Section 4.2 complies with this requirement.
- 2 *Any test excavation point must be separated by at least 5m.*
  - The sampling strategy outlined in Section 4.2 complies with this requirement. It should be noted that while the initial transect will have 10m intervals, the Code allows expansion around pits displaying notable concentrations of artefacts (i.e. more than 60 artefacts per square metre) or archaeological features. These 'expansions' are limited to a maximum area of 3m<sup>2</sup>.
- 3 *Test excavations units must be excavated using hand tools only.*
  - The sampling strategy outlined in Section 4.2 complies with this requirement.
- 4 *Test excavations must be excavated in 0.5m x 0.5m units.*
  - The sampling strategy outlined in Section 4.2 complies with this requirement.
- 5 *Test excavations units may be combined and excavated as necessary to understand the site characteristics, however:*

*i) the maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3m<sup>2</sup>;*

- The sampling strategy outlined in **Section 4.2** complies with this requirement.

*ii) the maximum surface area of all test excavation units must be no greater than 0.5% of the area—either PAD or site—being investigated.*

- The number and size of test excavations undertaken as part of this program will be managed to ensure that this requirements is satisfied.

**6** *Where the 0.5m x 0.5m excavation unit is greater than 0.5% of the area then point 5 (ii) (above) does not apply.*

- Not applicable. As the potential archaeological deposit is spatially large, less than 0.5% of the known potential archaeological deposits dimensions will be investigated.

**7** *The first excavation unit must be excavated and documented in 5cm spits at each area—either PAD or site—being investigated. Based on the evidence of the first excavation unit, 10cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.*

- Complies. See in **Section 4.2** point 5.

**8** *All material excavated from the test excavation units must be sieved using a 5mm aperture wire-mesh sieve.*

- Complies. See in **Section 4.2** point 6.

**9** *Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.*

- This requirement will be fulfilled in the field and all excavation squares will be excavated to the B-Horizon basal clays. To ensure that, as suspected, these basal clays are culturally sterile, several deeper probes in each excavation area will be excavated into these clays to ensure that they are, in fact, culturally sterile.

**11** *Photographic and scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects must be made for each single excavation point.*

- Complies. See in **Section 4.2** points 8, 9, 12, 13 and 14.

**12** *Test excavations units must be backfilled as soon as practicable.*

- Complies. See in **Section 4.2** point 7.

**13** *Following test excavation, an Aboriginal Site Impact Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each AHIMS site that has been the subject of test excavation in accordance with the requirements of the Code.*



- It will be the responsibility of OzArk to ensure that this requirement is met.

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## 5 REFERENCES

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- Umwelt 2014a                      Umwelt (Australia) Pty Ltd. *Mangoola Coal Aboriginal Archaeological Salvage Program*. Report for Mangoola Coal.
- Umwelt 2014b                      Umwelt (Australia) Pty Ltd. *Report on Cultural Heritage works conducted as part of PA 10\_002, ETL Relocation at Mangoola Coal*. Report for TransGrid/Mangoola Coal.

**11.3.21 Archaeological Excavation 28 Day Review Feedback from RAPs**

<b>Group/Organisation</b>	<b>Contact Person</b>	<b>Methodology Comments Received</b>	<b>Agree with Methodology</b>	<b>Methodology Comment</b>
Culturally Aware	Tracey Skene	09-Apr-18	Yes	"Culturally Aware has no issues at this point with Methodology"
Didge Ngunawal Clan	Paul Boyd & Lilly Carroll	15-Apr-18	Yes	"DNC agrees to survey/study area and wishes to continue in the next stages of fieldwork for when required."
Muragadi Heritage Indigenous Corporation	Jesse Carroll-Johnson	27-Apr-18	Yes	"I have read the draft archaeological test excavation methodology for the above project and endorse Ozark recommendations"
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson	17-Apr-18	Yes	"I have read the proposed draft Archaeological test excavation methodology for the above project. I endorse the recommendations made by OzArk."

## 11.3.22 Example Letter - Archaeological Test Pitting Invitation

# MANGOOLA OPEN CUT

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## GLENCORE

6 April 2018

Jeffery Matthews  
Crimson-Rosie  
6 Eucalypt Avenue  
Muswellbrook NSW 2333

Dear Jeffery;

***Re: Mangoola Coal Continued Operations Project – Archaeological Assessment Summary, Draft Test Excavation Methodology and Fieldwork***

### **Introduction & Assessment Update**

Thank you for ongoing involvement in relation to the Aboriginal Archaeological Values Impact Assessment for the Mangoola Coal Continued Operations (MCCO) Project.

As you are aware, the Aboriginal Cultural Heritage Field Survey was completed between the 5<sup>th</sup> – 16<sup>th</sup> February 2018 in collaboration with OzArk Archaeologists and MCCO Project Registered Aboriginal Parties (RAPs). In this regard an *Preliminary Archaeological Assessment Summary* report has been prepared by OzArk to provide further context of the preliminary findings and discussion regarding further assessment (**Attachment 1**).

Following a review of the preliminary fieldwork findings it has been identified that further archaeological investigation is warranted in the form of a small test excavation program. OzArk have identified one existing Potential Archaeological Deposit (PAD) located within the future mining area that should be subjected to test excavation to better assess the extent and distribution, integrity and overall significance of that archaeological record.

The preliminary findings also indicated an area of approximately 100 hectares within the MCCO Additional Project Area, east of Big Flat Creek, that remains unassessed. This area, plus an additional 35 hectares in the western portion of the Additional Project Area, will also need be assessed to complete the Aboriginal Archaeological Values Impact Assessment.

### **Draft Test Excavation Methodology**

Please find enclosed a copy of the draft *Archaeological Test Excavation Methodology* (OzArk 2018) (**Attachment 2**) and associated response form (**Attachment 3**) to enable you to provide comment.

In accordance with the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*, your comments regarding the draft *Archaeological Test Excavation Methodology* must be received in writing or via oral communication by **Monday, 7 May 2018**.

PO Box 495, Muswellbrook, NSW 2333  
Wybong Road, Muswellbrook, NSW 2333  
T + 61 2 6549 5500 F + 61 2 6549 5655 [www.glencore.com](http://www.glencore.com)  
Mangoola Coal Operations Pty Ltd ABN 54 127 535 755

# GLENCORE

## Fieldwork

A test excavation program has been scheduled (1 day), along with the remaining field assessment (3 days) of the MCCO Additional Project Area, from **Tuesday, 15 May – Friday, 19 May 2018** and will inform the scientific values component of the Aboriginal Archaeological Values Impact Assessment to be prepared for the MCCO Project. You will be contacted by your previously nominated supplier if you are required for fieldwork.

In addition to the test excavation, an opportunity to provide cultural heritage values will also be facilitated through upcoming Values Workshops currently anticipated to be held in May 2018. Further details regarding these workshops will be forthcoming.

If you have any questions, please contact Lori Dennen-King, our Project Approvals Officer, on the details below or myself at any stage.

Lori Dennen-King  
Project Approvals Officer  
Phone: (02) 6549 5520  
Email: [Lori.Dennen-King@glencore.com.au](mailto:Lori.Dennen-King@glencore.com.au)

We look forward to working with you for the duration of the MCCO Project.

Kind Regards,



Jason Martin  
Project Approvals Manager  
Email: [Jason.martin@glencore.com.au](mailto:Jason.martin@glencore.com.au)  
Phone: (02) 6549 5577

## **Attach:**

*Attachment 1: Mangoola Coal Continued Operations Preliminary Archaeological Assessment Summary (OzArk 2018)*  
*Attachment 2: Archaeological Test Excavation Methodology (OzArk 2018)*  
*Attachment 3: FORM - Archaeological Test Excavation Methodology Comments*



## **ATTACHMENT 1**

*Mangoola Coal Continued Operations  
Preliminary Archaeological Assessment Summary (OzArk 2018)*

## **ATTACHMENT 2**

*DRAFT*

*Archaeological Test Excavation Methodology (OzArk 2018)*

**ATTACHMENT 3**

FORM

*Mangoola Coal Continued Operations Project  
Archaeological Test Excavation Methodology Comments*

**Mangoola Coal Continued Operations Project**  
*Archaeological Test Excavation Methodology Comments*

Comments are required to be provided in writing or via oral communication by **Monday, 7 May 2018**.

Your comments can be submitted by either email, post or fax using the details listed below.

Phone: (02) 6549-5520

Fax: (02) 6549 5655

Email: [lori.dennen-king@glencore.com.au](mailto:lori.dennen-king@glencore.com.au)

Mail: Attention Lori Dennen-King (Project Approvals Officer)  
c/o Mangoola Open Cut  
PO Box 495, Muswellbrook NSW 2333

Do you agree with the draft Archaeological Test Excavation Methodology (OzArk 2018)?	YES	NO
(List here or on a separate sheet):		

## 11.4 28-Day Review Feedback

---

**From:** WIDESCOPE . <widescope.group@live.com>  
**Sent:** Sunday, 13 January 2019 16:32  
**To:** Dennen-King, Lori (Mangoola - AU)  
**Subject:** RE: Mangoola Coal Continued Operations (MCCO) Project - ACHAR Review for Comment (2)

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

Hi Lori,

Thank you, I have reviewed and support the Draft Aboriginal Cultural Values Assessment Report

Regards  
 Steven Hickey

---

**From:** Lori.Dennen-King@glencore.com.au <Lori.Dennen-King@glencore.com.au>  
**Sent:** Friday, January 11, 2019 2:42:05 PM  
**To:** widescope.group@live.com  
**Subject:** Mangoola Coal Continued Operations (MCCO) Project - ACHAR Review for Comment (2)

Hi Donna,

Thank you for taking my call this afternoon. As discussed, please find a copy of the email previously sent, along with a new link to the ACHAR document for you to download. As mentioned, a cover letter and copy of the Comment Form is attached for your reference and use. Please let me know if you have any problems with the download.

Regards,  
 Lori Dennen-King

---

**From:** Dennen-King, Lori (Mangoola - AU)  
**Sent:** Wednesday, 19 December 2018 3:06 PM  
**Cc:** Jason Martin (Mangoola - AU) (Jason.Martin@glencore.com.au) <Jason.Martin@glencore.com.au>  
**Subject:** Mangoola Coal Continued Operations (MCCO) Project - ACHAR Review for Comment

Dear Registered Stakeholder,

Mangoola Coal Operations Pty Limited (Mangoola) is continuing to progress environmental assessments and stakeholder consultation associated with the preparation of the Mangoola Coal Continued Operations (MCCO) Project Environmental Impact Statement. In this regard, please find below a link to a copy of the draft *Aboriginal Cultural Values Assessment Report* prepared by Australian Cultural Heritage Management (ACHM) with significant contributions from the Registered Aboriginal Parties and OzArk Environmental and Heritage Management (OzArk). For security reasons, access is available through to 24 December 2018 to download the file after which time the link will expire. Please follow the directions provided below to download the report.

We invite all Registered Aboriginal Parties to provide, in writing, comments on the draft *Aboriginal Cultural Values Assessment Report (ACHM 2018)* by Friday 25 January 2019. To assist, the attached correspondence contains an associated response form to enable you to provide your feedback.



---

**From:** lilly carroll <didgengunawalclan@yahoo.com.au>  
**Sent:** Tuesday, 15 January 2019 10:50  
**To:** Dennen-King, Lori (Mangoola - AU)  
**Subject:** Re: MCCO Cultural Values Workshop Session #2 - 17 September 2018 (Muswellbrook)

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Lori,

DNC is happy with all upcoming proposals that is occurring at Muswellbrook,

Kind regards  
Paul Boyd & Lilly Carroll  
Directors DNC

[Sent from Yahoo Mail for iPhone](#)

On Tuesday, September 4, 2018, 7:31 am, Lori.Dennen-King@glencore.com.au <Lori.Dennen-King@glencore.com.au> wrote:

Hi Paul,

Jason passed on your message so thank you for your reply and interest in participating in the Workshop scheduled for 17 September 2018 at the Upper Hunter Conservatorium of Music (Atherstone Room) in Muswellbrook. Your name will now be added to the list of attendees and we look forward to seeing you again on the 17<sup>th</sup> around 12:30pm.

If you have any questions or require additional information, please do not hesitate to contact either myself or Jason directly.

Kind Regards,

**Lori Dennen-King**

*Project Approvals Officer*

Mangoola Coal Continued Operations Project

Phone: [\(02\) 6549 5520](tel:0265495520)

---

**From:** Will Moon <william@tocomwall.com.au>  
**Sent:** Tuesday, 15 January 2019 10:17  
**To:** Dennen-King, Lori (Mangoola - AU)  
**Cc:** Martin, Jason (Mangoola - AU); Scott Franks  
**Subject:** RE: Mangoola Coal Continued Operations (MCCO) Project - ACHAR Review for Comment  
**Attachments:** MANGOODLA\_ACHAR Review\_Comment Ltr\_TOCOMWALL\_RESPONSE.docx; Response to Mangoola ACHAR.pdf  
**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Lori

Please find attached the PCWP and Tocomwall response to the MCCO Project ACHAR. There are two attachments, one relates the part 1 of the report with a request to include our registration of interest in the table of consolidated management recommendations and the other relates to part 3 and the recommendations relating to the ACHAR.

Regards

Will Moon

Archaeologist  
 Tocomwall Pty Ltd  
 m: 041 9399230  
 e: [william@tocomwall.com.au](mailto:william@tocomwall.com.au)  
[www.tocomwall.com.au](http://www.tocomwall.com.au)




---

**From:** Lori.Dennen-King@glencore.com.au <Lori.Dennen-King@glencore.com.au>  
**Sent:** Wednesday, 19 December 2018 3:06 PM  
**Cc:** Jason.Martin@glencore.com.au  
**Subject:** Mangoola Coal Continued Operations (MCCO) Project - ACHAR Review for Comment

Dear Registered Stakeholder,

Mangoola Coal Operations Pty Limited (Mangoola) is continuing to progress environmental assessments and stakeholder consultation associated with the preparation of the Mangoola Coal Continued Operations (MCCO) Project Environmental Impact Statement. In this regard, please find below a link to a copy of the draft *Aboriginal Cultural Values Assessment Report* prepared by Australian Cultural Heritage Management (ACHM) with significant contributions from the Registered Aboriginal Parties and OzArk Environmental and Heritage Management (OzArk). For security

reasons, access is available through to 24 December 2018 to download the file after which time the link will expire. Please follow the directions provided below to download the report.

We invite all Registered Aboriginal Parties to provide, in writing, comments on the draft *Aboriginal Cultural Values Assessment Report (ACHM 2018)* by **Friday 25 January 2019**. To assist, the attached correspondence contains an associated response form to enable you to provide your feedback.

If you have any questions or require further information, my contact details are listed below.

### Directions to download document and complete file transfer:

1. Click on the blue box "**Download**" below to download the 'MCCO Project ACHAR.zip' file
2. Password: **Mangoola**
3. Download and save [file in desired location](#)

### **Shared File from Jason Martin**

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Let me know if you have any issues accessing or downloading the file. You will have until 24 December 2018 to complete file transfer.

Kind Regards.

**Lori Dennen-King**

*Project Approvals Officer*

Mangoola Coal Continued Operations Project

Phone: (02) 6549 5520

Email: [Lori.Dennen-King@glencore.com.au](mailto:Lori.Dennen-King@glencore.com.au)





**Tocomwall Pty Ltd**

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Tel: 02 9542 7714 Fax: 02 9524 4146

Email: [info@tocomwall.com.au](mailto:info@tocomwall.com.au) [www.tocomwall.com.au](http://www.tocomwall.com.au)

ABN: 13 137 694 618

Attention: Lori Dennen-King (Project Approvals Officer)

c/o Mangoola Open Cut

PO Box 495, Muswellbrook NSW 2333

Dear Lori

Tocomwall and the PCWP have considered the draft Aboriginal Archaeology Impact Assessment report prepared by OzArk EHM and provide the following comments in relation to the recommendations listed in **section 9** of the report.

The analysis and scientific values of the archaeology for this part of the Hunter Valley has not been fully realised to date, with most heritage assessments associated with mining and development limiting their work to the identification of sites and artefacts, recording, retrieving and cataloguing them. For example we do not know what chronological changes were occurring in technology, raw materials, tool use, or the spatial patterns of site use. There has been very little done in terms of the spatial analysis of sites, their relationship to each other, and their relationship to resources for this part of the Hunter. Very general comments and observations are made in reports about sites conforming to other trends evident in the valley however there is little analysis and associated data available in the report to back up the statements. We presently do not understand whether the late Holocene decrease of archaeological material evident in other parts of the Hunter (Hiscock 1986) is evident in the MCCO Project Area and surrounds. We do not understand whether the artefact typology and range from open and closed sites within the MCCO Project Area and surrounds align with those of rock shelters and open sites in other areas of the upper Hunter Valley (Moore 1970, Hiscock 1986). We do not know if the manufacture of Bondi Points in the study area or MCCO Project Area was done in the systematic way as described in Hiscock's Redbank A strategy (Hiscock 1993) for the reduction, heat treatment, and use of different locations during the production process. Does the debris being uncovered at sites support the Redbank A strategy as was found in the nearby Sandy Hollow 1 rock shelter, or were Bondi Points imported into the area from other parts of the valley? Only by conducting analysis of the sites in and around the MCCO Project Area will we be in a position that we are better informed from the archaeology. Projects that are confined to the identification and salvage of artefacts do not contribute to our knowledge.

**Items 2 and 3.** In relation to items 2 and 3 of the recommendations, rather than simply salvage the artefacts and then store them away, consider undertaking a geomorphological assessment of those artefact scatter

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sites with moderate or low-moderate value, plus the four sites in the proposed disturbance footprint, to determine if they may contain deposits and datable material. If suitable deposits are identified, the application of a suitable excavation and dating regime, including optically stimulated luminescence (OSL) and carbon dating, together with an analysis of the artefacts and objects has the potential to further enhance our understanding of chronological changes occurring in Aboriginal objects, and spatial changes in site use patterns in the area and would help increase our understanding of habitation patterns and behaviours over time.

**Item 6.** It is understood that during the inspection of the rock shelters in the project area, that no objects were detected. Understanding the nature of shelter use in the area is considered to be an important research question for which we do not currently have an understanding. The rock shelters throughout the area and to the north in the Crown Land are numerous. Tocomwall's own research of the Crown Land area found very little evidence of shelter use present on the surface. Where evidence was present this was often limited to single artefacts. Many shelters in the wider Sydney Basin, including areas such as the Wollemi National Park, Goulburn River, the Blue Mountains, the Hawkesbury, Hornsby and Woronora Plateaus show evidence of a long history of habitation, some extending back into the Pleistocene, such as Shaws Creek Kill (Stockton 1993). If further investigation of the rock shelters in the project area confirmed the results of the surface inspections, that they were subjected to minimal use for habitation for some, or all of the history and pre history of this part of the Hunter, this would reveal a very different role for rock shelters in this part of the Sydney Basin, and would provide the basis for a more in depth research project that might consider factors that influenced human behaviour relating to rock shelter use in the area. For example lower rainfall and a more open topography with wider valleys to that of other parts of the Sydney Basin may have been significant factors influencing the way that landscape was inhabited.

The report's authors have not considered any consultation with the traditional knowledge holders for how rock shelters were used in the Hunter Valley and how this might help inform their recommendations and proposed investigation methods. For example, some rock shelters were used as burial sites, such as those at Scone and Hillcrest, some sites were used as birthing sites, and guarding sites, such as at Laguna. The archaeology from these types of sites would be very different to the archaeology of sites used for purely domestic habitation purposes. Also some shelters may have been used during the period of post contact conflict in the valley as people were forced off their traditional hunting and habitation areas close to the major water sources.

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The archaeological investigation of the rock shelters could be conducted in a way that takes the opportunity to contribute towards expanding our understanding of shelter use in the area, rather than just for the purpose of updating the site cards. If a test excavation program was undertaken to confirm whether or not deposits are present, this could be extended in order to undertake some analysis and gain knowledge from the exercise. Where deposits are detected the opportunity should be undertaken to conduct analysis of the objects present, including artefact raw materials, artefact types, chronological changes observed and to implement dating methods. Comparisons could be made between the results obtained for the shelters subjected to the excavations. Due to variations in patterns of intra site use, the method should consider an addition 50 x 50 excavation square if nothing is detected by the initial 50 x 50 test pit. This would increase the percentage tested and may help improve the likelihood of detecting deposits where the intra-site habitation pattern may have influenced the location of the deposit. If a deposit were detected, the nature of the deposit could be assessed to determine whether it would be worthwhile extending the size of the excavation.

#### Summary

The current report and recommendations do not offer any opportunity to enhance our understanding of the Aboriginal culture of this part of the Hunter Valley. Whilst it is appreciated that the nature of the sites, many being isolated artefacts, make it difficult to uncover information through their analysis, there are some areas where there are opportunities to realise the scientific values of sites that are in the areas proposed for destruction or impact from mining. The PCWP would like to see some further research undertaken in these areas before the sites are destroyed or impacted and would like to see these research possibilities reflected in the report's recommendations.

Yours Faithfully

William Moon

Archaeologist

Tocomwall Pty Ltd

m: 0419399230

e: [william@tocomwall.com.au](mailto:william@tocomwall.com.au)

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## References

- Hiscock, P. 1993 Bondaian technology in the Hunter Valley, New South Wales. *Archaeology in Oceania*, 28(2):65-76.
- Hiscock, P. 1986 Technological change in the Hunter River valley and the interpretation of late Holocene change in Australia. *Archaeology in Oceania*, 21(1):40-50.
- Moore, D.R. 1969 The prehistory of the Hunter River Valley. In *Australian Natural History, March 1969*: pp.166-171.
- Moore, D.R. 1970 Results of an archaeological survey of the Hunter River Valley, New South Wales, Australia. Part 1. The Bondaian Industry of the Upper Hunter and Goulburn River Valleys. In *Records of the Australian Museum* 28(2): 25-64.
- Stockton, E., 1993 Archaeology of the Blue Mountains. *Blue Mountains Dreaming the Aboriginal Heritage*, pp23-52. *Winmalee (NSW): Three Sisters*.

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**From:** Leslie Atkinson <les.atkinson@hotmail.com>  
**Sent:** Wednesday, 16 January 2019 09:04  
**To:** Dennen-King, Lori (Mangoola - AU)  
**Subject:** Mangola MCCO

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Lori ,

From Jarban + Mugrebea the ACHAR report looks all ok ,  
Uncle Barry French, commented that the rock shelters could they be able to be monitored on an 1/2  
yaerly basis as to mine blasting , ?  
Also that the significance of the Skull Rock landscape feature(Just outside the footprint) (attach a photo in  
the report ?) Which may be a marker in the song line ? ..This is visual alignment from the Wingen Maid  
to the north east (Murrundi )> and posible to other land scape faetures such as Biamia Cave to southern  
end (Milbradale)  
Many thanks  
Les (jarban )

---

**From:** Noel Downs <ceo.wanaruah@bigpond.com>  
**Sent:** Thursday, 24 January 2019 17:20  
**To:** Dennen-King, Lori (Mangoola - AU)  
**Subject:** RE: Mangoola Coal Continued Operations (MCCO) Project - ACHAR Review Comments  
**Attachments:** admin.wanaruah@bigpond.com\_20190124\_162439.pdf  
**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Cheers

**From:** Lori.Dennen-King@glencore.com.au [mailto:Lori.Dennen-King@glencore.com.au]  
**Sent:** Friday, 11 January 2019 2:22 PM  
**To:** ceo.wanaruah@bigpond.com  
**Subject:** Mangoola Coal Continued Operations (MCCO) Project - ACHAR Review Comments

Hi Noel,

As per our conversation, I'm sending this email as a reminder that any comments you may or may not have regarding the review of MCCO's ACHAR Report will need to be submitted by Friday, 25 January 2019. For your convenience, a copy of the Comment Form was included in both the email and hard copy sent to your office.

Let me know if you'd like me to send you another form or if you had any issues with the download. Thanks.

Kind Regards,

**Lori Dennen-King**  
*Project Approvals Officer*  
 Mangoola Coal Continued Operations Project

Phone: (02) 6549 5520  
 Mobile: 0428 997 599  
 Email: [Lori.Dennen-King@glencore.com.au](mailto:Lori.Dennen-King@glencore.com.au)

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Lori Dennen-King  
*Contract Approvals Officer*  
 Mangoola Coal Continued Operations Project

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Response to Mangoola Coal Continued operations Project Aboriginal Cultural Values  
 Assessment report

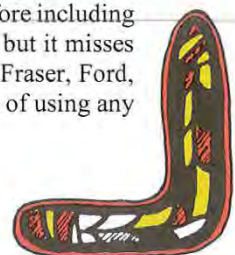
Dear Lori,

Firstly Wanarua Local Aboriginal Land Council representing some 3000 (possibly 4000) Aboriginal people in the Upper Hunter not representing themselves DO NOT agree with nor does it support the conclusion reached by the consultant paid by the proponent to deliver this report that there are no traditional Cultural Values associated with the area.

It would also appear (based on what has been written in the report) the consultant has confused or does not know the difference between a "Native Title Claimant Group" and a "Knowledge Holder". Although there may be knowledge holders in those groups, they are not THE knowledge holders. Nor are they the only groups with knowledge holders, and not all knowledge holders are part of a group. Some choose not to share their knowledge for fear of its misuse by others claiming it as their own and profiteering from it. The practice of falsely claiming community or family knowledge as personal knowledge is one the LALC has seen occur in the Hunter by unscrupulous individuals trying to bolster their claim and assertion of rights to country that is not theirs to claim solely.

It would also appear (based on what has been written in the report) the consultant does not know the difference between "Cultural" and "Spiritual" significance.

It is very disappointing that in this day and age with so much data and information at our finger tips, consultants and scholars still fail to do any real due diligence, instead choosing to use the same limited and incomplete group of references and copy what has been done before including the same mistakes. There is an extensive bibliography with 49 or 50 reference but it misses a number of very important ones. There is no mention of the work by Cooper, Fraser, Ford, Howitt, Matthews, Ogilvie, O'Rourke, Rusden or Tickle. There is no indication of using any local historical references other than Wood which seems to have be ignored.





This would lead Wanaruah LALC to question the suitability of this consultant to deliver this report.

The report talks widely of the Wonnarua. It does not identify Wonnarua as a language group nor identify the term Wonnarua (in its various spellings) is a derivation of a Gadjang (also known as Kattang, or Kutthung) word used first by RH Matthews in the 1860s or 1870's.

The Map on page 35 by Tindale is disputed as hugely inaccurate. Something discussed at length by Ford and O'Rourke. Both cite a number of historical records supporting their conclusions.

Our information is the land including the MCCO area was once known as Gundibri (bri = place of - the Gundi speakers) and was under the custodianship of the Gundical (the people who spoke Gundi). Gundical could also be written as Gundigal. One of 4 dialects known to be spoken in the Upper Hunter at the time of settlement (Ogilvie 1851). Gundi should not be confused with the Paninikilal word Gunda meaning Camp or Gunga Gunda (a very good camp) now known as Gundy. It was once a rich and flourishing wetland. There is much evidence of this remaining in the landscape. Rehabilitation could return it to its pre settlement condition.

It is here the distinction between cultural and spiritual significance becomes important.

If you were to ask Sydneysider (who was not first peoples) on culturally significant places in Sydney, they would name the Bridge, Opera house, the Rocks, and Bondi beach. Some would name the library and museum others parliament house the barracks and QVB. These are places that fed, housed and entertained people. They are part of pathways and recreational areas... None of them is a purpose centred spiritual place. So why is it forced upon Aboriginal people that Cultural significance ONLY refers to places of spiritual significance?

This resource rich area fed people and supplied pretty much all they needed. It was traditionally (to the Gundical) and is still today (the local community) a very culturally significant place.

Beyond that there is believed to be a bora ground near the current location of the Yarraman holiday stay. This bora's extents could be several kilometres it has not been studied. It could be linked to the Anvil Hill complex and Skull rock.

There is also the Skull Rock formation. It would have been of significance as an odd geological formation therefore a gift from the creator.

There were many micro blades found during the Mangoola study, excavations and salvages. This is believed by the community to show the area is potentially linked to a scarification area in the vicinity. It is also evidence of the importance of aquatic resources in the diet of the community, eel, fish and tortoise to name a few.

There are reports of a water spring in a cave. Although often linked to evil places there is no local knowledge on whether it was considered such or if it was a women's site.

The physical evidence remaining of past use cave shelters, cultural objects and modified trees may have had traditional cultural value however they have far greater contemporary cultural value. They are evidence of a once rich and vibrant community.



Page | 237

This is a unique area that is not replicated anywhere else. If it is lost it is gone forever there are no other places like this.



The image above list the traditional place names of the local features and places. Excluding Gundibri as it covers a large area rather than a small local or point.





The image above showing where people were known to live. There are others but as yet we have no supporting evidence. Other than archaeological. For example Halls Creek at Devil's Elbow on the Golden Highway.



The dialect boundaries on the map above are indicative only there would be overlap and they are based on where people were known to be at points in time...

In conclusion I would like to reiterate Wanaruah Local Aboriginal Land Council representing some 3000 (possibly 4000) Aboriginal people in the Upper Hunter not representing themselves DO NOT agree with nor does it support the conclusion reached by the consultant paid by the proponent to deliver this report that there are no traditional Cultural Values associated with the area.

I would also like to reiterate Wanaruah LALC questions the suitability of this consultant to deliver this report based on what would appear to be a lack of understanding between native title claimants, and knowledge holders, and cultural significance and spiritual significance and a general appearance of disinterest in fully understanding the available information and a failure to conduct due diligence/ research to ensure there was no bias created by community and/ or family politics.

We believe this report is incomplete and is not an accurate representation of facts. It should be done again.

Wanaruah LALC does not support this report or its conclusions.

Yours Truly

Noel Downs  
CEO

24/1/2019

**Mangoola Coal Continued Operations Project**  
*Draft Aboriginal Cultural Values Assessment Report Comments*

Your comments can be submitted by either email, post or fax using the details listed below.

Mail: Attention Lori Dennen-King (Project Approvals Officer)  
c/o Mangoola Open Cut  
PO Box 495, Muswellbrook NSW 2333

Page | 239

## 11.5 Aboriginal Archaeology Impact Assessment (AAIA) Report





A retouched chert flake recorded at site MCO001 on the banks of Big Flat Creek.

## **ABORIGINAL ARCHAEOLOGY IMPACT ASSESSMENT**

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### **MANGOOLA COAL CONTINUED OPERATIONS PROJECT**

MANGOOLA COAL MINE, WYBONG, NSW

APRIL 2019

Report prepared by  
OzArk Environment & Heritage  
for Umwelt Environmental and Social Consultants  
on behalf of  
Mangoola Coal Operations Pty. Limited

**OzArk  
Environment & Heritage**

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## DOCUMENT CONTROLS

Proponent	Mangoola Coal Operations Pty. Limited		
Client	Umwelt Environmental and Social Consultants		
Document Description	Aboriginal Archaeology Impact Assessment. Mangoola Coal Continued Operations Project		
	Name	Signed	Date
Clients Reviewing Officer			
Clients Representative Managing this Document	OzArk Person(s) Managing this Document		
Location	OzArk Job No.		
	1768/1972		
Document Status <b>V3.2 FINAL</b>	Date 15 April 2019		
Draft V1.1 Author to Editor OzArk 1 <sup>st</sup> Internal (Series V1._ = OzArk internal edits)	V1.0: TD to BC 10/7/18 V1.1: BC authors 20/7/18 V1.2: AC edit 24/7/18 V1.3: BC check 25/7/18		
Draft V2.0 Report Draft for release to client (Series V2._ = OzArk and Client edits)	V2.0 BC incorporates client comments 27/8/18 V2.1 BC incorporates V2 comments 14/11/18 V2.2 BC prepares draft for RAP distribution 17/12/18		
FINAL V3._once latest version of draft approved by client	V3.0 BC incorporates RAP comments on draft ACHAR 4/2/19 V3.1 BC incorporates client comments 5/3/19 V3.2 BC finalises 15/4/19		
Prepared For	Prepared By		
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Enquiries should be addressed to OzArk Environmental & Heritage Management Pty Ltd.

### **Acknowledgement**

OzArk acknowledge Traditional Owners of the area on which this assessment took place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

OzArk would like to thank all RAPs or RAP representatives who participated in the survey and test excavation program. As this involved many people it is impossible to thank everyone individually although OzArk acknowledges that your hard work, and the dedication you showed towards the understanding and protection of your cultural heritage, contributed to the success of this assessment program.

## ABBREVIATIONS

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The following abbreviations are used in this report.

AAIA	Aboriginal Archaeology Impact Assessment
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHMP	Aboriginal Cultural Heritage Management Plan
AHIMS	Aboriginal Heritage Information Management System (administered by OEH)
AHIP	Aboriginal Heritage Impact Permit
BCE	Before the Common Era (an alternative for using BC in dates)
BP	Before Present
DECC	Former New South Wales Department of the Environment and Climate Change (now OEH)
EIS	Environmental Impact Statement
EP&A Act	The Environmental Planning and Assessment Act 1979
GIS	Geographical Information System
GPS	Global Positioning System
LALC	Local Aboriginal Land Council
LGA	Local Government Area
Mangoola	Mangoola Coal Operations Pty Limited
MCCO Project	Mangoola Coal Continued Operations Project
NPW Act	National Parks and Wildlife Act 1974
NSW	New South Wales
NSW NPWS	New South Wales National Parks and Wildlife Service (now OEH)
OEH	New South Wales Office of the Environment and Heritage
OzArk	OzArk Environmental & Heritage Management Pty Limited
PA	Project Approval
PAD	Potential Archaeological Deposit



PCWP	<i>Plains Clans of the Wonnarua People</i> , Native Title Claimant Group
RAP	Registered Aboriginal Party
SBB	Sydney Basin Bioregion
SEARs	Secretary's Environmental Assessment Requirements
SSD	State significant development
Umwelt	Umwelt Environmental & Social Consultants

## GLOSSARY

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Assemblage:	refers to all artefacts recorded at a particular location. In this report, assemblage refers to stone artefacts as this was the only artefact class recorded.
Bondaian:	A chronological period where bondi points become more frequent in artefact assemblages. Post-3000 BP, although earlier at some sites.
Capertian:	Chronological phase preceding the Bondaian Phase. Pre-3000 BP, although earlier at some sites.
Code of Practice	<i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i> under Part 6 NPW Act. Issued by DECCW in 2010, the Code of Practice is a set of guidelines that allows limited test excavation without the need to apply for an AHIP. The test excavation programme for this assessment was conducted under the Code of Practice.
Debitage:	The term debitage refers to all the waste material produced during lithic reduction and the production of stone tools. Therefore, technically, all artefacts other than reworked tools are debitage. However, in this report debitage is used in its other common meaning being the small flakes and chips produced purely as a by-product of knapping. This distinguishes these small flakes from the larger flakes that were removed (while technically 'debitage', a non-retouched flake can be used as a tool and therefore could have been the intended end point for a knapping event).
Holocene:	is the geological epoch which lasted from around 12,000 years ago to the present (10,000 BCE). This period is generally warmer and wetter than the preceding Pleistocene period.
Pleistocene:	is the geological epoch which lasted from about 2.5 million years ago to 10,000 BCE. This period spans the world's recent period of repeated glaciations. Aboriginal occupation of Australia occurs during the upper Pleistocene.
Taphonomy:	The study of how artefacts can be moved in archaeological deposits due to natural occurrences such as animals burrowing or treadage into the ground.

## EXECUTIVE SUMMARY

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Mangoola Coal Mine is an open cut coal mine located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman in the Upper Hunter Valley of NSW. Mangoola Coal Operations Pty Limited (Mangoola) has operated the Mangoola Coal Mine in accordance with Project Approval (PA) 06\_0014 since mining commenced at the site in September 2010. The Mangoola Coal Continued Operations Project (MCCO Project) will allow for the continuation of mining at Mangoola into a new mining area to the immediate north of the existing operations. The MCCO Project will extend the life of the existing operation providing for ongoing employment opportunities for the Mangoola workforce.

OzArk Environment & Heritage (OzArk) has been engaged by Umwelt Environmental and Social Consultants (Umwelt) on behalf of Mangoola to complete an Aboriginal Archaeology Impact Assessment (AAIA) for the MCCO Project. The purpose of this assessment is to form part of an *Environmental Impact Statement* (EIS) being prepared by Umwelt to accompany an application for development consent under Division 4.1 and 4.7 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the MCCO Project. The AAIA has been undertaken in accordance with the *Secretary's Environmental Assessment Requirements* (SEARs) and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). This report examines the scientific or archaeological values associated with the MCCO Project and is a component of the *Aboriginal Cultural Values Assessment Report* being prepared for the MCCO Project.

Assessment of the MCCO Additional Project Area took place with the assistance of Registered Aboriginal Parties, Wonnarua Knowledge Holders and Gomeroi Knowledge Holders during February and May 2018 and included a 13 day survey program. A test excavation program was undertaken on 15 May 2018.

The assessment achieved excellent survey coverage at a time when there was very high ground surface visibility due to an extended dry period. The survey coverage, coupled with the excellent visibility, produced a high survey efficacy and an increased confidence in the survey results.

The assessment of the MCCO Additional Project Area recorded 12 artefact scatters and 13 isolated finds. It also re-assessed 49 previously recorded and registered sites that were known to exist in the MCCO Additional Project Area.

Therefore, in total, this assessment considers 74 sites. The majority of these sites are stone artefact sites although there are two potential archaeological deposits (PADs) and five rockshelters with PAD in this number.

Undertaking the impact assessment (**Section 7.3**) concluded that there are 26 sites (15 artefact scatters and 11 isolated finds) within the Proposed Disturbance Footprint that will be impacted by the MCCO Project.

As a result of information gained during the survey and test excavation, the majority of sites (n=24; 92 per cent of all 26 sites liable to be impacted) have been assessed as having low scientific significance. In most cases this is because the sites are low density artefact scatters or isolated finds located in landforms with thin A-Horizon soils where further subsurface archaeological deposits are unlikely. In some cases, the artefacts may be more numerous but erosion has affected a large percentage of the site and the visible artefacts are displaced and of limited archaeological value. The remaining two sites have been assessed to have a low-moderate or moderate scientific significance. Due to the level of disturbance within the Proposed Disturbance Footprint, no sites have been assessed as having a high scientific significance (see **Section 7.2** for further details).

The loss of the 26 sites, should the MCCO Project be approved, contributes to the cumulative harm inflicted on Aboriginal sites in the region but as the sites are neither remarkable in their manifestation nor contain artefacts that are not commonly represented in the region, this loss of heritage value is manageable and the intergenerational loss arising from the MCCO Project is considered to be minimal at a regional level.

A series of management options are advanced in this report to manage these impacts. Should the MCCO Project be approved, four sites are recommended for further subsurface investigation and all sites will be salvaged by a surface collection and recording of all visible surface artefacts (see **Section 8.3** for further details).

It is envisaged that the archaeological management strategy proposed by this AAIA will ensure that artefacts are not only removed from direct impact but, within a research framework, our understanding of the archaeological record within a key location associated with Big Flat Creek within the Proposed Disturbance Footprint will be enhanced.

Following granting of a development consent for the MCCO Project the following archaeological recommendations are made to responsibly mitigate the loss of cultural heritage in the Proposed Disturbance Footprint.

1. The existing Mangoola Open Cut *Aboriginal Cultural Heritage Management Plan* (ACHMP) will be updated in consultation with the Registered Aboriginal Parties (RAPs) and the NSW Department of Planning and Environment (with input from the Office of Environment and Heritage). The archaeological management recommendations within this report should be incorporated into the ACHMP.

2. 22 Aboriginal sites within the Proposed Disturbance Footprint are recommended to be salvaged through a surface artefact collection. The protocol for this salvage is set out in **Section 8.4.1**.
3. Four Aboriginal sites within the Proposed Disturbance Footprint (BFC31, BFC93, BFC95 and MN OS8) are recommended to be salvaged through a program of limited archaeological salvage. The protocol for this salvage is set out in **Section 8.4.2**.
4. Four sites (Manobalai-Castle Rock 5, BFC118, MCO001 and MN OS5) as set out in **Section 8.3.2** require fencing and signage to prevent inadvertent harm from the MCCO Project.
5. In order to address the issue of cumulative loss of sites in the district, the MCCO Project will ensure management of a 23.5 hectare area of land in the southeast of the MCCO Additional Project Area as discussed in **Section 8.3.5**. This MCCO Cultural Heritage Management Area will be fenced to exclude livestock and will be signed to recognise the area's cultural and archaeological values. Mangoola will allow natural landform rehabilitation to occur in this area but will also investigate non-intrusive erosion controls such as seeding or hand planting of trees. The area will be monitored by Mangoola to ensure weed and feral animal control is maintained. The area could be visited by Aboriginal community members during scheduled monitoring programs (as per ACHMP Section 3.6.1.1) or following a request to Mangoola.
6. The five registered rockshelters (37-2-5443 [BFC128]; 37-2-5444 [BFC129]; 37-2-5445 [BFC130]; 37-2-5446 [BFC131] and 37-2-5447 [BFC132] will be subjected to limited archaeological excavation as set out in **Section 8.3.4** to determine whether the shelters have associated archaeological deposits. Depending on the results of the excavations, the following outcomes will be followed:
  - a. If these investigations demonstrate that there are associated archaeological deposits, the applicable shelters will have their site card updated to include this finding. These rockshelter sites will not be subject to specific blast monitoring (as geotechnical expert advice is that blast impacts are unlikely) but a photographic record should be maintained so that any deleterious changes to the condition of these sites is recorded and, if possible, remedied. This photographic monitoring will be part of the existing monitoring program as set out in the ACHMP Section 3.6.1.1. The remaining deposits not disturbed by the limited archaeological investigation shall be maintained *in situ*.
  - b. If these investigations demonstrate that there are no associated archaeological deposits, the applicable shelters will be listed as 'not a site' by the agency of an



Aboriginal Heritage Impact Recording Form and no further management is required.

7. Mangoola will undertake to manage the 45 known Aboriginal sites within the MCCO Additional Project Area but outside of the Proposed Disturbance Footprint listed in **Table 8-3**. Management of these sites will follow the procedures set out in the ACHMP Section 3.2.1.
8. Any salvaged artefacts will remain on site at the temporary artefact storage facility maintained by Mangoola. At the cessation of mining in the Additional MCCO Project Area, Mangoola will initiate consultation with RAPs to determine the ultimate fate of the artefacts that could include being placed back in the landscape near to where they originated. Any such decision would be subject to a Care and Control agreement between the RAPs and OEH (see ACHMP Section 4).

## CONTENTS

---

Abbreviations .....	iii
Glossary.....	v
Executive summary.....	vi
1 Introduction .....	1
1.1 MCCO Project overview.....	1
1.2 The MCCO Project.....	4
1.3 The MCCO Additional Project Area.....	6
1.4 Existing archaeological management at the Mangoola Coal Mine.....	8
1.4.1 Background .....	8
1.4.2 Aboriginal Cultural Heritage Offsets (ACHOAs) .....	8
1.4.3 Management activities .....	9
1.4.4 Aboriginal party consultation .....	9
1.4.5 Management of sites outside of the currently approved operations.....	9
1.5 Relevant legislation.....	10
1.5.1 State legislation .....	11
1.5.2 Commonwealth legislation .....	12
1.5.3 Applicability to the MCCO Project .....	12
1.6 Assessment approach .....	13
2 The Archaeological Assessment .....	14
2.1 Purpose and objectives.....	14
2.1.1 Aboriginal archaeological assessment objectives .....	14
2.2 Date of archaeological assessment .....	14
2.3 Aboriginal community involvement.....	14
2.3.1 RAP review of the draft AAIA.....	15
2.4 OzArk involvement.....	17
2.4.1 Field assessment.....	17
2.4.2 Reporting .....	17

3	Landscape Context .....	18
3.1	Topography.....	18
3.2	Geology and soils .....	21
3.3	Hydrology .....	22
3.4	Vegetation .....	24
3.5	Climate .....	25
3.6	Land-use history and existing levels of disturbance.....	26
3.7	Conclusion.....	29
4	Aboriginal Archaeology Background .....	31
4.1	Ethno-historic sources of regional Aboriginal culture.....	31
4.2	European occupation.....	31
4.3	Regional archaeological context .....	32
4.3.1	Previous archaeological studies in the region .....	33
4.4	Local archaeological context.....	36
4.4.1	Desktop database searches conducted .....	36
4.4.2	Previous archaeological investigations within the MCCO Additional Project Area.....	41
4.4.3	Previously recorded sites within the MCCO Additional Project Area .....	43
4.5	Predictive model for site location.....	48
4.5.1	Settlement strategies .....	48
4.5.2	Past land use .....	49
4.5.3	Previously recorded sites .....	51
4.5.4	Landform modelling .....	51
4.5.5	Previous studies .....	52
4.5.6	Conclusion.....	54
5	Results of Aboriginal Archaeological Survey .....	57
5.1	Sampling strategy and field methods .....	57
5.2	Project constraints .....	58
5.3	Effective survey coverage .....	58
5.4	Aboriginal sites recorded.....	62

5.4.1	Artefact scatters.....	64
	Mangoola North OS1 .....	64
	Mangoola North OS2 .....	66
	Mangoola North OS3 .....	68
	Mangoola North OS4 .....	70
	Mangoola North OS5 .....	72
	Mangoola North OS6 .....	74
	Mangoola North OS7 .....	76
	Mangoola North OS8 .....	78
	Mangoola North OS9 .....	79
	Mangoola North OS10 .....	81
	Mangoola North OS11 .....	83
	Mangoola North OS12 .....	85
5.4.2	Isolated finds.....	88
	Mangoola North IF1 .....	90
	Mangoola North IF2 .....	91
	Mangoola North IF3 .....	92
	Mangoola North IF4 .....	94
	Mangoola North IF5 .....	95
	Mangoola North IF6 .....	97
	Mangoola North IF7 .....	97
	Mangoola North IF8 .....	99
	Mangoola North IF9 .....	99
	Mangoola North IF10 .....	101
	Mangoola North IF11 .....	102
	Mangoola North IF12 .....	103
	Mangoola North IF13 .....	105
5.5	Previously recorded Aboriginal sites .....	106
5.6	Discussion .....	135

5.6.1	Veracity of the predictive model .....	135
5.6.2	Settlement strategies .....	135
5.6.3	Land use .....	136
5.6.4	Landform modelling .....	138
5.6.5	Research questions .....	139
6	Aboriginal Archaeological Test Excavation.....	142
6.1	Introduction .....	142
6.2	Field methods .....	144
6.3	BFC114a test excavation results.....	145
6.3.1	Stratigraphy .....	145
6.3.2	Artefact assemblage .....	147
6.3.3	Results.....	148
7	Assessment of Significance and Potential Impacts .....	149
7.1	Significance assessment.....	149
7.1.1	Introduction.....	149
7.1.2	Background to the assessment of scientific significance .....	149
7.1.3	Known Aboriginal sites in the MCCO Additional Project Area .....	151
7.2	Assessed scientific significance of known sites.....	151
7.2.1	Newly recorded sites.....	151
7.2.2	Previously recorded sites .....	154
7.3	Likely impacts to Aboriginal heritage from the MCCO Project .....	156
7.3.1	Impacts to a former portion of ACHOA-5.....	157
7.3.2	Ecological sustainable development principles .....	160
8	Management and Mitigation: Aboriginal Heritage .....	162
8.1	General principles for the management of Aboriginal sites.....	162
8.2	Management Options.....	162
8.2.1	Option A: Do Nothing .....	162
8.2.2	Option B: Modify project design to avoid harm .....	163
8.2.3	Option C: No design change and mitigate archaeological impacts .....	164



8.3	Management and Mitigation of Recorded Aboriginal Sites .....	165
8.3.1	Archaeological salvage .....	165
8.3.2	Sites requiring specific management to prevent harm.....	167
8.3.3	Management of blast impacts .....	168
8.3.4	Further investigation of rockshelter sites .....	169
8.3.5	Conservation management options.....	170
8.3.6	Protocols related to the discovery of new sites.....	174
8.3.7	Protocols related to the discovery of human skeletal material .....	174
8.3.8	Care of salvaged artefacts .....	174
8.4	Management Process .....	175
8.4.1	Archaeological salvage: surface artefact collection .....	175
8.4.2	Archaeological salvage: limited manual excavation.....	176
9	Recommendations .....	179
	References .....	182
	Appendix 1: Survey Methodology.....	186
	Appendix 2: Test Excavation Methodology.....	225
	Appendix 3: Survey update .....	246
	Appendix 4: AHIMS Search Results.....	252
	Appendix 5: Supplementary site location and artefact photos .....	276

## FIGURES

Figure 1-1: Location of the MCCO Project in relation to Muswellbrook.....	2
Figure 1-2: Aerial showing the MCCO Project Area, the MCCO Additional Project Area, and the Proposed Disturbance Footprint.....	3
Figure 1-3: MCCO Additional Project Area: Conceptual Project Layout. ....	5
Figure 1-4: Aerial showing the MCCO Additional Project Area. ....	7
Figure 3-1: Aerial showing the major topographic zones at the MCCO Additional Project Area. ....	19
Figure 3-2: Examples of the topography of each survey unit. ....	20
Figure 3-3: Aerial showing the soil landscapes of the MCCO Additional Project Area. ....	22
Figure 3-4: Aerial showing the hydrology of the MCCO Additional Project Area. ....	23
Figure 3-5: Examples of the hydrology within the MCCO Additional Project Area. ....	23
Figure 3-6: Examples of vegetation types within the MCCO Additional Project Area. ....	25
Figure 3-7: The MCCO Additional Project Area superimposed on a 1967 aerial image.....	27
Figure 3-8: Examples of disturbances within the MCCO Additional Project Area.....	28
Figure 3-9: Environmental zones conducive to Aboriginal occupation. ....	30
Figure 4-1: AHIMS site types near the MCCO Additional Project Area.....	38
Figure 4-2: Aerial showing the location of previously recorded 'closed sites'.....	40
Figure 4-3: Previously recorded sites within the MCCO Additional Project Area.....	47
Figure 4-4: Aerial showing the correlation between site recordings and landform types. ....	49
Figure 4-5: A 1967 aerial image with previously recorded sites.....	50
Figure 4-6: Previously recorded sites and major landform types. ....	52
Figure 5-1: Aerial showing areas subjected to survey. ....	58
Figure 5-2: Examples of GSE/GSV within the MCCO Additional Project Area.....	60
Figure 5-3: Survey transects undertaken during the assessment of the MCCO Additional Project Area. ....	61
Figure 5-4: Aerial showing newly recorded artefact scatters.....	63
Figure 5-5: Aerial showing location and extent of Mangoola North OS1.....	65
Figure 5-6: Photographs showing an overview and details of Mangoola North OS1.....	65
Figure 5-7: Aerial showing location and extent of Mangoola North OS2.....	67
Figure 5-8: Photographs showing an overview and details of Mangoola North OS2.....	67
Figure 5-9: Aerial showing location and extent of Mangoola North OS3.....	69
Figure 5-10: Photographs showing an overview and details of Mangoola North OS3.....	69
Figure 5-11: Aerial showing location and extent of Mangoola North OS4.....	71
Figure 5-12: Photographs showing an overview and details of Mangoola North OS4.....	71

Figure 5-13: Aerial showing location and extent of Mangoola North OS5. ....	73
Figure 5-14: Photographs showing an overview and details of MN OS5. ....	73
Figure 5-15: Aerial showing location and extent of Mangoola North OS6. ....	75
Figure 5-16: Photographs showing an overview and details of Mangoola North OS6. ....	75
Figure 5-17: Photographs showing an overview and details of Mangoola North OS7. ....	77
Figure 5-18: Aerial showing locations and extents of Mangoola North OS7 and Mangoola North OS8. ....	78
Figure 5-19: Photographs showing an overview and details of Mangoola North OS8. ....	79
Figure 5-20: Aerial showing location and extent of Mangoola North OS9. ....	80
Figure 5-21: Photographs showing an overview and details of Mangoola North OS9. ....	80
Figure 5-22: Aerial showing location and extent of Mangoola North OS10. ....	82
Figure 5-23: Photographs showing an overview and details of Mangoola North OS10. ....	82
Figure 5-24: Aerial showing locations and extents of Mangoola North OS11 and Mangoola North OS12. ....	84
Figure 5-25: Photographs showing an overview and details of Mangoola North OS11. ....	84
Figure 5-26: Photographs showing an overview and details of Mangoola North OS12. ....	86
Figure 5-27: Aerial showing newly recorded isolated finds. ....	89
Figure 5-28: Aerial showing location and extent of Mangoola North IF1. ....	90
Figure 5-29: Photographs showing an overview and details of Mangoola North IF1. ....	91
Figure 5-30: Aerial showing location and extent of Mangoola North IF2. ....	92
Figure 5-31: Photographs showing an overview and details of Mangoola North IF2. ....	92
Figure 5-32: Aerial showing location and extent of Mangoola North IF3 and Mangoola North IF4. ....	93
Figure 5-33: Photographs showing an overview and details of Mangoola North IF3. ....	94
Figure 5-34: Photographs showing an overview and details of Mangoola North IF4. ....	95
Figure 5-35: Aerial showing locations and extents of Mangoola North IF5 and Mangoola North IF6. ....	96
Figure 5-36: Photographs showing an overview and details of Mangoola North IF5. ....	96
Figure 5-37: Photographs showing an overview and details of Mangoola North IF6. ....	97
Figure 5-38: Aerial showing locations and extents of Mangoola North IF7 and Mangoola North IF8. ....	98
Figure 5-39: Photographs showing an overview and details of Mangoola North IF7. ....	98
Figure 5-40: Photographs showing an overview and details of Mangoola North IF8. ....	99
Figure 5-41: Aerial showing location and extent of Mangoola North IF9. ....	100
Figure 5-42: Photographs showing an overview and details of Mangoola North IF9. ....	100

Figure 5-43: Aerial showing location and extent of Mangoola North IF10 and Mangoola North IF11. ....	101
Figure 5-44: Photographs showing an overview and details of Mangoola North IF10.....	102
Figure 5-45: Photographs showing an overview and details of Mangoola North IF11.....	103
Figure 5-46: Aerial showing locations and extents of Mangoola North IF12 and Mangoola North IF13. ....	104
Figure 5-47: Photographs showing an overview and details of Mangoola North IF12.....	104
Figure 5-48: Photographs showing an overview and details of Mangoola North IF13.....	105
Figure 5-49: Aerial showing the location of all previously recorded, registered, sites in the MCCO Additional Project Area.....	109
Figure 5-50: Aerial showing the extent of sites in the eastern portion of the MCCO Additional Project Area. ....	110
Figure 5-51: Newly recorded sites in relation to landforms of archaeological potential. ....	136
Figure 5-52: All known sites superimposed on a 1967 aerial of the MCCO Additional Project Area. ....	137
Figure 5-53: All known sites shown in relation to the major landform types. ....	139
Figure 6-1: Location of the test excavation program.....	143
Figure 6-2: Photographs showing the location of the test excavation program. ....	144
Figure 6-3: Aerial showing locations of BFC114a test excavation squares.....	145
Figure 6-4: View of artefact from the test excavation program.....	148
Figure 7-1: Aerial showing the location of all known sites within the Proposed Disturbance Footprint.....	159
Figure 8-1: Aerial showing the sites that require special management during the proposed works. ....	168
Figure 8-2: Aerial showing the MCCO Cultural Heritage Management Area. ....	171
Figure 8-3: Recorded Aboriginal sites inside the MCCO Additional Project Area but outside the Proposed Disturbance Footprint.....	173

## TABLES

Table 1-1: Concordance between the OEH input to the SEARs and this AAIA.....	12
Table 2-1: RAP comments on the draft AAIA. ....	15
Table 4-1: Aboriginal heritage: desktop-database search results. ....	36
Table 4-2: AHIMS sites near the MCCO Additional Project Area: site types and frequencies...	39
Table 4-3: Previous archaeological surveys within the MCCO Additional Project Area.....	41

Table 4-4: Site characteristics of previously recorded sites in the MCCO Additional Project Area.	44
Table 4-5: Previously recorded sites within the MCCO Additional Project Area.	44
Table 4-6: Duplicate AHIMS ID concordance table.	46
Table 5-1: Survey coverage data.	59
Table 5-2: Previously unrecorded sites noted during the survey.	62
Table 5-3: Mangoola North OS1. Artefact attributes.	66
Table 5-4: Mangoola North OS2. Artefact attributes.	67
Table 5-5: Mangoola North OS3. Artefact attributes.	70
Table 5-6: Mangoola North OS4. Artefact attributes.	72
Table 5-7: Mangoola North OS5. Artefact attributes.	74
Table 5-8: Mangoola North OS6. Artefact attributes.	76
Table 5-9: Mangoola North OS7. Artefact attributes.	77
Table 5-10: Mangoola North OS8. Artefact attributes.	79
Table 5-11: Mangoola North OS9. Artefact attributes.	81
Table 5-12: Mangoola North OS10. Artefact attributes.	83
Table 5-13: Mangoola North OS11. Sample artefact attributes.	85
Table 5-14: Mangoola North OS12. Sample artefact attributes.	87
Table 5-15: Recorded isolated finds artefact attributes and coordinates.	88
Table 5-16: All previously recorded and registered sites within the MCCO Additional Project Area.	106
Table 5-17: Results of inspection of previously recorded, registered, sites.	111
Table 6-1: Soil profiles at the BFC114a test excavation.	146
Table 6-2: Artefact details from the test excavation program.	147
Table 7-1: Scientific significance of newly recorded sites.	152
Table 7-2: Significance assessment of previously recorded sites.	154
Table 7-3: All known sites within the Proposed Disturbance Footprint.	157
Table 8-1: Management recommendations for sites within the Proposed Disturbance Footprint.	166
Table 8-2: Sites requiring specific management to ensure conservation.	168
Table 8-3: Recorded Aboriginal sites inside the MCCO Additional Project Area but outside the Proposed Disturbance Footprint.	171



# 1 INTRODUCTION

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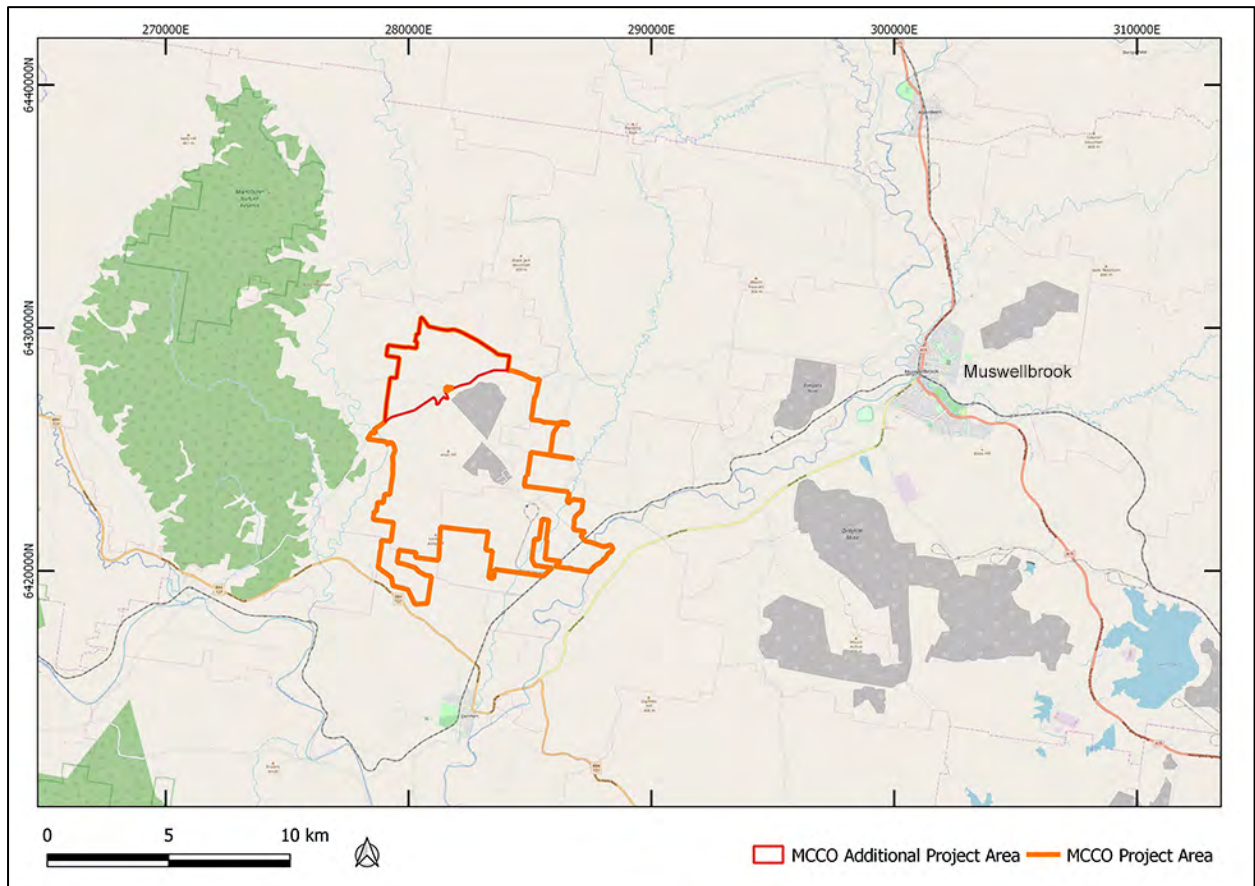
OzArk Environment & Heritage (OzArk) has been engaged by Umwelt Environmental and Social Consultants (Umwelt) on behalf of Mangoola Coal Operations Pty Limited (Mangoola) to complete an Aboriginal Archaeology Impact Assessment (AAIA) for the Mangoola Coal Continued Operations Project (MCCO Project). The purpose of the assessment is to form part of an *Environmental Impact Statement* (EIS) being prepared by Umwelt to accompany an application for development consent under Division 4.1 and 4.7 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the MCCO Project.

Australian Cultural Heritage Management Pty Limited (ACHM) will prepare the *Aboriginal Cultural Heritage Assessment Report* (ACHAR). This AAIA will be an appendix to the ACHAR.

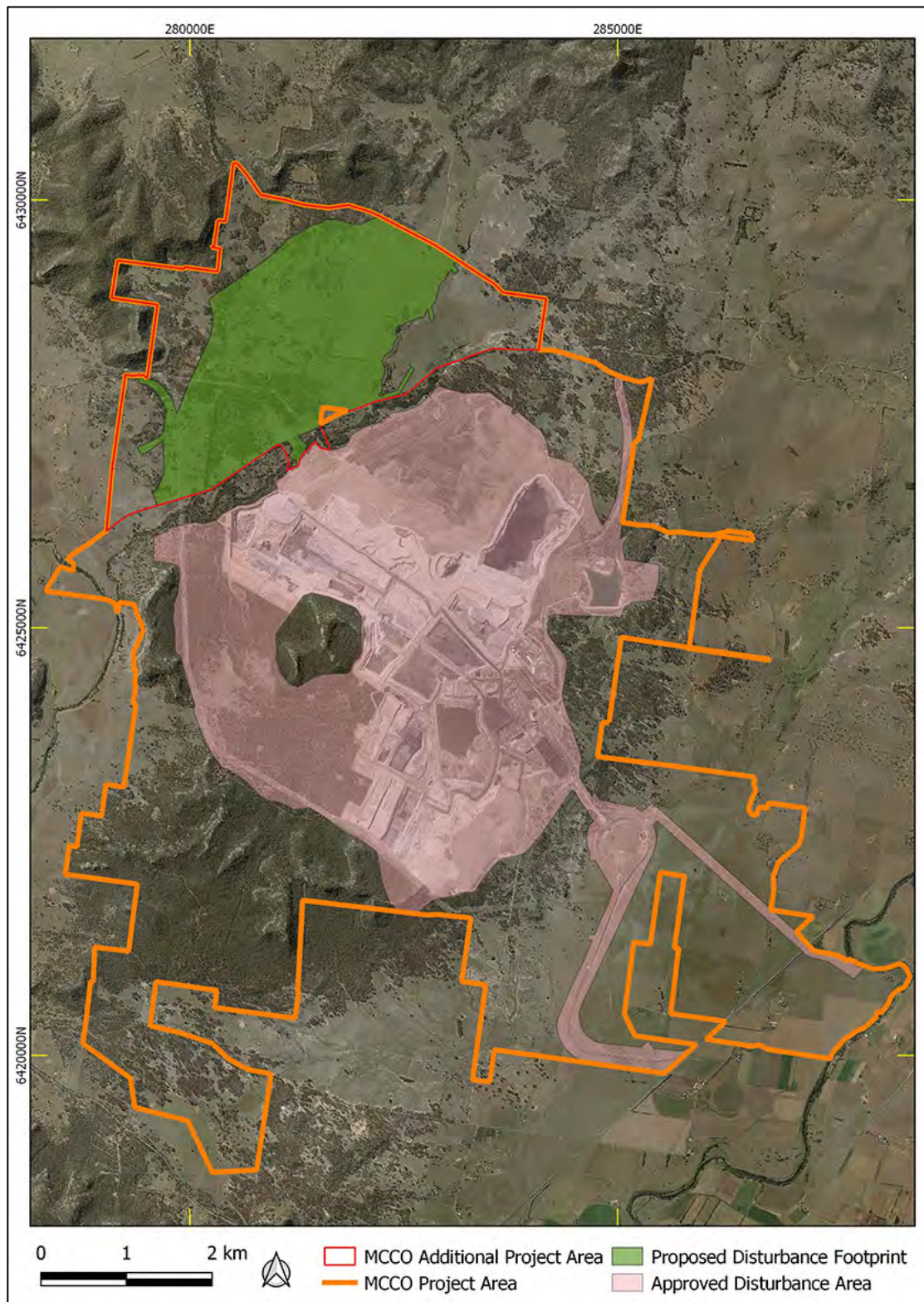
## 1.1 MCCO PROJECT OVERVIEW

Mangoola Coal Mine is an existing open cut coal mine located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman in the Upper Hunter Valley of NSW (**Figure 1-1**). Mangoola has operated the Mangoola Coal Mine in accordance with Project Approval (PA) 06\_0014 since mining commenced at the site in September 2010.

The MCCO Project will allow for the continuation of mining at Mangoola Coal Mine into a new mining area to the immediate north of the existing operations. The MCCO Project will extend the life of the existing operation providing for ongoing employment opportunities for the Mangoola workforce. The MCCO Project Area includes the existing approved Project Area for Mangoola Coal Mine and the MCCO Additional Project Area as shown on **Figure 1-2**. The Approved Disturbance Area for the current operations is not part of this assessment and this area, as shown on **Figure 1-2** and **Figure 1-3**, has been previously assessed.

**Figure 1-1: Location of the MCCO Project in relation to Muswellbrook.**

**Figure 1-2. Aerial showing the MCCO Project Area, the MCCO Additional Project Area, and the Proposed Disturbance Footprint.**



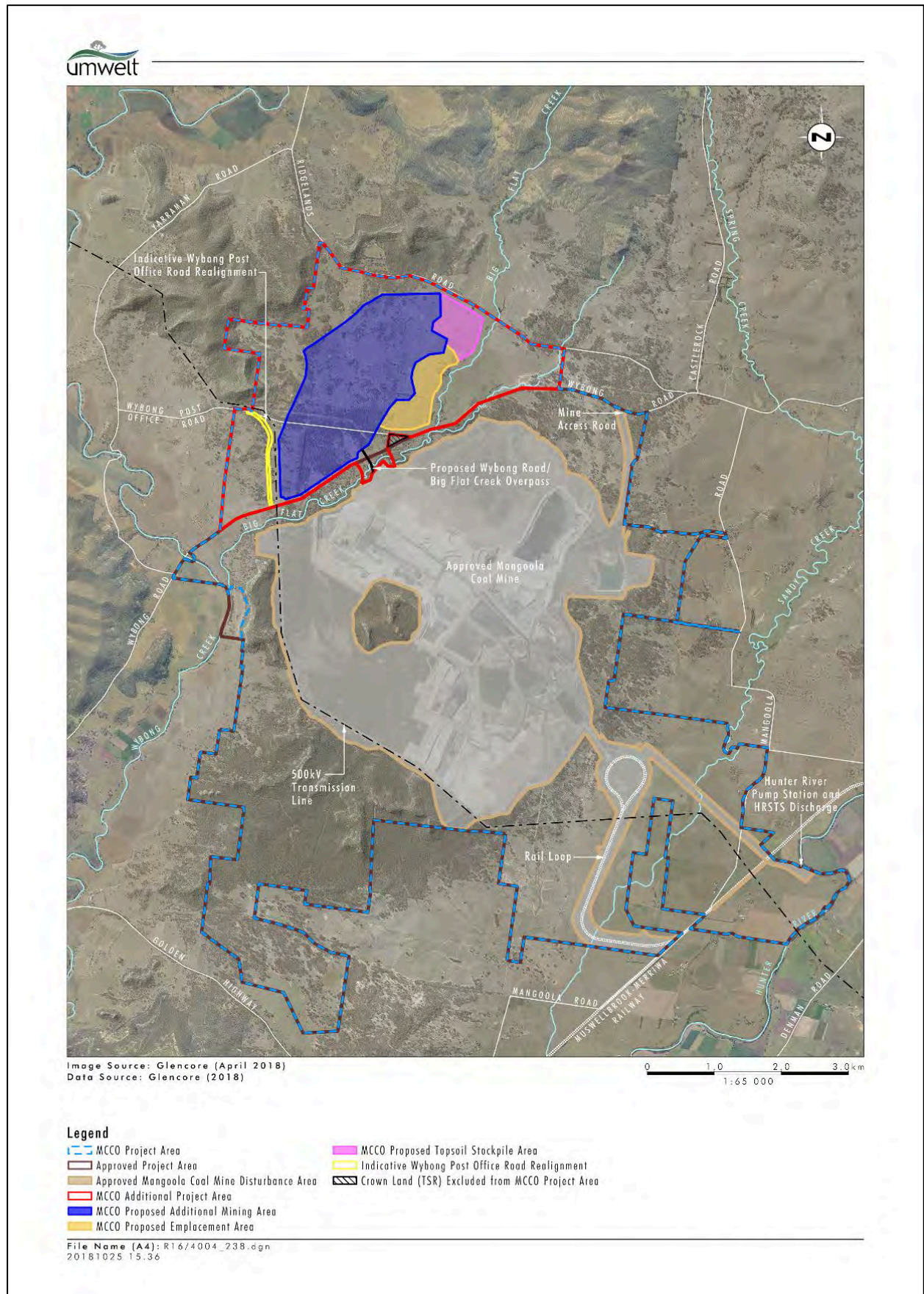
## 1.2 THE MCCO PROJECT

The MCCO Project generally comprises:

- Open cut mining at up to the same rate as that currently approved (13.5 million tonnes per annum (Mtpa) of run of mine (ROM) coal) using truck and excavator mining methods
- continued operations within the existing Mangoola Coal Mine
- Mining operations in a new mining area located north of the existing Mangoola Coal Mine, Wybong Road, south of Ridgeland Road and east of the 500 kilovolt (kV) Electricity Transmission Line (ETL)
- Construction of a haul road overpass over Big Flat Creek and Wybong Road to provide access from the existing mine to the proposed Additional Mining Area
- Establishment of an out-of-pit overburden emplacement area
- Distribution of overburden between the proposed Additional Mining Area and the existing mine in order to optimise the final landform design of the integrated operation.
- Realignment of a portion of Wybong Post Office Road
- The use of all existing or approved infrastructure and equipment for the Mangoola Coal Mine with some minor additions to the existing mobile equipment fleet
- Construction of a water management system to manage sediment laden water runoff, divert clean water catchment, provide flood protection from Big Flat Creek and provide for reticulation of mine water. The water management system will be connected to that of the existing mine
- Continued ability to discharge excess water in accordance with the Hunter River Salinity Trading Scheme (HRSTS)
- Establishment of a final landform in line with current design standards at Mangoola Coal Mine including use of natural landform design principles consistent with the existing site
- Rehabilitation of the proposed Additional Mining Area using the same revegetation techniques as at the existing mine
- A likely construction workforce of approximately 145 persons. No change to the existing approved operational workforce
- Continued use of the mine access for the existing operational mine and access to/from Wybong Road, Wybong Post Office Road and Ridgeland Road to the MCCO Additional Project Area for construction, emergency services, ongoing operational environmental monitoring and property maintenance.

**Figure 1-3** illustrates the key features of the MCCO Project. There are no proposed changes to the extraction areas or approved disturbance areas at the existing and approved Mangoola Coal Mine with all new proposed project features contained within the Proposed Disturbance Footprint as shown on **Figure 1-2**.



**Figure 1-3. MCCO Additional Project Area: Conceptual Project Layout.**



### 1.3 THE MCCO ADDITIONAL PROJECT AREA

The MCCO Additional Project Area has been used extensively for agriculture since the 1800s and is comprised of rolling grazing land and patches of native woodland. The land to the immediate south is occupied by the existing Mangoola Coal Mine which is surrounded by Mangoola owned buffer land. To the north and east are further areas of Mangoola owned grazing land and existing ecological offsets. Land to the north-west includes a parcel of forested Crown Land which is surrounded by private grazing properties associated with the community of Manobalai and further west by privately owned properties associated with the community of Wybong. The nearest townships are Muswellbrook and Denman which lie approximately 20 km east and 10 km west of the MCCO Additional Project Area respectively.

The MCCO Additional Project Area comprises approximately 1062 hectares (ha) located in largely cleared land to the north of the existing Mangoola operations. Of this area, approximately 623 ha is contained within the Proposed Disturbance Footprint where all MCCO Project impacts will be located. The remaining 439 ha within the MCCO Additional Project Area will not be impacted by the MCCO Project (**Figure 1-4**) and operations within the existing approved Mangoola Coal Mine will continue as approved by PA 06\_0014 with no new disturbance proposed.

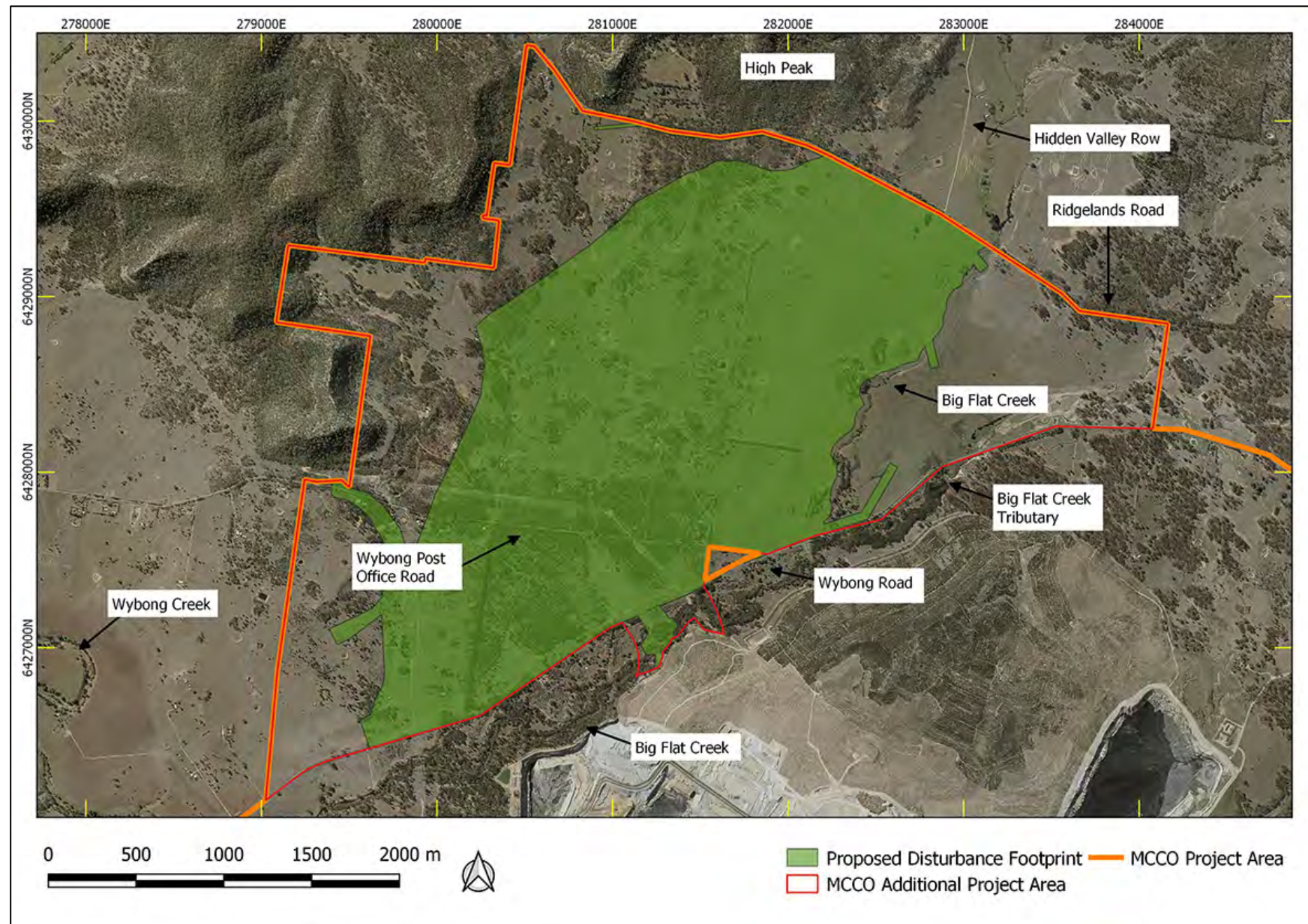
The topography of the MCCO Additional Project Area is characterised by lower slopes, giving way to undulating hills and rocky outcrops to the north and west. Lower topographic areas are associated with drainage lines feeding Big Flat Creek to the south.

A dominant topographical feature in the surrounding landscape is the series of undulating wooded hills which occur outside and to the north of the MCCO Additional Project Area. These hills rise to a maximum height of approximately 360 metres (m) Australian Height Datum (AHD) and are elevated approximately 200 m above the surrounding area.

The MCCO Project lies entirely within the catchment of Big Flat Creek, which is part of the upper catchment of the Hunter River. Big Flat Creek drains south-westerly through the MCCO Additional Project Area before it converges with a major tributary and continues below the southern boundary of the MCCO Additional Project Area. Most local Aboriginal sites have been recorded in proximity to Big Flat Creek south of the MCCO Additional Project Area.

The MCCO Additional Project Area has been subject to agricultural land uses, including intensive grazing and pasture improvement. Remnant native vegetation is generally confined to watercourses, roadsides and areas of steeper topography that are not suitable for agricultural purposes.

Figure 1-4: Aerial showing the MCCO Additional Project Area.



## **1.4 EXISTING ARCHAEOLOGICAL MANAGEMENT AT THE MANGOOLA COAL MINE**

### **1.4.1 Background**

Originally established as Anvil Hill Open Cut Mine in 2007 following the granting of Project Approval (PA 06\_0014) to Centennial Hunter Pty Limited, Mangoola acquired the mine in October 2007 and it was subsequently renamed as the Mangoola Coal Mine.

In accordance with Project Approval PA 06\_0014, a Mangoola Open Cut *Aboriginal Cultural Heritage Management Plan* (ACHMP) was developed in consultation with the relevant Aboriginal parties and was approved by the Department of Planning (now Department of Planning and Environment: DPE). Since the initial Project Approval was issued, Mangoola Coal Mine has undergone eight modifications to that approval. As required, the ACHMP has been updated and approved by DPE when these modifications had an effect on Aboriginal cultural heritage. The current ACHMP was first developed in December 2014, was reviewed in December 2017, and the revision approved by DPE on 5 November 2018 (MANOC-1772150304-4642).

Should the MCCO Project be approved, the ACHMP will require updating to consider the Aboriginal cultural heritage values of the MCCO Additional Project Area. This revised ACHMP should contain the management recommendations set out in this AAIA (see **Section 8**). As such, these recommendations also need to comply with the existing management regime already in place at the Mangoola Coal Mine. What follows is a summary of the most relevant sections from the existing ACHMP.

### **1.4.2 Aboriginal Cultural Heritage Offsets (ACHOAs)**

The Mangoola Coal Mine incorporates several areas set aside as offsets for their Aboriginal cultural and/or ecological values. The approved ACHOAs include 1225 ha of land located along Big Flat Creek, Anvil Hill, Wallaby Rocks, the Limb of Addy Hill and a section of Wybong Creek and an associated rocky outcrop. These areas are joint offsets set aside for long term security due to their Aboriginal cultural and ecological values. An additional area (the SC10 Management Zone) is subject to long term security for the life of the mine due to its Aboriginal cultural value. Other ecological offset areas include Habitat Enhancement Offset areas, Sustainable Agricultural Offset areas and designated corridors designed to provide vegetated connectivity to areas outside the Mangoola Coal Mine.

In accordance with Project Approval PA 06\_0014, Mangoola is required to identify measures that are implemented to protect Aboriginal sites located within the ACHOAs and to provide a detailed plan for the management of Aboriginal cultural heritage values of high significance within these areas. This must be done in a manner that recognises that Mangoola will be required to undertake activities within these areas to ensure compliance with other approval conditions and the requirements of other management plans.

Annual inspections of the ACHOAs and SC10 Management Zone are currently undertaken to ensure that these areas and the sites they contain are not adversely affected by mining activities (be it directly or indirectly) and to monitor the effects of activities required under other management plans (such as revegetation works) (see ACHMP Section 3.6.1.1).

#### **1.4.3 Management activities**

Many of the management activities required to be undertaken for the life of the mine have already been completed in compliance with ACHMP requirements. These include:

- Commencement of an annual Aboriginal community consultation meeting process
- Development and implementation of a Blast Monitoring Program that includes a protocol for evaluating and monitoring blasting impacts on rockshelters and demonstrating compliance with blasting criteria
- Survey of previously unsurveyed areas in proposed revegetation areas in relevant offset areas and development of management strategies for sites identified in these areas
- Salvage of archaeological sites within the Approved Project Area
- Continued Implementation of an Aboriginal Cultural Education Program as part of the induction process for employees and contractors
- Fencing and signage of ACHOAs and SC10 Management Zone
- Removal of stock and initiation of feral animal control within ACHOAs/SC10 Management Zone and sites to be managed for *in situ* conservation
- Development of site-specific ground vibration impact assessment criteria for rockshelters that may be affected by blasting operations, with blast monitoring report provided to DPE.

#### **1.4.4 Aboriginal party consultation**

Aboriginal people have rights and interests in their heritage and the involvement of Aboriginal people in the protection and management of their heritage is critical in maintaining the identity, health and well-being of Aboriginal people. Consultation with Aboriginal people is therefore a critical component of the ACHMP and of ongoing management of cultural heritage at the Mangoola Coal Mine.

#### **1.4.5 Management of sites outside of the currently approved operations**

In accordance with Project Approval PA 06\_0014, sites located outside currently approved disturbance areas (but within lands owned/managed/subject to activities conducted by Mangoola) should be protected.

All sites are listed on the Mangoola Coal Mine Aboriginal sites database that forms part of the internal geographic information system (GIS) system. These records are checked prior to the

issuing of any on-site approval for ground disturbance works. A Ground Disturbance Permit (GDP) is required prior to any ground disturbing activities (see ACHMP Section 3.2.1).

#### **1.4.5.1 New site recordings**

All new sites (regardless of site type and whether or not they fall within currently approved disturbance areas) will be recorded in accordance with NSW Office of Environment and Heritage (OEH) requirements, including submission of a site card to OEH in accordance with Section 89A of the *National Parks and Wildlife Act 1974* (NPW Act). In addition, all new sites are listed on the Mangoola Coal Aboriginal archaeological sites GIS database.

Should a previously unknown Aboriginal scarred tree be identified, all works near the site will cease and the Mangoola Coal Mine Environment and Community Department will be informed of the presence of the site. The opportunity will then be provided to a qualified archaeologist, at least two Aboriginal party representatives and a qualified arborist (if required) to inspect the newly identified tree and evaluate whether the scarring is a result of Aboriginal cultural activities and, if this is the case, to assess the Aboriginal cultural and archaeological significance of the site (see ACHMP Sections 3.3 and 3.4).

#### **1.4.5.2 Human skeletal remains**

If a potential burial site or potential human skeletal material is exposed, the procedure should follow the *Policy Directive – Exhumation of Human Remains* (NSW Department of Health 2008), *Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977* (NSW Heritage Office 1998) and the *Aboriginal Cultural Heritage Standards and Guidelines Kit* (NPWS 1997) (see ACHMP Section 3.5).

### **1.5 RELEVANT LEGISLATION**

Cultural heritage is managed by several state and national Acts. Baseline principles for the conservation of heritage places and relics can be found in the *Burra Charter* (Australia ICOMOS 2013). The *Burra Charter* has become the standard of best practice in the conservation of heritage places in Australia, and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The *Burra Charter* generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a state level.

Several Acts of parliament provide for the protection of heritage at various levels of government.



### 1.5.1 State legislation

#### ***Environmental Planning and Assessment Act 1979*** (EP&A Act)

This Act, amended by the *Environmental Planning and Assessment Amendment Act 2017*, establishes requirements relating to land use and planning. The framework governing environmental and heritage assessment in NSW is contained within the following parts of the EP&A Act:

- **Part 4:** Local government development assessments, including heritage. May include schedules of heritage items;
  - **Division 4.7:** Approvals process for state significant development.

As the MCCO Project is a State Significant Development (SSD), Section 4.41 of the EP&A Act (formerly Section 89J) applies and certain authorisations, such as an Aboriginal Heritage Impact Permit (AHIP), are not required for the MCCO Project. This section also provides a defence for any investigative or other activities that are required to be carried out for the purpose of complying with any environmental assessment requirements (i.e. SEARs: see below).

#### ***Secretary's Environmental Assessment Requirements***

Secretary's Environmental Assessment Requirements (SEARs) were issued for the MCCO Project (SSD 8642) on 15 February 2019.

The SEARs recognise heritage as a key issue to be examined in the EIS and state (in part):

*an assessment (will be undertaken) of the potential impacts of the development on Aboriginal heritage (cultural and archaeological), including consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage*

To inform the SEARs, OEH provided input regarding Aboriginal cultural heritage. The OEH input is set out in **Table 1-1** along with a concordance of where the OEH requirements are addressed in this AAIA.

#### ***National Parks and Wildlife Act 1974*** (NPW Act)

Amended during 2010, the NPW Act provides for the protection of Aboriginal objects (sites, objects and cultural material) and Aboriginal places. Under the Act (Part 6), an Aboriginal object is defined as: any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises NSW, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains.

An Aboriginal place is defined under the NPW Act as an area which has been declared by the Minister administering the Act as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.

As the MCCO Project is a State Significant Development (SSD), Section 4.41 of the EP&A Act applies and an AHIP under section 90 of the NPW Act to harm Aboriginal objects is not required. Instead, all management related to Aboriginal cultural heritage within the MCCO Additional Project Area will be governed by the policies within an approved ACHMP.

Identified Aboriginal items and sites are registered on the OEHS administered Aboriginal Heritage Information Management System (AHIMS).

### 1.5.2 Commonwealth legislation

#### ***Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)***

Matters of National Environmental Significance listed under the EPBC Act include the National Heritage List and the Commonwealth Heritage List, both administered by the Commonwealth Department of the Environment and Energy. Ministerial approval is required under the EPBC Act for proposals involving significant impacts to National/Commonwealth heritage places.

### 1.5.3 Applicability to the MCCO Project

The MCCO Project will be assessed under Divisions 4.1 and 4.7 of the EP&A Act.

Any Aboriginal sites within the MCCO Additional Project Area are afforded legislative protection under the NPW Act. It is noted, however, that Section 4.41 of the EP&A Act removes the requirement for SSD projects to apply for an AHIP to harm Aboriginal objects.

It is noted there are no Commonwealth or National heritage listed places within the MCCO Additional Project Area, and as such, the heritage provisions of the EPBC Act do not apply.

The OEHS requirements set out in the SEARs are listed in **Table 1-1**, along with a concordance of where this requirement, if applicable, is addressed in this AAIA.

**Table 1-1: Concordance between the OEHS input to the SEARs and this AAIA.**

OEHS requirement	Where addressed in the AAIA
The EIS must identify and describe Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in the EIS. This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the <i>Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW</i> (DECCW 2011) and consultation with OEHS regional officers.	This AAIA contains the results of the archaeological survey and test excavation program undertaken for the MCCO Project. It also assesses the scientific, or archaeological, values present within the MCCO Additional Project Area. This report is part of the ACHAR that will examine the cultural, aesthetic and historic values of the MCCO Additional Project Area.
Where Aboriginal cultural heritage values are identified, consultation with Aboriginal people must be undertaken and documented in accordance with the <i>Aboriginal cultural heritage consultation requirements for proponents 2010</i> (DECCW). The significance of cultural heritage values for	This requirement has been followed by the MCCO Project and is documented in the ACHAR.

OEH requirement	Where addressed in the AAIA
Aboriginal people who have a cultural association with the land must be documented in the EIS.	
Impacts on Aboriginal cultural heritage values are to be assessed and documented in the EIS. The EIS must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEHL.	Impacts to the scientific values within the MCCO Additional Project Area are discussed in <b>Section 7.3</b> . Management considerations ranging from a 'do nothing' scenario through to an 'unavoidable impact' scenario is discussed in <b>Section 8.2</b> . Conservation outcomes are discussed in <b>Section 8.3.5</b> .
Where the project's footprint occurs in areas identified by the EIS as sensitive Aboriginal Cultural heritage (ACH) areas, surface surveys must be undertaken by a qualified archaeologist to determine the presence or absence of Aboriginal objects and the significance of those objects. The result of the surface survey is to inform the need for targeted subsurface test excavation to better assess the integrity, extent, distribution, nature and overall significance of the archaeological record. The results of surface surveys and test excavations undertaken at this stage are to be documented in the EIS.	This AAIA presents the results of the archaeological survey in <b>Section 5</b> and the test excavation program in <b>Section 6</b> . The assessment of scientific significance of the results from these investigations is presented in <b>Section 7.2</b> .
Where the project's footprint is unknown at the submission of the EIS, point C above ( <i>i.e. the requirement above</i> ) applies if the future footprint occurs in areas identified by the EIS as sensitive ACH areas.	This requirement is not applicable as the entire MCCO Additional Project Area was assessed; not just the Proposed Disturbance Footprint. As all impacts associated with the MCCO Project will be contained within the MCCO Additional Project Area, the disturbance footprint has been assessed in full; even if there is a need for this footprint to change slightly due to project design changes.
The EIS must outline procedures to be followed if Aboriginal objects are found at any stage of the life of the project to formulate appropriate measures to manage unforeseen impacts.	This requirement will be contained in an updated and approved ACHMP. The policy for new discoveries contained within the existing ACHMP is set out in <b>Section 1.4.5.1</b> and it is recommended in <b>Section 8.3.6</b> that this policy be carried over into the updated ACHMP that will incorporate the MCCO Project should it be approved.
The EIS must outline procedures to be followed in the event Aboriginal burials or skeletal material is uncovered during construction to formulate appropriate measures to manage the impacts to this material.	This requirement will be contained in an updated and approved ACHMP. The policy for new discoveries contained within the existing ACHMP is set out in <b>Section 1.4.5.2</b> and it is recommended in <b>Section 8.3.7</b> that this policy be carried over into the updated ACHMP that will incorporate the MCCO Project should it be approved.
The cumulative impacts from all clearing activities and operations, associated edge effects and other indirect impacts on cultural heritage, biodiversity and OEHL Estate need to be comprehensively assessed in accordance with the <i>Environmental Planning and Assessment Act 1979</i> .	The cumulative impact of the proposed MCCO Project on the area's scientific values is discussed in <b>Section 7.3.2</b> .

## 1.6 ASSESSMENT APPROACH

The current assessment follows the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010).

Field assessment and reporting followed the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEHL 2011).

## 2 THE ARCHAEOLOGICAL ASSESSMENT

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### 2.1 PURPOSE AND OBJECTIVES

The purpose of the AAIA is to identify and assess heritage constraints relevant to the MCCO Project.

#### 2.1.1 Aboriginal archaeological assessment objectives

The AAIA will apply the Code of Practice, in the completion of an Aboriginal archaeological assessment, to meet the following objectives:

**Objective One:** Undertake background research on the region to formulate a predicative model for Aboriginal site location within the MCCO Additional Project Area

**Objective Two:** Identify and record objects or sites of scientific or archaeological significance within the MCCO Additional Project Area, as well as any landforms likely to contain further archaeological deposits

**Objective Three:** Assess the likely impacts of the MCCO Project to Aboriginal archaeological sites and/or deposits and provide management recommendations.

### 2.2 DATE OF ARCHAEOLOGICAL ASSESSMENT

The fieldwork component of this assessment was undertaken by OzArk from 5–16 February 2018. Test excavation and additional survey occurred from 15–18 May 2018.

From 5–16 February the survey team consisted of two teams, each including two OzArk archaeologists and up to four representatives from the Aboriginal community. From 15–18 May the survey team consisted of a single team of two archaeologists and four members of the Aboriginal community.

### 2.3 ABORIGINAL COMMUNITY INVOLVEMENT

The MCCO Project has followed the Aboriginal Cultural Heritage *Consultation Requirements for Proponents* including the identification of Registered Aboriginal Parties (RAPs) and the provision of both survey and test excavation methodologies for RAP review and comment (**Appendix 1; Appendix 2**).

RAPs, or their representatives, accompanied the field survey and test excavation program. As up to eight members of the Aboriginal community were present for the first two weeks of survey and up to four members of the Aboriginal community were present for the third week of survey and test excavation, up to 96-person days of Aboriginal community involvement has been included in the assessment.

At the end of the main portion of the survey in February 2018, all RAPs were sent an update to inform them of the progress of the investigation (**Appendix 3**).

Full details of the consultation undertaken is provided in the ACHAR that this AAIA supports.

### 2.3.1 RAP review of the draft AAIA

On 19 December 2018, all RAPs were provided with the opportunity to review a draft of this AAIA (along with a draft of the ACHAR). Comments were sought from the RAPs by the 25 January 2019 to account for the Christmas period.

At the end of the review period, nine comments were received either by email or phone. A summary of the responses received are shown on **Table 2-1**. Of these comments, only the responses from Jarban & Mugrebea, and the Plains Clans of the Wonnarua People (PCWP), dealt with the archaeological values of the MCCO Additional Project Area and these will be responded to below.

**Table 2-1: RAP comments on the draft AAIA.**

RAP	Comment on the draft AAIA
Aboriginal Native Title Consultants	Per phone conversation with Lori Dennen-King (Mangoola) (LDK) (11/1/19 @ 14:55am) - Margaret wanted it noted that she and John agreed with everything in the document.
Amanda Hickey Cultural Services (AHCS)	Per phone conversation with LDK (9/1/19 @ 3:33pm) - "I am happy with report." No additional comments received.
Didge Ngunawal Clan	15/1/19 - comments received via email from Paul Boyd and Lilly Carroll – "DNC is happy with all upcoming proposals that is occurring at Muswellbrook".
Gomery Cultural Consultants	Per phone conversation with LDK on 25/1/19 @ 9:24 "agree with management measures" - comment submitted verbally because FAX is not working, and he does not have email.
Jarban & Mugrebea	16/1/19 - comments received via email from Les Atkinson – "From Jarban + Mugrebea the ACHAR report looks all ok. Uncle Barry French, commented that the rock shelters could they be able to be monitored on a 1/2 yearly basis as to mine blasting?  Also, that the significance of the Skull Rock landscape feature (Just outside the footprint) (attach a photo in the report?) Which may be a marker in the song line? This is visual alignment from the Wingen Maid to the northeast (Murrundi) and possible to other landscape features such as Biamia Cave to southern end (Milbradale)"
PCWP	15/1/19 - comments received via email from Will Moon (Archaeologist) - see below
Wallangan Cultural Services	Per phone conversation with LDK (11/1/19 @ 13:33) - Maree was quite happy with ACHAR.
Wanaruah Local Aboriginal Land Council (WLALC)	24/1/19 - comments received via email from Noel Downs – The WLALC comments were related to cultural values, rather than archaeological values. As such, these will be discussed in the ACHAR, rather than this AAIA.
Widescope Indigenous Group Pty Ltd	13/1/19 - comments received via email from Steven Hickey – "Thank you, I have reviewed and support the Draft Aboriginal Cultural Values Assessment Report".

The Jarban & Mugrebea response made comment on two aspects of the AAIA:

- That the rock shelters be monitored on a half-yearly basis
- That a record of the Skull Rock landscape be included in the AAIA.

The OzArk reply to these comments follow:



- Recommendation 6 states that further archaeological investigation be undertaken at each of the rock shelters to determine the most appropriate management regime for each shelter. For example, should further archaeological investigation show that there is no potential archaeological deposit (PAD) at a shelter, then further management will not be required at that shelter. However, should a shelter show evidence of a PAD then appropriate management will be devised in consultation with the RAPs.
- Prior to the survey the Wanaruah Local Aboriginal Land Council (WLALC) response included a reference to Skull Rock. As neither Mangoola nor OzArk were aware of this landscape feature, Mangoola asked the WLALC on 30 January 2018 for further information. Although this query was prior to the survey, Mangoola did not receive a reply from the WLALC. During the survey, none of the attending Aboriginal community mentioned the Skull Rock formation. As such, OzArk remains uncertain exactly where this landscape feature is located, but as it is outside of the MCCO Additional Project Area, it will not be impacted by the MCCO Project.

The PCWP made comment on three aspects of the AAIA:

- That the AAIA did not include sufficient analysis of the artefact assemblage to enable a meaningful understanding of how the MCCO Additional Project Area relates to the broader Hunter Valley archaeological context
- To undertake a geomorphological assessment of those artefact scatter sites with moderate or low–moderate value, plus the four sites in the proposed disturbance footprint, to determine if they may contain deposits and datable material
- The archaeological investigation of the rockshelters should be conducted in a way that takes the opportunity to contribute towards expanding our understanding of shelter use in the area, rather than just to update the site cards.

The OzArk reply to these comments follow:

- The analytical investigations highlighted by the PCWP are admirable but are only applicable in instances where the archaeological data allows meaningful analysis. As the MCCO Project Area contains no undisturbed sites and few sites with more than a handful of artefacts in secondary contexts, further analysis would be misleading. However, elucidating the context of the MCCO Additional Project Area within the broader Hunter Valley context will be added as an aim of the salvage phase of the archaeological investigation should such data during become evident (see **Section 8.4.2**)
- As shown in **Table 8-1**, all sites within the Proposed Disturbance Footprint that have been assessed as having scientific significance greater than 'low' (37-2-2193 and 37-2-4119) will be subject to further archaeological investigation including manual excavation. The other sites with scientific values greater than 'low' are located outside of the Proposed Disturbance Footprint and will not be impacted by the MCCO Project. Further, five of the most significant sites in terms of archaeological values (37-2-5440, 37-2-5441, 37-2-5442, 37-2-5812, and 37-2-5813) are located within the MCCO Cultural Heritage Management Area where the sites will be conserved. OzArk does not agree to further invasive geomorphological testing at sites outside of the Proposed Disturbance Footprint, and as all sites of higher scientific value within the Proposed Disturbance Footprint will be archaeologically investigated, the aims of the PCWP comment will be attained

- OzArk appreciates the comments of the PCWP in terms of the rockshelter investigations and would be interested in obtaining further cultural information prior to the archaeological investigations commencing. As such, a recommendation has been added to this AAIA that an excavation methodology pertaining to the rockshelter investigations be sent to all RAPs prior to any investigation to enable further comments to be received from RAPs (see **Section 8.3.4**).

## **2.4 OZARK INVOLVEMENT**

### **2.4.1 Field assessment**

The fieldwork component for the AAIA was undertaken by:

- Fieldwork Director: Ben Churcher (OzArk Principal Archaeologist; BA[Hons], Dip Ed)
- Archaeologist: Philippa Sokol (OzArk Project Archaeologist)
- Archaeologist: Stephanie Rusden (OzArk Project Archaeologist)
- Archaeologist: Tom Dooley (OzArk Graduate Archaeologist).

### **2.4.2 Reporting**

The reporting component of the AAIA was undertaken by:

- Report Author: Ben Churcher
- Contributor: Tom Dooley.

### 3 LANDSCAPE CONTEXT

An understanding of the environmental contexts of a project area is requisite in any Aboriginal archaeological investigation (DECCW 2010). It is a particularly important consideration in the development and implementation of survey strategies for the detection of archaeological sites. In addition, natural geomorphic processes of erosion and/or deposition, as well as humanly activated landscape processes, influence the degree to which these material culture remains are retained in the landscape as archaeological sites; and the degree to which they are preserved, revealed and/or conserved in present environmental settings.

The MCCO Additional Project Area is located wholly within the Hunter Subregion of the Sydney Basin Bioregion (SBB). The Hunter Subregion is situated at the far north of the SBB and contains the townships of Scone, Muswellbrook, Singleton, Cessnock, Maitland and the city of Newcastle. The Hunter subregion is predominantly comprised of rolling hills, wide valleys and the meandering system of the Hunter River on a wide floodplain. A wide range of environments are present within the greater subregion including coastal, dune, estuarine, rainforest, plateau, lowland, riparian and swamp ecosystems; not all of which are represented in the MCCO Additional Project Area. The Hunter Subregion encompasses the catchments of Goulburn, Hunter, and Paterson Rivers (NSW NPWS 2016).

#### 3.1 TOPOGRAPHY

The MCCO Additional Project Area falls within the south-eastern portion of the Merriwa Plateau topographic zone of the Hunter central lowlands. This greater landscape is characterised by undulating or gently-sloping lowlands developed on weak sedimentary rock above the alluvial belt of the Hunter River, abruptly transitioning into steep country more than 500 m Australian Height Datum (AHD) (EMM 2018). The topography of the MCCO Additional Project Area is largely consistent with this broader landscape. Elevation is at its greatest (up to 360 m AHD) on the steep sandstone conglomerate ridges to the northwest, north, and northeast abruptly transitioning into undulating hills and gentle-moderate slopes. These gentle landforms represent the greatest portion of the landscape, together forming a broad slope southward towards Big Flat Creek before levelling out into flats (**Figure 3-1**). The small catchment area and smoothly hilly nature of this landscape means that the MCCO Additional Project Area encompasses few significant drainage lines.

For the purposes of this assessment, this landscape can be divided into several survey units based on topographic zones which inform an archaeological characterisation of its landforms. For convenience, the topography of these zones can be divided into two main areas: hilly terrain and flat terrain. These contiguous areas can be briefly characterised as follows:

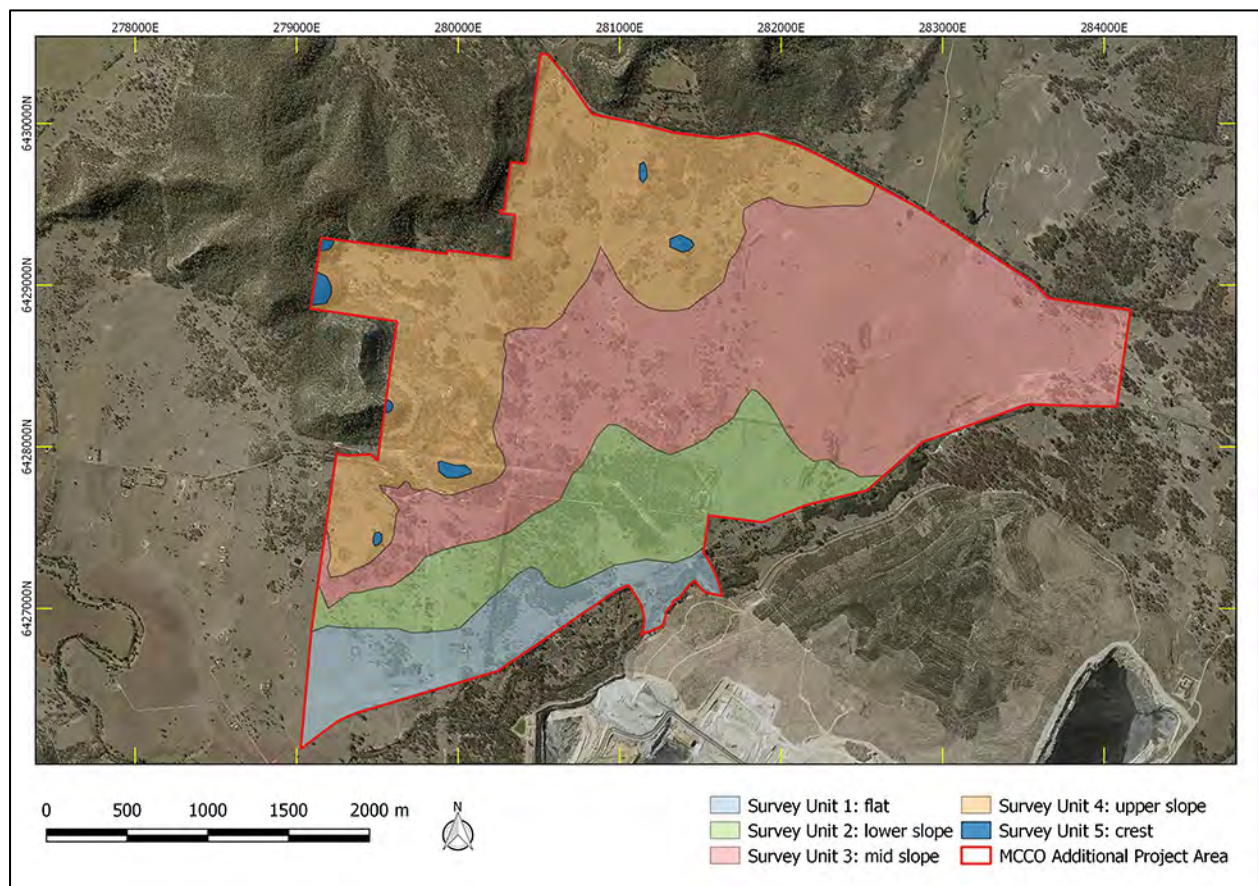
- **Hilly terrain:** Approximately 335 ha or 32 per cent of the MCCO Additional Project Area consists mostly of elevated landforms (upper slopes and crests) and is predominantly

located in the west of the MCCO Additional Project Area. This topography contains steep slopes in places but is more generally characterised by moderate slopes and ridge lines. These landforms currently support areas of open woodland of regenerated trees with very few mature trees, as well as cleared, grassed paddocks. Rock outcrops are common and in places, particularly in the far west, the lower reaches of escarpments are included in the MCCO Additional Project Area. Soils tend to be very thin due to soil loss when this area was historically cleared of vegetation.

- **Flat terrain:** Approximately 720 ha or 68 per cent of the MCCO Additional Project Area consists of flat terrain or gently undulating terrain (flat, lower slope and mid slope landform units). This terrain contains the only named waterway within the MCCO Additional Project Area: Big Flat Creek. However, Big Flat Creek is not a developed waterway in the MCCO Additional Project Area and there are few landforms that could be characterised as 'drainage landforms' (i.e. creek flats/floodplains/terraces). Most of this landscape zone is currently cleared and either consists of grass paddocks or small stands of regenerating woodland. Soil depths are variable, and it is only in the south of the MCCO Additional Project Area adjacent to Big Flat Creek where aggrading conditions have allowed some soil depth to accumulate.






**Figure 3-1** maps the major topographic zones of the MCCO Additional Project Area and **Figure 3-2** shows a representative view of each of these topographic zones.

**Figure 3-1: Aerial showing the major topographic zones at the MCCO Additional Project Area.**





**Figure 3-2: Examples of the topography of each survey unit.**

	
<p>1. View of landforms comprising Survey Unit 1: flat terrain.</p>	<p>2. View of landforms comprising Survey Unit 2: lower slopes.</p>
	
<p>3. View of landforms comprising Survey Unit 3: mid slopes.</p>	<p>4. View of landforms comprising Survey Unit 4: upper slopes.</p>
	
<p>5. View of landforms comprising Survey Unit 5: crests.</p>	



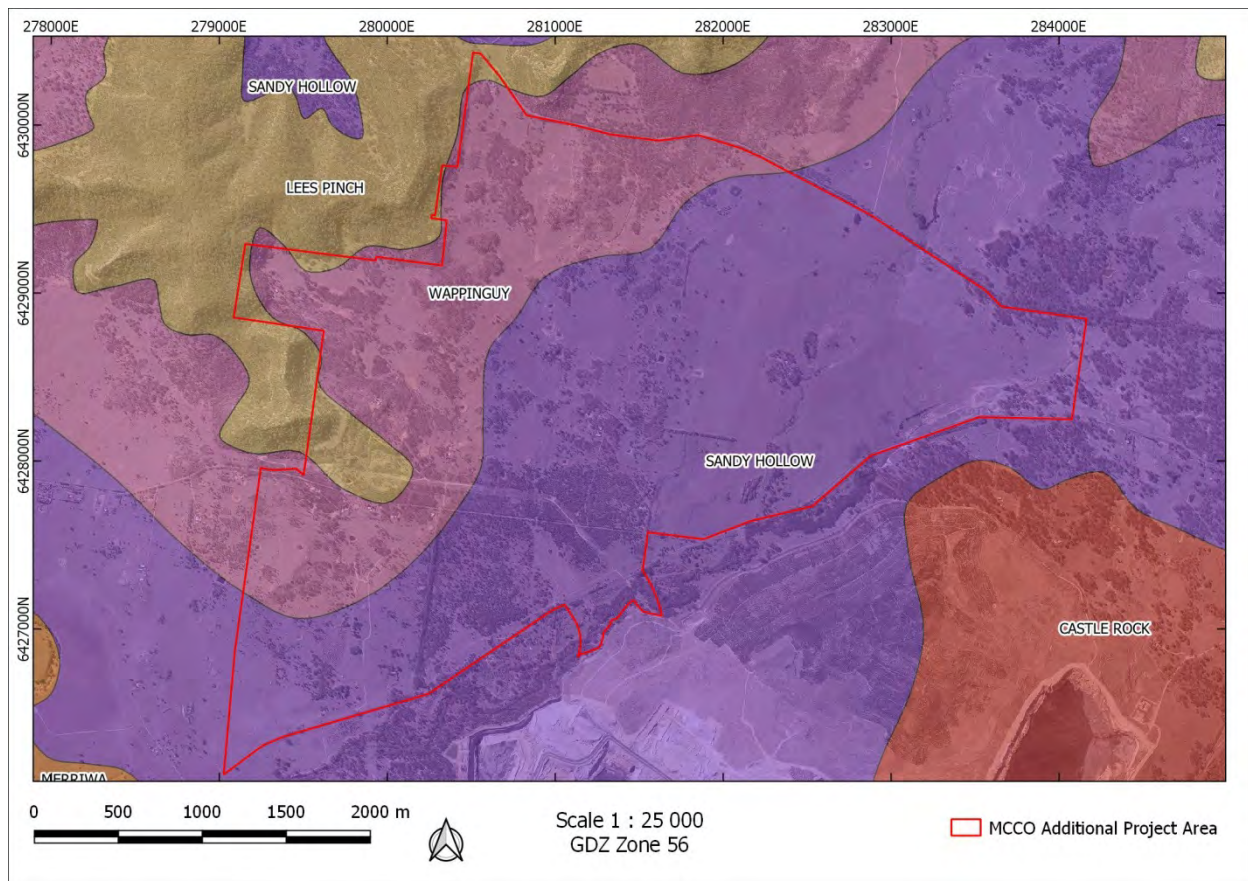
### 3.2 GEOLOGY AND SOILS

The MCCO Additional Project Area is situated on the edge of the Permian Singleton Coal Measures mapping with much of the surface geology being formed by the Triassic Narrabeen group (as determined both from regional geological mapping and from detailed geological investigations undertaken with the MCCO Additional Project Area). The detailed soil survey undertaken within the MCCO Additional Project Area found that the soils have mostly been derived from the Triassic Narrabeen group. The Sodosol and Tenosol soils found in the MCCO Additional Project Area generally support the soil landscape mapping done by Kovac and Lawrie (1991) (with some localised boundary readjustments) (**Figure 3-3**). EMM (2018: 20) summarise these soil landscapes as:

- **Sandy Hollow:** The Sandy Hollow soil landscape covers rolling to steep hills in the northern part of the southern mountains, the central Goulburn Valley and the south-eastern part of the Merriwa Plateau (Kovac and Lawrie 1991). This landscape is the dominant soil landscape in the MCCO Additional Project Area. The main soils associated with this unit are Yellow and Brown solodic soils. Yellow and Brown Earths can be found on footslopes and on better drained slopes Yellow Podzolic Soil and Earthy Sands occur (Kovac and Lawrie 1991). Minor sheet and rill erosion occur on slopes and moderate gully erosion can occur within drainage lines in this landscape.
- **Wappinguy:** The Wappinguy soil landscape occurs on the edge of the Merriwa Plateau and is associated with undulating low hills. This is the second dominant landscape in the MCCO Additional Project Area. The soil types are sourced from a variety of parent materials creating a varied soil landscape where Black Earths, Glayed Soloths and Prairie Soils occur along drainage lines; Solodic soils, Brown Clays and Red Earths occur on slopes and Earthy Sands occur on sandstone outcrops (Kovac and Lawrie 1991). The landscape is prone to minor to moderate gully erosion and moderate sheet and rill erosion on cleared areas.
- **Lees Pinch:** The Lees Pinch soil landscape is associated with outcropping steep hills and covers a small part of the MCCO Additional Project Area. Soils are generally shallow Solodic Soils or Siliceous Sands and minor to moderate sheet and rill erosion can occur with mass colluvium movement on steep slopes (Kovac and Lawrie 1991).

The alluvial influence along Wybong Creek and Big Flat Creek has also played a part in the soil formation in the MCCO Additional Project Area, with alluvial derived soils in the southern portion of the MCCO Additional Project Area and some alluvial influence further on the flats (EMM 2018).

The majority of the MCCO Additional Project Area is covered by soils that have a minor to moderate susceptibility to erosion and poor fertility. The soils also generally have a high salinity when compared to neighbouring areas.

**Figure 3-3: Aerial showing the soil landscapes of the MCCO Additional Project Area.**

### 3.3 HYDROLOGY

The only named watercourse in the MCCO Additional Project Area is Big Flat Creek and the MCCO Additional Project Area falls within this creek's catchment (**Figure 3-4**). Big Flat Creek starts near Castle Rock at an elevation of 229 m and ends at an elevation of 134 m merging with Wybong Creek to the southwest. Big Flat Creek drops around 95 m over its 8.7 km length.

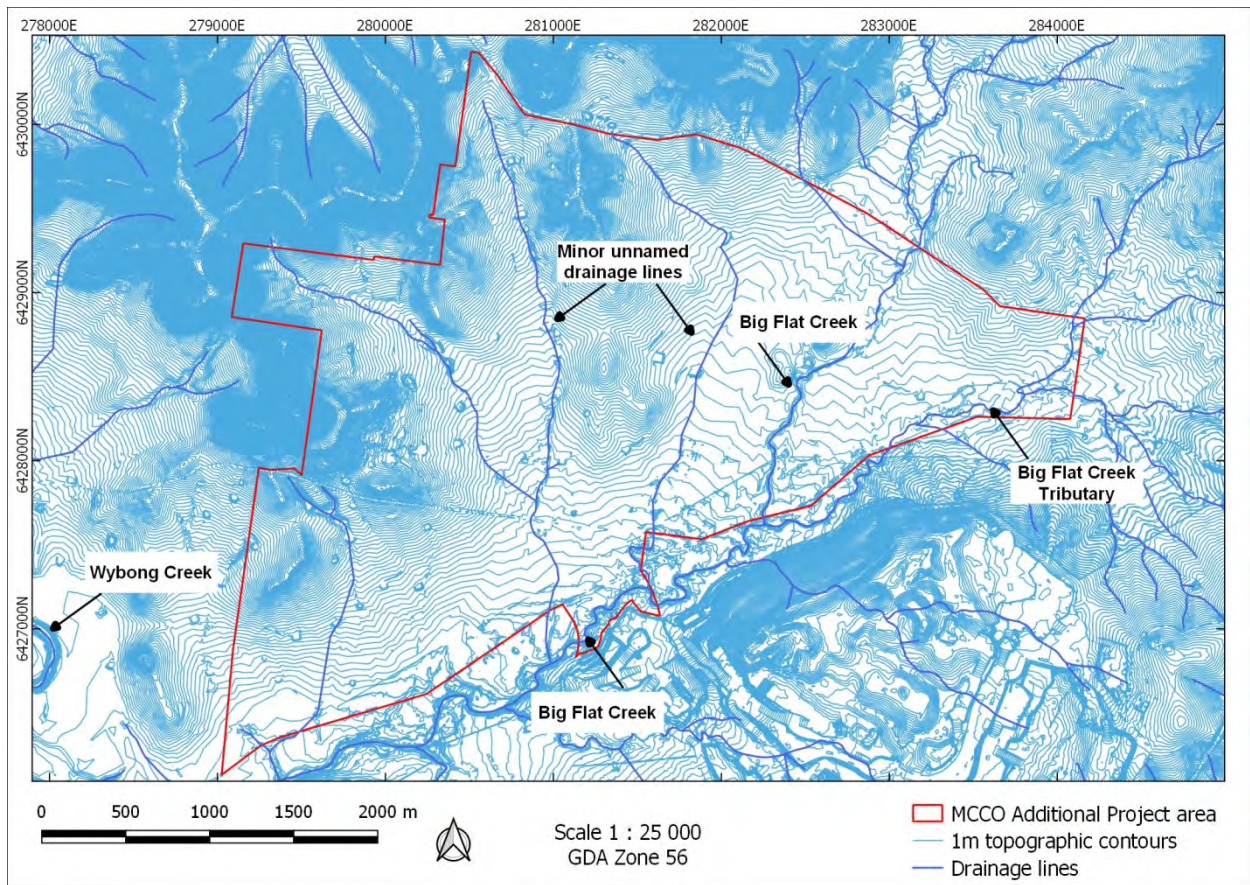
Big Flat Creek traverses the eastern portion of the MCCO Additional Project Area along a south-westerly orientation before continuing parallel to the southern boundary after converging with a major unnamed tributary. Big Flat Creek reaches a confluence with Wybong Creek, a significant tributary to the Goulburn River, 1 km to the southwest of the MCCO Additional Project Area. All other watercourses within the MCCO Additional Project Area represent unnamed drainage lines, draining south into Big Flat Creek. Many of these drainage features are heavily eroded and some display evidence of salinity, primarily in the form of large areas of spiny rush (*Juncus acutus*).

At the time of the survey, both Big Flat Creek and its tributaries within the MCCO Additional Project Area were dry because of a prolonged dry period preceding the survey (**Figure 3-5**). The catchment for Big Flat Creek has not been altered significantly in the historic period and so the dryness of these creek systems in the MCCO Additional Project Area indicates their ephemeral

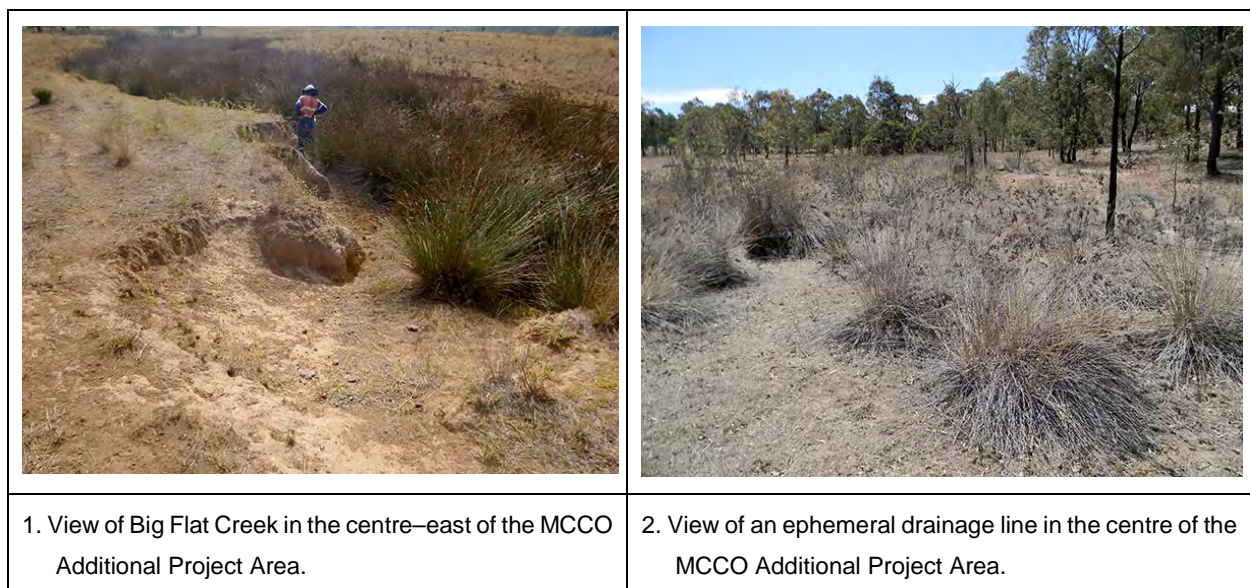


nature. While these systems may have contained ponds prior to their channelisation, it is unlikely that these ponds would have been extensive enough to retain water during long dry spells.

**Figure 3-4: Aerial showing the hydrology of the MCCO Additional Project Area.**



**Figure 3-5: Examples of the hydrology within the MCCO Additional Project Area.**







3. View of Big Flat Creek in the vicinity of the Wybong Road Overpass.



4. View of the tributary to Big Flat Creek in the south-east corner of the MCCO Additional Project Area.

### 3.4 VEGETATION





In the past, Aboriginal people would have encountered a variety of vegetation communities in the region of the MCCO Additional Project Area, however, extensive areas of native vegetation have been cleared since European settlement.

The MCCO Additional Project Area encompasses sections of the Central Hunter Foothills, and Lees Pinch Foothills landscape units (Mitchell 2002). Before historical clearing, the dominant vegetation of the Central Hunter Foothills landscape unit would have been comprised of woodlands to open forest of spotted gum, forest red gum, narrow-leaved ironbark, red ironbark, white box, slaty gum, rough-barked apple, with kangaroo and wallaby grass (Mitchell 2002: 112). The vegetation of the Lees Pinch Foothills landscape unit would have comprised of woodland of red ironbark, stringybarks, grey gum, and black cypress pine on slopes and ridges with ironbarks and scattered forest red gum along streams (Mitchell 2002: 92).

Currently, the primary vegetation of the MCCO Additional Project Area includes derived grassland paddocks, dense casuarina regrowth forests and stands of open regrowth eucalypt woodland (**Figure 3-6**). The vegetation communities of the steep slopes and crest of the northern and western sandstone ridges retain significant stretches of remnant vegetation and are more consistent with those characterising the landscape units detailed above.

In the crest and upper slope landforms it was noted during the survey that many of the immature eucalypt trees were dying from the prolonged dry period preceding the survey (**Figure 3-6**). This was an indication of the shallow nature of the soils which usually were a thin veneer over the conglomerate bedrock.

**Figure 3-6: Examples of vegetation types within the MCCO Additional Project Area.**

	
1. View of a portion of dying eucalypt woodland.	2. View of open, grass paddocks.
	
3. View of remnant vegetation communities in the far west of the MCCO Additional Project Area.	4. View of regenerating Casuarina woodland.

### 3.5 CLIMATE

The nearest Bureau of Meteorology (BOM) record station to the MCCO Additional Project Area is located at the Scone Soil Conservation Service (BOM 2018). Climate statistics from the Scone Soil Conservation Service indicate that the region experiences a mostly temperate climate with temperatures above zero during the cooler months. The climate statistics show that the highest mean monthly temperatures are in January (31.4°) and the lowest mean monthly temperatures are in July (4.7°). Rainfall is greatest in January (mean rainfall: 81.8 millimetres [mm]) and the lowest in July (mean rainfall: 36.3 mm). The annual average rainfall is 640.1 mm.

As such, the climate of the region would not have offered any obstacles to past Aboriginal occupation.



### 3.6 LAND–USE HISTORY AND EXISTING LEVELS OF DISTURBANCE

The MCCO Additional Project Area is bordered to the south by the existing Mangoola Coal Mine. Land parcels situated within and to the west, north and east of the MCCO Additional Project Area are dominated by low intensity grazing and interspersed with rural residential properties or vegetation which is delineated for conservation purposes. Collectively these land uses dominate the area surrounding the MCCO Additional Project Area.

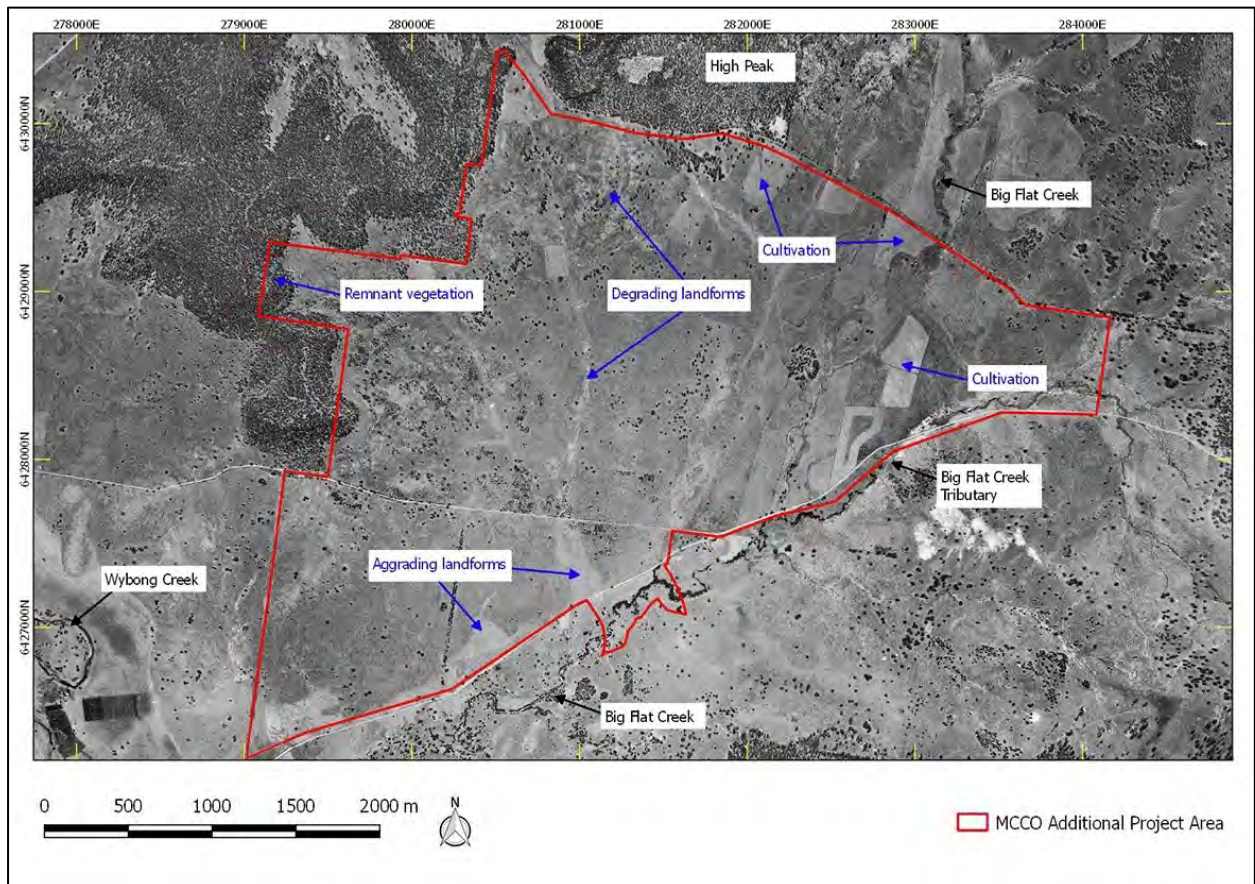
**Figure 3-7** shows the MCCO Additional Project Area superimposed on to a 1967 aerial image. This imagery allows an examination of the types of impacts that have occurred to the landforms within the MCCO Additional Project Area as a result of European farming practices. These include:

- Extensive clearing of native vegetation. Apart from some small pockets of vegetation in the western portions, the entirety of the MCCO Additional Project Area has been cleared. This would suggest that certain site types, such as scarred trees, will be extremely rare within the MCCO Additional Project Area. In addition, extensive clearing will have encouraged downslope movement of soils. As the MCCO Additional Project Area is generally sloping from north to south (see **Figure 3-4**), this would indicate that soils, as well as the artefacts that may have been within them, have accumulated in the southern portions of the MCCO Additional Project Area.
- Soil movement. As noted above, landforms in the north of the MCCO Additional Project Area are within degrading environments, while landforms in the south adjacent to Big Flat Creek are within an aggrading environment. The archaeological implications are that sites in the north may have been displaced or destroyed, while sites in the south are either buried or are representations of artefacts that have accumulated in these more low-lying areas.
- Cultivation. The 1967 aerial shows substantial areas of the MCCO Additional Project Area under cultivation. While cultivation may not completely remove archaeological material from an area, it will, at least in the upper-most levels, severely disturb any archaeological deposits.
- Erosion. Inspection of the 1967 aerial does not suggest that erosion adjacent to creeks extensive during this time. However, physical inspection of the MCCO Additional Project Area during the current assessment found that erosive degradation of drainages has been extensive in the past. The drainage systems of the MCCO Additional Project Area, including Big Flat Creek, have become channelised (perhaps losing their former Chain of Ponds morphology) and many show evidence of bank collapse. Large areas of deep sheetwash erosion are present in the north. Additionally, extensive gully erosion of creek banks and sheet wash erosion of adjacent landforms was identified across the MCCO Additional Project Area. The major tributary to Big Flat Creek in the eastern portion of the MCCO Additional Project Area has been subject to significant modification through erosion. The channelised eastern extent of this tributary is deeply incised and broadens out into a wide sand plain in the west.

In summary, the impact of European farming practices within the MCCO Additional Project Area has led to a significant modification of the pre-1788 environment. This includes a marked change

in vegetation cover, increased erosion and morphological changes to the local creeks. The impact of all these disturbances on the archaeological record is profound and any archaeological investigations of areas such as the MCCO Additional Project Area are inevitably examining a depleted and disrupted archaeological landscape.

**Figure 3-7: The MCCO Additional Project Area superimposed on a 1967 aerial image.**









The predominant land uses within the localities surrounding the MCCO Project include grazing, intensive agriculture, vineyards, olive plantations, rural residential and commercial land uses. Other surrounding land uses include bushland, community uses and Commonwealth Government land use.

The MCCO Additional Project Area has been subject to agricultural land uses, including intensive grazing, pasture improvement and cultivation. This has resulted in a landscape that is a patchwork of residences, fencing, roads, and dams and other earthworks. Due to the erodible nature of the soils the intensive use of the area has resulted in sizeable areas of erosion; both sheet wash and gully erosion (**Figure 3-8**).

Other disturbances include infrastructure installations such as former and current ETLs, and approved mine related activities such as exploration drill pads (**Figure 3-8**). Mining related disturbances, such as drill pads, were subject to Due Diligence inspections prior to the works commencing (Umwelt 2017, EMM 2017).



**Figure 3-8: Examples of disturbances within the MCCO Additional Project Area.**

 <p>A photograph showing a dry, open field with a wooden fence and a small wooden building in the background. Two workers in high-visibility vests and hard hats are standing near the fence.</p>	 <p>A photograph showing a large metal ETL tower structure on a dry, rocky hillside. A worker in high-visibility gear is standing near the base of the tower.</p>
<p>1. Disturbances related to the past agricultural land use phase include dwellings, buildings, fences and roads.</p>	<p>2. Infrastructure works such as ETL towers have impacted portions of the MCCO Additional Project Area.</p>
 <p>A photograph showing a wide, flat, dry area with a few scattered trees in the background. A worker in high-visibility gear is standing in the foreground.</p>	 <p>A photograph showing a deep, dark gully or erosion channel cutting through a dry, brown landscape. A worker in high-visibility gear is standing near the edge of the gully.</p>
<p>3. View of extensive sheet wash erosion.</p>	<p>4. View of extensive earth works and gully erosion.</p>
 <p>A photograph showing a large, flat, dry area with a small pond or dam in the background. A worker in high-visibility gear is standing near the edge of the pond.</p>	 <p>A photograph showing a large white truck with a drilling rig mounted on its back, parked on a dry, open field.</p>
<p>5. Numerous dams and associated contour banking are located within the MCCO Additional Project Area.</p>	<p>6. Approved mine related impacts such as drill pads have disturbed discrete portions of the MCCO Additional Project Area.</p>

### 3.7 CONCLUSION

Review of the environmental landscape of the MCCO Additional Project Area and surrounding landforms presents a landscape that has been extensively disturbed and modified, primarily as a result of agricultural practices and associated hydrological changes.

In the past, the presence of semi-permanent watercourses, such as Big Flat Creek and its major tributary, would have provided resources to enable short-term occupation within the MCCO Additional Project Area. However, due to the naturally occurring high salinity of the main arm of Big Flat Creek within the MCCO Additional Project Area, occupation was probably more restricted along this watercourse when compared to areas closer to Wybong Creek.

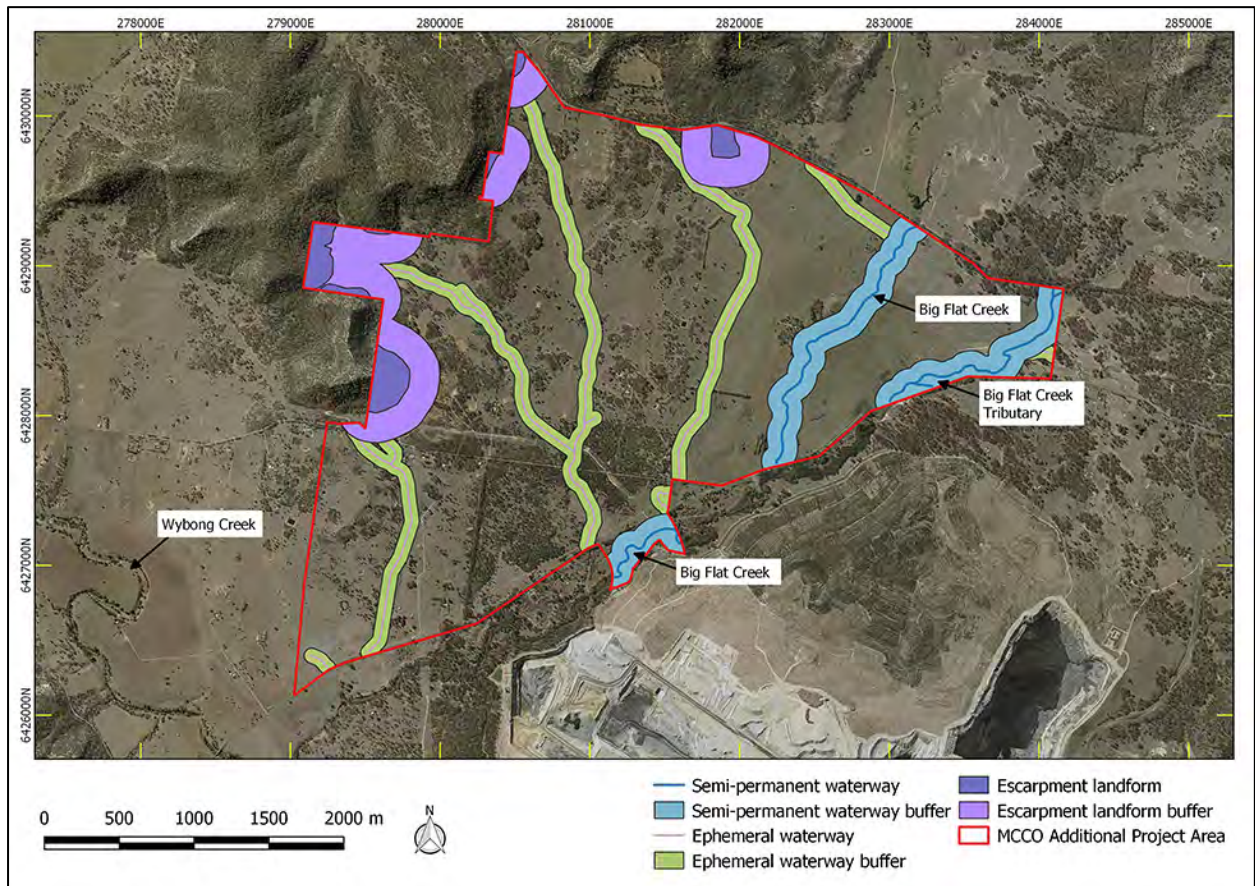
As all watercourses within the MCCO Additional Project Area have a relatively restricted catchment, and all were dry at the time of the survey, the indication is that these systems would have only supported sporadic and short-term visitation. While it is accepted that these systems may have had a Chain of Ponds morphology prior to their modification following European settlement, it is suspected that these ponds would not have been extensive enough to encourage long-term occupation.

The escarpment country to the west and north of the MCCO Additional Project Area would have provided a range of resources not available in the flat terrain to the south. As such, the zone of interaction between the escarpment and the plains may have encouraged hunting or land management visits but not occupation due to the lack of water.

Mapping these landform features demonstrates the environmental zones most conducive to Aboriginal occupation within the MCCO Additional Project Area (**Figure 3-9**). This figure shows a 100 m buffer on either side of the semi-permanent watercourses within the MCCO Additional Project Area, and a 50 m buffer on either side of ephemeral waterways. The figure also includes a 200 m buffer adjacent to escarpment landforms as this zone between escarpment and flatter terrain would have offered a mix of resources that may have encouraged hunting or foraging visits into these areas. Viewing the information on **Figure 3-9**, indicates that the majority of the MCCO Additional Project Area is outside of any environmental areas conducive to Aboriginal occupation.

Extensive clearing of much of the MCCO Additional Project Area has likely removed any culturally modified trees, disturbed significant portions of the landscape, and to have translocated much of the archaeological material record into a secondary context. Erosion, however, will also mean that larger sites, while disturbed, will be more visible and more likely to be recorded.



**Figure 3-9: Environmental zones conducive to Aboriginal occupation.**



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## **4 ABORIGINAL ARCHAEOLOGY BACKGROUND**

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### **4.1 ETHNO-HISTORIC SOURCES OF REGIONAL ABORIGINAL CULTURE**

The MCCO Additional Project Area is located in the overlapping boundaries of the Wonnarua and Gomeroi tribal areas of the upper Hunter Valley.

Tocomwall (2017: 49) notes that ethnographic accounts and anthropological notes written in the mid- to late-19th century indicate that the traditional territory of the Wonnarua people extended over a two thousand square mile area of land that included the Hunter River and all its tributaries from within ten miles of Maitland to the apex of the Liverpool Ranges. This interpretation is challenged by the Wonnarua Local Aboriginal Land Council (Tocomwall 2017: 482) who state that there is much debate about the tribal boundaries and that the dividing line between the Wonnarua and the Gomeroi (Kamilaroi) may have been much further south in the area of 'Jerrys Plains'. The generally accepted mapping produced in Horton 1994 places the MCCO Additional Project Area within the Wonnarua tribal lands. However, while maps such as Horton 1994 are useful tools and represent the best available published research at the time, they are always generalisations and should be treated with some caution.

The Aboriginal people in the region of the MCCO Additional Project Area lived in an environment rich in food resources. Freshwater fish, shellfish, reptiles, mammals, birds and plant food provide a diverse diet (see Brayshaw 1981). Brayshaw (1986: 82) suggests that inland groups visited the coast during the summer when marine resources were plentiful, and coastal groups travelled inland to participate in the winter kangaroo hunts. Trade and/or exchange also occurred between the coastal and inland groups including visiting by coastal and inland groups for initiations and ceremonies seemed to occur. These were conducted within earthen circles. Carved trees were associated with these sites (Brayshaw 1981: 12). Reed spears and shells were traded inland for possum skin rugs and fur cord (Brayshaw 1986: 41).

The only known ethnographic mentions of the use stone artefacts relate to the use of stone hatchets as multi-purpose tools and of the attachment of quartz flakes as barbs on spears (Brayshaw 1986: 66, 68). There is also little ethnographic evidence concerning the locations of regional Aboriginal camping places, however, the factors of proximity to fresh water and of elevation for visibility are mentioned as important considerations (Fawcett 1898).

### **4.2 EUROPEAN OCCUPATION**

Due to its proximity to Sydney, its nutrient rich alluvial soils, grazing pastures for livestock and cedar trees on the higher terraces of the valley, the Hunter Valley was a desirable location for early European settlement. Within a short timeframe, the Aboriginal people of the area had to deal with the depletion of their resources and major changes to the environment caused by ill-informed European farming practices.

The early settlers observed valleys of grassland and rich alluvial soils adjacent to the major waterways that were ideal for agriculture and cattle/sheep grazing, and soon the prime land was occupied. But the allure of the area continued and as more Europeans settled in the Hunter Valley the more marginal hill slopes were occupied and cleared of standing timber.

As noted by Tocomwall (2017: 35):

*By 1825 more land was owned by the new settlers and the original Aboriginal inhabitants became increasingly disenfranchised from their traditional lands. The invasion by the European settlers changed the distribution of vegetation, with increasing landscape instability as a result of the logging of the forested areas around the higher elevations and the clearing of the brush around the understorey and along the tributaries for agriculture and pastoral farming. Aboriginal dependence of the Hunter River for many staples meant that the Wonnarua suffered severely when the Europeans settled: they immediately lost access to water and the raw materials in the river and on the banks. They also lost their game to the intruders who chased kangaroos in hunts to reduce competition for their introduced grazing animals; shellfish and fish populations also declined. Breton (1833) wrote that he only noted 16 kangaroos, in contrast to a previous visit to the area when they had numbered in the hundreds. The loss of fish for protein and the loss of managed plains for game hunting and seed gathering destroyed long established hunting and gathering practices of the Aboriginal community. This exclusion and alteration of the landscape by the Europeans brought them into conflict with the local Wonnarua People.*

### 4.3 REGIONAL ARCHAEOLOGICAL CONTEXT

There have been numerous archaeological investigations in the local area with a small number undertaken in the MCCO Additional Project Area itself. The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (**Section 4.5**). The following section (**Section 4.3.1**) refers to archaeological investigations in areas outside of, but relevant to, the MCCO Additional Project Area. **Section 4.4.2** refers to those investigations that were entirely or partially within the MCCO Additional Project Area, including salvage programs that have taken place at Mangoola.

The previous investigations did not identify any specific socio-cultural heritage values unrelated to the Aboriginal sites identified. No historical connection has been identified specifically pertaining to the MCCO Additional Project Area and its surrounds that have been investigated. No declared Aboriginal places (under section 84 of the NPW Act) have been identified in the MCCO Additional Project Area or its surrounds.

Aboriginal cultural heritage values may be identified through further Aboriginal consultation concerning the MCCO Additional Project Area. These may relate to social, cultural or historic

values associated with Aboriginal sites and objects or places with intangible values. If such cultural values are provided, they will be set out in the ACHAR.

#### 4.3.1 Previous archaeological studies in the region

A very large amount of archaeological work has been undertaken in the Hunter Valley and only a brief regional archaeological context that focuses on work in similar landforms to the MCCO Additional Project Area is provided here.

Evidence from the Central Lowlands sub-region of the Hunter Valley (broadly between Murrurundi in the north and Cessnock in the south-east), suggests that archaeological material is scattered almost continuously, but in varying density, along most creek banks and flats. It has been suggested that archaeological material is primarily contained in a corridor approximately 100 m wide on either side of a creek channel (Koettig 1990: 13).

In broad terms, these open artefact scatters appear to be confined to the A-Horizon of the soil (topsoil) profile which is generally less than 50 centimetres (cm) in depth (Hughes 1981; Stern 1981). These sites are often disturbed, and stratification is unclear (Hughes 1984: 8). Artefacts are generally manufactured from indurated mudstone and silcrete, with quartz, petrified wood and chert occurring less frequently (Hiscock and Koettig 1985). Features found at open surface scatters include hearths, pits, ovens and heat treatment areas (Burton *et al.* 1990). These sites are generally detected where some form of ground disturbance has occurred, for example erosion due to both cultural and non-cultural processes, and thus the extent of the site is often difficult to determine. Often the density of artefacts on the surface do not relate to the amount of subsurface archaeological material (see Koettig 1990: 15).

Archaeological excavations have so far determined that human occupation of the Hunter Valley has occurred since the last Glacial Maximum approximately 27,000–17,000 years ago (HLA-Envirosciences 2005). It is hypothesised that evidence predating this period will likely be discovered in the future.

A review of GHD (2005), HLA-Envirosciences (2005) and Umwelt (2007) provides the following regional synthesis:

- Archaeological sites, even where surface evidence is not present, occur on most landforms. This was confirmed by a HLA-Envirosciences (2005) excavation program, in which Aboriginal sites were encountered on alluvial terraces, flats, slopes, bench areas, spurs and ridgelines. HLA-Envirosciences acknowledges that the sample areas were biased somewhat as they were all near creek lines
- Site frequency and density are dependent on their location in the landscape. This theme is consistent throughout NSW and is influenced by a range of factors, the most relevant of which the existing level of disturbance. More specifically, the potential for undisturbed *in situ* deposits remaining in the upper Hunter Valley on a mining property is generally low

- The highest concentration of Aboriginal sites on the floor of the Hunter Valley is associated with creeks and waterways
- Few scarred trees are recorded reflecting the high degree of tree clearing in the region
- The most frequently recorded raw material is indurated mudstone (a fine grained siliceous material) associated with Hunter River gravels. Other frequently recorded materials include locally sourced silcrete, quartz and volcanic stones
- Assemblages recorded in the region consist largely of unmodified flakes with few formed tools. Backed blades comprise the characteristic diagnostic artefact in the region. The mid- to late-Holocene appears to have witnessed this move to smaller tools, perhaps as an impetus to conserve raw material during tool manufacture or due to new functionality requirements. This impetus seems to have driven the development of what Hiscock (1993) calls the Redbank A Strategy (RAS, after three sites along Redbank Creek within the United Colliery south of Singleton) of backed blade production. It is noted that RAS reduction has been infrequently recorded at other sites in the district and no mention of it is made for sites within the MCCO Additional Project Area.

Previous studies conducted in closer proximity to the MCCO Additional Project Area are outlined below.

**Witter** (2002) conducted an archaeological survey for the Great Northern Coal Project, located within the Mangoola Coal Mine Approved Project Area boundary (see **Figure 1-3** for the location of the Approved Project Area). The survey retraced an area covered by Aiken (1985), although the area was surveyed in greater detail and artefact scatters were defined and grouped into larger sites. As a result, nine sites containing a total of 144 artefacts were identified, being four artefact scatters and five isolated finds. The three largest sites identified were:

- Anvil Vale: contained 79 artefacts on a creek terrace/pasture and included site #37-2-0509
- Big Flat Creek: contained 24 artefacts on a creek/pasture and including site #37-2-0510. Despite its name, this site is located 1.3 km south of Big Flat Creek on a tributary to Big Flat Creek
- Clarks Gully: contained 31 artefacts on tributary flats, pasture and woodland.

Witter discusses two other sites of interest beyond the larger site groupings. One was a small microblade workshop (EWA 19) located in a small scald of the valley bottom north of Big Flat Creek (the site is located approximately 110 m outside the MCCO Additional Project Area). This workshop is isolated and consisted of five silcrete flakes, four of which were blades. Witter suggests that the site may represent a 'quick repair event' servicing backed blade tools when away from the camp. In addition, there was a small elouera of orange chert which was found on the foot-slopes below Anvil Hill (located 2 km south of the MCCO Additional Project Area in an area that is not currently mined); this was assessed as an uncommon and interesting artefact

type manufactured from unusual stone material. It was described as part of a hafted flake tool and had probably been transported extensively.

**Umwelt** (2008) was commissioned to undertake an Aboriginal heritage assessment of a proposed 66kV ETL to connect the existing Denman substation and the Mangoola Coal Mine.

Following completion of the survey, a review of the proposal identified that three poles (Poles 53, 54 and 63) were within recorded archaeological sites, two poles (Poles 63 and 64) were within 5 m of recorded sites, two poles (Poles 52 and 57) were located within 20 m of recorded sites, and that heavy vehicle movement over site SC48 would be required. To reduce the extent of impact associated with the project, Energy Australia subsequently relocated three poles (Poles 52, 53 and 63) to avoid direct impacts to archaeological sites. However, site SC48 and the associated area of archaeological potential (Area #1) could not be avoided as the site/area was approximately 420 m in length and the maximum pole span for the transmission line was 150 m. Opportunities for alternative alignments to avoid these sites were investigated, however, there was no practical alternative and impacts to Site SC48 and Area #1 were unavoidable. These impacts were subject to an AHIP application and salvage program (see **Section 4.4.2.2**).

**Umwelt** (2010) was engaged by Mangoola, on behalf of TransGrid, to undertake the necessary environmental assessments associated with the relocation of a 500kV powerline. This project was to improve the efficiency of mining at Mangoola as it was proposed to remove an existing 500kV powerline that bisected the site and to relocate the powerline to a route within the southern and western boundaries of the Approved Project Area's disturbance area.

Two sections of the relocated powerline and five associated designated access tracks were outside the Approved Project Area's disturbance area and were the subject of the Umwelt assessment. Fourteen sites (SC56, SC57, BFC69 to BFC73 and SC60 to SC66) were located within the assessment areas and consisted of five isolated finds and nine artefact scatters containing a total of 166 artefacts. The largest artefact scatter (SC56) contained 49 artefacts, followed by SC57 (36 artefacts) and BFC72 (31 artefacts). No areas of PAD were identified in association with the recorded sites or any other portion of the assessment areas.

A total of 15 new Aboriginal archaeological sites (BFC74 to BFC88) were recorded within a Habitat Enhancement Area that was inspected to evaluate its suitability as a cultural heritage offset. The sites consisted of six isolated finds and ten artefact scatters (including BFC49) containing a combined total of 44 artefacts. The largest artefact scatter was BFC75 (11 artefacts), followed by BFC80, BFC81 and BFC87, all of which contained five artefacts each. No areas of PAD were identified in association with the recorded sites or any other portion of the Habitat Enhancement Area. Ultimately it was assessed that the Habitat Enhancement Area lacked archaeological values of suitable significance to qualify it as a cultural heritage offset.



Unavoidable impacts to Aboriginal cultural heritage were managed under a Cultural Heritage Management Plan (CHMP) that provided the methodology for the salvage of certain sites (see **Section 4.4.2.2**).

## 4.4 LOCAL ARCHAEOLOGICAL CONTEXT

### 4.4.1 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any potential previously-recorded heritage within the MCCO Additional Project Area. The results of this search are summarised in **Table 4-1** and presented in detail in **Appendix 4**.

**Table 4-1: Aboriginal heritage: desktop-database search results.**

Name of Database Searched	Date of Search	Type of Search	Comment
Commonwealth Heritage Listings	06/07/18	Muswellbrook LGA	No places listed on either the National or Commonwealth heritage lists are located within the MCCO Additional Project Area
National Native Title Claims Search	06/07/18	Muswellbrook Shire Council	Two Native Title Claims encompass the MCCO Additional Project Area.
OEH AHIMS	14/08/18	GDA Zone 56 Eastings: 276122–289145; Northings: 6416168–6432714. Six searches totalling 13 x 16 km centred on the MCCO Additional Project Area. (see <b>Appendix 4</b> )	533 sites within the total search area. 49 sites are within the MCCO Additional Project Area.
Local Environment Plan (LEP)	06/07/18	Muswellbrook LEP of 2009	None of the Aboriginal places noted occur near the MCCO Additional Project Area.

As per **Table 4-1**, it is noted that the MCCO Additional Project Area includes land currently subject to Native Title Claims NC2013/006 (NSD1680/2013, Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People) and NC2011/006 (NC2011/006, Gomeroi People).

Six searches of the OEH administered AHIMS database together returned 533 records for Aboriginal heritage sites within a 13 by 16 km combined search area, centred on the MCCO Additional Project Area with 49 sites identified within the MCCO Additional Project Area. **Figure 4-1** maps the MCCO Additional Project Area in relation to nearby previously recorded AHIMS sites. **Figure 4-1** records the AHIMS data as it existed in August 2018 and this data has not been corrected to account for errors in the AHIMS data. **Table 4-2** tabulates the AHIMS sites from the search divided into site type. This shows a clear majority of the previously recorded sites (95 per cent) are stone artefact sites, with other site types together being a small percentage of the total.

Also shown on **Figure 4-1** are sites recorded during a 2018 survey by Tocomwall of parcels of Crown Land located to the west and north of the MCCO Additional Project Area. These sites had not been registered with AHIMS at the time of the site search, and although all are located outside of the MCCO Additional Project Area, the site recordings closest to the MCCO Additional Project Area are shown.

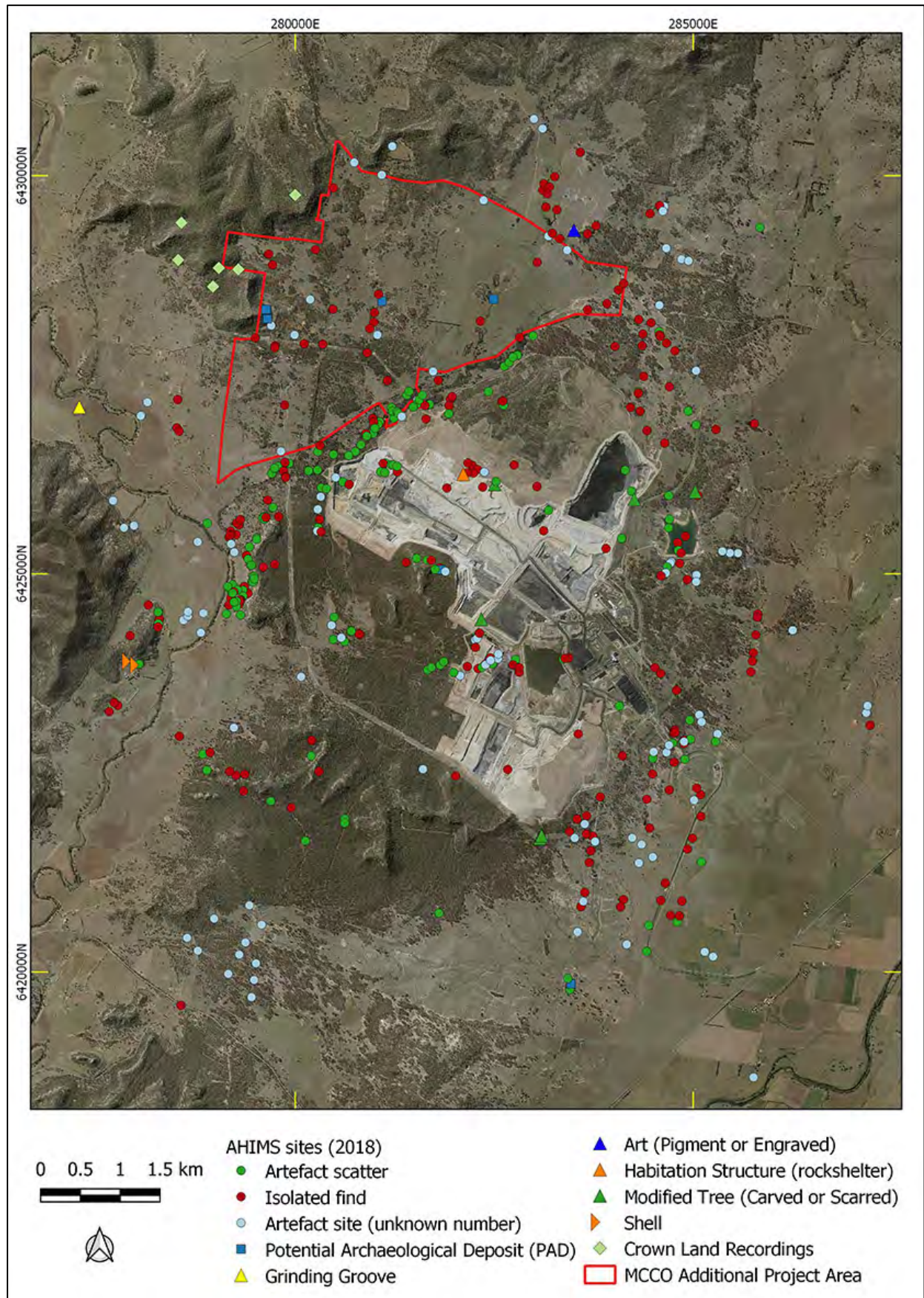
On 25 September 2018, Mr Scott Franks registered the Overtly Complex (37-2-5834). The Overtly Complex does not extend into the MCCO Additional Project Area but does include portions of the Approved Disturbance Area currently managed in accordance with the existing Mangoola Coal Mine ACHMP. As stated in **Section 1.1**, the Approved Disturbance Area for the existing operations is not part of this assessment as it has previously been assessed and approved.

The Overtly Complex (37-2-5834) is registered as an Aboriginal resource and gathering site, a burial site and a conflict site. After the registration, AHIMS changed the site status to 'not a site' pending further information being provided to determine the veracity of the large site area.

Although this site is relatively near to the MCCO Additional Project Area, it does not currently need to be considered as it has no statutory protection. However, should this change, and the site is reinstated on the AHIMS register, it is highly unlikely that the MCCO Additional Project Area contains any of the values associated with this registration. Specifically:

- Aboriginal resource and gathering site: all portions of the MCCO Additional Project Area have been cleared of native vegetation in the past and currently only support regrowth vegetation. While the past disturbances to the landscape do not preclude the presence of Aboriginal resource plants or animals in the MCCO Additional Project Area, it is likely that these have been highly disturbed. Further, there are contiguous and identical landforms to the north, east and west the MCCO Additional Project Area and should Aboriginal resource plants and animals survive in the MCCO Additional Project Area, they will continue to be represented in these nearby areas
- Burial site: due to the agricultural phase of land use in the MCCO Additional Project Area, soil loss has been considerable and had there been burials in the area, it is likely that these have been disturbed and/or dispersed. Further, the MCCO Additional Project Area does not contain sand bodies—a favoured burial location—and burials are extremely rare at the regional level potentially precluding their existence in the MCCO Additional Project Area. In addition, all rock overhangs/crevices within the MCCO Additional Project Area were inspected during the survey and none contained burials
- Conflict site: While it is acknowledged that the wider area saw conflict between early colonial settlers and Aboriginal people, there are no remains of colonial settlements within the MCCO Additional Project Area meaning that it is impossible deduce that the conflict occurred within the MCCO Additional Project Area.

Figure 4-1: AHIMS site types near the MCCO Additional Project Area.



**Table 4-2: AHIMS sites near the MCCO Additional Project Area: site types and frequencies.**

Site Type	Number	% Frequency (may not equal 100% due to rounding)
Isolated Find	205	38%
Artefact (number unspecified)	169	32%
Artefact Scatter	134	25%
Potential Archaeological Deposit (PAD)	13	2%
Modified Tree	7	1%
Shell	2	<1%
Habitation structure (rockshelter)	1	<1%
Grinding Groove	1	<1%
Art	1	<1%
<b>Total</b>	<b>533</b>	

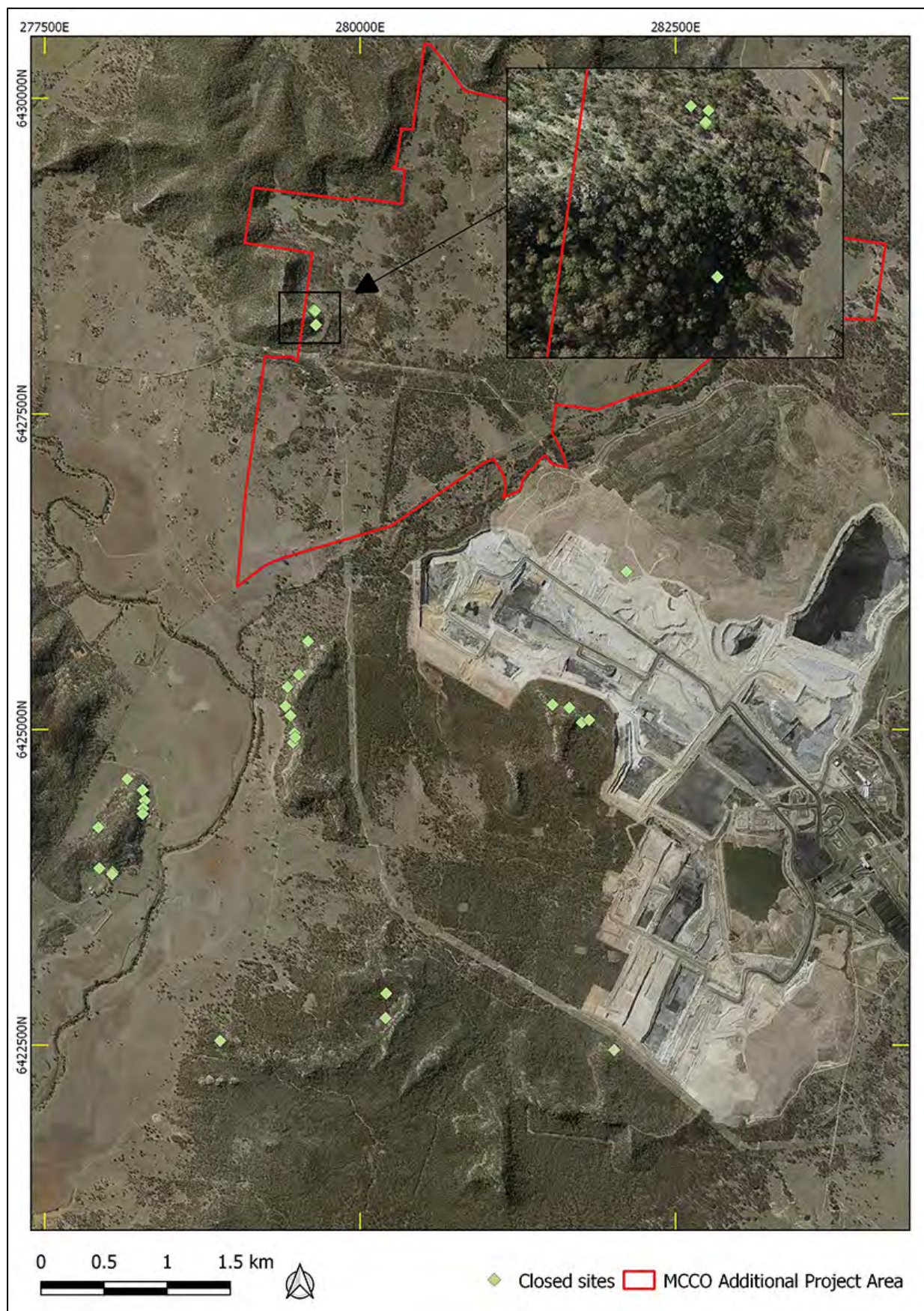
The high sample size of the combined results for these searches allows for a representative understanding of the distribution of site types across the landscape surrounding the MCCO Additional Project Area. Stone artefact sites (isolated finds, artefact scatters) are by far the most commonly recorded local site types, together representing 508 (95%) of the 533 sites returned by the AHIMS search area. The majority of these have been recorded in areas of high exposure, with the densest and most complex sites being recorded on distinct landforms in proximity to watercourses. The very low instance of modified trees (1%), conforms with the rarity of this site type for the region, likely related to the extensive clearance that has occurred historically.

The presence of closed sites (most frequently rockshelters either with archaeological deposits or with potential archaeological deposit) located in sandstone ridges like those of the MCCO Additional Project Area is also noteworthy (**Figure 4-2**). Five ‘closed sites’, all with potential archaeological deposit, have been recorded within the MCCO Additional Project Area. **Figure 4-2** represents the AHIMS data as it existed in August 2018. Errors in the AHIMS data, such as the presence of a rockshelter site in open cut pit, have not been corrected. In fact, this site, CG07 (37-2-2225), is not a ‘habitation site’ as it is listed in AHIMS, but an open site consisting of a single artefact.

These results inform the predictive model for site distribution outlined in **Section 4.5**.



Figure 4-2: Aerial showing the location of previously recorded 'closed sites'.





## 4.4.2 Previous archaeological investigations within the MCCO Additional Project Area

### 4.4.2.1 Archaeological survey

There have been numerous archaeological investigations in the local area with a small number undertaken in the MCCO Additional Project Area itself (**Table 4-3**). The results of these investigations provide an archaeological context for the current assessment and were the primary reference used in the preparation of the predictive model of Aboriginal site location outlined in **Section 4.5**. The most applicable survey was by EMM Consulting Pty Limited (EMM) in 2016 as part of a pre-feasibility study for the MCCO Project (EMM 2016).

**Table 4-3. Previous archaeological surveys within the MCCO Additional Project Area.**

Author	Year	Project	Results	Within the MCCO Additional Project Area?
Jill Ruig	1993	Fibre optic cable route Manobalai to Castle Rock	An archaeological survey identified 35 artefacts in five site locations. Eight artefacts were retouched flakes. The dominant raw material was mudstone (25 of the 35) with silcrete (8) and quartz (1) also recorded. Most of the sites had low cultural, education and scientific significance and one site (#37-2-0742) had moderate significance due to a higher than average artefact density (1 artefact per 15 m <sup>2</sup> ).	Yes: in the northern portions.
Umwelt	2006	Anvil Hill Project	In 2006 Umwelt conducted a survey of the Approved Project Area's disturbance boundary and its surrounds, and Aboriginal Cultural Heritage Offset Areas (ACHOAs). A total of 173 sites were identified with 69 sites in the Approved Project Area's disturbance area, 98 in the ACHOAs and six where no impacts would occur. All rockshelter sites were within ACHOAs. The survey indicated repeated and long term occupation related to reliable watercourses. High density areas were localised at the confluences of creeks (such as the confluence of Wybong and Big Flat Creek).  The site distributions were divided into the catchment areas of Anvil Creek (44 sites), Big Flat Creek (49 sites), Clarks Gully (18 sites), Sandy Creek (14 sites) and Wybong Creek (48 sites).	Yes: in the area where the proposed Wybong Road/Big Flat Creek overpass is located.
Umwelt	2014a	Works conducted as part of the 500kV powerline relocation (PA 10_002 Modification 4)	An ACHMP was prepared as part of PA 10_002 (referred to as MOD4: this approval was specifically for the construction of a 500kV powerline and was not a modification to PA_06_0014 under which Mangoola operates). The ACHMP specified management measures for sites within the proposed powerline and for sites subject to impacts from the dismantling of the existing powerline. This included demarcating sites to be avoided, temporary and permanent collection of sites within the proposed and existing 500kV powerline and salvage excavations.  In 2012, a survey team inspected an existing 500kV powerline north of Wybong Road (which identified sites BFC97-100).  Site BFC98 was permanently salvaged.  Site BFC96 within the proposed disturbance area for the Wybong Road/Big Flat Creek overpass was subject to temporary surface	Yes: portions north of Wybong Road.

Author	Year	Project	Results	Within the MCCO Additional Project Area?
			collection during the dismantling of the existing powerline. Although the nine artefacts were returned to the site following the completion of works, the site is listed as 'partially destroyed' with AHIMS.	
EMM	2016	Pre-feasibility study for the MCCO Project	EMM conducted an opportunistic archaeological field survey in an indicative project footprint and its surrounds from 15 to 19 September 2014. This indicative project footprint included large areas of the MCCO Additional Project Area including the indicative connecting corridor between the Approved Project Area and the MCCO Additional Project Area where it crosses the ACHOA. The survey recorded 38 sites.	Opportunistic survey over large areas of the MCCO Additional Project Area.
Umwelt	2017	Due Diligence Assessments associated with the approved Exploration Activities within Assessment Lease 9.	30 borehole locations inspected. No Aboriginal objects recorded and all borehole locations were assessed as having low archaeological potential.	Yes
EMM	2017	Due Diligence Assessments associated with the approved Exploration Activities within Assessment Lease 9.	114 borehole locations inspected. No Aboriginal objects recorded and all borehole locations were assessed as having low archaeological potential.	Yes

#### 4.4.2.2 Archaeological salvage

##### Approved Project Area salvage

Most sites within the Approved Project Area disturbance boundary at Mangoola Coal Mine were subject to salvage in a program of works conducted between September and November 2008 (Umwelt 2014b). A total of 132 sites were subject to salvage over the course of this program, which included:

- Surface collection of 107 artefact scatter/isolated artefacts located within the approved disturbance boundary (or which extended across the project disturbance boundary)
- Surface collection and grader scrapes at 23 artefact scatter/isolated artefact sites
- Geomorphological investigation of site AC13 and Clarks Gully
- Surface collection, test excavation and subsequent subsurface salvage (including archaeological excavation and grader scrapes) at site AC13
- Salvage of a scarred tree (site SC-ST-01).

##### Approved Project Area MOD2 salvage

Following a modification to the Mangoola Coal Mine Project Approval (PA 06\_0014) (referred to as MOD2), additional salvage works were undertaken in relation to the construction of a pipeline from the Hunter River. This involved the surface collection of site SC03 and the completion of geomorphic excavations at three locations within the Hunter River.

### 66kV ETL salvage

In relation to works outside the Approved Project Area but directly associated with the operation, Mangoola was granted an AHIP #1110275 by OEH in relation to works associated with the construction of a new 66kV powerline extending from Denman to the Approved Project Area. In accordance with the requirements of AHIP #1110275, surface collection and subsurface salvage were undertaken within the sections of site SC48 as detailed in Umwelt 2011.

### 500kV ETL salvage

In 2012, Project Approval (PA 10\_0002) was issued to TransGrid in relation to the relocation of a section of the Bayswater to Mt Piper 500kV powerline that bisected the Approved Project Area. The conditions of PA 10\_0002 required the development of a CHMP that incorporated the management of Aboriginal cultural heritage within the PA 10\_0002 approval area. In accordance with this CHMP, 10 sites (SC60-66, 91–93) were subject to surface collection, and cultural salvage activities were undertaken at three tower locations. At one of the locations of cultural salvage at Tower 28, located within the MCCO Additional Project Area, five sub-surface artefacts were salvaged. The remainder of site is valid and has been registered as 'partially destroyed' as site BFC102. Temporary surface collections were also conducted within the SC10 Management Zone, at site BFC96 within the Big Flat Creek ACHOA and at site BFC98 in the existing powerline easement. Both BFC96 and BFC98 are within the MCCO Additional Project Area. At BFC96 the artefacts were returned following the completion of construction works (Umwelt 2014a) resulting in the site being regarded as 'partially destroyed'. BFC98 was fully salvaged and is listed as 'destroyed' with the AHIMS register.

### Conclusion

In summary, a total of 149 sites at Mangoola Coal Mine have been subject to salvage activities and within the MCCO Additional Project Area one site has been completely salvaged and two sites have been partially salvaged. All these works have been conducted in accordance with the requirements of relevant management plans and approvals.

#### **4.4.3 Previously recorded sites within the MCCO Additional Project Area**

Because of these previous assessments, there are 49 Aboriginal sites that have been recorded within or immediately adjacent to the MCCO Additional Project Area<sup>1</sup>. **Table 4-4** displays the site characteristics of these previously recorded sites.

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<sup>1</sup> It is noted that there are six sites on the Mangoola GIS heritage site database (EWA11, EWA12, EWA13, EWA14, EWA18 and Ruig 4) that have never been recorded with AHIMS. All of these locations were inspected during the survey and, if artefacts were present, they were recorded as a 'new' site (as it was impossible, without documentation, to know if the Mangoola GIS coordinates of the 'old' sites were actually correct). As such, these sites will not be included in this study and are not included in any of the numerical calculations in the AAIA.

**Table 4-4. Site characteristics of previously recorded sites in the MCCO Additional Project Area.**

Site type	Frequency
Artefact scatter	23
Isolated artefact	16
Rockshelter with PAD	5
PAD	3
Artefact scatter with PAD	2
<b>Total</b>	<b>49</b>

Of the 49 sites, 61% (n=30) occur within 50 m of a watercourse. These sites are typically artefact scatters and isolated artefacts identified on eroding creek banks and spurs and elevated flat areas overlooking watercourses. This pattern may be partly the result of a sampling bias as most of the EMM 2016 field survey transects (which recorded the bulk of the sites in the MCCO Additional Project Area; see **Section 4.4.2.1**) were confined to 50 m of a watercourse which were predicted to have the highest archaeological sensitivity. There is a significant drop-off in site frequency over 100 m from watercourses with only 16 sites identified at distances greater than 200 m of watercourses. Of these 16 sites over 200 m from watercourses; nine are isolated finds, two are artefact scatters and the remaining five sites comprise rockshelters with PAD.

**Figure 4-3** illustrates the location of the 49 previously recorded sites within the MCCO Additional Project Area and **Table 4-5** lists the sites.

**Table 4-5: Previously recorded sites within the MCCO Additional Project Area.**

AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Site status	Permit
37-2-0509	Sandy Hollow, Singleton 1	281535	6427179	Artefact scatter	Valid	
37-2-0739	Manobalai-Castle Rock 2	280741	6430165	Isolated artefact	Valid	
37-2-0740	Manobalai-Castle Rock 3	281086	6430009	Isolated artefact	Valid	
37-2-0741	Manobalai-Castle Rock 4	282366	6429691	Artefact scatter	Valid	
37-2-0742	Manobalai-Castle Rock 5	283181	6429240	Artefact scatter	Valid	
37-2-2164	BFC01	281401	6427243	Artefact scatter	Valid	
37-2-2190	BFC28	281524	6427130	Artefact scatter	Valid	
37-2-2191	BFC29	281556	6427184	Artefact scatter	Valid	
37-2-2193	BFC31	281240	6426955	Artefact scatter	Valid	
37-2-3882	BFC69	279746	6427863	Isolated artefact	Valid	
37-2-3883	BFC70	279743	6427841	Artefact scatter	Valid	
37-2-3884	BFC71	279867	6427119	Isolated artefact	Valid	
37-2-3990	BFC90	281031	6428000	Isolated artefact	Valid	
37-2-3991	BFC91	279991	6428000	Isolated artefact	Valid	
37-2-4109	BFC96	281429	6427290	Artefact scatter	Partially destroyed	PA 10_0002
37-2-4116	BFC92	281209	6427089	Artefact scatter	Valid	
37-2-4117	BFC93	281221	6427043	Artefact scatter	Valid	
37-2-4118	BFC94	281279	6427036	Artefact scatter	Valid	

AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Site status	Permit
37-2-4119	BFC95	281295	6427016	Artefact scatter	Valid	
37-2-4490	BFC98	280112	6427888	Artefact scatter	Salvaged	PA 10_0002
37-2-4491	BFC99	280346	6427883	Isolated artefact	Valid	
37-2-4492	BFC100	280903	6427775	Isolated artefact	Valid	
37-2-4563	BFC102	279819	6426539	Artefact scatter	Partially destroyed	PA 10_0002
37-2-4580	BFC107(MDG1)	283416	6429064	Isolated artefact	Valid	
37-2-4582	BFC109 (MDG3)	280187	6428445	Isolated artefact	Valid	
37-2-4863	BFC111	279698	6428117	Isolated artefact	Valid	
37-2-5425	BCF150	281157	6427427	Artefact scatter	Valid	
37-2-5428	BCF113A	280986	6428161	Artefact scatter	Valid	
37-2-5429	BCF114A	281089	6428425	PAD	Valid	
37-2-5430	BFC115	281046	6428510	Isolated artefact	Valid	
37-2-5431	BFC116	280994	6428280	Artefact scatter	Valid	
37-2-5432	BFC117	280935	6428081	Isolated artefact	Valid	
37-2-5433	BFC118	282324	6428173	PAD	Valid	
37-2-5434	BFC119	282490	6428448	PAD	Valid	
37-2-5439	BFC124	284126	6428645	Artefact scatter	Valid	
37-2-5440	BFC125	284057	6428564	Artefact scatter	Valid	
37-2-5441	BFC126	283915	6428393	Artefact scatter, PAD	Valid	
37-2-5442	BFC127	283672	6428316	Artefact scatter, PAD	Valid	
37-2-5443	BFC128	279649	6428204	Rockshelter, PAD	Valid	
37-2-5444	BFC129	279641	6428309	Rockshelter, PAD	Valid	
37-2-5445	BFC130	279641	6428308	Rockshelter, PAD	Valid	
37-2-5446	BFC131	279643	6428317	Rockshelter, PAD	Valid	
37-2-5447	BFC132	279631	6428320	Rockshelter, PAD	Valid	
37-2-5448	BFC133	280480	6429845	Isolated artefact	Valid	
37-2-5449	BFC134	280473	6428323	Artefact Scatter	Valid	
37-2-5450	BFC135	279665	6429015	Artefact scatter	Valid	
37-2-5451	BFC136	279714	6428879	Artefact scatter	Valid	
37-2-5452	BFC137	280253	6429070	Isolated artefact	Valid	
37-2-5480	MCO001	283039	6428912	Isolated artefact	6428912	

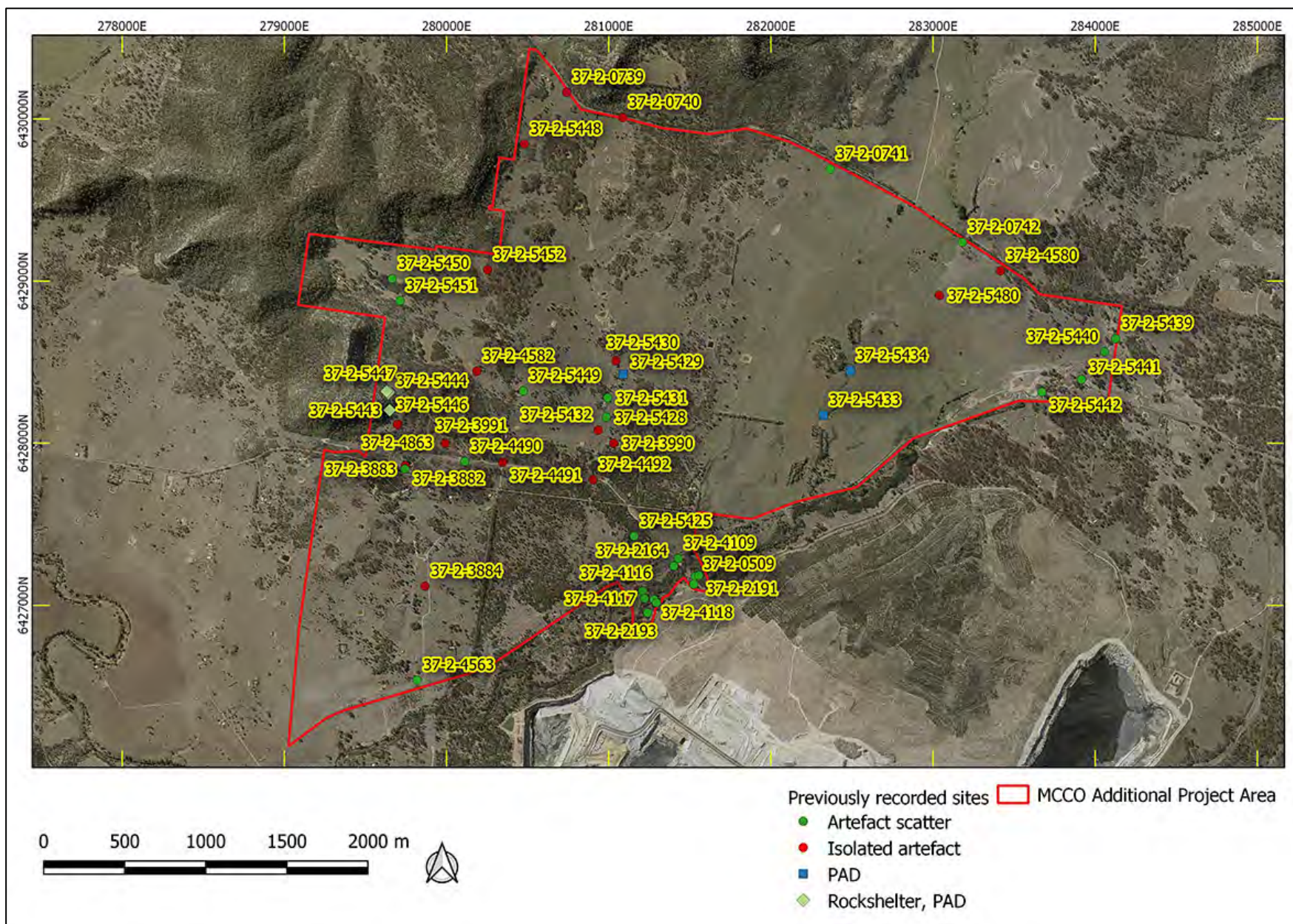
Several sites within the MCCO Additional Project Area were identified as having duplicate AHIMS IDs. **Table 4-6** details these duplicated IDs (now redundant) alongside the name and valid ID for each site.



**Table 4-6: Duplicate AHIMS ID concordance table.**

Site Name	Valid AHIMS ID	Duplicate AHIMS ID
BFC133A	37-2-5428	37-2-5388
BFC114A	37-2-5429	37-2-5389
BFC115	37-2-5430	37-2-5390
BFC116	37-2-5431	37-2-5391
BFC117	37-2-5432	37-2-5392
BFC118	37-2-5433	37-2-5393
BFC119	37-2-5434	37-2-5394
BFC124	37-2-5439	37-2-5399
BFC125	37-2-5440	37-2-5400
BFC126	37-2-5441	37-2-5401
BFC127	37-2-5442	37-2-5402
BFC128	37-2-5443	37-2-5403
BFC129	37-2-5444	37-2-5404
BFC130	37-2-5445	37-2-5405
BFC131	37-2-5446	37-2-5406
BFC132	37-2-5447	37-2-5407
BFC133	37-2-5448	37-2-5408
BFC134	37-2-5449	37-2-5409
BFC135	37-2-5450	37-2-5410
BFC136	37-2-5451	37-2-5411
BFC137	37-2-5452	37-2-5412

Figure 4-3. Previously recorded sites within the MCCO Additional Project Area.



## 4.5 PREDICTIVE MODEL FOR SITE LOCATION

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rockshelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short- and long-time scales—or (b) the historical impacts associated with the introduction of European farming practices. Scarred trees, by their nature, may survive for up to several hundred years but rarely beyond.

### 4.5.1 Settlement strategies

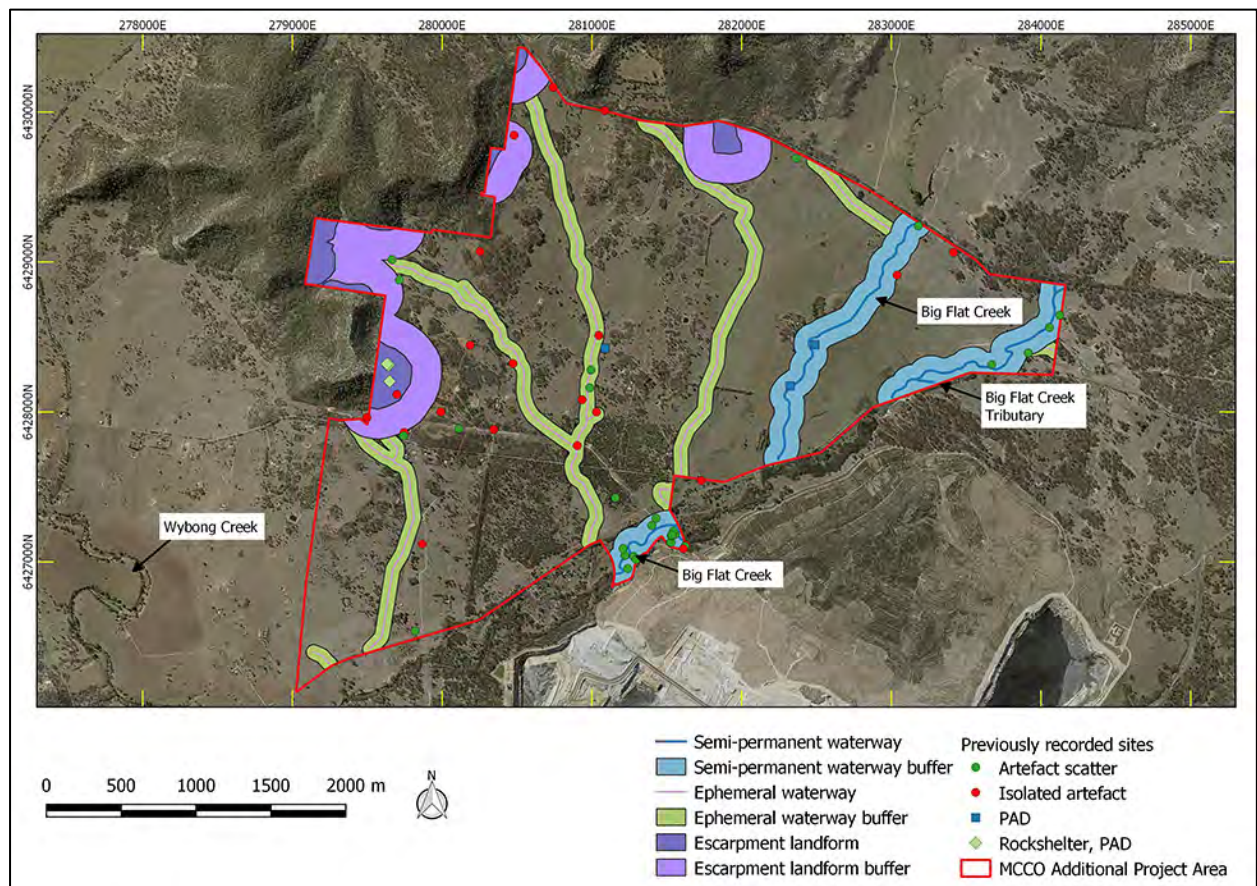
The large number of archaeological studies undertaken within the vicinity of the MCCO Additional Project Area provides information to obtain a sound understanding of the nature and distribution of archaeological sites within the area. Although there is some conjecture about the relationship between stream order, site numbers and densities, the general pattern is that the majority of sites are present within 30 m of watercourses (Dean-Jones 1992: 26–27; AMBS 1997: 29). Although sites are present in locations at a greater distance from water, these sites are limited in terms of both number and size, constituting a lower density scatter than is found along the creek lines (Dean-Jones 1992: 24; ERM 1999: 22–23). Most sites are small, with larger sites typically found in association with permanent watercourses. Reduced visibility has been proffered as an explanation for the higher number of sites and artefacts present along the more heavily eroded and less vegetated minor watercourses as compared to major creeks (Umwelt 2004: 7.7; ERM 1999: 84).

**Figure 4-4** maps the previously recorded sites within the MCCO Additional Project Area in relation to the landform zones identified in **Section 3.7** as having potential to contain evidence of past Aboriginal occupation. As can be seen, most previously recorded sites fall into these environmental zones with a clear majority being associated with the semi-permanent waterway



buffer. Sites located outside of these zones are more likely to be isolated finds. This would indicate that the settlement strategies noted elsewhere within the Hunter Valley are also valid for the MCCO Additional Project Area in that most sites will be located in association with water sources.

**Figure 4-4: Aerial showing the correlation between site recordings and landform types.**



#### 4.5.2 Past land use

Crucial for the preservation of archaeological deposits is the history of past land use in an area. In particular, the European history of the Hunter Valley lowlands, where the MCCO Additional Project Area is located, is a stark example of historic land mismanagement leading to wide-spread erosion as the dispersible soils were exposed to rain.

An analysis of aerial photography of the MCCO Additional Project Area 51 years ago in 1967 (**Figure 4-5**) shows that there is very little tree cover within the MCCO Additional Project Area and evidence of sheet wash erosion with the majority of the area impacted either by degrading or aggrading factors. The 1967 image shows de-vegetated creek lines with noticeable gully erosion within the channel (channelisation) and, in places, extensive sheet wash erosion at their margins.

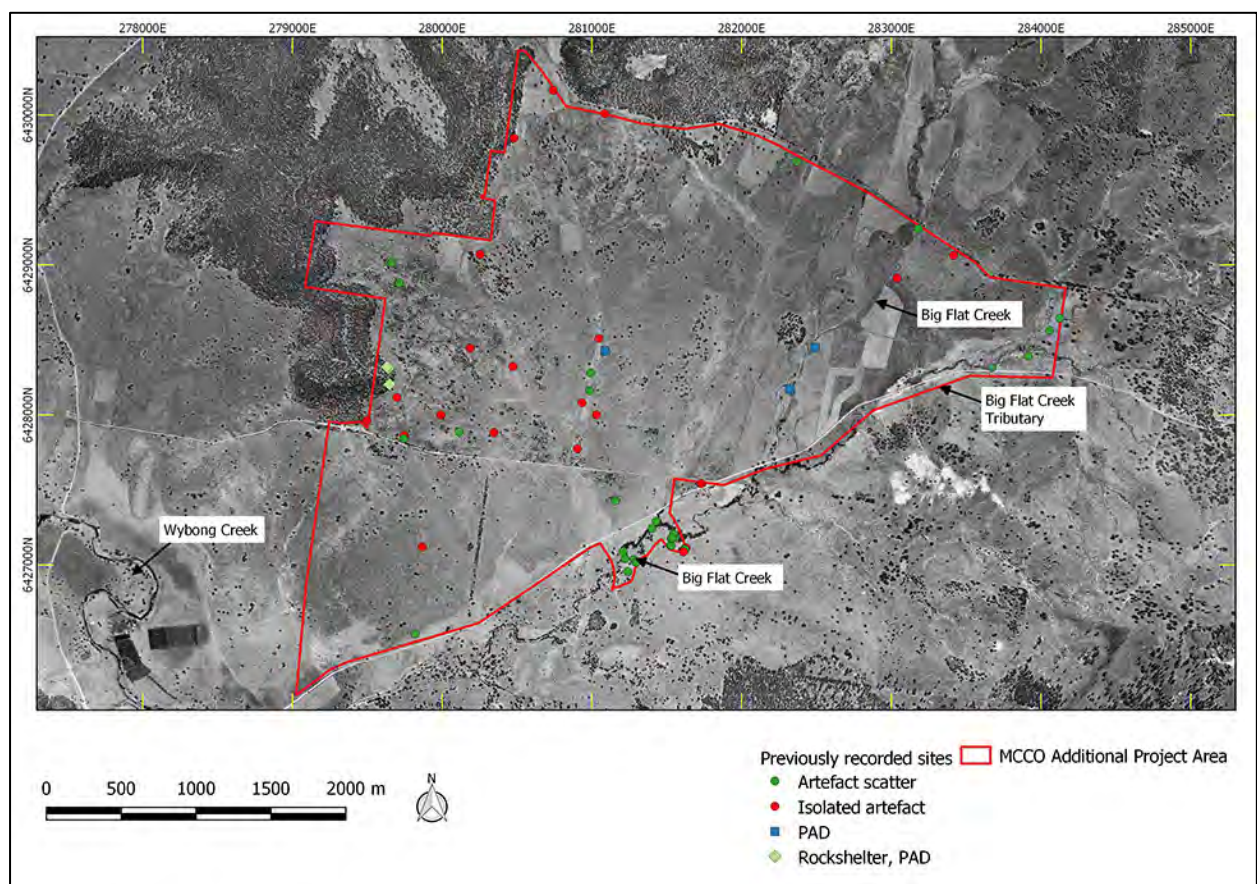
Such widespread impacts have undoubtedly affected the archaeological landscape in that many tens of centimetres of topsoils have been removed from areas such as the MCCO Additional

Project Area, along with any archaeological deposits they may have contained. With such widespread soil movement, it is also important to remember that accumulations of artefacts that may be termed a 'site' today may have, in fact, been washed into that location during the historic period and bear no relationship to past Aboriginal occupation patterns in the area.

When previously recorded sites are overlain on the 1967 aerial image (**Figure 4-5**), several observations can be made:

- Site density along the arm of Big Flat Creek in the centre-east of the MCCO Additional Project Area is very low. Perhaps, as noted in **Section 3.7**, due to the high salinity of the creek in this area
- Site density is greatest in the portion of Big Flat Creek where the proposed Wybong Road Overpass is proposed
- The tributary to Big Flat Creek in the southeast of the MCCO Additional Project Area appears to be highly eroded in 1967
- The sites located along the ephemeral drainage line in the centre of the MCCO Additional Project Area are likely to be displaced due to the evident erosion in this system including an alluvial fan at its southern extent where it joins Big Flat Creek
- There is generally widespread sheet wash erosion and very little original vegetation cover across the MCCO Additional Project Area.

**Figure 4-5: A 1967 aerial image with previously recorded sites.**





### 4.5.3 Previously recorded sites

Due to the history of archaeological investigation near the MCCO Additional Project Area (see **Section 4.4.2**), there have been a number of sites recorded either within the MCCO Additional Project Area. 47 sites remain extant, either completely or partially, within the MCCO Additional Project Area as one of the sites (BFC98) has been previously salvaged (see **Section 4.4.2.2**).

The results of previous investigations would suggest that:

- The most common site type will be stone artefact sites; either low density artefact scatters or isolated finds
- Culturally modified trees will be extremely rare due to the level of historical clearing and the fact that they are a regionally rare site type
- Grinding grooves will be unlikely to occur in the MCCO Additional Project Area as the major creek lines have been subject to previous assessment and it would be expected that these site types would have already been recorded
- Other site types such as burials or stone arrangements will be very rare due to the long-term agricultural disturbances that have occurred in the MCCO Additional Project Area
- Rockshelters are possible in the west of the MCCO Additional Project Area. However, while the MCCO Additional Project Area contains five rockshelters with PAD, the veracity of there being PADs associated with these shelters will be further examined during this investigation as the photographs tend to indicate that PADs would be unlikely at such rockshelters.

### 4.5.4 Landform modelling

The MCCO Additional Project Area is entirely contained within landforms between 280 m and 140 m in altitude (**Section 3.1**). Generally, the land is sloping towards the south and is part of the Big Flat Creek catchment. In the northern and western portions of the MCCO Additional Project Area there are localised ridges with some associated steeper slopes, however, generally the MCCO Additional Project Area has a relatively gentle gradient.

Hydrological resources are generally limited to Big Flat Creek along the southern boundary of the MCCO Additional Project Area.

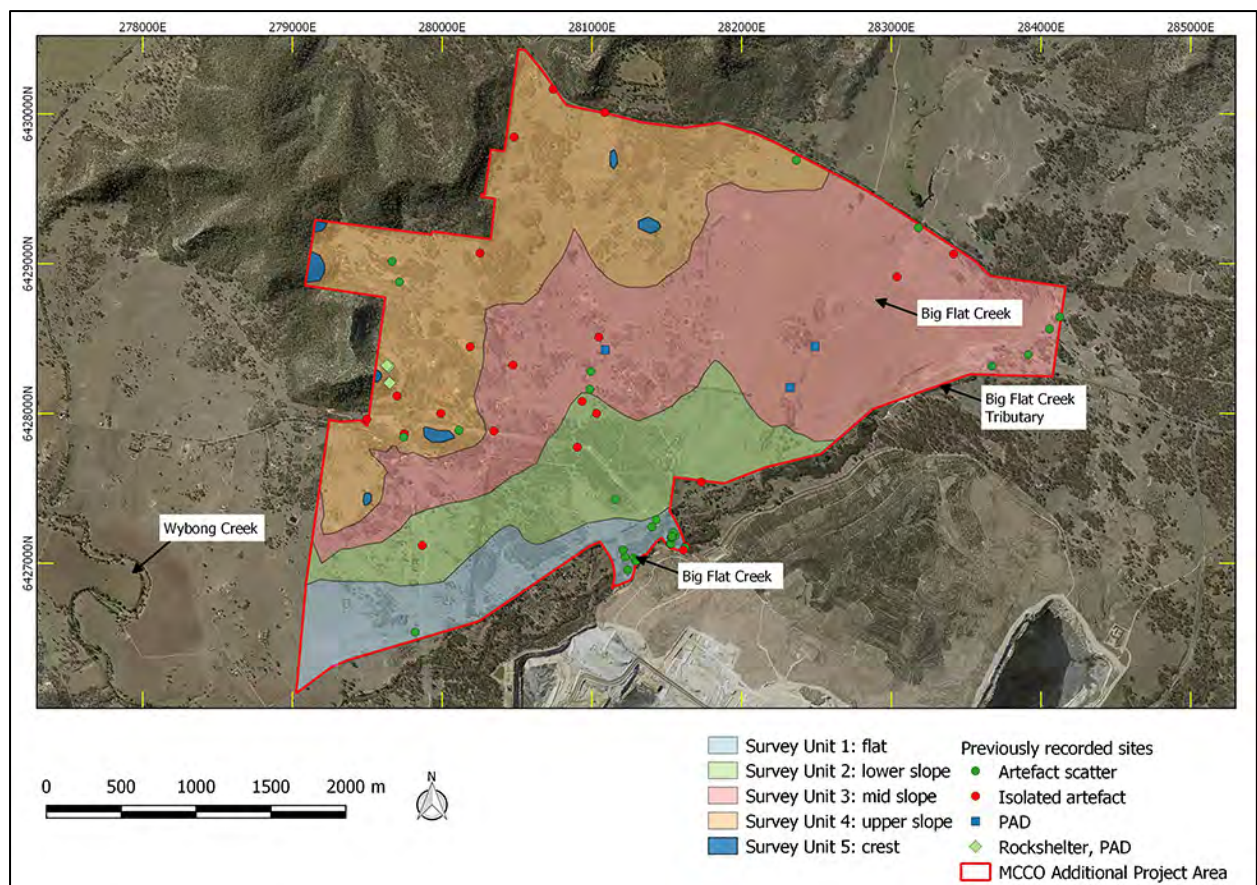
As such there are a variety of topographic features within the MCCO Additional Project Area that would have encouraged past Aboriginal occupation; namely:

- The elevated sandstone conglomerate landforms in the north and west of the MCCO Additional Project Area have the capability to provide rockshelters for habitation and/or ceremonial purposes
- The landforms adjacent to Big Flat Creek have the capability of providing elevated landforms adjacent to water: landforms recognised in the area as having archaeological sensitivity.

When previously recorded sites are mapped against the major landform types of the MCCO Additional Project Area (**Figure 4-6**), there is little correlation between site location and landform type. Indeed, the major determination of the probability of an area containing a site appears to be availability of water (see **Section 4.5.1**) rather than landform type.

Similarly, there does not appear to be a correlation between site type and landform type. Artefact scatters and isolated finds can be found in all landform types; although rarely in crest landforms. The only correlation is that shelter sites, self-evidently, are associated with upper slope or crest landforms.

**Figure 4-6: Previously recorded sites and major landform types.**



#### 4.5.5 Previous studies

##### 4.5.5.1 Upper Hunter Valley Aboriginal Heritage Baseline Study (ERM 2004)

ERM (2004) undertook a review of the archaeology in the upper Hunter Valley on behalf of Upper Hunter Aboriginal Heritage Trust. Following is several ERM's conclusions about archaeological sites in the upper Hunter Valley of relevance to this assessment:

- Artefact assemblages will typically be comprised of flaked stone with a component associated with the manufacture of backed artefacts. Backed artefacts typically make up less than 2 per cent (and up to 5 per cent in rare cases) of an assemblage

- Evidence of backed artefacts is generally found wherever large numbers of artefacts have been recorded
- Cores and flakes associated with backed artefact manufacture typically show evidence of platform modification to increase platform angles. This modification is sometimes referred to as faceting, and is typical of open site assemblages between Singleton and Muswellbrook
- The backed artefact component may typically include a larger proportion of asymmetric, elongate (bondi point) forms and a smaller proportion of symmetric (geometric microlith) forms in the same assemblage
- Eloueras occur occasionally and sometimes exhibit use-wear chipping and polishing along the chord
- Artefact assemblages have, on rare occasions, included small grindstones or fragments thereof, and ground-edge hatchet heads made on flat ovate water rolled small cobbles
- Hearths, comprising tight concentrations of heat-retainer stones clearly distinguishable from the natural environment are rare
- Sites along creek lines have potential for subsurface archaeological deposit. Topsoil is often quite deep, commonly between 100 and 300 mm
- The small numbers of artefacts found on slopes and ridge crests generally do not allow identification of particular activities, but do provide evidence for occupation of these areas and at the very least transient movement over, and use of, all parts of the landscape
- In areas close to the Hunter River (very likely to have been the major foci of occupation) alluvial deposits may have buried sites, or periods of flooding may have eroded and displaced archaeological material. Nevertheless, excavations at a number of sites indicate that high density subsurface assemblages may occur in this context
- Sites on or within colluvial deposits are also rare, however, they do occur and may represent stratified cultural deposits providing evidence of chronological change
- Archaeological sites other than artefact scatters or isolated artefacts are not common
- Quarry sites have been identified where silcrete outcrops occur; however, the vast majority of raw material used in the manufacture of stone artefacts would have been derived (quarried/collected) from the Hunter River
- Axe-grinding grooves often occur where suitable sandstone is located in association with water or a creek line
- Scarred trees are rare, presumably because most trees that may be old enough to have been scarred have been cleared or died naturally (and rotted away or been burnt in fires)
- Art sites, ceremonial sites or Bora grounds are also rare and are either deteriorating or can no longer be located.

#### **4.5.5.2 Aboriginal and Historical Cultural Heritage Assessment. Mangoola Coal Continued Operations Project Pre-feasibility Study (EMM 2016)**

Based on previous reports and Aboriginal site data contained on AHIMS, the EMM 2016 study concluded that the following site characteristics are likely to occur in the MCCO Additional Project Area:

- Stone artefact sites (i.e. artefact scatters and isolated finds) dominate the archaeological record of this area, accounting for over 90% of all known sites in the immediate area
- Most artefact scatters contain less than 10 artefacts. Scatters with over 50 artefacts are uncommon
- Site types other than artefact scatters and isolated finds are poorly represented in the local area and restricted to rockshelters, grinding grooves and scarred trees
- The dominant raw material for stone artefact production in the area is indurated mudstone/tuff followed by silcrete. Both raw materials were sourced from gravel bars and/or terraces associated with the Hunter and/or Goulburn Rivers
- Stone artefact assemblages are dominated by flake and non-flake debitage. Retouched implements are comparatively rare in the local area
- PADs are primarily identified near watercourses on elevated, level to gently inclined landforms with good outlook over the surrounding landscape
- Rockshelters occur along the sandstone escarpments that surround the valleys below.

EMM 2016 mapped the archaeological sensitivity of the MCCO Additional Project Area and the areas where EMM predict rockshelters to be located are restricted to small areas in the west of the MCCO Additional Project Area. Other than the areas of sensitivity related to this site type, other archaeologically sensitive areas are confined to the drainage lines within the MCCO Additional Project Area with the most sensitive areas being within 50 m of drainage lines and a general archaeological sensitivity within 200 m of waterways.

#### **4.5.6 Conclusion**

Utilising knowledge of the environmental contexts of the MCCO Additional Project Area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of those site types being recorded within the MCCO Additional Project Area:

- Isolated finds may be indicative of: random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or sub-surface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.

- As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the MCCO Additional Project Area.
- Open artefact scatters are defined as two or more artefacts, not located within a rockshelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

- The MCCO Additional Project Area incorporates elevated landforms with good vantages over significant seasonal watercourses. In addition, previous investigations of the immediate landscape and surrounds have identified numerous artefacts scatters of variable density and complexity. This site type is therefore considered likely to be encountered in the current assessment, but the artefact scatters are not expected to be as frequent or as complex as would be the case if the water sources within the MCCO Additional Project Area were more permanent. The previous erosive ground disturbances impacting the drainage features and adjacent landforms of the MCCO Additional Project Area are likely to have displaced and redeposited many of these sites and it is expected that the majority of any recorded will be in secondary context with little potential for subsurface archaeological deposits.
- Closed sites are most commonly rockshelters and, as noted in **Section 4.4.1**, a number have been previously recorded both within the MCCO Proposed Project Area, as well as in the nearby vicinity. Due to their physical nature, rockshelters are confined to escarpment areas, primarily in sandstone dominated landforms. Rockshelters are more likely to be preserved in sandstone of the Hawkesbury group rather than the more-friable Narrabeen sandstone group (for example, Attenbrow 2010: 121).
  - EMM (2018: 18) state that Triassic age Narrabeen group sandstone dominates the northwest of the MCCO Additional Project Area. Therefore, while there may be overhangs in the portions of the MCCO Additional Project Area, it is unlikely



that these will preserve art and/or archaeological deposits. It is noted that five rockshelter sites were recorded by EMM (2016) but none of these provided material evidence, such as artefacts, of occupation by Aboriginal people.

- Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed to gather food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any particular example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.
  - Due to the historical near-total clearance of trees from within the MCCO Additional Project Area, this site type is predicted to be very rare. It is also noted that this site type is very rare at a regional level.
- Quarry sites and stone procurement sites typically consist of exposures of stone material where evidence for human collection, extraction and/or preliminary processing has survived. Typically, these involve the extraction of siliceous or fine grained igneous and meta-sedimentary rock types for the manufacture of artefacts. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations.
  - This site type could be recorded within the MCCO Additional Project Area should suitable rock outcroppings be available.
- Burials are generally found in soft sediments such as aeolian sand, alluvial silts and rockshelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.
  - Although it is possible that this site type could be found within the MCCO Additional Project Area, it is considered a rare site type especially given the disturbance that has occurred within the MCCO Additional Project Area.

## 5 RESULTS OF ABORIGINAL ARCHAEOLOGICAL SURVEY

### 5.1 SAMPLING STRATEGY AND FIELD METHODS

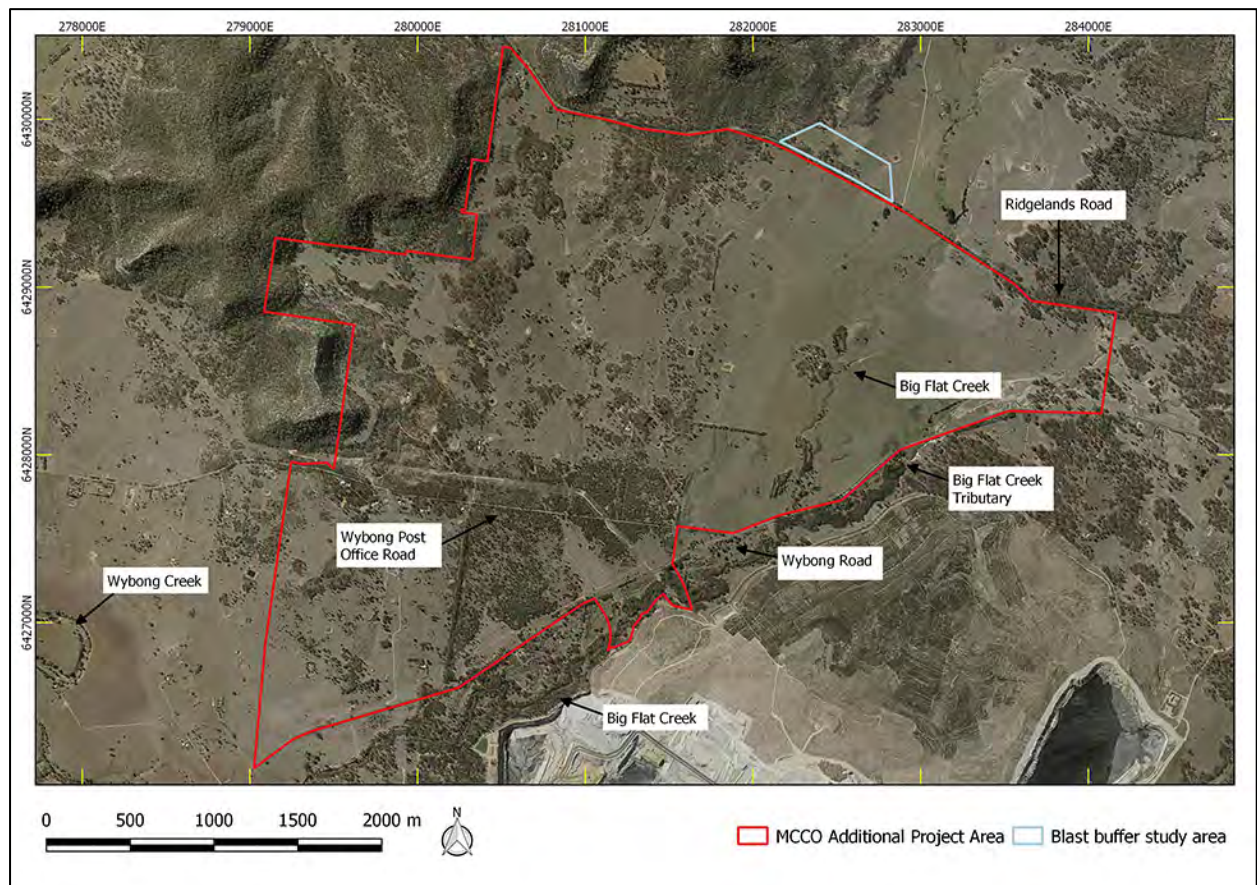
Standard archaeological field survey and recording methods were employed in this study (Burke & Smith 2004). Survey of the entire MCCO Additional Project Area was conducted systematically according to pre-determined parallel transects spaced 100 m apart. Surveyors walked at even spacing sufficient to sample the entirety of each transect. RAPs, or their representatives, assisted the field effort by identifying objects/features of cultural interest and by placing flags at artefact locations to assist with the recording of artefact sites. Vehicles were only used for access between transects. The MCCO Additional Project Area was divided into five landform units for recording purposes, with ground surface exposure (GSE) and ground surface visibility (GSV) noted for each, however, transects were not confined to these landform units but were organised spatially so that one transect could sample two or even three landscape units where applicable. GSE and GSV are further examined in **Section 5.3**.

It should be noted that the aim of any archaeological survey is not to locate each and every artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within a MCCO Additional Project Area are known. Therefore, the aims of the survey were to:

- Reinspect the location of all 49 previously recorded sites within the MCCO Additional Project Area so that their current condition and scientific heritage values could be assessed
- Conduct pedestrian transects across all landforms in the MCCO Additional Project Area so that their archaeological potential could be determined
- Evaluate whether the predictive model set out in **Section 4.5** is valid
- Determine if any portions of the MCCO Additional Project Area require test excavation in order to understand the archaeological potential at a particular location
- Determine whether any previously recorded sites within 100 m of the MCCO Additional Project Area extend into areas where proposed impacts are to occur.

The entirety of the MCCO Additional Project Area was subjected to full pedestrian survey as set out in the survey methodology (**Appendix 1**). In addition, a 12 ha area of land to the north of Ridgeland Road was also inspected. This area, while outside of the MCCO Additional Project Area, is within the blast radius buffer and was inspected to ensure that Aboriginal cultural heritage objects or places will not be harmed by blast vibrations during the Life of Mine.

**Figure 5-1** shows the two areas, the MCCO Additional Project Area and the blast buffer study area, that were surveyed by pedestrian transects by OzArk archaeologists and members of the Aboriginal community.

**Figure 5-1: Aerial showing areas subjected to survey.**

## 5.2 PROJECT CONSTRAINTS

There were no factors which significantly constrained the successful completion of this assessment. In the majority, the topography of the MCCO Additional Project Area consisted of gentle gradients that were able to be easily traversed and there were few areas of dense vegetation. The weather was hot during the survey with temperatures in the high 30s being frequent, however, this did not diminish the survey efficacy. The only portions of the MCCO Additional Project Area that were unable to be assessed were areas immediately adjacent to houses that were occupied by tenants. While the survey was able to include closely adjacent landforms, the 'house paddock' of most houses was not inspected in respect to the tenants' privacy. There were 11 such houses in the MCCO Additional Project Area with 'house paddocks' of approximately 0.5 ha each. This equates to 0.5% of the MCCO Additional Project Area being unable to be assessed. The inability to survey these small areas did not detract from the efficacy of the overall survey.

## 5.3 EFFECTIVE SURVEY COVERAGE

Two of the key factors influencing the effectiveness of archaeological survey are GSV and GSE. These factors are quantified to ensure that the survey data provides adequate evidence for the evaluation of the archaeological materials across the landscape. For the purposes of the current

assessment, these terms are used in accordance with the definitions provided in the *Code of Practice* (DECCW 2010).

GSV is defined as:

*... the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. Things like vegetation, plant or leaf litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals' (DECCW 2010: 39).*

GSE is defined as:

*... different to visibility because it estimates the area with a likelihood of revealing buried artefacts or deposits rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals' (DECCW 2010: 37).*

The landscape was very dry at the time of assessment and significant die-back of vegetative ground cover had occurred. As such, usually, GSV was moderate to high allowing for adequate investigation of the ground surface within the MCCO Additional Project Area (**Table 5-1**).

In general, **Table 5-1** presents an approximation of the amount of ground surface able to be seen at any location within the particular landform units. For example, at any one location within the flat landforms to the south of the MCCO Additional Project Area approximately 6.7% of the ground surface could be seen. This increases on lower and mid slope landforms as these were generally cleared with less ground cover than the flat landforms. Upper slopes tended to support regenerating woodland and the ground surface was obscured by leaf litter and bark. Crest landforms often contained sizeable exposures where the soils had been depleted by erosion (**Figure 5-2**).

The survey effort illustrated on **Figure 5-3** is the data taken on a GPS device operated by one of the archaeologists in each team. It therefore does not consider the other five surveyors in each team that 'filled in' the spaces between the transects shown on **Figure 5-3**.





**Table 5-1: Survey coverage data.**

Survey Unit	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
1	Flat	802700	45	15	54182	6.7
2	Lower Slope	1571300	70	25	274978	17.5
3	Mid Slope	4549100	60	20	838117	18.4



Survey Unit	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
4	Upper Slope	3132100	50	15	234907	7.5
5	Crest	58400	70	20	8176	14

**Figure 5-2: Examples of GSE/GSV within the MCCO Additional Project Area.**

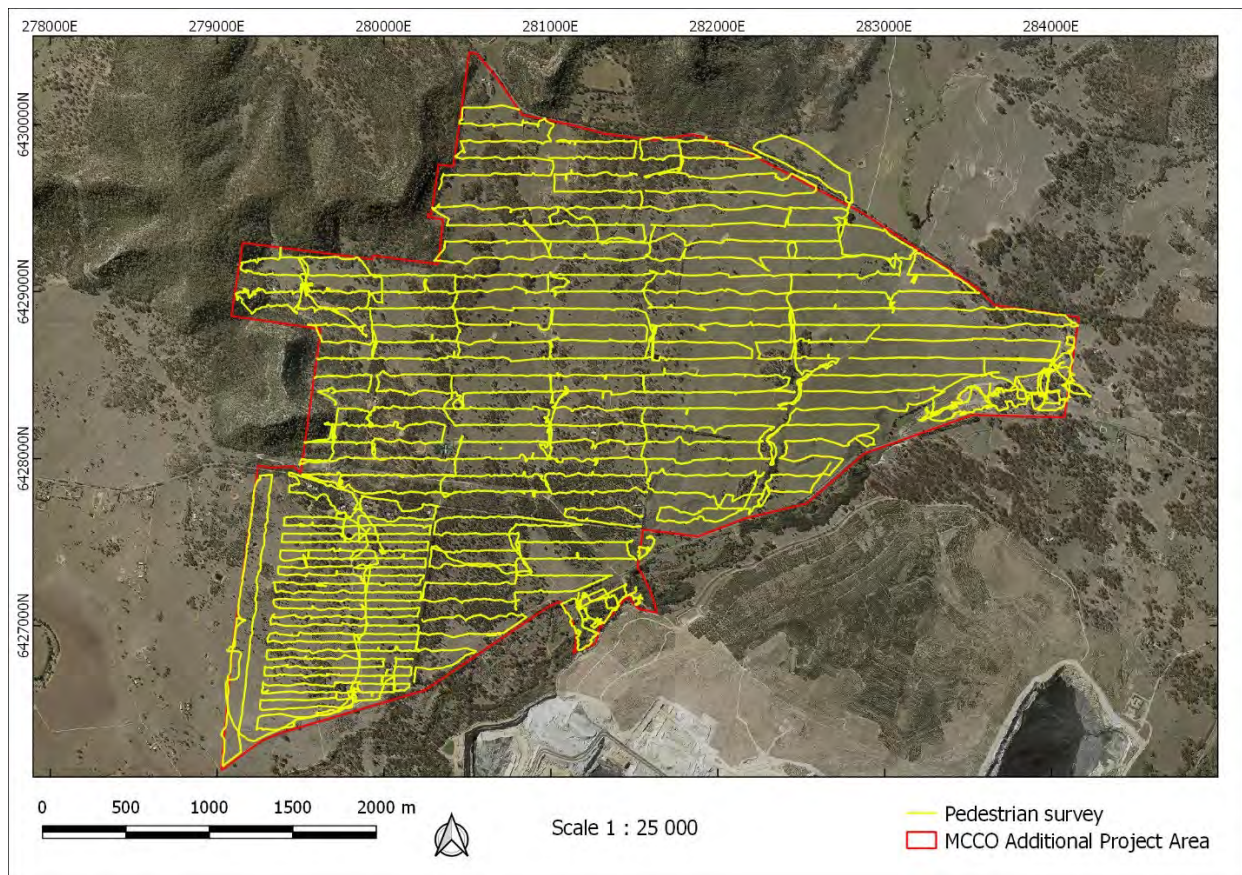
	
<p>1. Survey Unit 1. GSV was lower in flat landforms due to grass cover, albeit often dead grass. Flat landforms often contained cracking alluvial soils as seen here.</p>	<p>2. Survey Unit 2. GSV increased on the lower slope landforms as ground covers were less and exposures were larger.</p>
	
<p>3. Survey Unit 3. While leaf litter sometimes obscured views of the ground surface, exposures in mid slope landforms were numerous and frequent.</p>	<p>4. Survey Unit 4. GSV was often obscured in upper slope landforms by a combination of leaf litter and grass cover.</p>





5. Survey Unit 5. GSV increased in crest landforms as there were sizeable exposures due to soil loss.

**Figure 5-3. Survey transects undertaken during the assessment of the MCCO Additional Project Area.**



## 5.4 ABORIGINAL SITES RECORDED

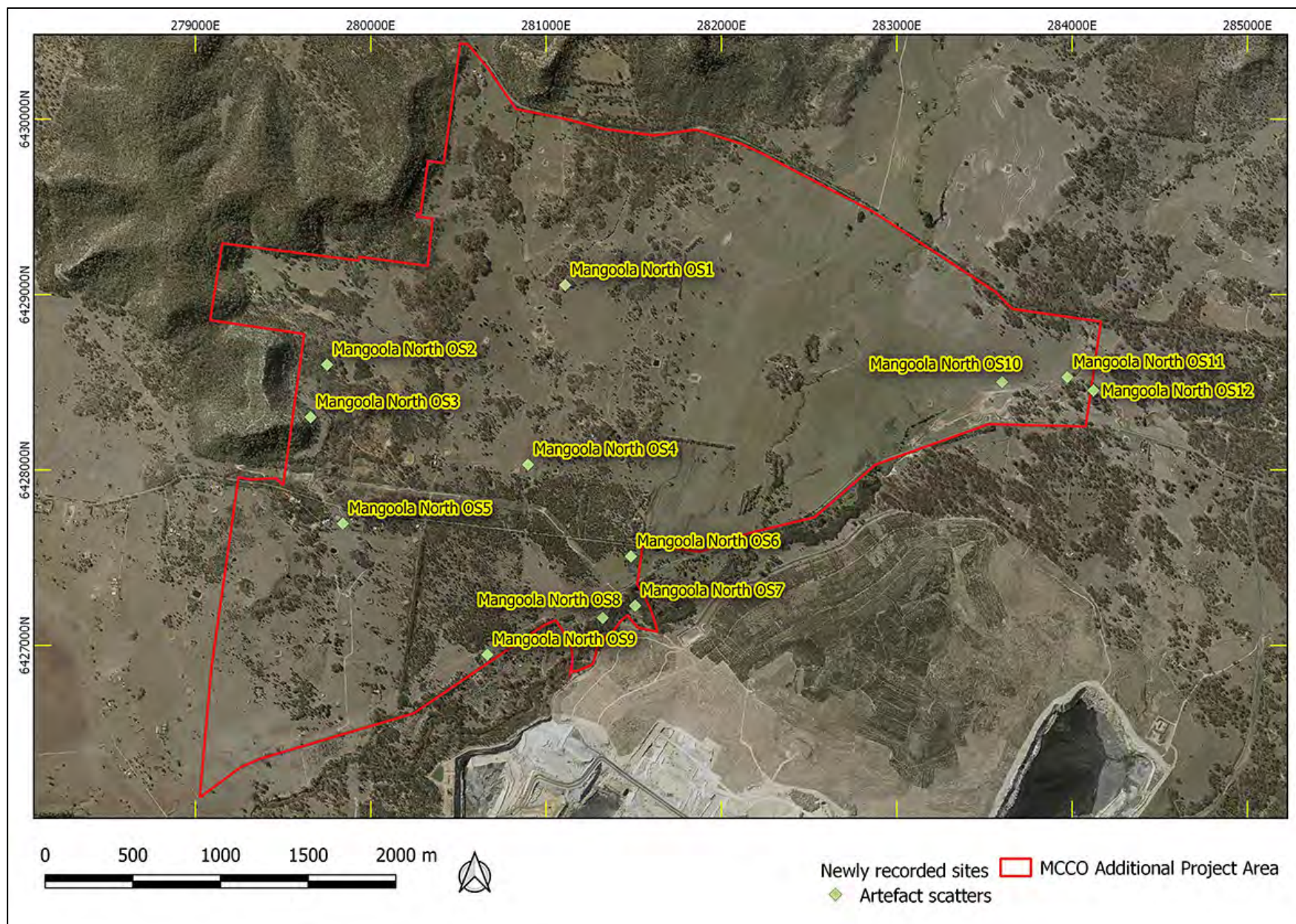
25 previously unrecorded Aboriginal cultural heritage sites were identified during the survey (**Figure 5-4** and **Figure 5-27**). All sites were artefact sites; either artefact scatters (n=12) or isolated finds (n=13). Further details including the GPS locations, site features and landform have been recorded for each site (**Table 5-2**). The AHIMS ID for each site will be updated once the sites have been approved by AHIMS. The significance assessment and impact assessment for all sites, is presented in **Sections 7.1** and **7.3** respectively.

**Table 5-2: Previously unrecorded sites noted during the survey.**

AHIMS ID	Site Name	GDA Zone 56 Easting	GDA Zone 56 Northing	Feature(s)	Landform
<b>Artefact scatters</b>					
37-2-5802	Mangoola North OS1	281109	6429054	Artefacts: 2	Upper Slope
37-2-5803	Mangoola North OS2	279751	6428600	Artefacts: 2	Upper Slope
37-2-5804	Mangoola North OS3	279657	6428301	Artefacts: 2	Upper Slope
37-2-5805	Mangoola North OS4	280897	6428031	Artefacts: 4	Lower Slope
37-2-5806	Mangoola North OS5	279841	6427694	Artefacts: 11	Mid Slope
37-2-5807	Mangoola North OS6	281484	6427507	Artefacts: 8	Lower Slope
37-2-5808	Mangoola North OS7	281508	6427226	Artefacts: 2	Flat
37-2-5809	Mangoola North OS8	281323	6427157	Artefacts: 2	Flat
37-2-5810	Mangoola North OS9	280665	6426947	Artefacts: 6	Flat
37-2-5811	Mangoola North OS10	283601	6428501	Artefacts: 2	Mid Slope
37-2-5812	Mangoola North OS11	283973	6428529	Artefacts: 12	Mid Slope
37-2-5813	Mangoola North OS12	284122	6428453	Artefacts: 100+	Mid Slope
<b>Isolated finds</b>					
37-2-5814	Mangoola North IF1	280755	6429805	Isolated Find	Upper Slope
37-2-5815	Mangoola North IF2	279476	6428873	Isolated Find	Upper Slope
37-2-5816	Mangoola North IF3	282813	6428831	Isolated Find	Mid Slope
37-2-5817	Mangoola North IF4	282638	6428558	Isolated Find	Mid Slope
37-2-5818	Mangoola North IF5	281343	6428107	Isolated Find	Mid Slope
37-2-5819	Mangoola North IF6	281266	6427960	Isolated Find	Lower Slope
37-2-5820	Mangoola North IF7	279912	6428038	Isolated Find	Upper Slope
37-2-5821	Mangoola North IF8	279677	6427905	Isolated Find	Upper Slope
37-2-5822	Mangoola North IF9	279494	6427608	Isolated Find	Upper Slope
37-2-5823	Mangoola North IF10	281437	6427258	Isolated Find	Flat
37-2-5824	Mangoola North IF11	281179	6427171	Isolated Find	Flat
37-2-5825	Mangoola North IF12	284056	6428302	Isolated Find	Mid Slope
37-2-5801	Mangoola North IF13	284233	6428372	Isolated Find	Mid Slope



Figure 5-4: Aerial showing newly recorded artefact scatters.



### 5.4.1 Artefact scatters

Twelve artefact scatters were recorded during the survey. Details on each site follow.

The nomenclature of all site recordings uses the term 'Mangoola North' to signify that these recordings are north of the current 2018 operations of the Mangoola Coal Mine (generally north of Wybong Road). It was also devised to distinguish the 2018 site recordings from the earlier recordings that most commonly use 'BFC' or Big Flat Creek as a preface. 'Mangoola North' is abbreviated to 'MN' for brevity. The site name also uses the term 'OS'. This is an abbreviation of 'open site' and refers to artefact scatters which are obviously only one type of open site.

#### **Mangoola North OS1**

**Site Type:** Open Artefact Scatter

**GPS Coordinates:** GDA Zone 56 E281109 N6429054

**Location of Site:** 1.4 km north of Wybong Post Office Rd and 0.9 km south of Ridgeland Rd, Wybong, on the east side of a property dam (**Figure 5-4**). The site is located by an ant mound in sparse tree cover on the southwest upper slope of a gradual hill, approximately 300 m downslope of the crest (**Figure 5-5**).

**Description of Site:** Mangoola North OS1 is a low-density artefact scatter comprising two small silcrete flakes (**Table 5-3; Figure 5-6**). These artefacts are located within an upper slope landform of redeposited sand on top of a clayey B-Horizon. The 45 by 35 m extent of the site was defined by the area of exposure. Surrounding vegetation represented clusters of Ironbark regrowth with sparse grass cover. The GSE at the time of recording was high (70%) with a GSV of 85% within these exposures. Scattered gravel and pebbles were present. Identified disturbances included cattle grazing, erosion, and the establishment of the adjacent property dam and ant mound.

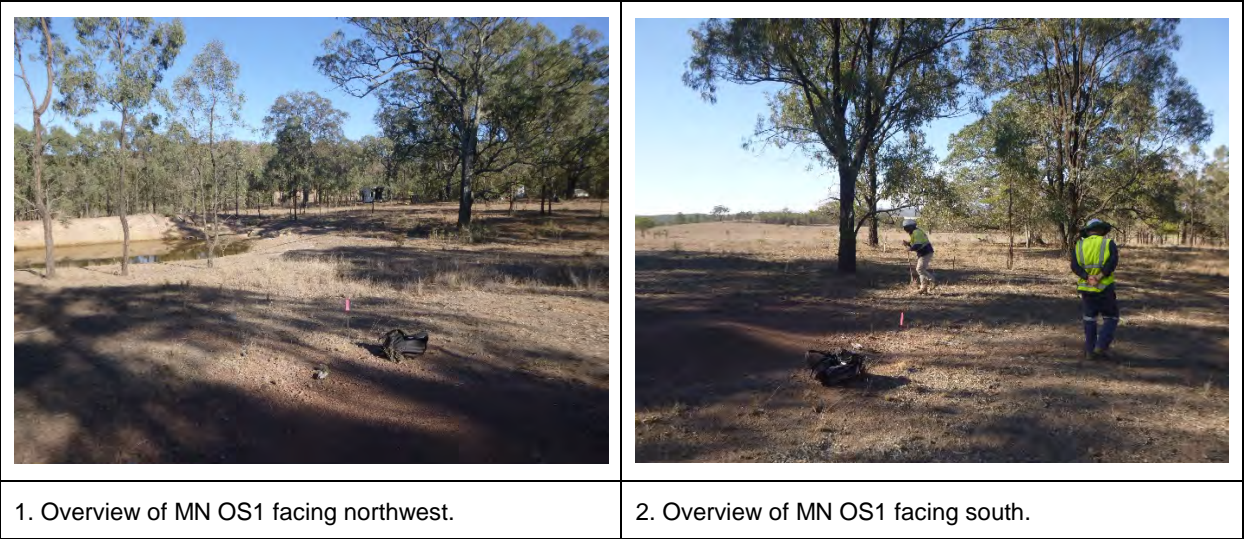
Potential for the presence of further subsurface archaeological deposits at Mangoola North OS1 was assessed as negligible.





Figure 5-5: Aerial showing location and extent of Mangoola North OS1.



Figure 5-6: Photographs showing an overview and details of Mangoola North OS1.





	
3. View of MN OS1 silcrete flakes.	4. View of MN OS1 silcrete flake showing usewear along distal margin.

**Table 5-3: Mangoola North OS1. Artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Flake	Silcrete	Complete	Tertiary	2-4cm	
Flake	Silcrete	Complete	Tertiary	2-4cm	Distal usewear

### **Mangoola North OS2**

**Site Type:** Open Artefact Scatter

**GPS Coordinates:** GDA Zone 56 E279751 N6428600

**Location of Site:** 0.8 km north of Wybong Post Office Rd, 2 km south of Ridgeland Rd, Wybong, and 50 m to the southwest of a property dam (**Figure 5-4**). The site is located on the gentle eastern toe-slope of a dominant ridgeline, approximately 300 m downslope of the crest (**Figure 5-7**).

**Description of Site:** Mangoola North OS2 is a low-density artefact scatter comprising two flakes (**Table 5-4; Figure 5-8**). These artefacts are located within a 3° upper slope landform of sandy, highly eroded sediment. The extent of the site was defined by a 10 m buffer around the two artefacts. Surrounding vegetation represented pencil pines, clusters of Ironbark regrowth, and tall shrubs. The GSE at the time of recording was moderate (40%) with a GSV of 75% within these exposures. Scattered gravel and pebbles were present. Identified disturbances included previous clearing and heavy sheet wash erosion. Potential for the presence of further subsurface archaeological deposits at Mangoola North OS2 was assessed as negligible.

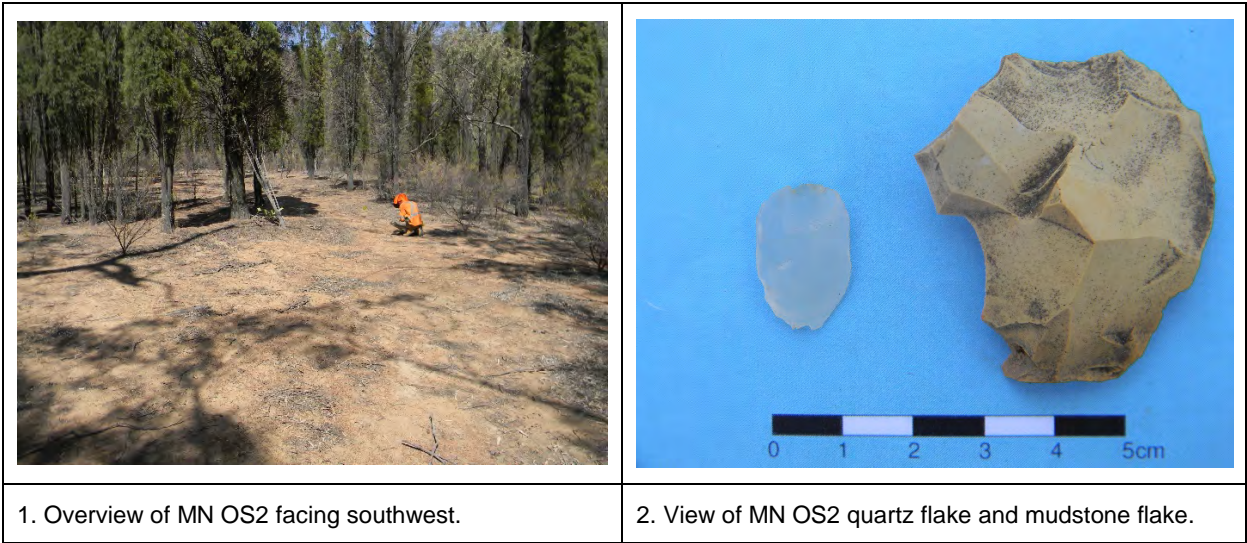
Figure 5-7: Aerial showing location and extent of Mangoola North OS2.



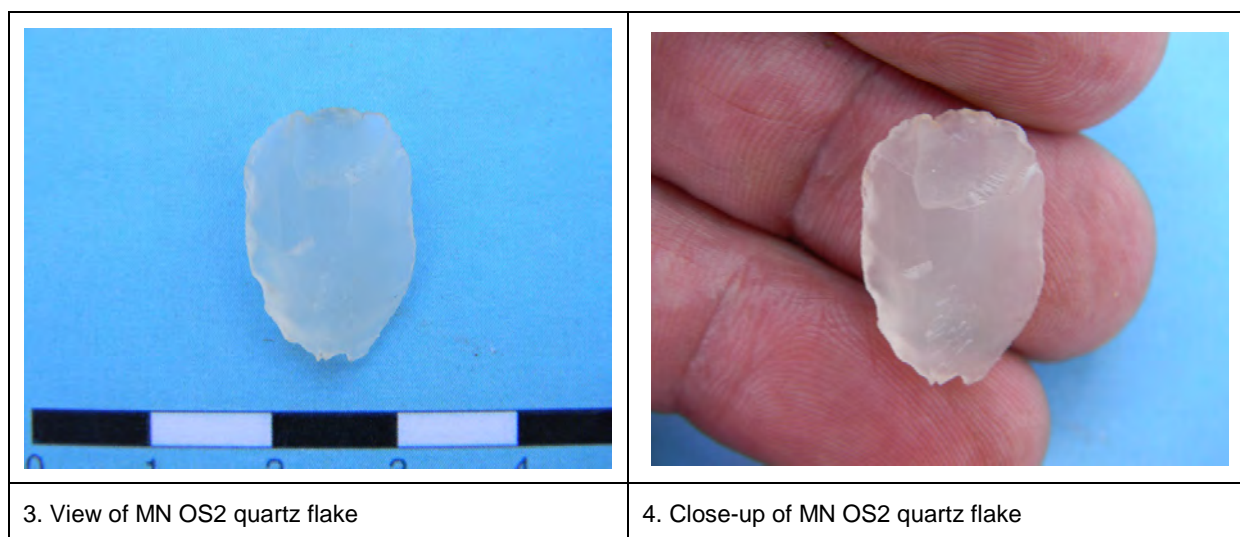
Table 5-4: Mangoola North OS2. Artefact attributes.

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Complete	Tertiary	4-6cm	
Flake	Quartz	Complete	Tertiary	<2cm	

Figure 5-8: Photographs showing an overview and details of Mangoola North OS2.







### **Mangoola North OS3**

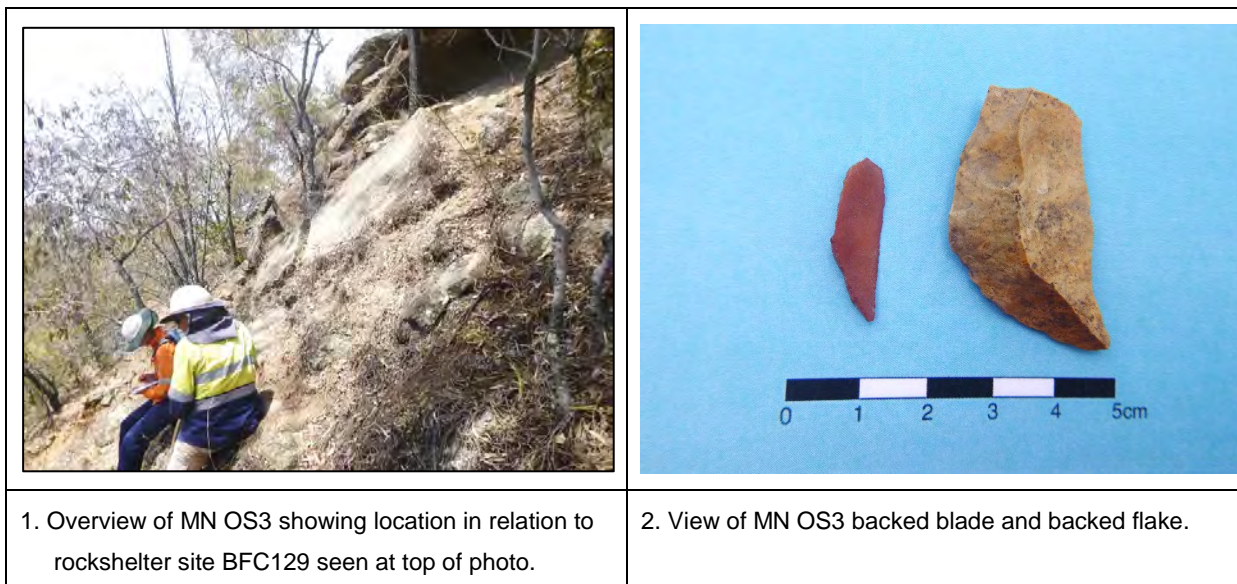
**Site Type:** Open Artefact Scatter

**GPS Coordinates:** GDA Zone 56 E279657 N6428301

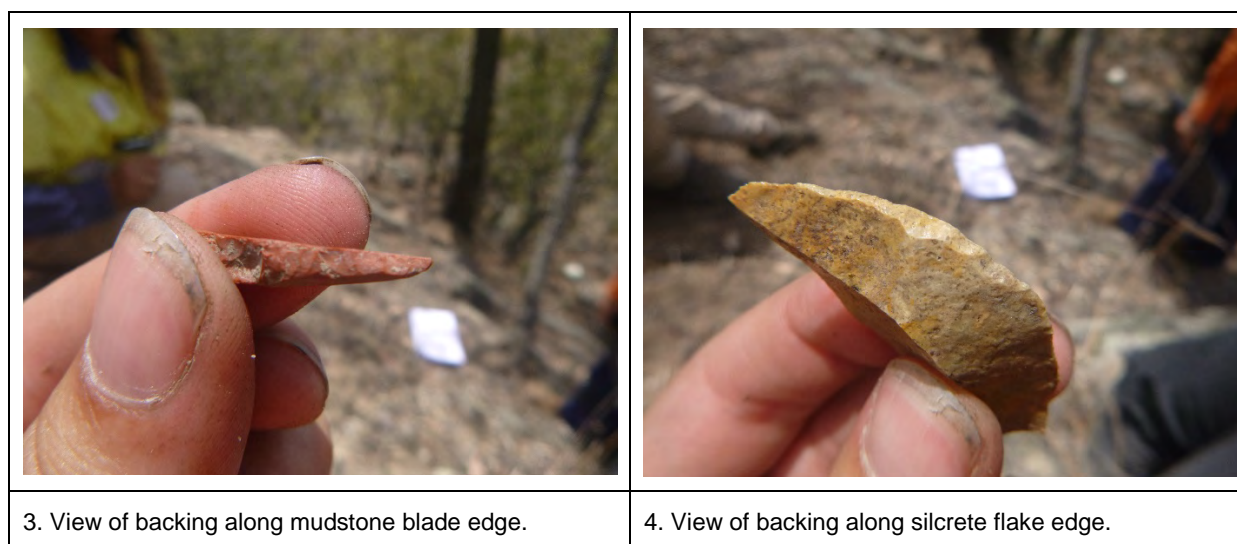
**Location of Site:** Approximately 10 m downslope of rockshelter BFC129 (AHIMS #37-2-5444) (**Figure 5-4**). The site is located 0.4 km north of Wybong Post Office Rd and 2.5 km south of Ridgeland Rd on a steep, rocky scree slope on the northeast slope of a dominant ridge approximately 100 m from the crest (**Figure 5-9**).

**Description of Site:** Mangoola North OS3 is a low-density artefact scatter comprising a backed silcrete flake and a backed mudstone blade (**Table 5-5; Figure 5-10**). These artefacts are located within an upper slope landform of degrading scree, heavy leaf litter, and loamy sand redeposited from the rockshelters above. The extent of the site was defined by a 10 m buffer around these artefacts. Surrounding vegetation represented sparse low eucalypts and infrequent shrubs. The GSE at the time of recording was moderately high (60%) with a GSV of 75% within these exposures. Ordinary stone fragments of various sizes were prevalent. Identified disturbances included erosion, water wash, and wildlife trampling (chiefly wallabies).

Potential for the presence of further subsurface archaeological deposits at Mangoola North OS3 was assessed as negligible.

**Figure 5-9: Aerial showing location and extent of Mangoola North OS3.****Figure 5-10: Photographs showing an overview and details of Mangoola North OS3.**





**Table 5-5: Mangoola North OS3. Artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Backed Blade	Mudstone	Complete	Tertiary	2-4cm	
Backed Flake	Silcrete	Complete	Tertiary	2-4cm	Steep medial retouch

#### **Mangoola North OS4**

**Site Type:** Open Artefact Scatter

**GPS Coordinates:** GDA Zone 56 E280897 N6428031

**Location of Site:** 0.4 km north of Wybong Post Office Rd and 2 km south of Ridgeland Rd, Wybong, 50 m to the northeast of a property dam (**Figure 5-4**). The site is located in an area of extreme erosion by an ephemeral tributary of Big Flat Creek (**Figure 5-11**).

**Description of Site:** Mangoola North OS4 is a low-density artefact scatter comprising four mudstone flakes (**Table 5-6; Figure 5-12**). These artefacts are located within a saline flat of deflated, friable, clayey soils eroding into an ephemeral drainage line. The 25 by 15 m extent of the site was defined by the area of exposure. Surrounding vegetation was constricted to dense *Juncus acutus* shrubs. The GSE at the time of recording was very high (85%) with a GSV of 90% within these exposures. Dense gravel and pebbles cover was prevalent. Identified disturbances included grazing, extreme sheet wash erosion and extensive clearing.

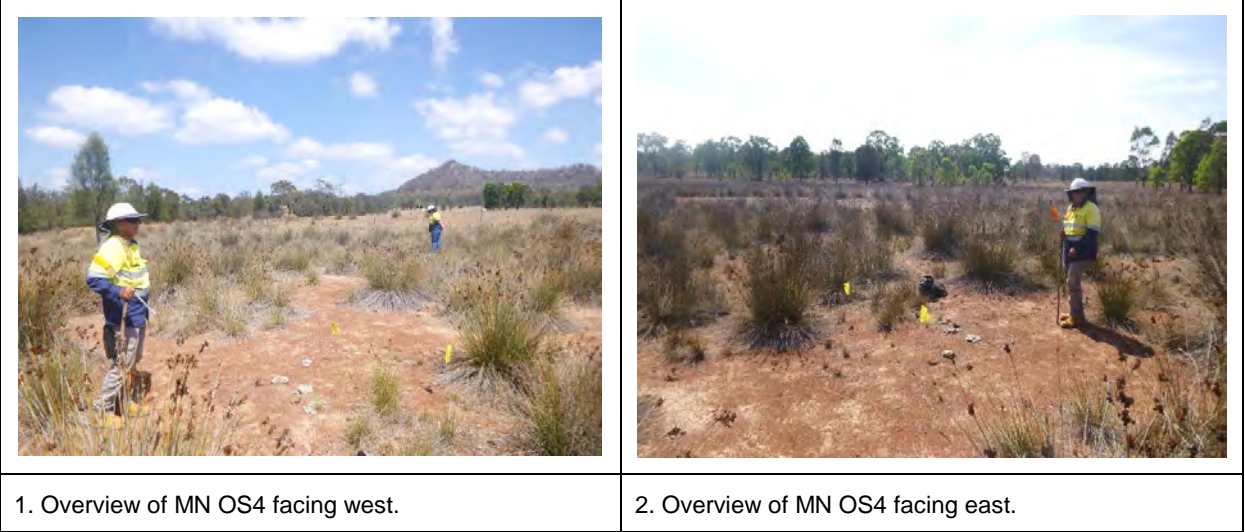
Potential for the presence of further subsurface archaeological deposits at Mangoola North OS4 was assessed as negligible.



Figure 5-11: Aerial showing location and extent of Mangoola North OS4.



Figure 5-12: Photographs showing an overview and details of Mangoola North OS4.



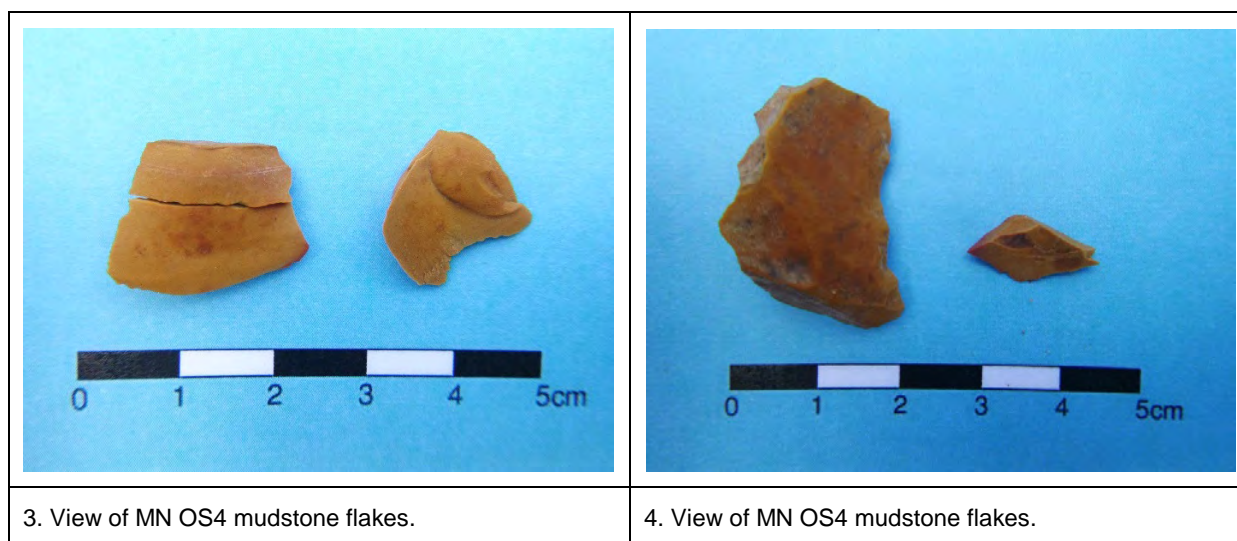


Table 5-6: Mangoola North OS4. Artefact attributes.

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Complete	Tertiary	>2cm	Broken yet refit together
Flake	Mudstone	Complete	Tertiary	>2cm	
Flake	Mudstone	Distal fragment	Secondary	2-4cm	
Flake	Mudstone	Complete	Tertiary	>2cm	

### **Mangoola North OS5**

**Site Type:** Open Artefact Scatter

**GPS Coordinates:** GDA Zone 56 E279841 N6427694

**Location of Site:** 80 m south of Wybong Post Office Rd and 1.1 km north of Wybong Rd, Wybong, beneath a 500kv transmission structure (Tower 79) (**Figure 5-4**). The site is located by a farm house and property dam in barren, eroding area 140 m downslope of the crest of a low hill (**Figure 5-13**).

**Description of Site:** Mangoola North OS5 is a low-moderate density artefact scatter comprising eleven artefacts including cores and flakes of mudstone and silcrete (**Table 5-7; Figure 5-14**). These artefacts are located within a mid-slope landform of gravelly skeletal B-Horizon soils. The 60 by 30 m extent of the site was defined by the area of exposure. Surrounding vegetation has been subject to heavy previous clearing, representing a scattering of eucalypt sapling and low shrubs. Grass cover was very sparse. The GSE at the time of recording was high (80%) with a GSV of 90-95% within these exposures. Dense gravel cover and pebbles were prevalent. The construction of the transmission tower representing the most significant identified disturbances, however, others included cattle grazing, property fencing, and high erosion.

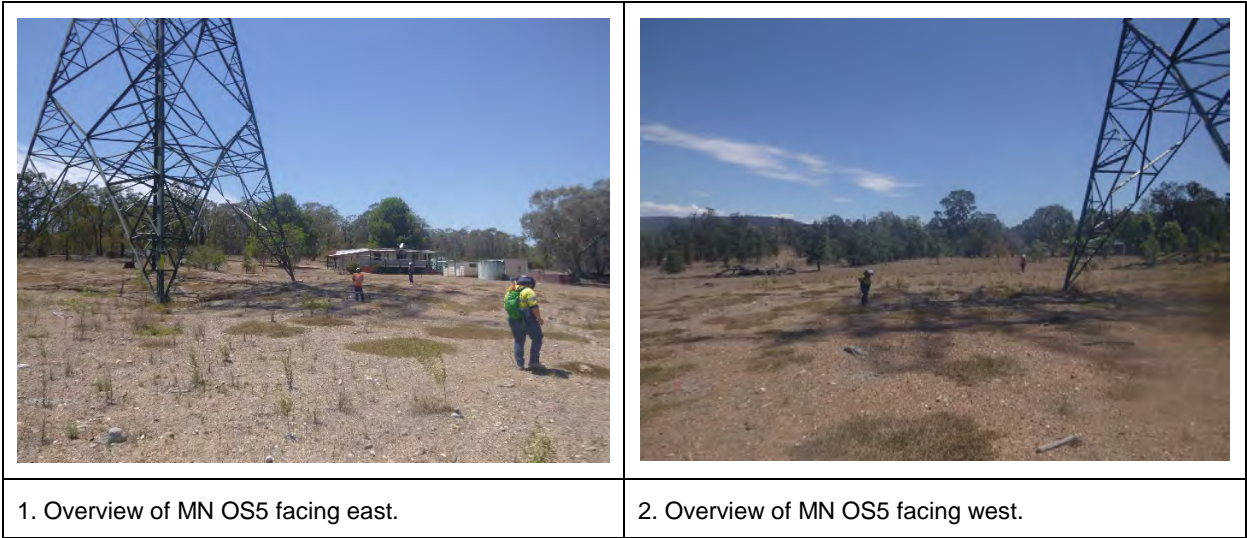
Potential for the presence of further subsurface archaeological deposits at Mangoola North OS5 was assessed as negligible.

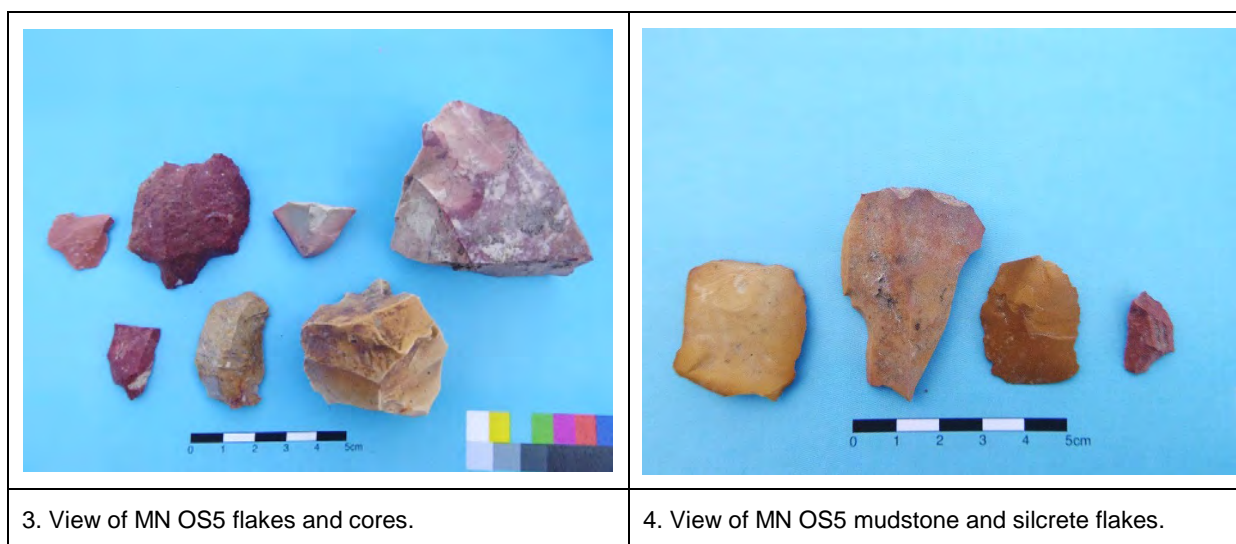


Figure 5-13: Aerial showing location and extent of Mangoola North OS5.



Figure 5-14: Photographs showing an overview and details of MN OS5.





3. View of MN OS5 flakes and cores.

4. View of MN OS5 mudstone and silcrete flakes.

**Table 5-7: Mangoola North OS5. Artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Complete	Tertiary	2-4cm	
Flake	Silcrete	Complete	Tertiary	4-6cm	
Flake	Mudstone	Distal fragment	Secondary	<2cm	
Core	Mudstone	Proximal fragment	Secondary	8-10cm	Multidirectional, 4 scars, 35% cortex
Flake	Silcrete	Proximal fragment	Tertiary	<2cm	
Flake	Silcrete	Complete	Tertiary	2-4cm	
Core	Mudstone		Tertiary	4-6cm	Multidirectional, 10+ scars, <5% cortex
Flake	Mudstone	Complete	Primary	2-4cm	
Flake	Mudstone	Complete	Tertiary	4-6cm	
Flake	Mudstone	Complete	Secondary	2-4cm	
Flake	Silcrete	Complete	Tertiary	<2cm	

**Mangoola North OS6****Site Type:** Open Artefact Scatter**GPS Coordinates:** GDA Zone 56 E281484 N6427507

**Location of Site:** 120 m north of Wybong road, 50 m south of Wybong Post Office Rd, and 50 m west of a property dam in the locality of Wybong (**Figure 5-4**). The site is located on a small rise adjacent a swampy, ephemerally inundated area to the south (**Figure 5-15**).

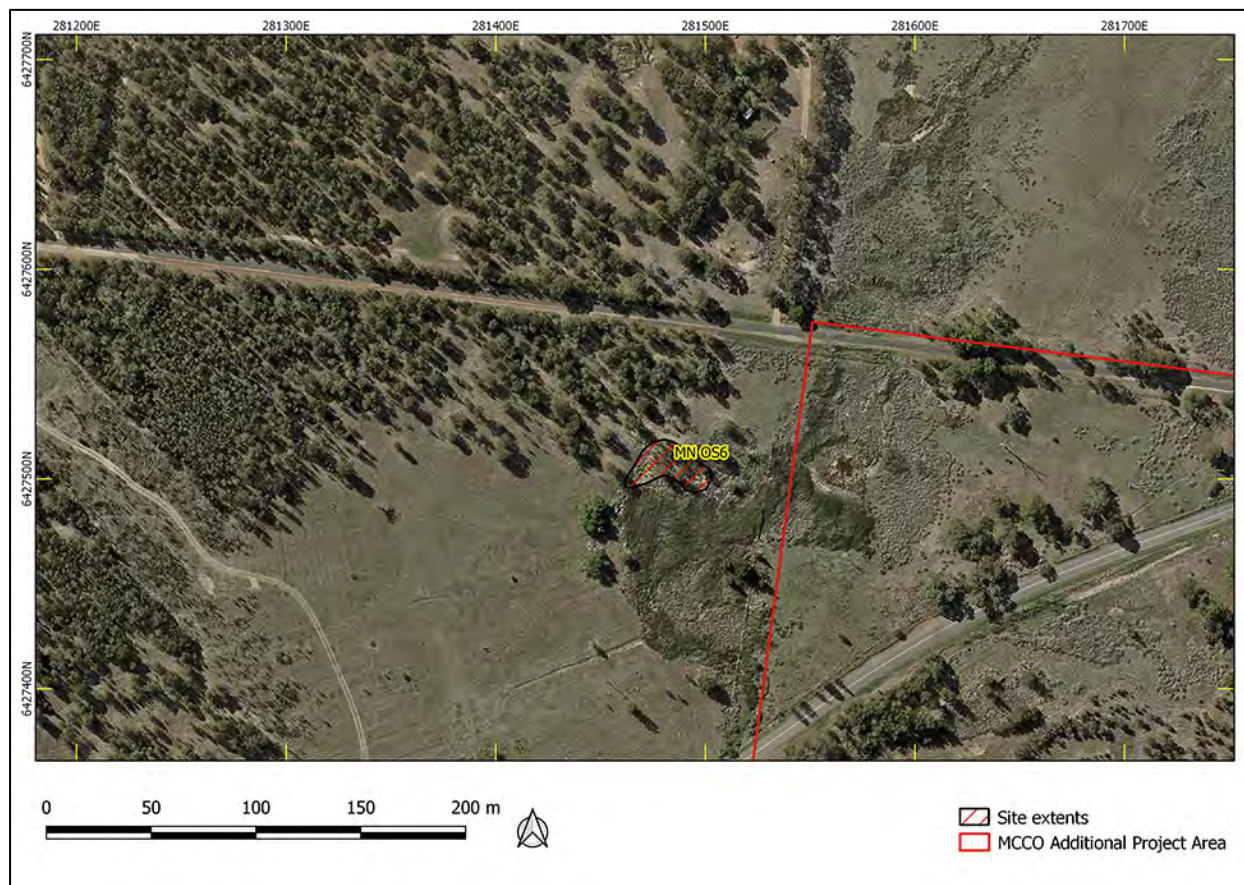
**Description of Site:** Mangoola North OS6 is a low-moderate density artefact scatter comprising eight artefacts including silcrete and mudstone flakes and a flaked piece (**Table 5-8; Figure 5-16**). These artefacts are located within a lower slope landform of sandy, silty loam above a swamp. The 40 by 15 m extent of the site was defined by the area of exposure. Surrounding vegetation primarily constituted mature and regrowth



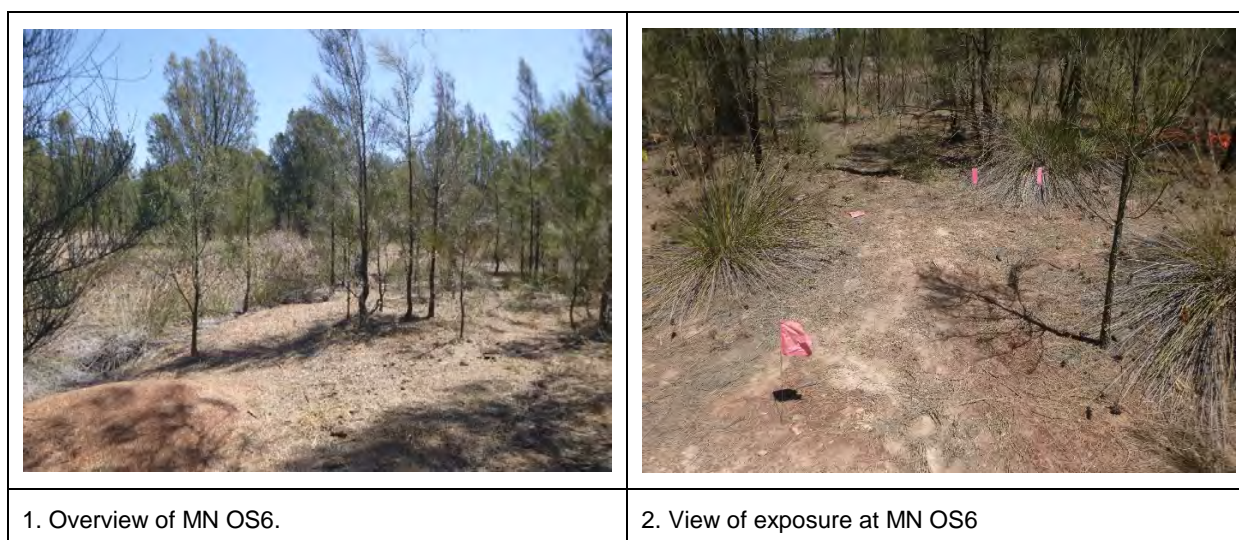
casuarina with clumps of *Juncus acutus* and blackberry. Grass cover was very sparse. The GSE at the time of recording was low (10%) beneath heavy casuarina needle litter with a GSV of 60% within these exposures. Scattered pebbles were also present. Identified disturbances included water wash and erosion.

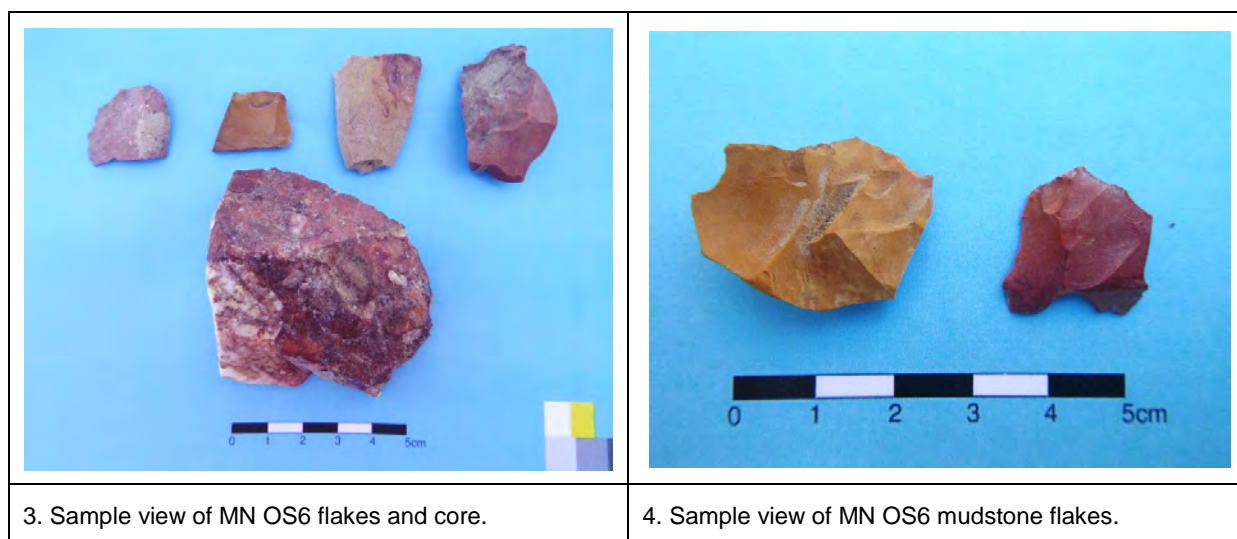
Potential for the presence of further subsurface archaeological deposits at Mangoola North OS6 was assessed as negligible.

**Figure 5-15: Aerial showing location and extent of Mangoola North OS6.**



**Figure 5-16: Photographs showing an overview and details of Mangoola North OS6.**





3. Sample view of MN OS6 flakes and core.

4. Sample view of MN OS6 mudstone flakes.

**Table 5-8: Mangoola North OS6. Artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Flake	Silcrete	Proximal fragment	Tertiary	2-4cm	
Flake	Mudstone	Complete	Tertiary	<2cm	
Flake	Silcrete	Distal fragment	Tertiary	2-4cm	
Flaked piece	Mudstone	Complete	Tertiary	2-4cm	
Flake	Silcrete	Complete	Secondary	6-8cm	
Flake	Mudstone	Complete	Secondary	2-4cm	
Flake	Mudstone	Complete	Secondary	2-4cm	Heat treated
Flake	Mudstone	Complete	Secondary	2-4cm	

**Mangoola North OS7****Site Type:** Open Artefact Scatter**GPS Coordinates:** GDA Zone 56 E281508 N6427226

**Location of Site:** 110 m south of Wybong Rd, Wybong, adjacent Big Flat Creek (**Figure 5-4**). The site is located on a gentle terrace on the southern bank of the creek approximately 75 m north of north of an unsealed access track (**Figure 5-18**).

**Description of Site:** Mangoola North OS7 is a low-density artefact scatter comprising a mudstone core and flake (**Table 5-9; Figure 5-17**). These artefacts are located within a remnant deposit of the upper terrace of Big Flat Creek, comprised of sandy loam. The extent of the site was defined by a 10 m buffer around the two artefacts. Surrounding vegetation represented dense regrowth casuarina and scattered mature eucalypts and peppercorn. Grass cover was moderate. The GSE at the time of recording was moderate (40%) with a GSV of 75% within these exposures. Ordinary stone was minimal in the immediate area. Identified disturbances included previous clearing and grazing.



Potential for the presence of further subsurface archaeological deposits at Mangoola North OS7 was assessed as low–moderate.

**Figure 5-17: Photographs showing an overview and details of Mangoola North OS7.**



**Table 5-9: Mangoola North OS7. Artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Core	Mudstone	Complete	Secondary	2-4cm	Bifacial, 10+scars, 30% cortex
Flake	Mudstone	Proximal fragment	Tertiary	<2cm	

**Figure 5-18: Aerial showing locations and extents of Mangoola North OS7 and Mangoola North OS8.**



### **Mangoola North OS8**

**Site Type:** Open Artefact Scatter

**GPS Coordinates:** GDA Zone 56 E281323 N6427157

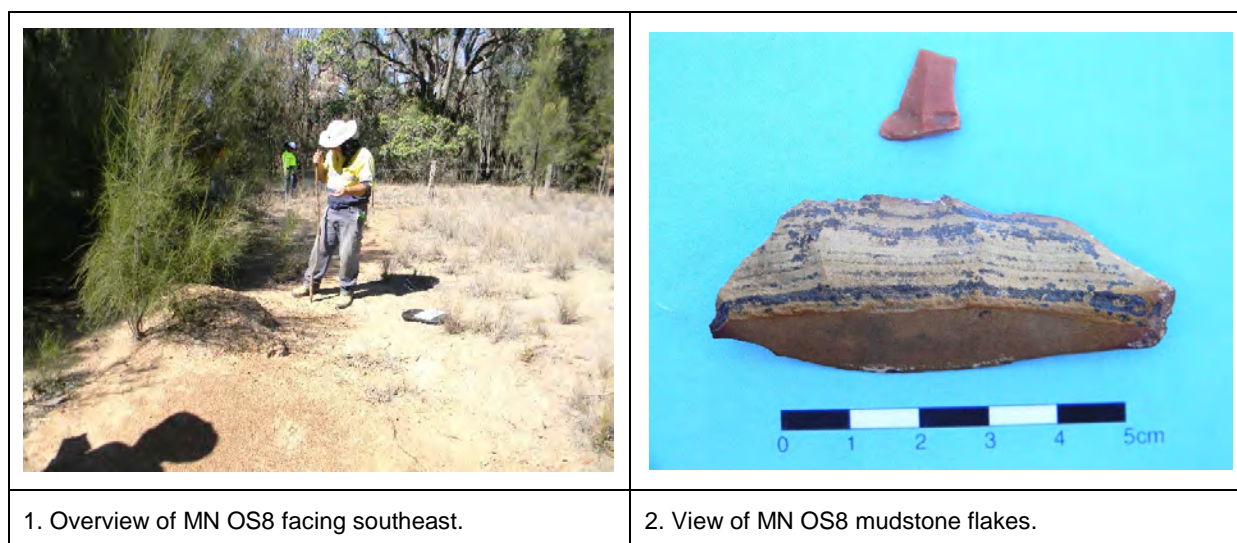
**Location of Site:** 100 m south of Wybong Rd, Wybong, adjacent Big Flat Creek (Figure 5-4). The site is located on the flat of the northern bank of the creek on the fringe of dense casuarina regrowth (Figure 5-18).

**Description of Site:** Mangoola North OS8 is a low-density artefact scatter comprising two mudstone flakes (Table 5-10; Figure 5-19). These artefacts were recorded on a recently redeposited pile of sandy soil adjacent an ant mound. The 25 by 10 m extent of the site was defined by an area of exposure around the two artefacts. Surrounding vegetation represented open eucalypt woodland fringed by dense casuarina regrowth. Grass cover was moderate. The GSE at the time of recording was low (15%) with a GSV of 60% within these exposures. Ordinary stone was minimal in the immediate area. Identified disturbances included previous clearing, grazing, and minor earth moving.



Potential for the presence of further subsurface archaeological deposits at Mangoola North OS8 was assessed as negligible.

**Figure 5-19: Photographs showing an overview and details of Mangoola North OS8.**



1. Overview of MN OS8 facing southeast.

2. View of MN OS8 mudstone flakes.

**Table 5-10: Mangoola North OS8. Artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Complete	Secondary	6-8cm	
Flake	Mudstone	Distal fragment	Tertiary	<2cm	

### **Mangoola North OS9**

**Site Type:** Open Artefact Scatter

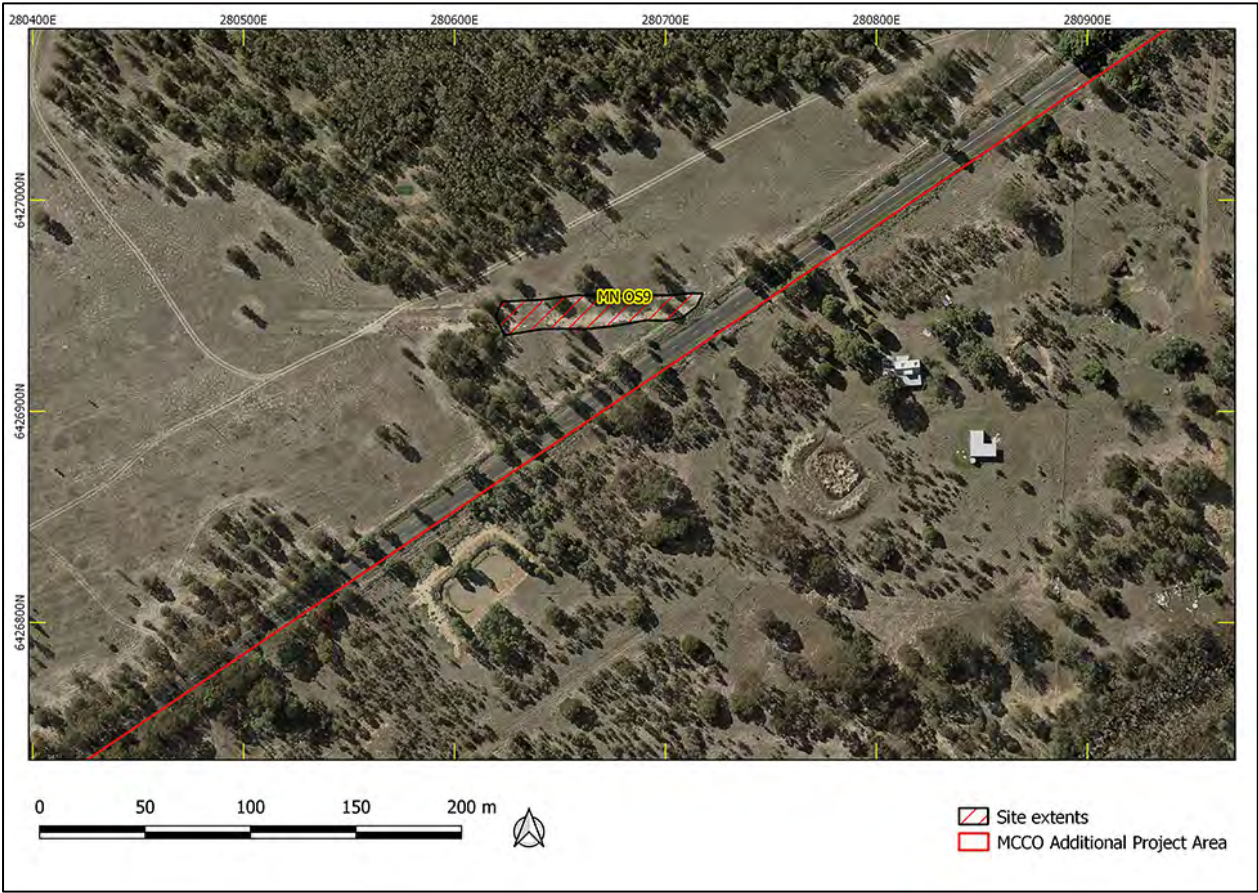
**GPS Coordinates:** GDA Zone 56 E280665 N6426947

**Location of Site:** Adjacent Wybong Rd (10 m on west side), 700 m south of Wybong Post Office Rd, Wybong (**Figure 5-4**). The site is located within an artificial bund on the flats extending from Big Flat Creek, 400 m north of the main channel (**Figure 5-20**).

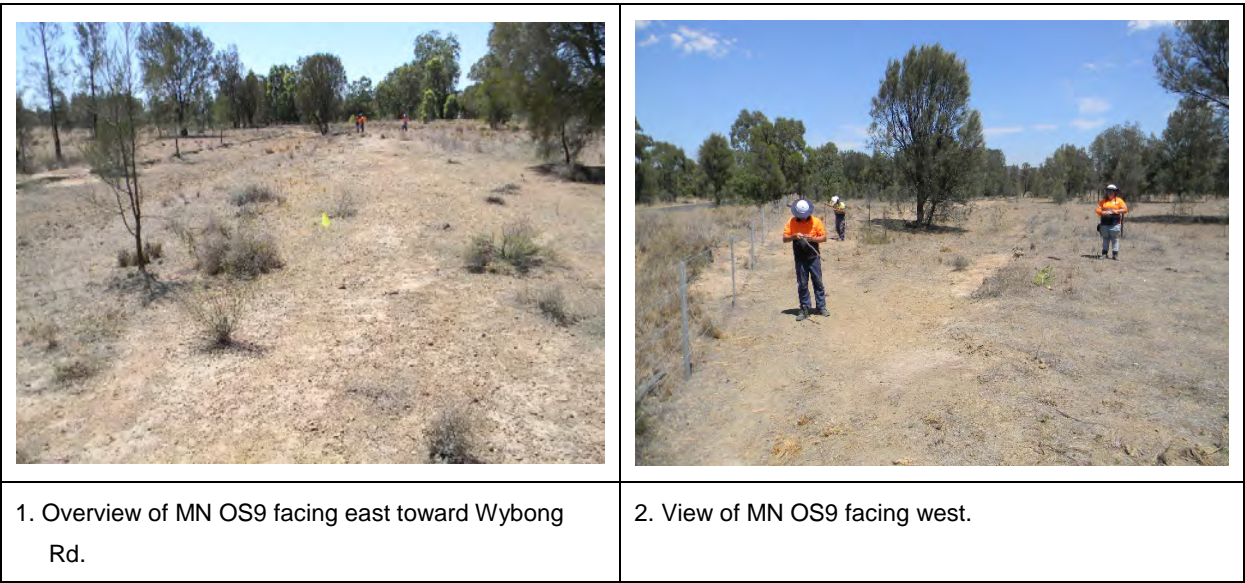
**Description of Site:** Mangoola North OS9 is a low-density artefact scatter comprising six mudstone flakes (**Table 5-11; Figure 5-21**). These artefacts are located on the bund of an artificial channel on an east–west orientation within redeposited sandy, gravelly soils. The 95 by 15 m extent of the site was defined by the area of exposure. Surrounding vegetation represented sparse casuarina regrowth with minimal grass cover. The GSE at the time of recording was high (80%) with a GSV of 80% within these exposures. Ordinary pebbles and gravel were prevalent in the immediate area. Identified disturbances were dominated by the earthworks associated with the construction of the channel but also included previous clearing and grazing.

Potential for the presence of further subsurface archaeological deposits at Mangoola North OS9 was assessed as negligible.

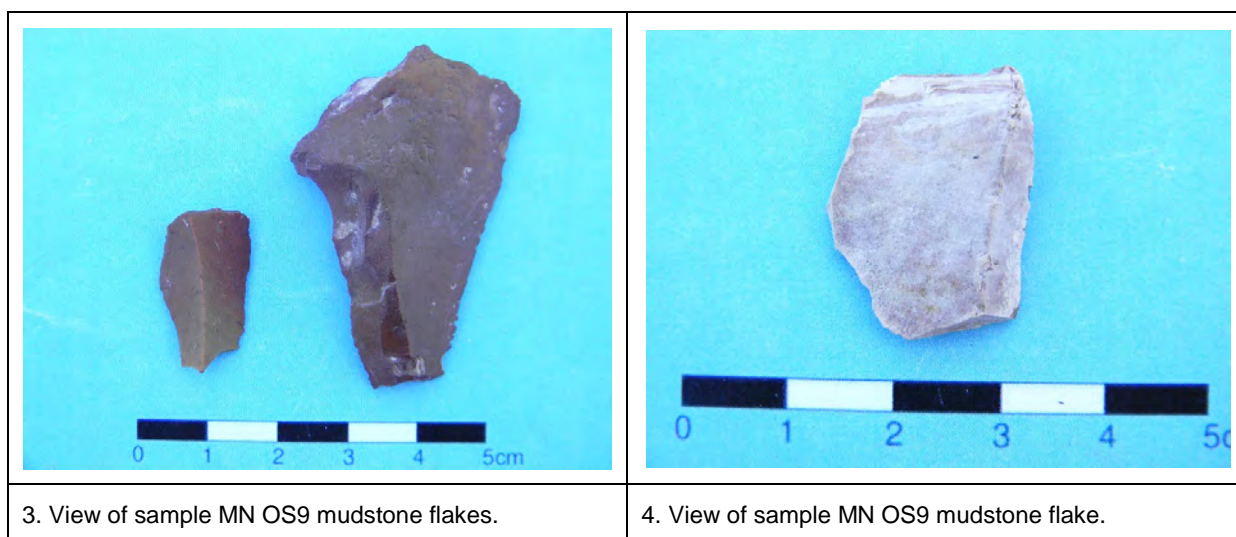
**Figure 5-20: Aerial showing location and extent of Mangoola North OS9.**



**Figure 5-21: Photographs showing an overview and details of Mangoola North OS9.**





**Table 5-11: Mangoola North OS9. Artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Complete	Primary	2-4cm	
Flake	Mudstone	Complete	Secondary	2-4cm	
Flake	Mudstone	Proximal fragment	Tertiary	2-4cm	
Flake	Mudstone	Longitudinal break	Tertiary	2-4cm	
Flake	Mudstone	Complete	Primary	4-6cm	
Flake	Mudstone	Distal fragment	Tertiary	2-4cm	

### **Mangoola North OS10**

**Site Type:** Open Artefact Scatter

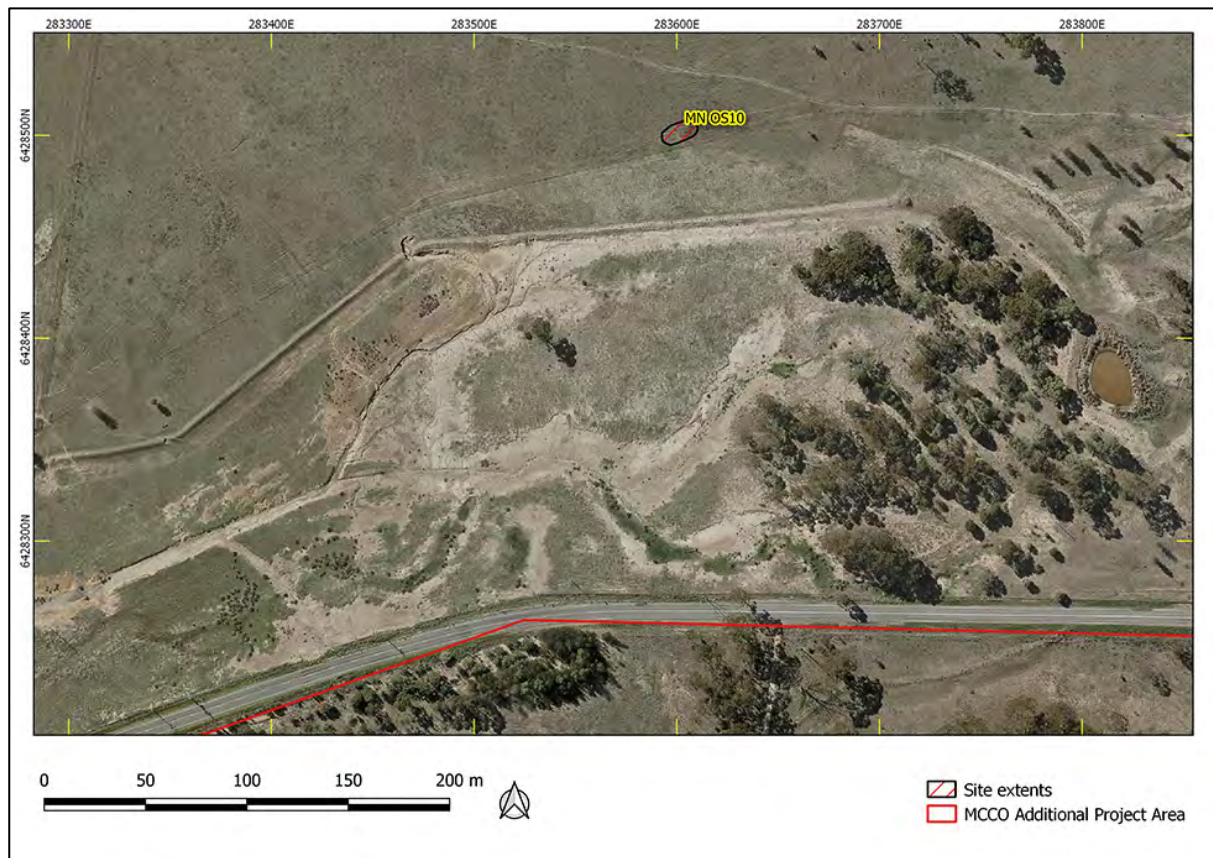
**GPS Coordinates:** GDA Zone 56 E283601 N6428501

**Location of Site:** 250 m north of Wybong Rd and 450 m south of Ridgeland Rd, Wybong (**Figure 5-4**). The site is located within an unsealed farm track on the north side of a fence which separates the tributary of Big Flat Creek from the adjacent paddocks (**Figure 5-22**).

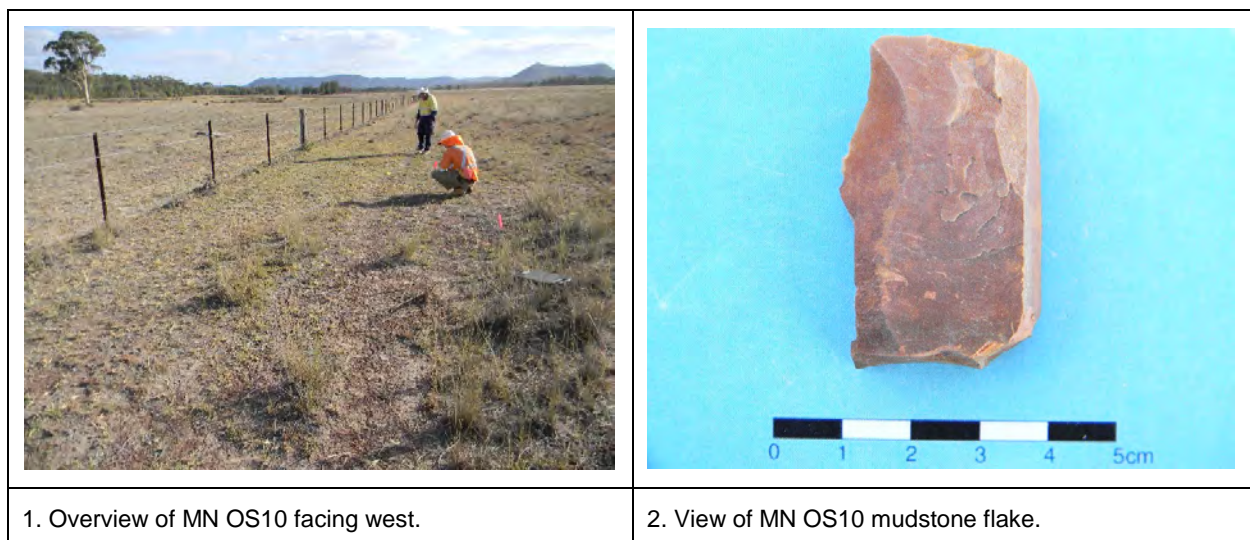
**Description of Site:** Mangoola North OS10 is a low-density artefact scatter comprising a mudstone flake, core, and shatter piece (**Table 5-12; Figure 5-23**). These artefacts are located in the vehicle damage of a farm track on a gentle mid-slope above the tributary within sandy, gravel-strewn soils. The 20 by 10 m extent of the site was defined by a 5 m buffer around these artefacts. Surrounding vegetation represented cleared paddock with moderate-high grass cover. The GSE at the time of recording was fair (35%) with a GSV of 40% within these exposures. Ordinary pebbles and gravel were prevalent in the immediate area. Identified disturbances were dominated by vehicle damage and cattle grazing.

Potential for the presence of further subsurface archaeological deposits at Mangoola North OS10 was assessed as negligible.

**Figure 5-22: Aerial showing location and extent of Mangoola North OS10.**



**Figure 5-23: Photographs showing an overview and details of Mangoola North OS10.**





**Table 5-12: Mangoola North OS10. Artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Core	Mudstone	Complete	Secondary	2-4cm	Multidirectional, 4 scars, 30% cortex
Flake	Mudstone	Longitudinal break	Tertiary	4-6cm	
Shatter	Mudstone		Tertiary	<2cm	

**Mangoola North OS11**

**Site Type:** Open Artefact Scatter

**GPS Coordinates:** GDA Zone 56 E283973 N6428529

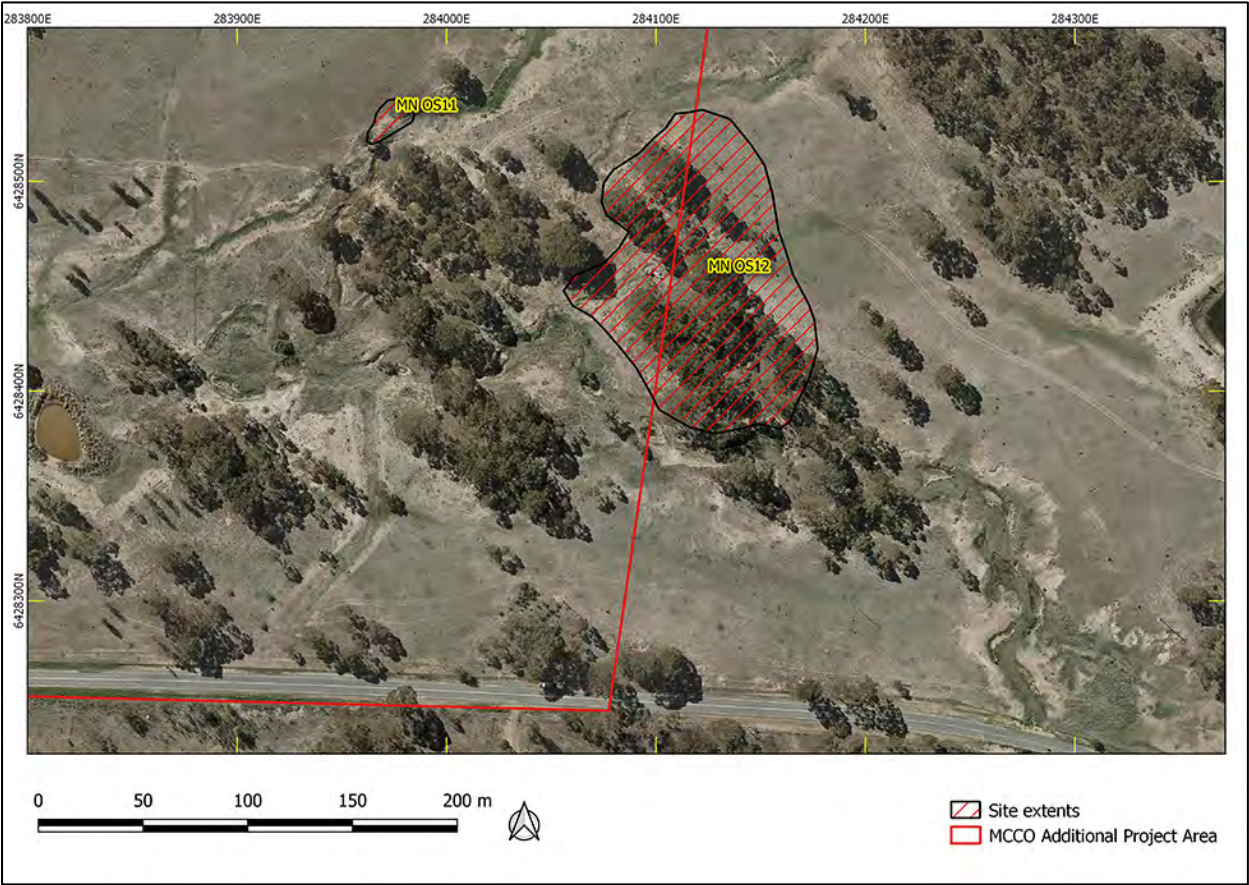
**Location of Site:** 200 m north of Wybong Rd, 350 m south of Ridgeland Rd, Wybong (**Figure 5-4**). The site is located on the northern bank of a tributary of Big Flat Creek opposite BFC125 (#37-2-5440) 150 m downstream of a property dam (**Figure 5-24**).

**Description of Site:** Mangoola North OS11 is a low-density artefact scatter comprising twelve mudstone, silcrete, and quartz flakes (**Table 5-13**;

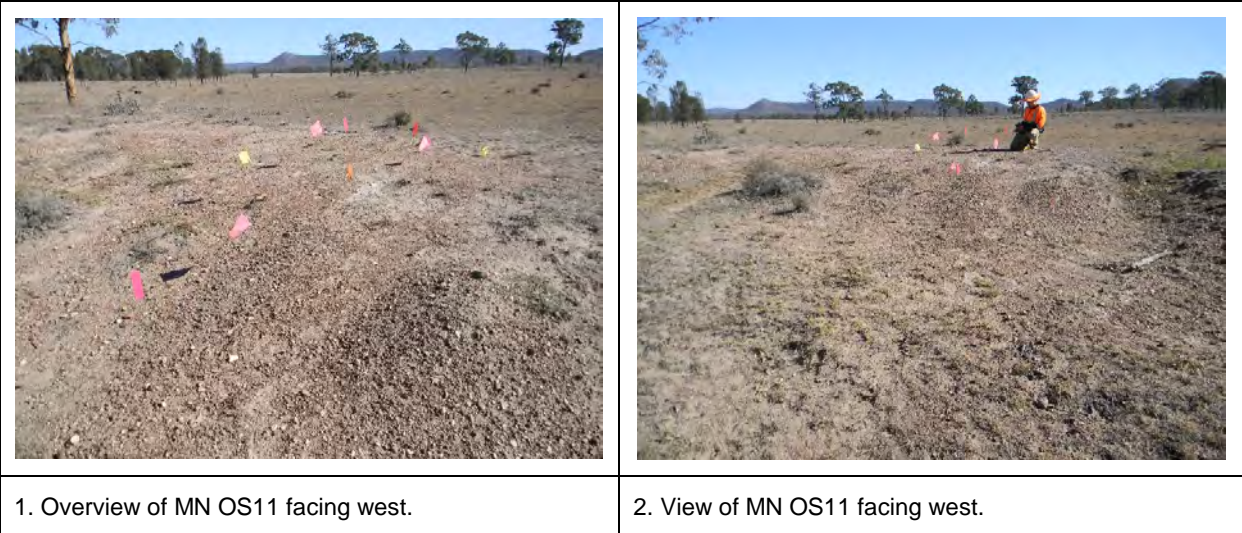
**Figure 5-25**). These artefacts are eroding out of a sandy, gravel-dense deposit forming the northern bank of the tributary. The 25 by 15 m extent of the site was defined by the area of exposure. Surrounding vegetation represented cleared paddock with mature eucalypts and moderate grass cover. The GSE at the time of recording was moderate (50%) with a GSV of 80% within these exposures. Ordinary pebbles and gravel were densely strewn over the immediate area. Identified disturbances were dominated by erosive scouring and cattle trampling.



Soil depth at Mangoola North OS11 suggests a moderate potential for further subsurface archaeological deposits, however, any *in situ* artefacts are likely to be limited to small areas that have not been impacted by erosion.

**Figure 5-24: Aerial showing locations and extents of Mangoola North OS11 and Mangoola North OS12.**



**Figure 5-25: Photographs showing an overview and details of Mangoola North OS11.**



	
3. View of erosion within MN OS11.	4. View of sample MN OS11 mudstone and silcrete flakes.

**Table 5-13: Mangoola North OS11. Sample artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Complete	Tertiary	4-6cm	
Blade	Mudstone	Complete	Tertiary	2-4cm	
Flake	Silcrete	Proximal fragment	Tertiary	4-6cm	
Flake	Quartz	Complete	Tertiary	<2cm	

### **Mangoola North OS12**

**Site Type:** Open Artefact Scatter

**GPS Coordinates:** GDA Zone 56 E284122 N6428453





**Location of Site:** 150 m north of Wybong Rd and 350 m south of Ridgeland Rd, Wybong (**Figure 5-4**). The site is located within several exposures on the confluence of two small tributaries or paleochannels of Big Flat Creek opposite BFC126 (#37-2-5441) (**Figure 5-24**).

**Description of Site:** Mangoola North OS12 is a high-density artefact scatter comprising 100+ artefacts including flakes, blades, and a bladelet core (**Table 5-14; Figure 5-26**). These artefacts are located within a flat, sandy deposit scoured on either side by the converging tributaries yet were recorded in secondary context, likely displaced by sheet wash erosion. The 150 by 100 m extent of the site was defined by the area of exposure revealing artefacts. Surrounding vegetation represented stands of open eucalypt woodland with moderate grass cover and heavy leaf litter. The GSE at the time of recording was moderate (60%) with a GSV of 80% within these exposures. Ordinary pebbles and gravel were minimal. Identified disturbances included scouring and sheet wash erosion as well as cattle trampling.



Soil depth at Mangoola North OS12 suggests a moderate potential for further subsurface archaeological deposits, however, any *in situ* artefacts are likely to be limited to small areas that have not been impacted by erosion.

**Figure 5-26: Photographs showing an overview and details of Mangoola North OS12.**

	
<p>1. View of central portion of MN OS12 facing west.</p>	<p>2. View of exposures in north section of MN OS12 facing southwest.</p>
	
<p>3. View of exposures in north section of MN OS12 facing southeast.</p>	<p>4. View of sample MN OS12 core and flakes.</p>





5. View of sample MN OS12 blade and flakes.



6. View of MN OS12 bladelet core.

**Table 5-14: Mangoola North OS12. Sample artefact attributes.**

Artefact Type	Material	Integrity	Reduction	Size	Additional detail
Core	Mudstone	Complete	Secondary	2-4cm	Unidirectional, bladelet, 8 scars, 15% cortex
Blade	Volcanic	Proximal fragment	Tertiary	6-8cm	
Flake	Mudstone	Proximal fragment	Tertiary	2-4cm	
Core	Quartzite	Longitudinal break		6-8cm	Unidirectional, 4 scars, 50-75% cortex
Flake	Quartz	Complete	Tertiary	<2cm	
Flake	Mudstone	Proximal fragment	Tertiary	2-4cm	
Flake	Quartzite	Complete	Tertiary	4-6cm	
Flake	Mudstone	Distal fragment	Tertiary	<2cm	
Core	Mudstone	Complete	Tertiary	2-4cm	Multidirectional, 10+ scars, <5% cortex
Flake	Silcrete	Proximal fragment	Tertiary	<2cm	

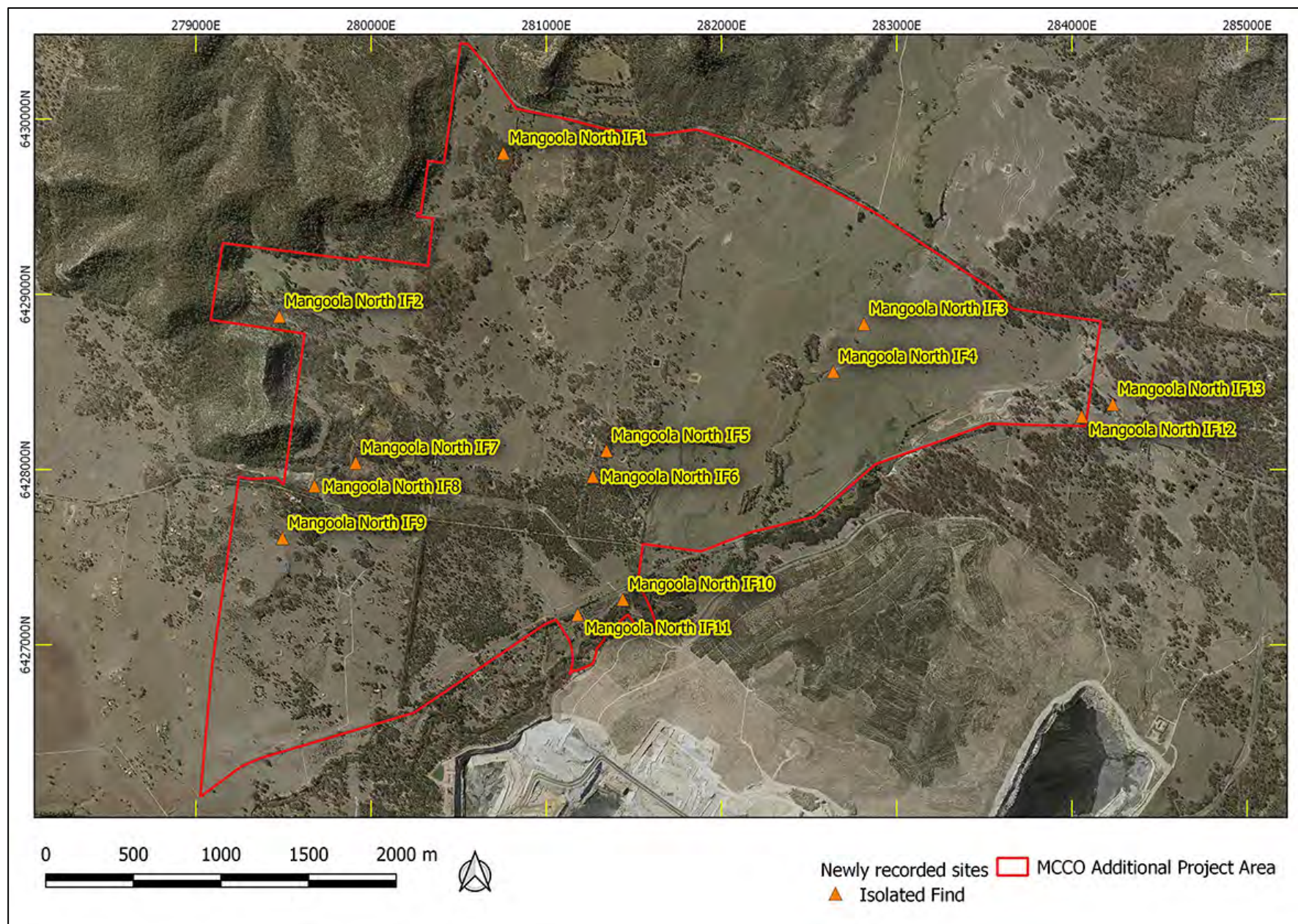
### 5.4.2 Isolated finds

Thirteen isolated finds were recorded during the survey. These are listed in **Table 5-15** and shown on **Figure 5-27**. Details of each isolated find follows.

**Table 5-15: Recorded isolated finds artefact attributes and coordinates.**

Site Name	GDA Zone 56 Easting	GDA Zone 56 Northing	Artefact Type	Material	Size	Additional detail
MN IF1	280755	6429805	Core	Silcrete	8-10cm	Bifacial, 25% cortex, 10+ scars
MN IF2	279476	6428873	Flake	Mudstone	4-6cm	Complete, secondary
MN IF3	282813	6428831	Flake	Silcrete	2-4cm	Complete, secondary
MN IF4	282638	6428558	Flake	Mudstone	4-6cm	Complete, secondary, distal usewear
MN IF5	281343	6428107	Flake	Mudstone	2-4cm	Proximal fragment, secondary
MN IF6	281266	6427960	Core	Silcrete	4-6cm	Multidirectional, 15% cortex, 5 scars
MN IF7	279912	6428038	Flake	Chert	2-4cm	Complete, secondary, usewear
MN IF8	279677	6427905	Core	Mudstone	6-8cm	Multidirectional, 15% cortex, 5 scars
MN IF9	279494	6427608	Side scraper	Mudstone	4-6cm	Complete tertiary
MN IF10	281437	6427258	Core	Silcrete	6-8cm	Unidirectional, 20% cortex, 10+ scars
MN IF11	281179	6427171	Flake	Mudstone	2-4cm	Proximal fragment
MN IF12	284056	6428302	Flake	Mudstone	4-6cm	Distal fragment, secondary
MN IF13	284233	6428372	Flake	Volcanic	4-6cm	Distal fragment, tertiary

Figure 5-27: Aerial showing newly recorded isolated finds.





## **Mangoola North IF1**

**Site Type:** Isolated Find

**Location of Site:** 0.3 km south of Ridglands Rd and 2.1 km north of Wybong Post Office Rd, Wybong, on the north side of a property dam (**Figure 5-27**). The site is located in a broad gully between two moderate slopes in a stand of regrowth and scattered mature trees (**Figure 5-28**).

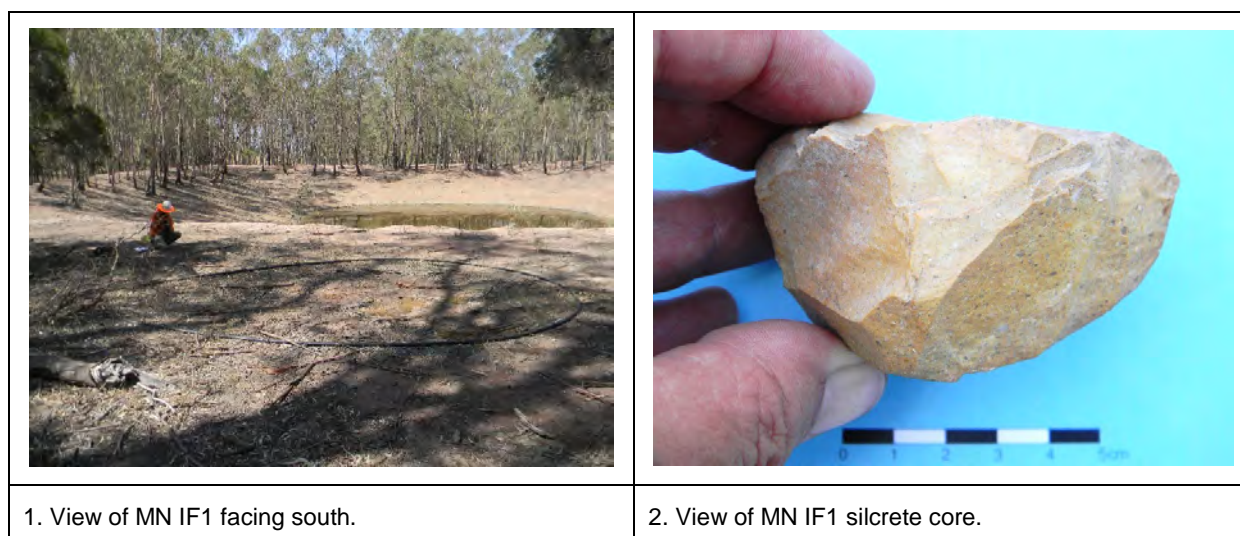
**Description of Site:** Mangoola North IF1 is a single silcrete core located within sandy earth redeposited during the construction of the adjacent dam (**Table 5-15; Figure 5-29**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is a combination of sparse mature eucalypts and dense melaleuca regrowth. The GSE at the time of recording was high (70%) with a GSV of 50% within these exposures. Small ordinary stone fragments and pebbles were present. Identified disturbances included erosion, water wash, cattle trampling, and the construction of the adjacent dam.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF1 was assessed as negligible.

**Figure 5-28: Aerial showing location and extent of Mangoola North IF1.**





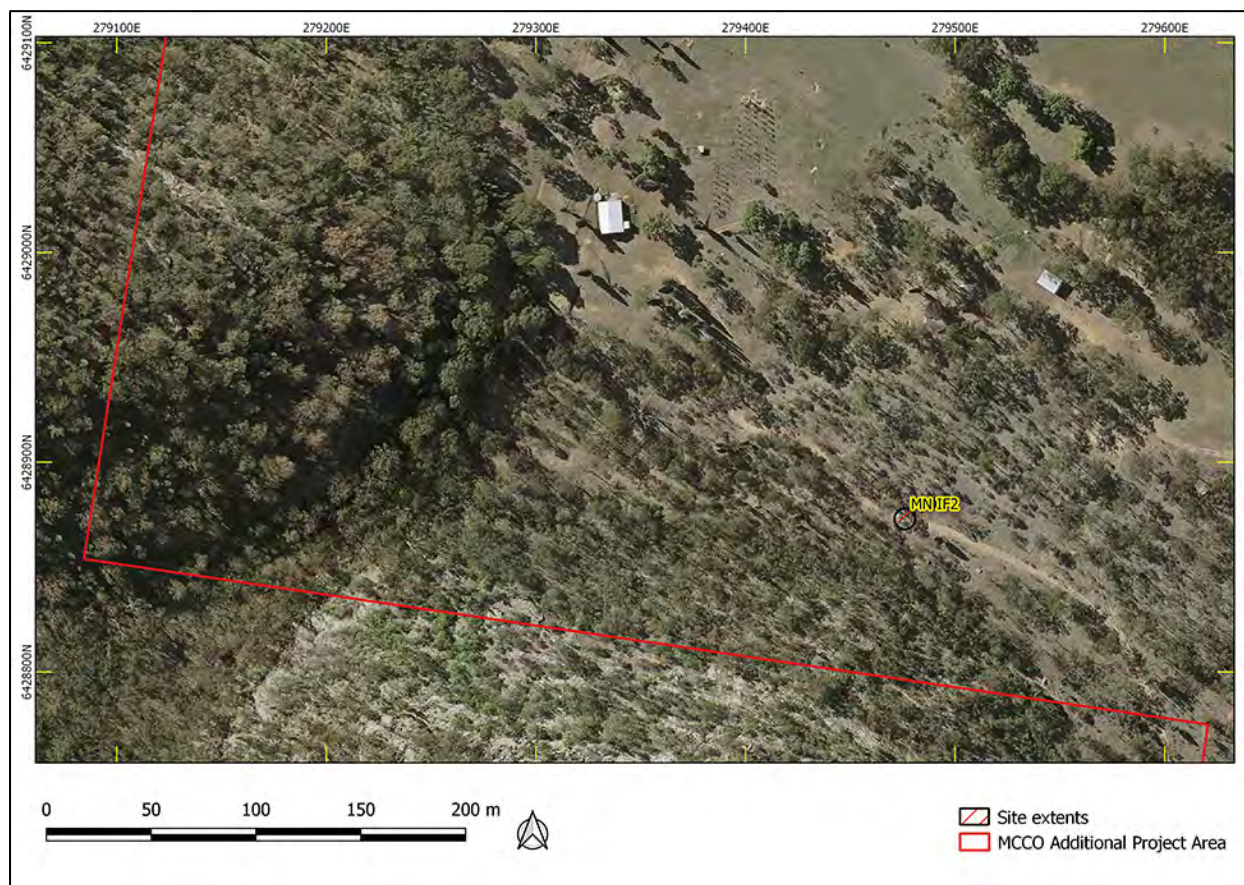
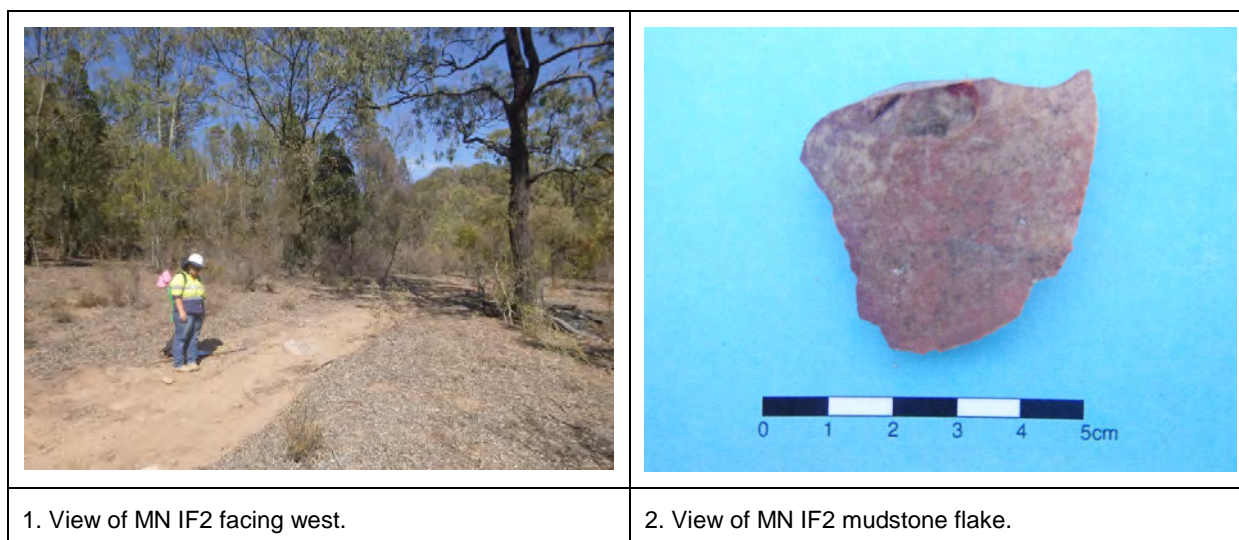
**Figure 5-29: Photographs showing an overview and details of Mangoola North IF1.****Mangoola North IF2**

**Site Type:** Isolated Find

**Location of Site:** 2 km south of Ridgelands Rd and 1 km north of Wybong Post Office Rd, Wybong, on an unsealed property track (**Figure 5-27**). The site is located at the northern foot of a precipitous ridge, approximately 100 m downslope from the crest (**Figure 5-30**).

**Description of Site:** Mangoola North IF2 is a single mudstone flake located on a vehicle track within sandy skeletal soils (**Table 5-15; Figure 5-31**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is saplings and isolated mature eucalypts. The GSE at the time of recording was very high (85%) with a GSV of 95% within these exposures. Small ordinary stone fragments and pebbles were present. Identified disturbances included clearing, cattle grazing, vehicle damage, and erosion.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF2 was assessed as negligible.

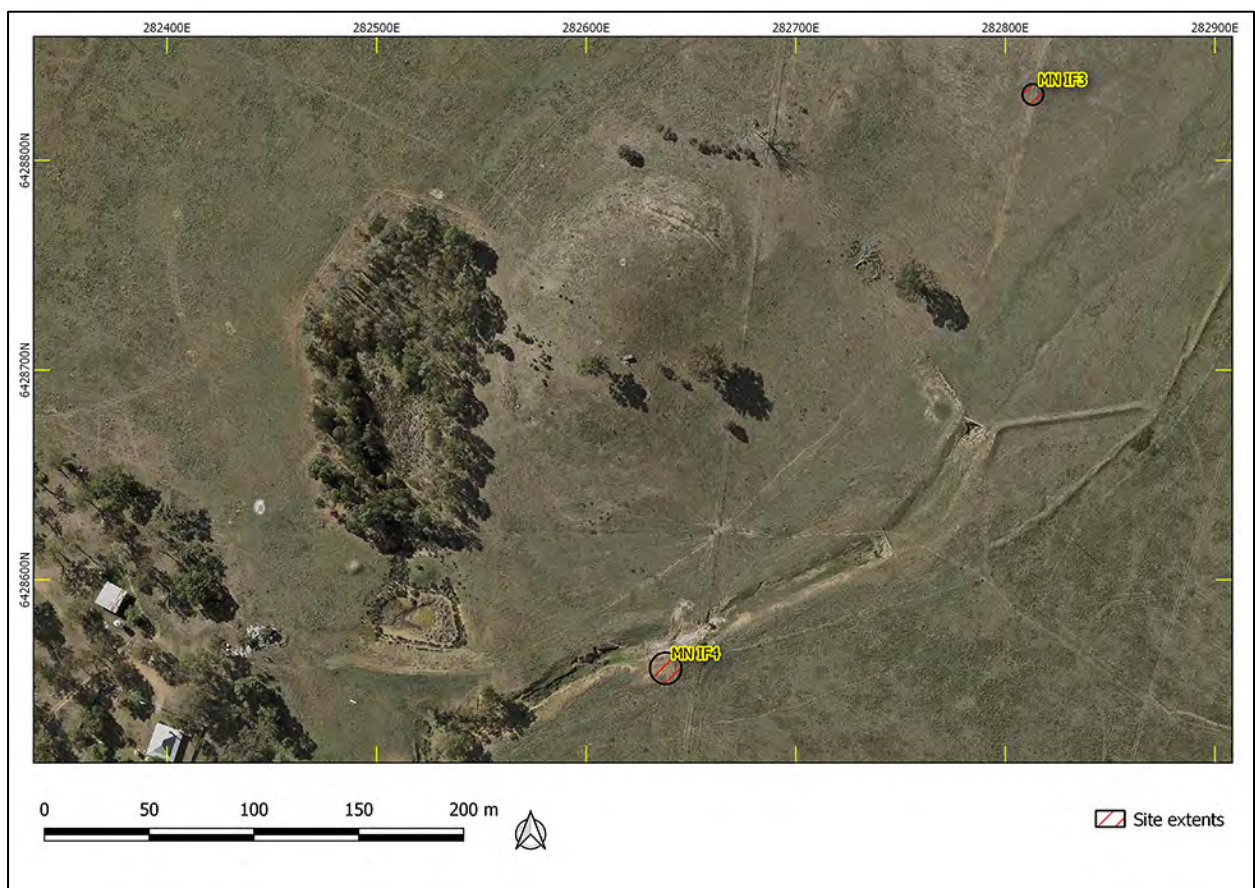
**Figure 5-30: Aerial showing location and extent of Mangoola North IF2.****Figure 5-31: Photographs showing an overview and details of Mangoola North IF2.****Mangoola North IF3****Site Type:** Isolated Find**Location of Site:** 0.7 km south of Ridglands Rd and 0.8 km north of Wybong Rd, Wybong, to the west of a broad modified channel (**Figure 5-27**). The site is located on a property track bordered by an open, grassy paddock (**Figure 5-32**).

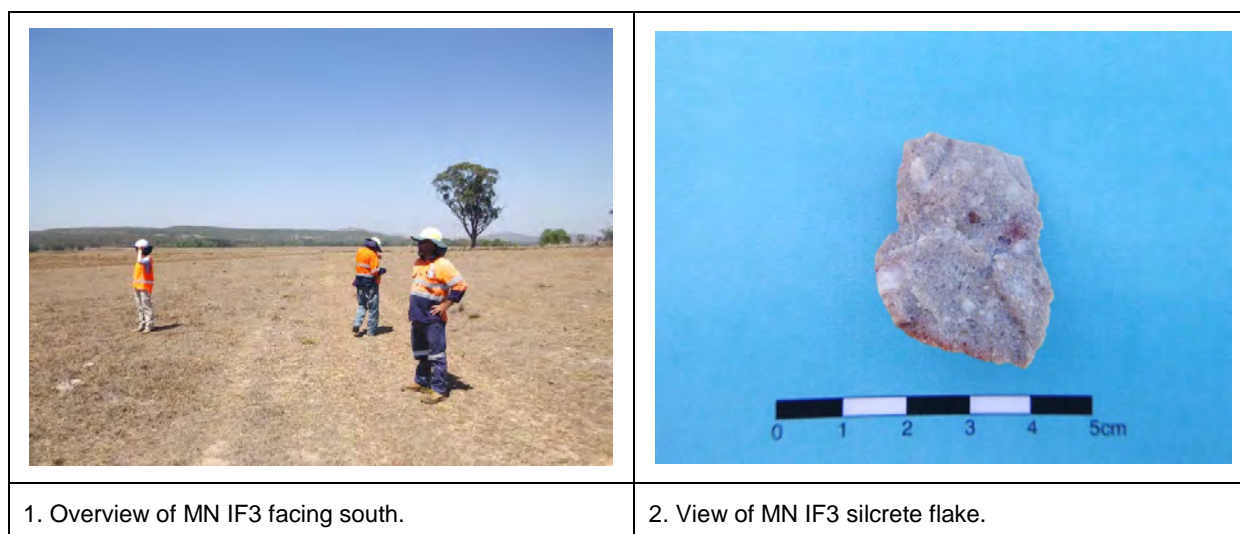


**Description of Site:** Mangoola North IF3 is a single silcrete flake located within sandy heavily grassed soils (**Table 5-15; Figure 5-33**). The extent of the site is defined by a 5 m buffer around the artefact. The surrounding area of the site is a completely cleared paddock with dense grass cover. The GSE at the time of recording was low (15%) with a GSV of 50% within these exposures. Small ordinary stone fragments and pebbles was minimal. Identified disturbances included erosion, water wash, cattle trampling, and vehicle damage.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF3 was assessed as negligible.

**Figure 5-32: Aerial showing location and extent of Mangoola North IF3 and Mangoola North IF4.**



**Figure 5-33: Photographs showing an overview and details of Mangoola North IF3.****Mangoola North IF4**

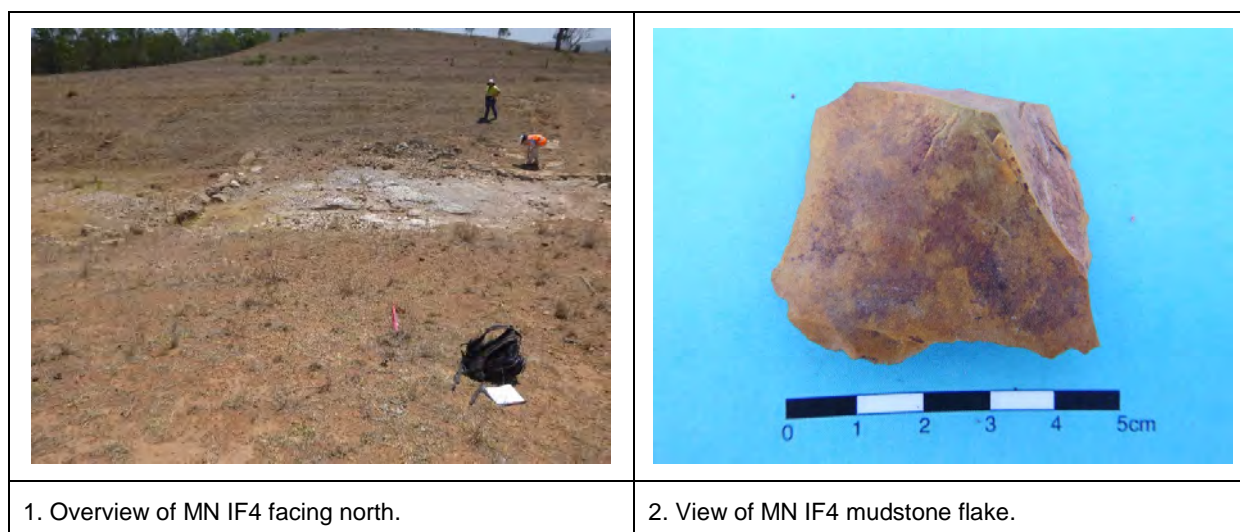
**Site Type:** Isolated Find

**Location of Site:** 1 km south of Ridgelands Rd and 0.6 km north of Wybong Rd, Wybong, on the south bank of a heavily eroded modified channel (**Figure 5-27**). The site is located 100 m south of a small broad rise and is bordered by open grassy paddock (**Figure 5-32**).

**Description of Site:** Mangoola North IF4 is a single mudstone flake located within sandy, heavily grassed soils (**Table 5-15; Figure 5-34**). The extent of the site is defined by a 5 m buffer around the artefact. The surrounding area of the site is a completely cleared paddock with dense grass cover. The GSE at the time of recording was high (60%) with a GSV of 80% within these exposures. Small ordinary stone fragments and pebbles were prevalent. Identified disturbances included erosion, water wash, cattle trampling, and vehicle damage.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF4 was assessed as negligible.



**Figure 5-34: Photographs showing an overview and details of Mangoola North IF4.****Mangoola North IF5**

**Site Type:** Isolated Find

**Location of Site:** 1.8 km south of Ridgeland Rd and 0.5 km north of Wybong Post Office Rd, Wybong, 100 m east of a farm property (**Figure 5-27**). The site is located on the edge of an electricity easement within open woodland (**Figure 5-35**).

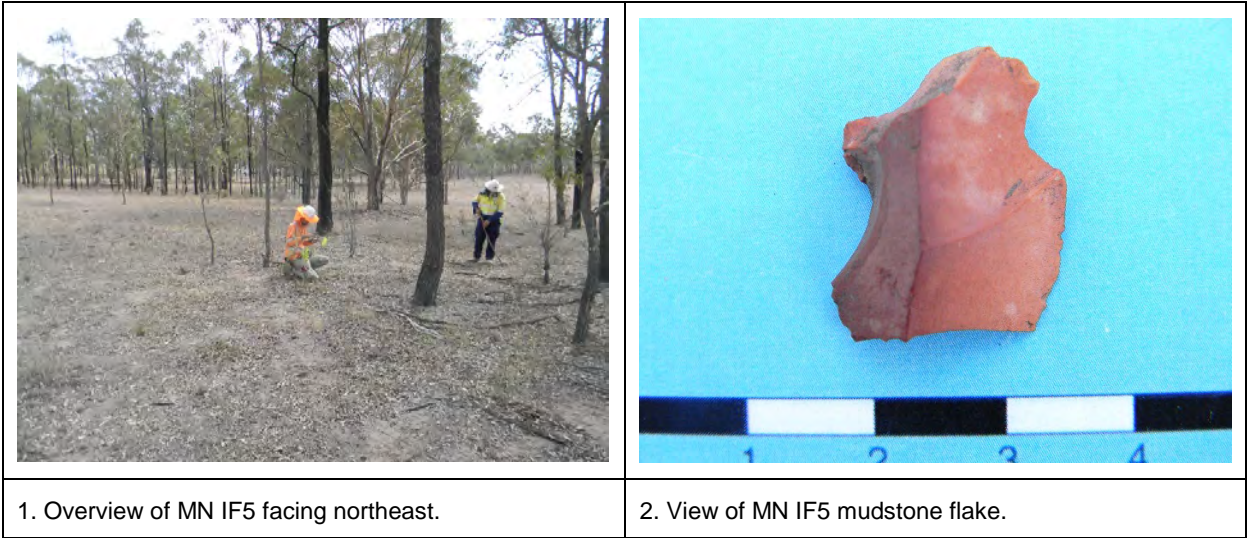
**Description of Site:** Mangoola North IF5 is a single mudstone flake located within thin, gravel lag soils (**Table 5-15; Figure 5-35**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is open ironbark woodland with sparse mature eucalypts. The GSE at the time of recording was low-moderate (35%) with a GSV of 60% within these exposures. Other gravels and silcrete cobbles are present. Identified disturbances included cattle grazing and clearing associated with the construction of the electricity easement.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF5 was assessed as negligible.

Figure 5-35: Aerial showing locations and extents of Mangoola North IF5 and Mangoola North IF6.



Figure 5-36: Photographs showing an overview and details of Mangoola North IF5.





## **Mangoola North IF6**

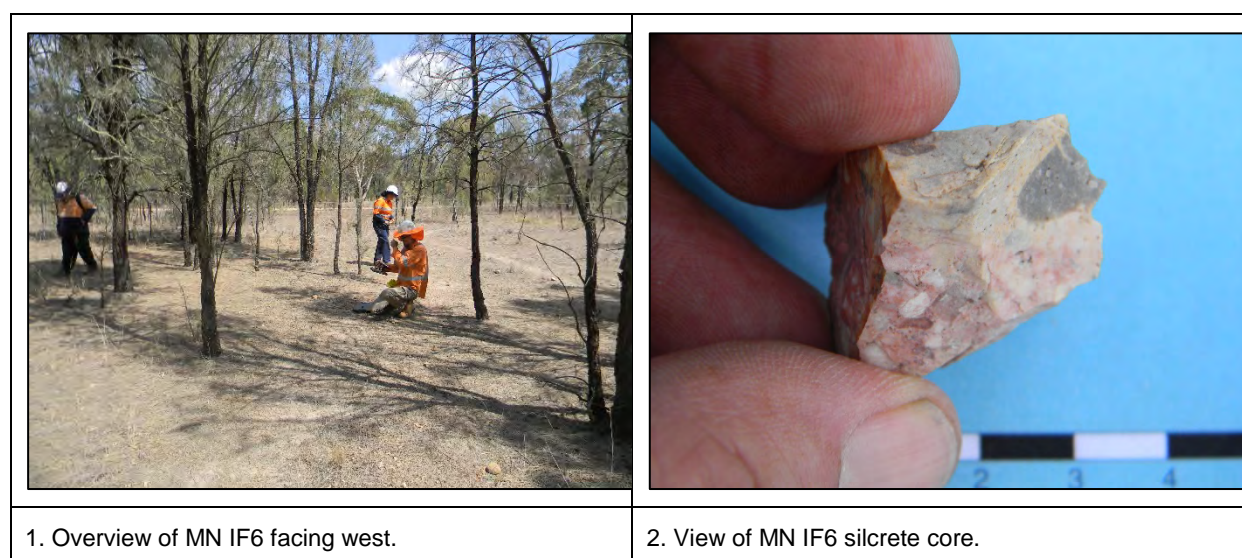
**Site Type:** Isolated Find

**Location of Site:** 2 km south of Ridgeland Rd and 0.3 km north of Wybong Post Office Rd, Wybong, east of a property access track (**Figure 5-27**). The site is located on a gentle slope in open casuarina woodland 180 m south of a farm property (**Figure 5-35**).

**Description of Site:** Mangoola North IF6 is a single silcrete core located within sandy, gravely skeletal soil (**Table 5-15; Figure 5-37**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is open casuarina sapling and regrowth with light grass cover. The GSE at the time of recording was low (20%) with a GSV of 20% within these exposures. Small ordinary stone fragments and pebbles were prevalent. Identified disturbances included erosion and cattle trampling.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF6 was assessed as negligible.

**Figure 5-37: Photographs showing an overview and details of Mangoola North IF6.**



## **Mangoola North IF7**

**Site Type:** Isolated Find

**Location of Site:** 2.5 km south of Ridgeland Rd and 250 m north of Wybong Post Office Rd, Wybong, 300 m south of a farm property (**Figure 5-27**). The site is located on a gravelly upper slope 130 m north of the crest (**Figure 5-38**).

**Description of Site:** Mangoola North IF7 is a single chert flake located within extensive gravel lag (**Table 5-15; Figure 5-39**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is regenerating eucalypt woodland. The GSE at the time of recording was high (80%) with a GSV of 80% within these

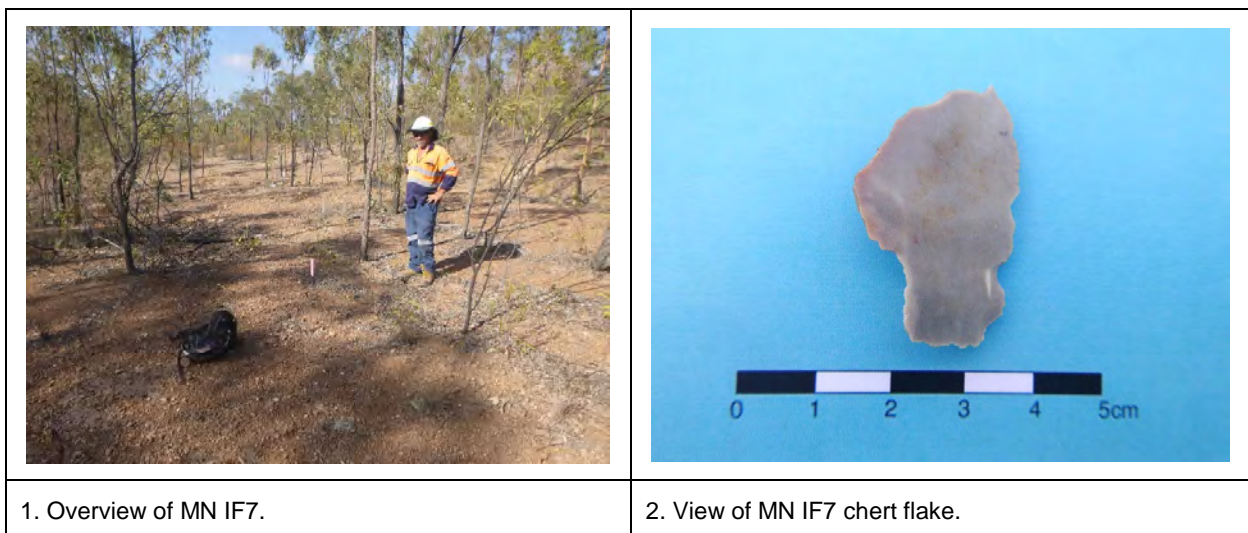
exposures. Small ordinary stone fragments and pebbles were extensive. Identified disturbances included erosion and deflation.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF7 was assessed as negligible.

**Figure 5-38: Aerial showing locations and extents of Mangoola North IF7 and Mangoola North IF8.**



**Figure 5-39: Photographs showing an overview and details of Mangoola North IF7.**





## **Mangoola North IF8**

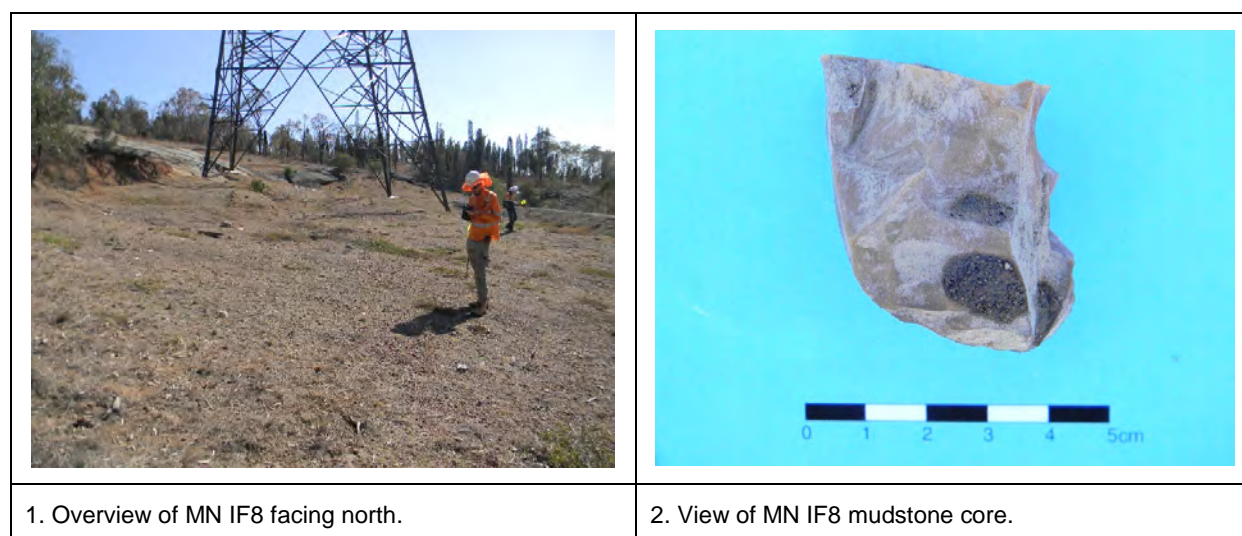
**Site Type:** Isolated Find

**Location of Site:** 2.5 km south of Ridgeland Rd and 60 m north of Wybong Post Office Rd, Wybong, on the south side of an electricity structure (**Figure 5-27**). The site is located on a gravelly upper slope 70 m west of a property dam (**Figure 5-38**).

**Description of Site:** Mangoola North IF8 is a single mudstone core located within deflated skeletal soils (**Table 5-15; Figure 5-40**). The extent of the site is defined by a 5 m buffer around the artefact. The surrounding slope was bare of vegetation within the electricity easement and grass cover was minimal. The GSE at the time of recording was high (80%) with a GSV of 80% within these exposures. Gravel and larger fragments of ordinary stone were widespread. The primary identified disturbances represented clearing, erosion, and the construction of the adjacent electricity structure.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF8 was assessed as negligible.

**Figure 5-40: Photographs showing an overview and details of Mangoola North IF8.**



## **Mangoola North IF9**

**Site Type:** Isolated Find

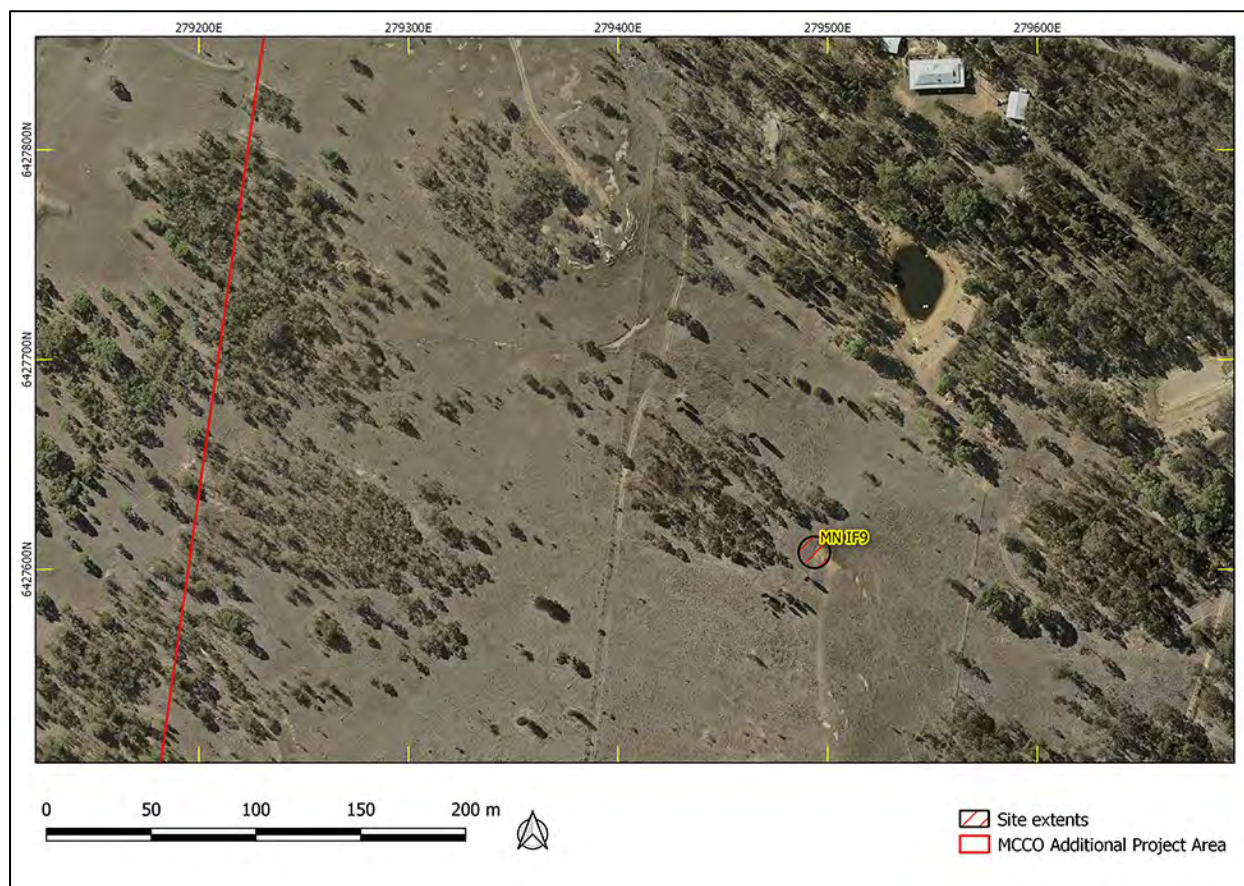
**Location of Site:** 1.2 km north of Wybong Rd and 300 m south of Wybong Post Office Rd, Wybong (**Figure 5-27**). The site is located on an upper slope 150 m north of a bald crest and 100 south of a property dam (**Figure 5-41**).

**Description of Site:** Mangoola North IF9 is a single mudstone side scraper located within the clayey skeletal soils of an erosion scar (**Table 5-15; Figure 5-42**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is isolated pencil pine and moderate grass cover. The GSE at the time of recording

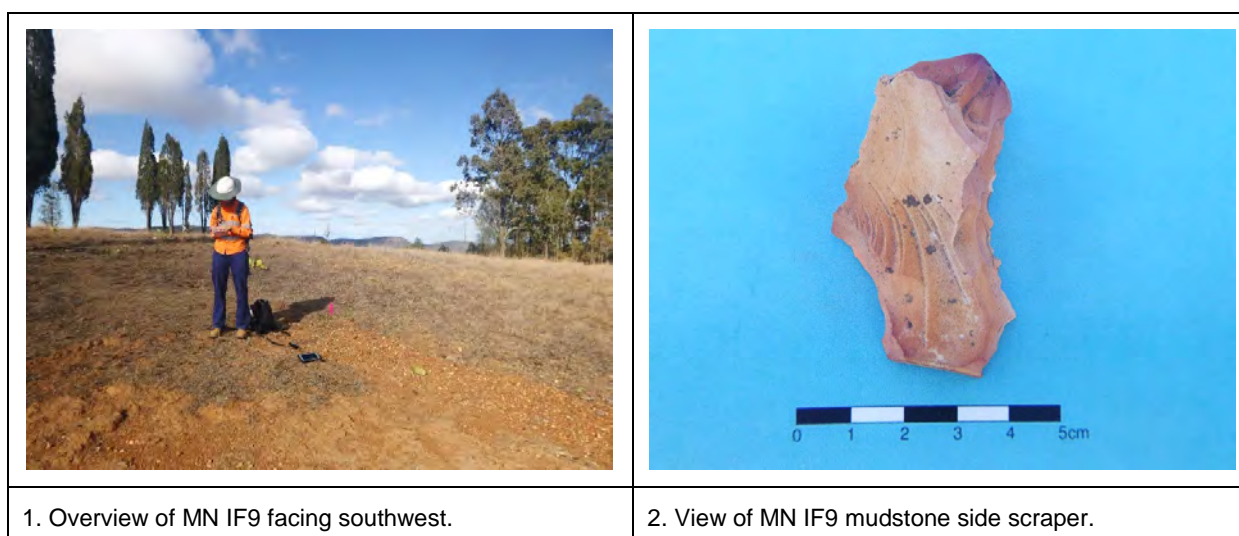
was high (70%) with a GSV of 85% within these exposures. Small ordinary stone fragments and pebbles were prevalent. Identified disturbances included heavy erosion and cattle trampling.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF9 was assessed as negligible.

**Figure 5-41: Aerial showing location and extent of Mangoola North IF9.**



**Figure 5-42: Photographs showing an overview and details of Mangoola North IF9.**





## **Mangoola North IF10**

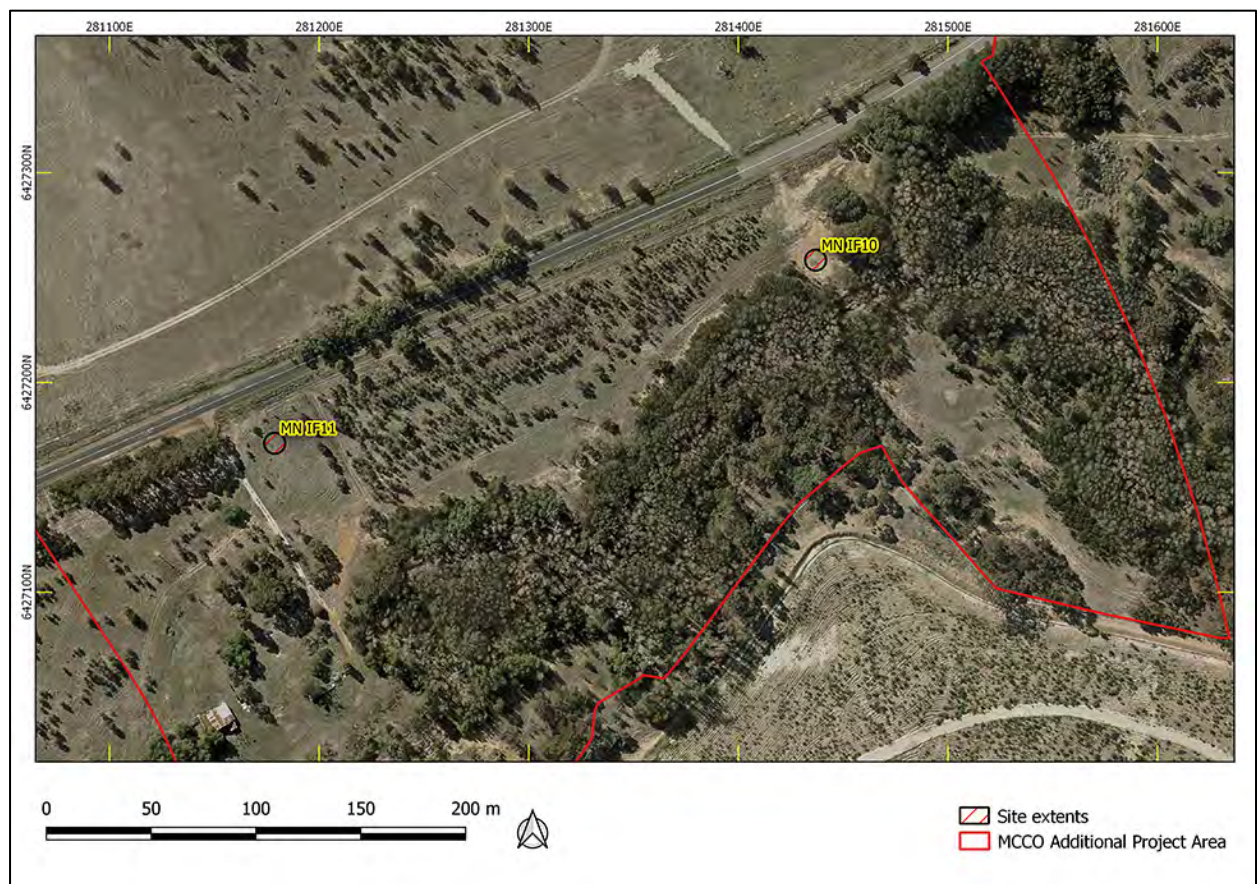
**Site Type:** Isolated Find

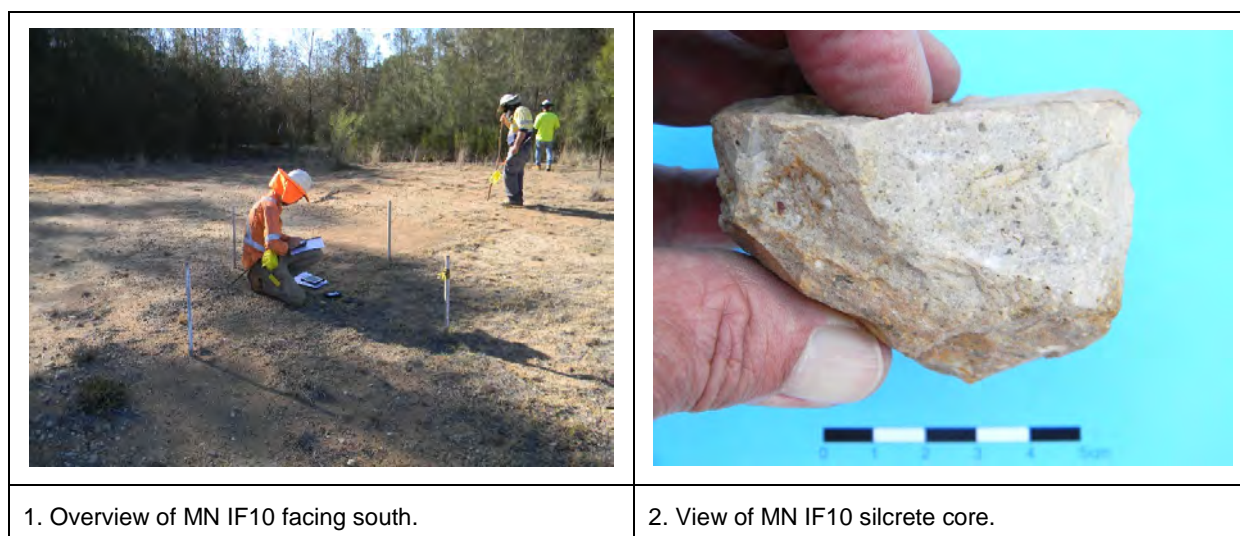
**Location of Site:** 50 m south of Wybong Rd, Wybong, adjacent a tributary of Big Flat Creek (**Figure 5-27**). The site is located on the flats north of the tributary on bare ground adjacent to dense casuarina regrowth (**Figure 5-43**).

**Description of Site:** Mangoola North IF10 is a single silcrete core located within a sandy, denuded area (**Table 5-15; Figure 5-44**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is cleared, sparse grass cover on the fringe of dense casuarina regrowth. The GSE at the time of recording was high (70%) with a GSV of 80% within these exposures. Small ordinary stone fragments and pebbles were prevalent. Identified disturbances included erosion, clearing, and water wash.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF10 was assessed as negligible.

**Figure 5-43: Aerial showing location and extent of Mangoola North IF10 and Mangoola North IF11.**



**Figure 5-44: Photographs showing an overview and details of Mangoola North IF10.****Mangoola North IF11**

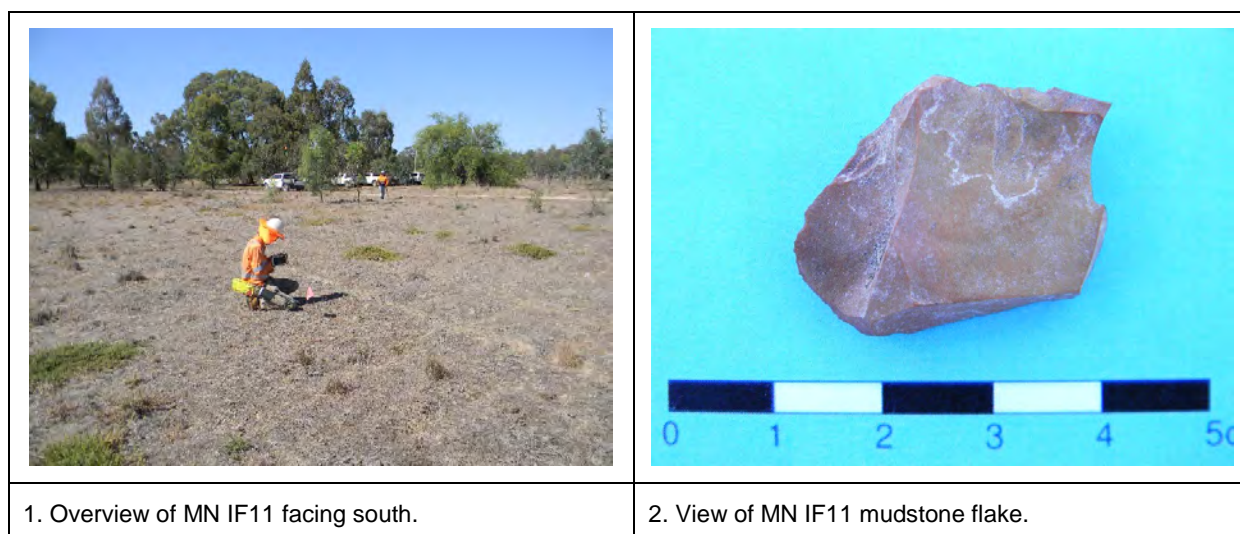
**Site Type:** Isolated Find

**Location of Site:** 30 m south of Wybong Rd, Wybong, 20 m to the east of a property access track (**Figure 5-27**). The site is located on the flats north of a tributary of Big Flat Creek in grassy paddock (**Figure 5-43**).

**Description of Site:** Mangoola North IF11 is a single mudstone flake located within friable, sandy soils (**Table 5-15; Figure 5-45**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is a cleared, grassy paddock with isolated sapling and rare mature eucalypt trees. The GSE at the time of recording was fair (40%) with a GSV of 40% within these exposures. Small ordinary stone fragments and pebbles were minimal. Identified disturbances included clearing, cattle grazing, and ripping for revegetation.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF11 was assessed as negligible.



**Figure 5-45: Photographs showing an overview and details of Mangoola North IF11.****Mangoola North IF12**

**Site Type:** Isolated Find

**Location of Site:** 50 m north of Wybong Rd and 550 m south of Ridgeland Rd, Wybong (**Figure 5-27**). The site is located on an ant mound at the base of an electricity pole on the flats south of a tributary of Big Flat Creek (**Figure 5-46**).

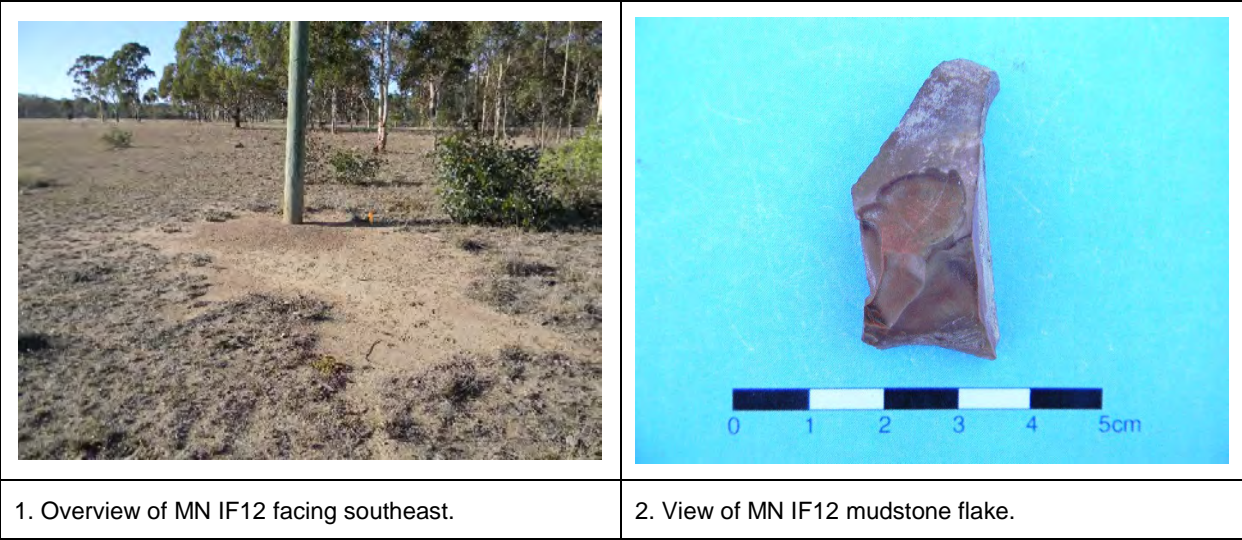
**Description of Site:** Mangoola North IF12 is a single mudstone flake located within friable, clayey soil (**Table 5-15; Figure 5-47**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is a cleared, open paddock with moderate-high grass cover fringed by stands of eucalypt woodland. The GSE at the time of recording was moderate-high (60%) with a GSV of 80% within these exposures. Small ordinary stone fragments and pebbles were prevalent. Identified disturbances included erosion, clearing, cattle grazing and the establishment of the adjacent ant mound.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF12 was assessed as negligible.

**Figure 5-46: Aerial showing locations and extents of Mangoola North IF12 and Mangoola North IF13.**



**Figure 5-47: Photographs showing an overview and details of Mangoola North IF12.**





## **Mangoola North IF13**

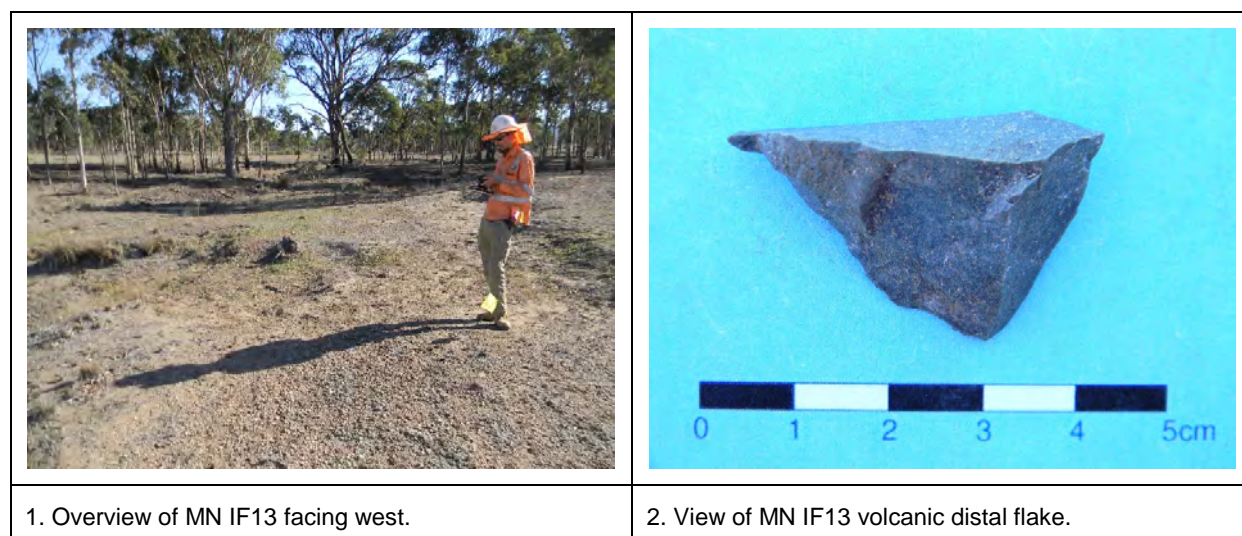
**Site Type:** Isolated Find

**Location of Site:** 125 m north of Wybong Rd and 500 m south of Ridgeland Rd, Wybong (**Figure 5-27**). The site is located on the north bank of a tributary or paleochannel of Big Flat Creek adjacent grassy paddock and is outside of the MCCO Additional Project Area (**Figure 5-46**).

**Description of Site:** Mangoola North IF13 is a single volcanic distal flake located within sandy, gravelly earth scoured by the adjacent tributary (**Table 5-15; Figure 5-48**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation represented cleared grassy paddock with stands of eucalypt woodland. The GSE at the time of recording was fair (60%) with a GSV of 80% within these exposures. Small ordinary stone fragments and pebbles were densely strewn. Identified disturbances included clearing, cattle trampling, and erosive scouring.

Potential for the presence of further subsurface archaeological deposits at Mangoola North IF13 was assessed as negligible.

**Figure 5-48: Photographs showing an overview and details of Mangoola North IF13.**



## 5.5 PREVIOUSLY RECORDED ABORIGINAL SITES

In **Section 4.4.3** it was noted that 49 sites have previously been recorded in the MCCO Additional Project Area. These sites consist of:

- 48 sites that have been previously recorded and registered with AHIMS
- One site (BFC98: 37-2-4490) that has been salvaged.

**Table 5-16** lists all 49 registered sites within the MCCO Additional Project Area and **Table 5-17** lists the results of the 2018 re-assessment of these sites (**Table 5-17** shows 48 sites as BFC98 as not re-inspected as it has been salvaged under permit). **Figure 5-49** shows the location of the previously recorded, registered, Aboriginal sites. In **Table 5-16**, **Table 5-17** and **Figure 5-49**, the sites are identified by a unique ID (numeral from 1 to 49) to allow easier concordance between the tables and the figure.

**Figure 5-50** shows the eastern portion of the MCCO Additional Project Area to indicate the extent of the recorded sites in this area that were able to be defined based on the results of the survey.

Further photographs of the sites and/or artefacts are presented in **Appendix 5**.

**Table 5-16: All previously recorded and registered sites within the MCCO Additional Project Area.**

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Site status	Permit
1	37-2-0509	Sandy Hollow, Singleton 1	281535	6427179	Artefact scatter	Valid	
2	37-2-0739	Manobalai-Castle Rock 2	280741	6430165	Isolated artefact	Valid	
3	37-2-0740	Manobalai-Castle Rock 3	281086	6430009	Isolated artefact	Valid	
4	37-2-0741	Manobalai-Castle Rock 4	282366	6429691	Artefact scatter	Valid	
5	37-2-0742	Manobalai-Castle Rock 5	283181	6429240	Artefact scatter	Valid	
6	37-2-2164	BFC01	281401	6427243	Artefact scatter	Valid	
7	37-2-2190	BFC28	281524	6427130	Artefact scatter	Valid	
8	37-2-2191	BFC29	281556	6427184	Artefact scatter	Valid	
9	37-2-2193	BFC31	281240	6426955	Artefact scatter	Valid	
10	37-2-3882	BFC69	279746	6427863	Isolated artefact	Valid	
11	37-2-3883	BFC70	279743	6427841	Artefact scatter	Valid	
12	37-2-3884	BFC71	279867	6427119	Isolated artefact	Valid	
13	37-2-3990	BFC90	281031	6428000	Isolated artefact	Valid	
14	37-2-3991	BFC91	279991	6428000	Isolated artefact	Valid	



ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Site status	Permit
15	37-2-4109	BFC96	281429	6427290	Artefact scatter	Partially destroyed	PA 10_0002
16	37-2-4116	BFC92	281209	6427089	Artefact scatter	Valid	
17	37-2-4117	BFC93	281221	6427043	Artefact scatter	Valid	
18	37-2-4118	BFC94	281279	6427036	Artefact scatter	Valid	
19	37-2-4119	BFC95	281295	6427016	Artefact scatter	Valid	
20	37-2-4490	BFC98	280112	6427888	Artefact scatter	Salvaged	PA 10_0002
21	37-2-4491	BFC99	280346	6427883	Isolated artefact	Valid	
22	37-2-4492	BFC100	280903	6427775	Isolated artefact	Valid	
23	37-2-4563	BFC102	279819	6426539	Artefact scatter	Partially destroyed	PA 10_0002
24	37-2-4580	BFC107 (MDG1)	283416	6429064	Isolated artefact	Valid	
25	37-2-4582	BFC109 (MDG3)	280187	6428445	Isolated artefact	Valid	
26	37-2-4863	BFC111	279698	6428117	Isolated artefact	Valid	
27	37-2-5425	BCF150	281157	6427427	Artefact scatter	Valid	
28	37-2-5428	BCF113A	280986	6428161	Artefact scatter	Valid	
29	37-2-5429	BCF114A	281089	6428425	PAD	Valid	
30	37-2-5430	BFC115	281046	6428510	Isolated artefact	Valid	
31	37-2-5431	BFC116	280994	6428280	Artefact scatter	Valid	
32	37-2-5432	BFC117	280935	6428081	Isolated artefact	Valid	
33	37-2-5433	BFC118	282324	6428173	PAD	Valid	
34	37-2-5434	BFC119	282490	6428448	PAD	Valid	
35	37-2-5439	BFC124	284126	6428645	Artefact scatter	Valid	
36	37-2-5440	BFC125	284057	6428564	Artefact scatter	Valid	
37	37-2-5441	BFC126	283915	6428393	Artefact scatter, PAD	Valid	
38	37-2-5442	BFC127	283672	6428316	Artefact scatter, PAD	Valid	
39	37-2-5443	BFC128	279649	6428204	Rockshelter, PAD	Valid	
40	37-2-5444	BFC129	279641	6428309	Rockshelter, PAD	Valid	
41	37-2-5445	BFC130	279641	6428308	Rockshelter, PAD	Valid	

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Site status	Permit
42	37-2-5446	BFC131	279643	6428317	Rockshelter, PAD	Valid	
43	37-2-5447	BFC132	279631	6428320	Rockshelter, PAD	Valid	
44	37-2-5448	BFC133	280480	6429845	Isolated artefact	Valid	
45	37-2-5449	BFC134	280473	6428323	Artefact Scatter	Valid	
46	37-2-5450	BFC135	279665	6429015	Artefact scatter	Valid	
47	37-2-5451	BFC136	279714	6428879	Artefact scatter	Valid	
48	37-2-5452	BFC137	280253	6429070	Isolated artefact	Valid	
49	37-2-5480	MCO001	283039	6428912	Isolated artefact	Valid	

Figure 5-49: Aerial showing the location of all previously recorded, registered, sites in the MCCO Additional Project Area.

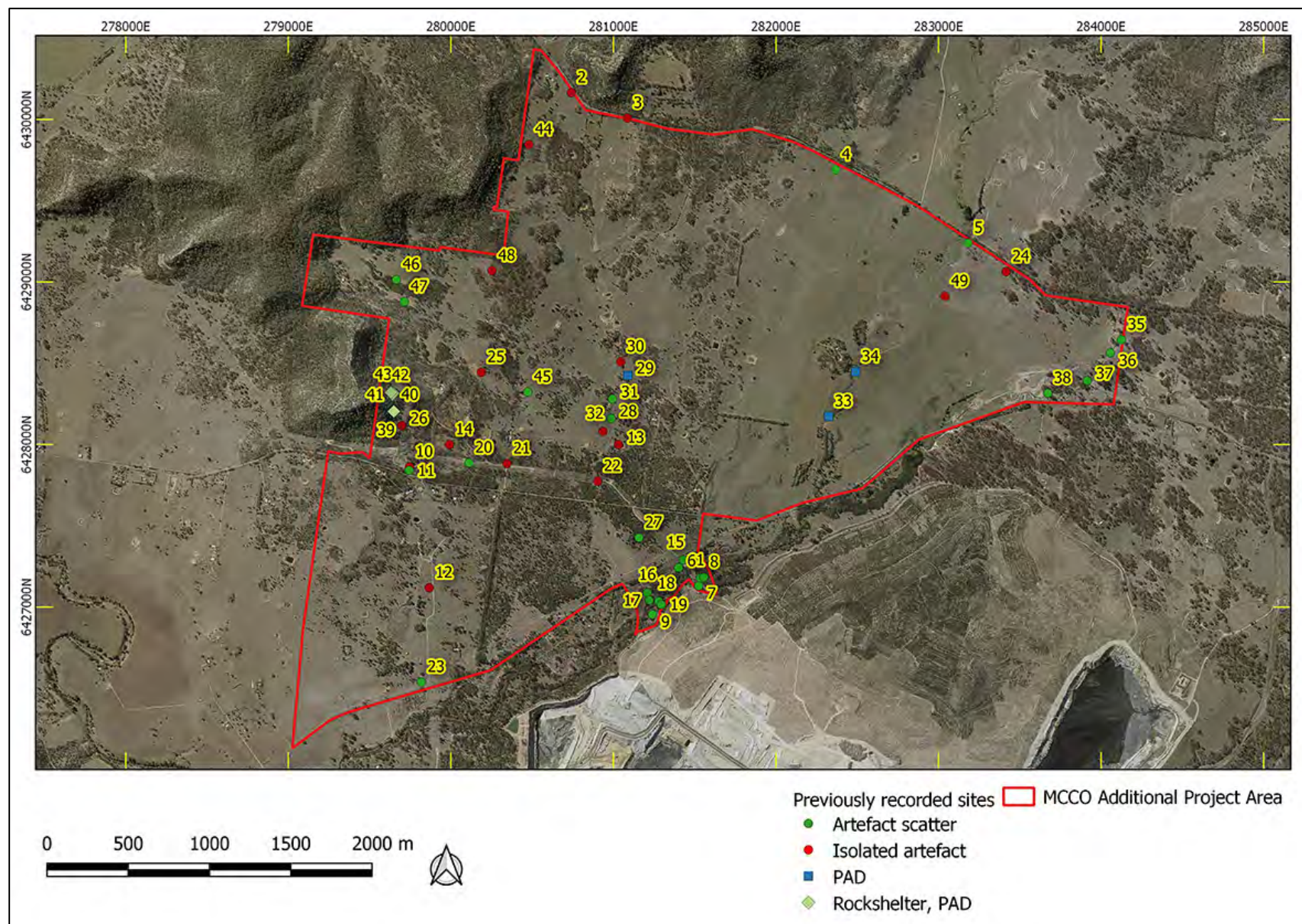
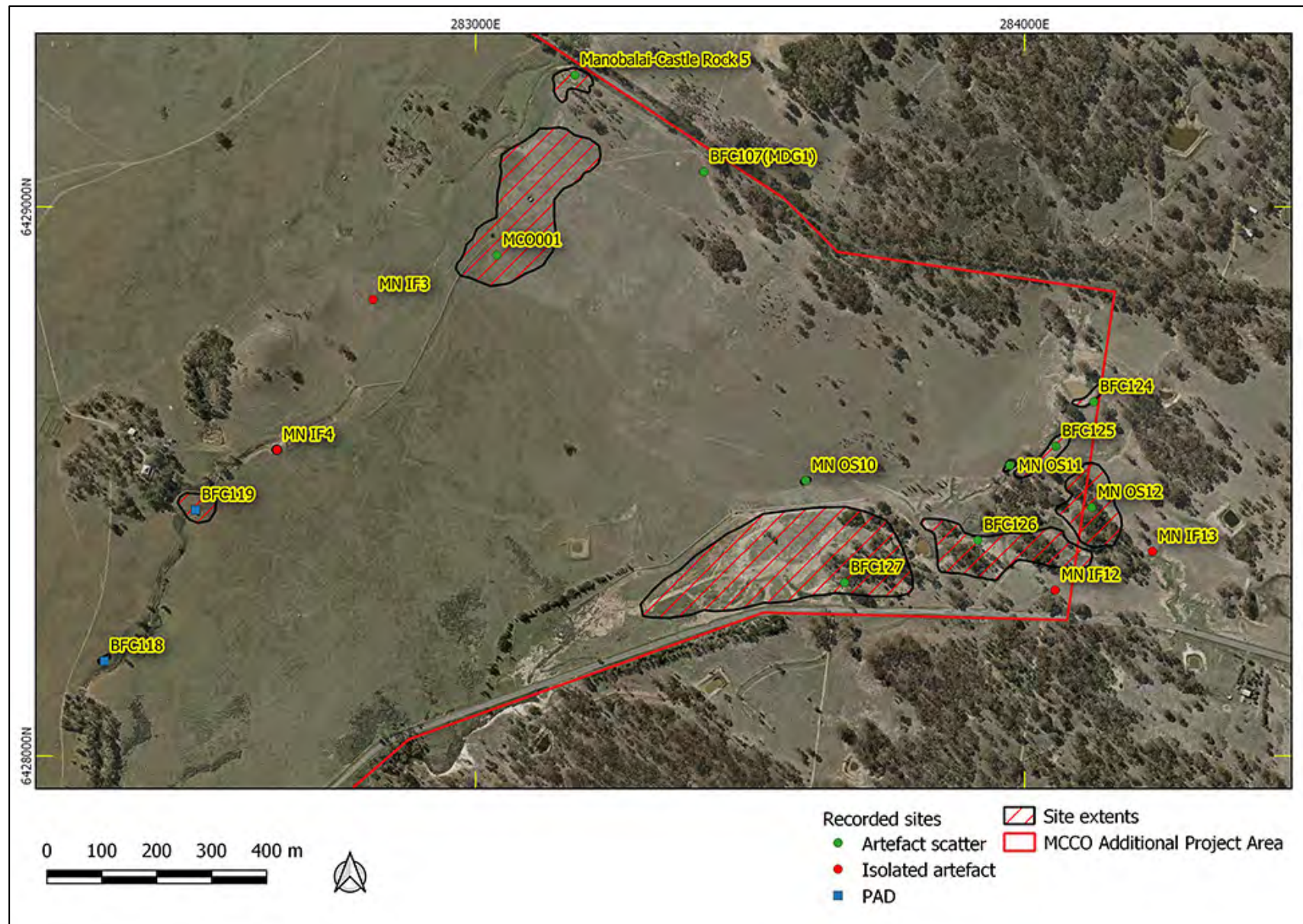








Figure 5-50: Aerial showing the extent of sites in the eastern portion of the MCCO Additional Project Area.









**Table 5-17: Results of inspection of previously recorded, registered, sites.**

ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
1	37-2-0509	Sandy Hollow, Singleton 1	281535	6427179	Artefact Scatter	20 artefacts recorded across three scalds at the junction of a lower slope landform with the flats of Big Flat Creek, including flakes, flaked pieces, and cores. Raw materials included mudstone, quartz, and silcrete. Identified disturbances included sheet wash erosion, cattle trampling, and ant mounds. The total extent of the site was recorded as 190 by 190m.	<p>Site card describes three exposures (A, B, &amp; C). Exposure A later recorded as separate site (BFC28, see below). The current recording is restricted to exposures B &amp; C.</p> <p>Site comprised seven visible artefacts, including mudstone and silcrete flakes and a mudstone core, located on a small rise above creek flats. Identified disturbances were consistent with the original recording.</p> <p>See <b>Appendix 5</b> for additional site location and artefact photos.</p>	<p><b>VIEW OF SANDY HOLLOW, SINGLETON 1 IN 2018.</b></p> 
2	37-2-0739	Manobalai-Castle Rock 2	280741	6430165	Isolated Find	A single tertiary mudstone flake located on a sandstone outcrop in open woodland.	<p>Artefact was not able to be located despite adequate areas of exposure. Location of AHIMS coordinates do not match site card description. No sandstone outcroppings nearby. Coordinates likely erroneous and it is impossible to discern exactly where the site was originally recorded.</p>	<p><b>VIEW OF M-CASTLE ROCK 2 AHIMS LOCATION.</b></p> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
3	37-2-0740	Manobalai-Castle Rock 3	281086	6430009	Isolated Find	Unable to consult site card	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Recorded in an area of high general disturbance from the construction and use of the property access gate.	<b>VIEW OF M-CASTLE ROCK 3 AHIMS LOCATION.</b> 
4	37-2-0741	Manobalai-Castle Rock 4	282366	6429691	Artefact Scatter	Two mudstone flakes located in cleared grassland on the side of a gully. The primary identified disturbance was cattle trampling.	The artefacts were not able to be located despite adequate areas of exposure. Location of AHIMS coordinates do not match site card description. No gully present within the vicinity. Coordinates likely erroneous and it is impossible to discern exactly where the site was originally recorded. Areas surrounding the site location were inspected and no sites were recorded.	<b>VIEW OF M-CASTLE ROCK 4 AHIMS LOCATION.</b> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
5	37-2-0742	Manobalai-Castle Rock 5	283181	6429240	Artefact Scatter	30+ artefacts, including mudstone and silcrete flakes and flaked pieces, located in a 30 by 15 m exposure by a small gully adjacent Ridgeland Rd. The primary identified disturbance was cattle trampling.	Site comprised 22 visible artefacts, including mudstone, silcrete, quartz, and basalt flakes along with a side scraper, an end scraper, and a backed blade. These artefacts were located within and adjacent the eroded bank of Big Flat Creek on a slight rise. Identified disturbances included sheet wash erosion, extensive clearing, and cattle grazing.  See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF M-CASTLE ROCK 5 NORTH EXTENT.</b> 
6	37-2-2164	BFC01	281401	6427243	Artefact Scatter	Two mudstone flakes recorded on the northern bank of Big Flat Creek by patches of vegetation.	Artefacts not able to be located despite adequate areas of local exposure. Location fringed by heavy casuarina regrowth obscuring nearby ground surfaces. AHIMS coordinates match site card description, however, no photo was included in the site card for comparison.	<b>VIEW OF BFC01 AHIMS LOCATION.</b> 






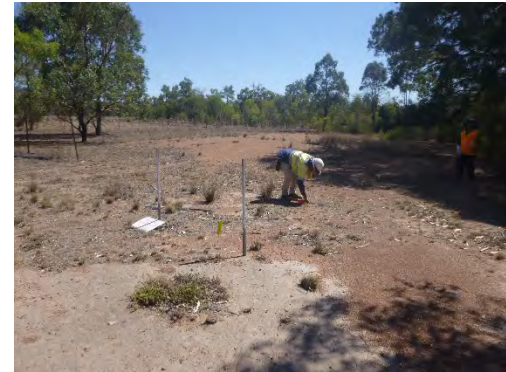
ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
7	37-2-2190	BFC28	281524	6427130	Artefact Scatter	Four silcrete and mudstone flakes recorded within a 23 by 30 m exposure behind houses on the southern bank of Big Flat Creek. Fringed by vegetation.	Site comprised three mudstone flakes and a mudstone flaked piece. These artefacts were located within an erosion scald by open regrowth woodland on a slight rise south of Big Flat Creek. A disused farm track traversed the centre of the site. Houses mentioned in the site card may have been situated within nearby mining lease and since been removed. Identified disturbances included sheet wash erosion, vehicle damage, and a large ant mound.  See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC28 IN 2018.</b> 
8	37-2-2191	BFC29	281556	6427184	Artefact Scatter	Four mudstone and silcrete flakes recorded within a 9 by 6 m exposure behind houses on the southern bank of Big Flat Creek. Fringed by vegetation.	Artefacts not able to be located despite adequate areas of exposure. Site card description and attached photos do not provide sufficient references to confirm location. Houses mentioned on the site card may have been situated within nearby mining lease and since been removed.	<b>VIEW OF BFC29 AHIMS LOCATION.</b> 





ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
9	37-2-2193	BFC31	281240	6426955	Artefact Scatter	77+ artefacts, including flakes, flaked pieces, and cores, recorded within a series of gullies associated with the southern bank of Big Flat Creek. Raw materials included mudstone, petrified wood, silcrete, and quartz. Site described as in poor condition.	Site comprised up to 100 artefacts in a flat landform of eroded B-Horizon south of Big Flat Creek. Artefacts included, flakes, cores and blades made from mudstone, silcrete, and quartz. Identified disturbances included water wash erosion, clearing, and grazing.  See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC31 IN 2018.</b> 
10	37-2-3882	BFC69	279746	6427863	Isolated Find	A single mudstone flake recorded in a disturbed context on a dam wall.	Artefact was not able to be located despite fencing around location and adequate areas of local exposure. AHIMS coordinates match site card description and photo.	<b>VIEW OF BFC69 AHIMS LOCATION.</b> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
11	37-2-3883	BFC70	279743	6427841	Artefact Scatter	Three mudstone flakes recorded within a vehicle track next to a dam wall.	Artefacts not able to be located despite fencing around location and adequate areas of local exposure. AHIMS coordinates match site card description and photo.	<p><b>VIEW OF BFC70 AHIMS LOCATION.</b></p> 
12	37-2-3884	BFC71	279867	6427119	Isolated Find	A single mudstone flake recorded in a disturbed context on dam wall.	The mudstone flake from the original recording was successfully located in the context described. No further disturbances were identified. See <b>Appendix 5</b> for an artefact photo.	<p><b>VIEW OF BFC71 IN 2018.</b></p> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
13	37-2-3990	BFC90	281031	6428000	Artefact Scatter	Originally recorded as an isolated find. A single retouched mudstone flake located in a disturbed context on a dam wall.	Site comprised of 10 artefacts distributed across the dam wall. Artefacts included flakes and a flaked piece made from mudstone, silcrete, and chert. No further disturbances were identified.  See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC90 IN 2018.</b> 
14	37-2-3991	BFC91	279991	6428000	Isolated Find	A single mudstone flake recorded in gravel lag within a highly eroded area.	Artefact was not able to be located despite adequate areas of local exposure. AHIMS coordinates match site card description and photo. Evidence of some earthmoving in the past (not necessarily post-recording of the artefact).	<b>VIEW OF BFC91 AHIMS LOCATION.</b> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
15	37-2-4109	BFC96	281429	6427290	Artefact Scatter	11 artefacts, including flakes and a retouched flake made from mudstone, silcrete and petrified wood, recorded within a vehicle track on the western bank of Big Flat Creek. Identified disturbances include the maintenance of the vehicle track, vehicle damage, sheet wash erosion, clearance, and cattle grazing.	Site comprised of three artefacts, a flake, a blade, and a hammerstone, made from mudstone and silcrete located in the context described. No further disturbances were identified.  See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC96 IN 2018.</b> 
16	37-2-4116	BFC92	281209	6427089	Artefact Scatter	Two artefacts, a mudstone flake and a fine-grained siliceous flake, located within a disused access track to the northwest of Big Flat Creek. Identified disturbances included vehicle damage, clearing, and nearby tilling for tree planting.	The two originally recorded artefacts were successfully located in the context described. No further disturbances were identified.  See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC92 IN 2018.</b> 





ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
17	37-2-4117	BFC93	281221	6427043	Artefact Scatter	Three artefacts, including two mudstone flakes and a mudstone flaked piece, located within a disused access track to the northwest of Big Flat Creek. Identified disturbances included vehicle damage, clearing, and nearby tilling for tree planting.	Only a single mudstone flake could be rerecorded with the described context despite good levels of local exposure. No further disturbances were identified. See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC93 IN 2018.</b> 
18	37-2-4118	BFC94	281279	6427036	Artefact Scatter	Three mudstone flakes eroding out of scoured gully by a vehicle track on the eastern bank of Big Flat Creek. Identified disturbances included vehicle damage, clearing, and erosion.	The three originally recorded mudstone flakes were successfully located in the context described. No further disturbances were identified. See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC94 IN 2018.</b> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
19	37-2-4119	BFC95	281295	6427016	Artefact Scatter	23 artefacts located by a vehicle track on the eastern bank of Big Flat Creek. Artefacts included flakes and flaked pieces made predominantly from mudstone and chert. Identified disturbances included vehicle damage, clearing, and erosion.	Site comprised 15+ artefacts located in the context described. Artefacts included flakes and flaked pieces made from mudstone, silcrete, and chert. No further disturbances were identified.  See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC95 IN 2018.</b> 
21	37-2-4491	BFC99	280346	6427883	Isolated find	A single mudstone flake located by a vehicle track within an ETL easement. Identified disturbances included vehicle damage, erosion, clearing, and the construction of the ETL.	Artefact was not able to be located despite fencing around location and adequate areas of local exposure. AHIMS coordinates match site card description and photo. No further disturbances identified.	<b>VIEW OF BFC99 LOCATION.</b> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
22	37-2-4492	BFC100	280903	6427775	Isolated Find	A single mudstone flake located in the exposure of an ephemeral drainage channel within an ETL easement. Identified disturbances included erosion, clearing, and the construction of the ETL.	Artefact was not able to be located despite fencing around location and adequate areas of local exposure. AHIMS coordinates match site card description and photo. No further disturbances identified.	<p><b>VIEW OF BFC100 AHIMS LOCATION.</b></p> 
23	37-2-4563	BFC102	279819	6426539	Artefact Scatter	Six artefacts located on a property vehicle access track within an ETL easement. Artefacts included flakes made from mudstone and silcrete and a retouched mudstone flake. The primary identified disturbance represented the construction of the ETL.	Site comprised of seven artefacts, including mudstone and silcrete flakes, a volcanic flake, and a silcrete core, located in the context described. Identified disturbances included clearing, erosion, and cattle grazing. See <b>Appendix 5</b> for additional site location and artefact photos.	<p><b>VIEW OF BFC102 IN 2018.</b></p> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
24	37-2-4580	BFC107 (MDG1)	283416	6429064	Isolated Find	A single chert core located in a grassed alluvial flat east of Big Flat Creek. Identified disturbances included clearing and cattle grazing.	Artefact was not able to be located despite fencing around location and adequate areas of local exposure. AHIMS coordinates match site card description and photo. No further disturbances identified.	<p><b>VIEW OF BFC107 (MDG1) AHIMS LOCATION.</b></p> 
25	37-2-4582	BFC109 (MDG3)	280187	6428445	Isolated Find	A single quartz core located by an access track on the constructed bank of a property dam. Identified disturbances included vehicle damage, cattle grazing, and the construction of the adjacent dam.	Originally recorded artefact was successfully located in the described context. No further disturbances were identified. See <b>Appendix 5</b> for an artefact photo.	<p><b>VIEW OF BFC109 (MDG3) IN 2018.</b></p> 





ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
26	37-2-4863	BFC111	279698	6428117	Artefact Scatter	This site was originally recorded as an isolated find. A single mudstone core located within an access track on a bench mid-slope. The primary identified disturbance was vehicle damage.	Site comprised of six artefacts, including quartz flakes, a mudstone core, and a mudstone flaked piece, located in the described context. Identified disturbances included clearing, erosion, and cattle grazing. See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC111 IN 2018.</b> 
27	37-2-5425	BFC150	281157	6427427	Isolated Find	A single mudstone flaked piece recorded within an exposure surrounded by bull-oak vegetation. No disturbances noted.	Originally recorded artefact successfully located in the context described. Identified disturbances included extensive clearing, cattle grazing, and erosion. See <b>Appendix 5</b> for an artefact photo.	<b>VIEW OF BFC150 IN 2018.</b> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
28	37-2-5428	BFC113A	280986	6428161	Artefact Scatter	Four quartz flakes located within an erosive scour on an eroded creek bank. The primary identified disturbance was erosion.	Site comprised of two artefacts, a quartz flake and a mudstone flake, located within a tributary of Big Flat Creek. Surrounding vegetation dominated by <i>Juncus acutus</i> . Identified disturbances included clearing and cattle grazing. See <b>Appendix 5</b> for additional artefact photos.	<p><b>VIEW OF BFC113A IN 2018.</b></p> 
29	37-2-5429	BCF114A	281089	6428425	PAD	A PAD situated on an elevated spur overlooking a creek. Vegetation limited ground surface visibility at the time of original recording.	Site was situated on an undifferentiated, sloping landform on thin soils. Nearby watercourse was assessed as a modified drainage, rather than a true creek. As such, the presence of a PAD was assessed as unlikely. See <b>Appendix 5</b> for an additional site location photo. BC114A was investigated in the test excavation program. See <b>Section 6</b> .	<p><b>VIEW OF BFC114A IN 2018.</b></p> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
30	37-2-5430	BFC115	281046	6428510	Isolated Find	A single mudstone core located on an area of exposure of a creek bank scour. The primary identified disturbance was erosion.	Originally recorded mudstone core was successfully located in the described context. Identified disturbances included clearing and cattle grazing. See <b>Appendix 5</b> for additional site location and artefact photos.	<p><b>VIEW OF BFC115 IN 2018.</b></p> 
31	37-2-5431	BFC116	280994	6428280	Artefact Scatter	10 artefacts, including mudstone, silcrete, and quartz flakes and a retouched mudstone flake, located within a creek bank scour. No disturbances noted.	40+ artefacts, including flakes, a core, and a backed flake, located mid-slope within the heavily eroded gullies of a tributary to Big Flat Creek. Raw materials included mudstone, silcrete and quartz. Identified disturbances included extensive erosion, clearing, and cattle grazing. See <b>Appendix 5</b> for additional site location and artefact photos.	<p><b>VIEW OF BFC116 IN 2018.</b></p> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
32	37-2-5432	BFC117	280935	6428081	Isolated Find	A single quartzite core located within the exposure of a creek bed. No disturbances noted.	Originally recorded quartzite core was successfully located in the described context. Identified disturbances included erosion, clearing and cattle grazing. See <b>Appendix 5</b> for additional site location and artefact photos.	<p><b>VIEW OF BFC117 IN 2018.</b></p> 
33	37-2-5433	BFC118	282324	6428173	PAD	A PAD situated on an elevated spur overlooking a creek. Vegetation limited ground surface visibility at the time of original recording.	Site situated on a slightly elevated landform with good visibility over Big Flat Creek. Approximately 10 cm depth to soil profile. Presence of PAD assessed as plausible. See <b>Appendix 5</b> for an additional site location photo.	<p><b>VIEW OF BFC118 IN 2018.</b></p> 





ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
34	37-2-5434	BFC119	282490	6428448	PAD	A PAD situated on an elevated spur overlooking Big Flat Creek. Vegetation limited ground surface visibility at the time of original recording.	Site situated on an uneven, slightly elevated landform with good visibility over Big Flat Creek. Approximately 30 cm depth to soil profile. Presence of PAD assessed as plausible. See <b>Appendix 5</b> for an additional site location photo.	<p><b>VIEW OF BFC119 IN 2018.</b></p> 
35	37-2-5439	BFC124	284126	6428645	Artefact Scatter	Three artefacts, comprising a mudstone core, a mudstone flake, and a silcrete flake, located on the bund of a dam wall. No disturbances noted.	Site comprised of three artefacts, a mudstone blade, a mudstone flake, and a silcrete core located in the context described. Primary identified disturbances were the construction of the adjacent dam and erosion. See <b>Appendix 5</b> for additional site location and artefact photos. See <b>Figure 5-50</b> for the amended site extent.	<p><b>VIEW OF BFC124 IN 2018.</b></p> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
36	37-2-5440	BFC125	284057	6428564	Artefact Scatter	High density scatter of 70+ artefacts, including cores, flakes, and retouched flakes made from silcrete, quartz, volcanic, quartzite, and mudstone. Distributed over 10,000 m <sup>2</sup> of eroding channel of tributary to Big Flat Creek. High subsurface potential noted. No disturbances noted.	Site comprised of 100+ artefacts distributed over the context described, including cores, blades, backed blades, flakes and a hammerstone made from silcrete, mudstone, quartzite, volcanic, chert, and quartz. Most artefacts were identified in eroded B-Horizon, however soil depth (PAD) present back from the channel. Disturbances included erosion, clearing, and cattle grazing.  See <b>Appendix 5</b> for additional site location and artefact photos.  See <b>Figure 5-50</b> for the amended site extent.	<b>VIEW OF BFC125 IN 2018.</b> 
37	37-2-5441	BFC126	283915	6428393	Artefact Scatter	High density scatter of 300+ artefacts, including cores, flakes, blades, backed blades, and retouched flakes made from silcrete, quartz, quartzite, and mudstone. Distributed over 25,000 m <sup>2</sup> of eroding channel of major tributary to Big Flat Creek. High subsurface potential noted. No disturbances noted.	Site comprised of 500+ artefacts distributed over the context described, including backed blades, scrapers, grindstones, microliths, hammerstones, cores, and flakes made from silcrete, mudstone, quartzite, porcelanite, chert, petrified wood and quartz. Numerous knapping areas. PAD associated with central western portion. Disturbances included extensive erosion, clearing, construction of water management bunds and cattle grazing.  See <b>Appendix 5</b> for additional site location and artefact photos.  See <b>Figure 5-50</b> for the amended site extent.	<b>VIEW OF BFC126 IN 2018.</b> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
38	37-2-5442	BFC127	283672	6428316	Artefact Scatter	Dense scatter of 100+ artefacts distributed over 17,500 m <sup>2</sup> of broad sand plain formed by the widening of a major tributary to Big Flat Creek. Likely a sparser continuation of BFC126. No disturbances noted.	Site comprised of 200+ artefacts distributed over several loci in the context described. Included backed blades, scrapers, hammerstones, cores, and flakes made from silcrete, mudstone, quartzite, chert, and quartz. PAD associated with southern central portion. Disturbances included extensive erosion, clearing, and cattle grazing.  See <b>Appendix 5</b> for additional site location and artefact photos.  See <b>Figure 5-50</b> for the amended site extent.	<b>VIEW OF BFC127 IN 2018.</b> 
39	37-2-5443	BFC128	279649	6428204	Shelter (PAD)	Rockshelter with PAD in good condition on a steep incline of scarp landform. Floor area 10 m <sup>2</sup> with no cracks or roof fall visible. Ground beneath drip line is heavily eroded.	Site successfully located. Deposit was found to be narrow (max. 90 cm) and shallow (max. 10 cm) with significant erosion at dripline. Assessed as unlikely to retain archaeological deposits due to the slope of the rockshelter floor.  See <b>Appendix 5</b> for additional site photos.	<b>VIEW OF BFC128 IN 2018.</b> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
40	37-2-5444	BFC129	279641	6428309	Shelter (PAD)	Rockshelter with PAD in good condition on a steep incline of scarp landform. Floor area 60 m <sup>2</sup> with no cracks or roof fall visible. Ground beneath drip line is heavily eroded.	Site successfully located. Deposit was found to be narrow (max. 170 cm) and shallow (max. 10 cm) with significant erosion at dripline. Assessed as unlikely to retain archaeological deposits due to the slope of the rockshelter floor. See <b>Appendix 5</b> for additional site photos.	<b>VIEW OF BFC129 IN 2018.</b> 
41	37-2-5445	BFC130	279641	6428308	Shelter (PAD)	Rockshelter with PAD in good condition on a steep incline of scarp landform. Floor area 5 m <sup>2</sup> with no cracks or roof fall visible. Ground beneath drip line is heavily eroded.	Site successfully located. Deposit was found to be narrow (max. 80 cm) and shallow (max. 12 cm) with significant erosion at dripline. Very low ceiling. Some small hairline cracks present. Assessed as unlikely to retain archaeological deposits due to the slope of the rockshelter floor. See <b>Appendix 5</b> for additional site photos.	<b>VIEW OF BFC130 IN 2018.</b> 



ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
42	37-2-5446	BFC131	279643	6428317	Shelter (PAD)	Rockshelter with PAD in good condition on a steep incline of scarp landform. Floor area 2 m <sup>2</sup> with no cracks or roof fall visible. Ground beneath drip line is heavily eroded.	<p>Site successfully located. Deposit was found to be narrow (max. 100 cm) and shallow (max. 10 cm) with significant erosion at dripline. Very low ceiling. Some small cracks present.</p> <p>Assessed as unlikely to contain archaeological deposits due to the restricted size of the rockshelter.</p> <p>See <b>Appendix 5</b> for additional site photos.</p>	<p><b>VIEW OF BFC131 IN 2018.</b></p> 
43	37-2-5447	BFC132	279631	6428320	Shelter (PAD)	Rockshelter with PAD in good condition on a steep incline of scarp landform. Floor area 5 m <sup>2</sup> with no cracks or roof fall visible. Ground beneath drip line is heavily eroded.	<p>Site successfully located. Deposit was found to be narrow (max. 100 cm) and shallow (max. 10 cm) with significant erosion at dripline. Very low ceiling. Floor comes down to sandstone in some areas.</p> <p>Assessed as unlikely to retain archaeological deposits due to the slope of the rockshelter floor.</p> <p>See <b>Appendix 5</b> for additional site photos.</p>	<p><b>VIEW OF BFC132 IN 2018.</b></p> 

ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
44	37-2-5448	BFC133	280480	6429845	Isolated Find	A single mudstone flake located within an outcrop of sandstone bedrock. No disturbances noted.	Originally recorded mudstone flake was successfully located in the described context. The primary disturbance identified was erosion. See <b>Appendix 5</b> for an artefact photo.	<b>VIEW OF BFC133 IN 2018.</b> 
45	37-2-5449	BFC134	280473	6428323	Artefact Scatter	Originally recorded as an isolated find. A single mudstone flake located on the bund of a property dam. No disturbances noted.	Site comprised of three artefacts, two quartz flakes and a chert flake, located in the context described. The primary identified disturbance were erosion and the construction of the adjacent dam. See <b>Appendix 5</b> for additional site location and artefact photos.	<b>VIEW OF BFC134 IN 2018.</b> 

ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
46	37-2-5450	BFC135	279665	6429015	Artefact Scatter	Four mudstone flakes recorded on a spur crest above a creek. No disturbances noted.	Site comprised a single mudstone flake located in the context described. The primary identified disturbance were clearing and cattle grazing. See <b>Appendix 5</b> for an artefact photo.	<p><b>VIEW OF BFC135 IN 2018.</b></p> 
47	37-2-5451	BFC136	279714	6428879	Artefact Scatter	Four artefacts, two mudstone flakes, a quartz flake, and a mudstone core, recorded on a spur crest above a creek.	Site comprised of five artefacts, including flakes, shatter, and a core made from mudstone and quartz, recorded along a farm track. Identified disturbances included clearing, cattle grazing, and vehicle damage. See <b>Appendix 5</b> for additional site location and artefact photos.	<p><b>VIEW OF BFC136 IN 2018.</b></p> 

ID	AHIMS ID	Site Name	GDA 56 East	GDA 56 North	Site type	Original site description	Current condition	2018 Site Photo
48	37-2-5452	BFC137	280253	6429070	Isolated Find	A single silcrete core. Location not described.	Originally recorded artefact successfully located in the sparse grassland of an upper slope landform on eroded skeletal soils. Identified disturbances included extensive clearing, cattle grazing, and erosion. See <b>Appendix 5</b> for an artefact photo.	<p><b>VIEW OF BFC137 IN 2018.</b></p> 
49	37-2-5480	MCO001	283039	6428912	Artefact Scatter	Originally recorded as an isolated find. A single mudstone shatter piece located on a stock track in a flat grassy paddock. No disturbances noted.	Site comprised of 40+ artefacts located on a slightly elevated landform above Big Flat Creek. Artefacts included flakes, flaked pieces, scrapers, and blades made from mudstone, silcrete, chert, quartz, and quartzite. Identified disturbances included extensive clearing, cattle grazing, and erosion. See <b>Appendix 5</b> for additional site location and artefact photos. See <b>Figure 5-50</b> for the amended site extent.	<p><b>VIEW OF MCO001 IN 2018.</b></p> 



## 5.6 DISCUSSION

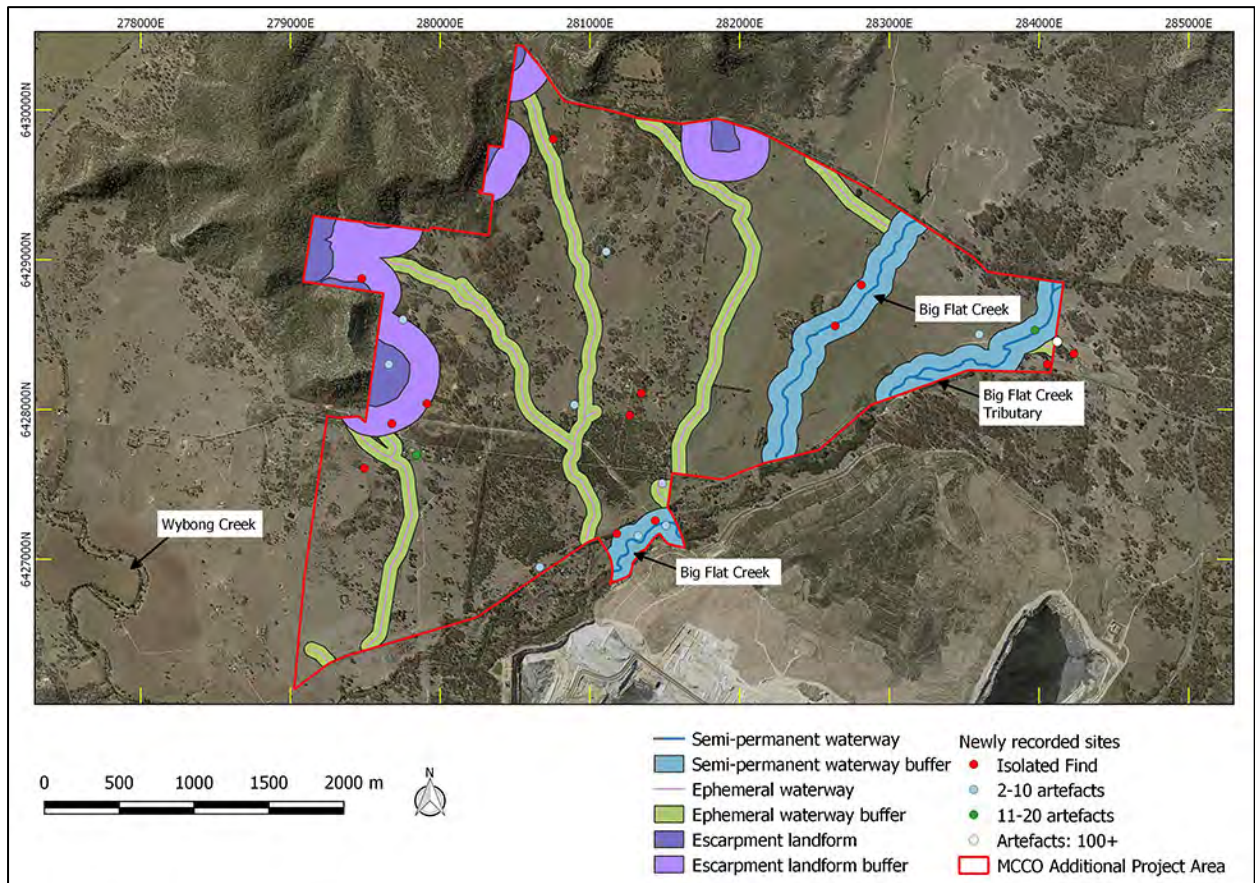
The survey of the MCCO Additional Project Area recorded 25 new Aboriginal sites and inspected the recorded locations of 48 previously recorded valid or partially valid sites. The newly recorded sites are artefact scatters and isolated finds, most of low density recorded in a secondary context.

### 5.6.1 Veracity of the predictive model

The predictive model outlined in **Section 4.5** suggested that artefact sites would represent the most common site type to be recorded, which is reflected in the survey results. The results are further consistent with the predictive expectations that most sites would be of low density except within proximity to a major watercourse. The predictive model expected that, given the long agricultural history and associated landscape modification of the Hunter Valley, most sites would be situated in disturbed contexts. This was also reflected by the current assessment. The absence of scarred trees is certainly due to a lack of endemic trees of sufficient age for Aboriginal cultural scarring throughout the MCCO Additional Project Area due to land clearance. In addition, the fact that most sites were recorded with low artefact density in secondary context means there are few areas with potential to retain intact subsurface archaeological deposits.

### 5.6.2 Settlement strategies

In **Section 4.5.1** certain landforms were identified as holding greater potential to contain Aboriginal sites. **Figure 5-51** shows that apart from a few exceptions, all newly recorded sites were recorded within these identified landforms (either landforms in association with escarpments or waterways). Further, those sites recorded outside of the landforms with archaeological potential are either isolated finds or low-density artefact scatters. As noted in **Section 4.5.1**, this accords with the archaeological context that has been established for the broader region.

**Figure 5-51: Newly recorded sites in relation to landforms of archaeological potential.**

### 5.6.3 Land use

**Figure 5-52** shows all 74 known Aboriginal sites superimposed on a 1967 aerial of the MCCO Additional Project Area. This figure highlights four clusters of sites that can perhaps be understood in terms of the past land use in the MCCO Additional Project Area.

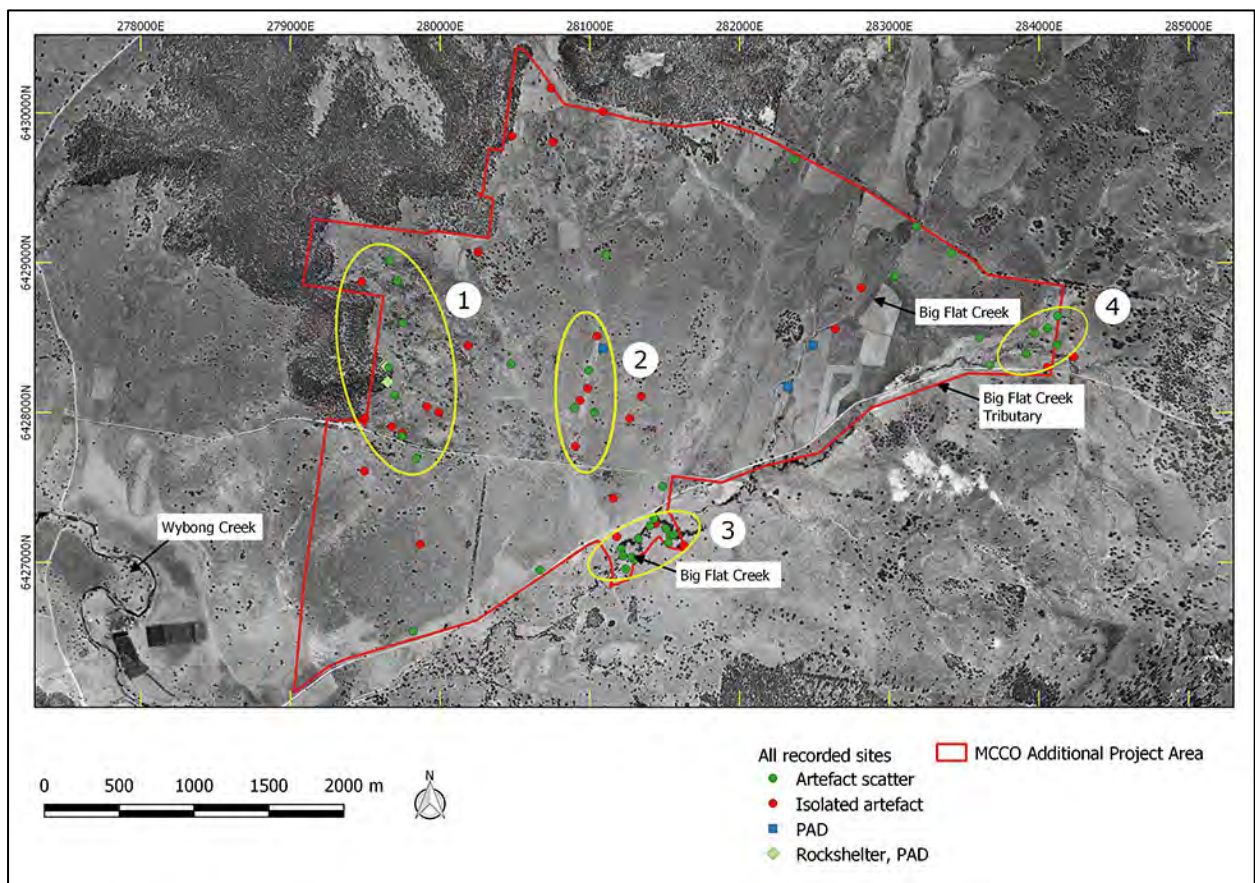
- **Cluster 1:** These sites may be associated with the escarpment landforms that have been identified as having a raised archaeological potential (see **Section 5.6.2**). However, their preservation in the landscape could be related to the fact that this area of the MCCO Additional Project Area has been impacted less by the historic agricultural land use of the area. Evidence for this statement comes from the fact that the landforms in this area were less suited to cultivation and intensive grazing and more trees have been left; although the entire area was originally cleared as no mature trees survive in this area
- **Cluster 2:** Sites in this cluster are likely in a secondary context as it is unlikely that the drainage line along which they were recorded was in evidence pre-1788 but, rather, is a product of increased water flows following the clearance of vegetation from surrounding landforms. These sites are likely to be what is becoming termed in the Hunter Valley as 'terrain sites'; that is, 'sites' formed by artefacts washing into an area because of post-1788 land mismanagement. Thus, these sites are a direct creation of the land use of the area
- **Cluster 3:** It is suspected that many of the recordings in this cluster are also 'terrain sites'. As will be discussed in **Section 5.6.4**, while the resources of Big Flat Creek would have

encouraged occupation, it is probable that the banks of the creek have accumulated artefacts washed in from surrounding landforms following the widespread clearance of vegetation and resultant soil loss

- **Cluster 4:** While European farming methods have resulted in widespread erosion in this area, archaeologically, this has resulted in many artefacts being revealed. An examination of these artefacts shows many to be *in situ* that perhaps indicates that this tributary contained more-permanent water resources in the form of ponds. However, due to erosion from increased water inflows, this creek morphology is now lost and can only be deduced from the remaining archaeological record.

A notable 'non-cluster' of sites is along the arm of Big Flat Creek in the centre-east of the MCCO Additional Project Area. While this area contains site MCO001 (37-2-5480) that recorded more than 40 artefacts, generally, there are few recordings along this arm of the creek. A possible reason is seen in the 1967 aerial as this area has been intensively cultivated and grazed; presumably for a long period of time. A possible consequence of this land use may have been to disperse and/or remove Aboriginal sites, had they existed in this area in the first place.

**Figure 5-52: All known sites superimposed on a 1967 aerial of the MCCO Additional Project Area.**





#### 5.6.4 Landform modelling

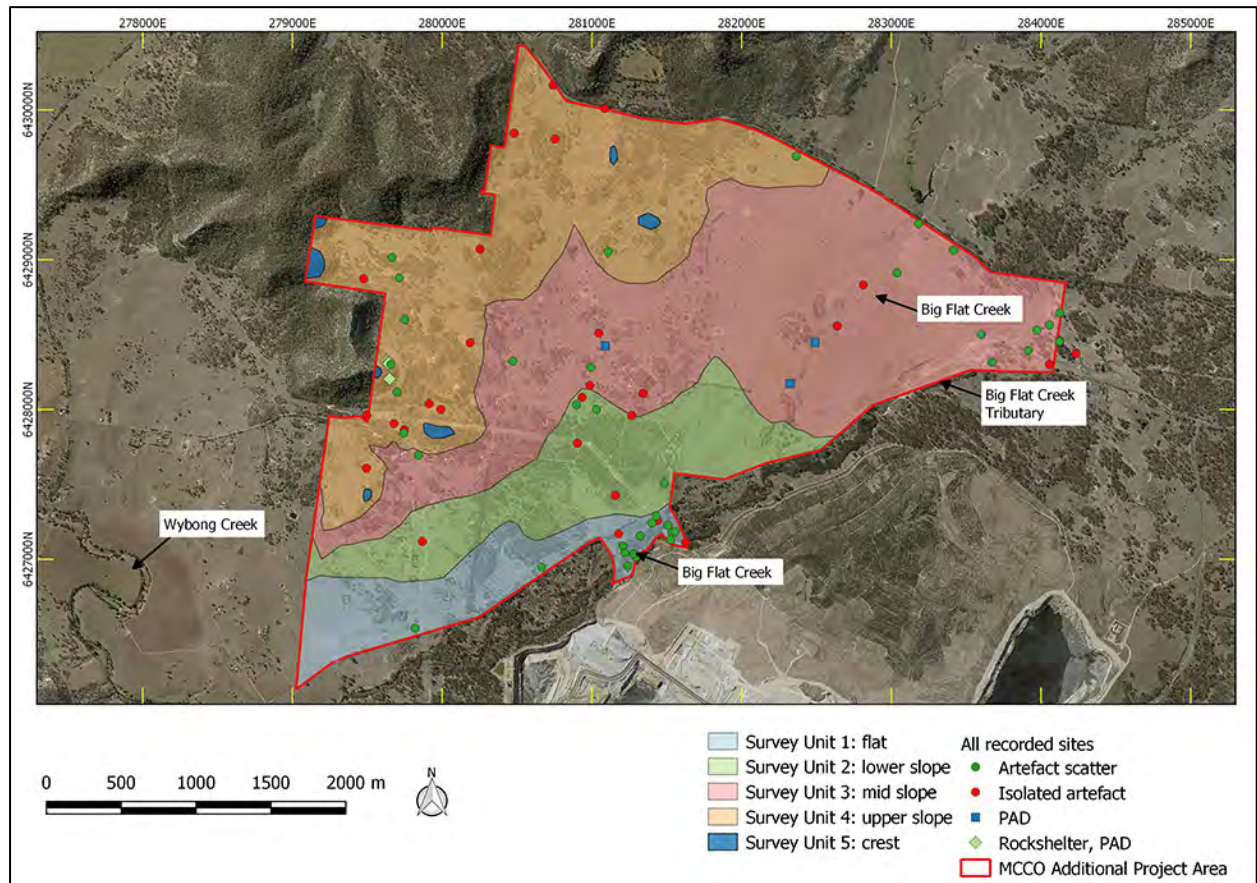
In **Section 4.5.4** it was noted that there was no discernible correlation between landform type and the location of previously recorded sites. When all 74 known Aboriginal sites are plotted against the major landform types (**Figure 5-53**) it is again difficult to discern any sort of spatial distribution influenced by landform type.

Of the 25 newly recorded sites, five were recorded in Survey Unit 1 (flat terrain), three in Survey Unit 2 (lower slopes), nine in Survey Unit 3 (mid-slopes) and eight in Survey Unit 4 (upper slopes). No sites were recorded in Survey Unit 5 (crests) but this is unremarkable given the small amount of this landform type in the MCCO Additional Project Area.

While the number of sites recorded in mid and upper slopes (Survey Units 3–4) is higher than would normally be the case (i.e. with a combined total of 68 per cent of all new site recordings), it must be borne in mind that these sites represent 10 isolated finds and four artefact scatters recording only two artefacts. Three artefact scatters in these landforms recorded 10 or more artefacts; with the largest recording more than 100 artefacts. This shows that while sites were relatively numerous in mid and upper slope landforms, they generally have a very low artefact density.

Finally, the differentiation of these landforms in the MCCO Additional Project Area is somewhat academic as it is difficult to discern the various landforms when in the field as the gradients are, in most cases, gradual. While crest landforms are obvious enough, it is often difficult to discern the break between, for example, a lower slope and a mid-slope landform. As such, while a site, such as MN OS12 that recorded more than 100 artefacts, may be technically in a mid-slope landform, when you are at MN OS12 the terrain appears flat or at least low lying and not on an obvious gradient as the term 'mid-slope' tends to imply. Thus, the landform designations need to be interpreted with some caution when used in relation to the MCCO Additional Project Area.



**Figure 5-53: All known sites shown in relation to the major landform types.**

### 5.6.5 Research questions

A number of research questions were posed in the survey methodology (**Appendix 1**) that could have applicability to the investigation of the MCCO Additional Project Area. These research questions are repeated below with a brief response to the question included:

- What resources were available to the Aboriginal people using the MCCO Additional Project Area (food, stone and water)?
  - The survey did not identify any specific sources of food that could have attracted Aboriginal occupation into the MCCO Additional Project Area. All stone resources noted were unsuitable for the manufacture of stone tools and no areas of quarry were noted that could have attracted use of the MCCO Additional Project Area in the past. Water resources were noted to be very meagre. All watercourses were dry at the time of the survey and it is suspected that all waterways in the MCCO Additional Project Area would have provided a very unreliable supply of water due to the limited catchment of these waterways. This would suggest that use of the MCCO Additional Project Area was short-term and/or sporadic.
- How do the artefact assemblages from the sites along the slopes and ridge crests in the MCCO Additional Project Area differ from sites that are located along Big Flat Creek?
  - There is a clear association of larger and more complex sites with Big Flat Creek when compared to all landforms away from the creek. Further the sites are more

associated with the main arm of Big Flat Creek in the south of the MCCO Additional Project Area and with the tributary to Big Flat Creek in the southeast of the MCCO Additional Project Area. In contrast, the arm of Big Flat Creek in the central east of the MCCO Additional Project Area recorded some sites but not at the density seen on the other portions of Big Flat Creek. The concentration of sites on the main arm of Big Flat Creek in the south of the MCCO Additional Project Area may include 'terrain sites' as reference to the 1967 image of the MCCO Additional Project Area (**Figure 3-7**) clearly shows alluvial fans of sediment being washed into Big Flat Creek from the north. This sediment movement undoubtedly brought artefacts with it and these may have accumulated in areas such as that proposed for impact by the Wybong Road overpass. Due to the widespread erosion along the tributary to Big Flat Creek in the southeast of the MCCO Additional Project Area, several *in situ* knapping areas were recorded along with a range of tool types not commonly recorded elsewhere such as bondi points. This would indicate that occupation along this tributary was widespread and perhaps more sustained than along the arm of Big Flat Creek in the centre-east of the MCCO Additional Project Area. In turn, this may indicate that perhaps water resources were better along the tributary; potentially in the form of ponds that may have been lacking elsewhere.

- What tasks were Aboriginal people undertaking at the sites?
  - Apart from knapping activities noted in areas along the tributary to Big Flat Creek in the southeast of the MCCO Additional Project Area, no specific activities or tasks, such as food preparation or ceremony, were noted.
- Did the Aboriginal people use the MCCO Additional Project Area at any particular time of the year?
  - No evidence was gained to help answer this question. As an answer to a question of this type would require a robust data set and perhaps further analysis in the form of usewear and residue analysis, it was perhaps ambitious to pose such a question related to a survey.
- Are there hearths in the area?
  - Despite excellent GSV across the MCCO Additional Project Area, no evidence of hearths was noted. This is not to say that hearths never existed in the MCCO Additional Project Area but that the widespread disturbances related to the agricultural phase of land use has likely removed such evidence.
- If there are hearths, do they contain remains (animal/plant) that may indicate what people were cooking/eating?
  - As no hearths were located, this question remains unanswered.
- Are there burials in the area?
  - There are no known burials in the MCCO Additional Project Area. A likely landform for the retention of burials are the escarpment landforms, but only small portions of these landforms are included in the MCCO Additional Project Area thereby diminishing the chance of locating burials. Other landforms in the MCCO

Additional Project area may have been utilised for burials in the past but any evidence of this will have been removed by the agricultural disturbances within landforms away from the escarpment areas.

- Is there evidence to suggest that Aboriginal people were using the area earlier than the mid to late Holocene?
  - No. All indications are that the MCCO Additional Project Area was occupied during the mid to late Holocene. The presence of backed blades, microliths and generally finer stone tools all indicate that the recorded sites date to the past 5000 years.
- Can dates be obtained for the Aboriginal use of the area?
  - This will be unlikely as no hearths were noted and most sites do not appear to have stratified subsurface deposits that have a potential to yield dateable material. The shelter sites all have thin deposits (if any) and none have indications of past occupation. As such, the closed sites in the MCCO Additional Project Area are also unlikely to contain stratified deposits that could contain material suitable for accurate chronological dating.
- What resources were transported to the area and where?
  - As no sources of stone suitable for stone tool manufacture were noted in the MCCO Additional Project Area, the implication is that all stone for the recorded artefacts was transported into the area. The source for this stone is unknown.

## 6 ABORIGINAL ARCHAEOLOGICAL TEST EXCAVATION

### 6.1 INTRODUCTION

The test excavation program followed the methodology that was sent to all RAPs and is presented in **Appendix 2**.

As is set out in the test excavation methodology only one location was selected for the test excavation program because:

- None of the 25 newly recorded sites that are located within the Proposed Disturbance Footprint were assessed as being associated with potential subsurface archaeological deposits
- Only two of the 49 previously recorded sites that are located within the Proposed Disturbance Footprint were assessed as being associated with potential subsurface archaeological deposits (BFC 126 and BFC127). However, both these sites are located outside of MCCO Project impacts and were therefore not included in the test excavation program
- Some of the sites on the main arm of Big Flat Creek at the location of the proposed Wybong Road Overpass have potential to be associated with subsurface archaeological deposits. However, as these sites are located within the existing Aboriginal Cultural Heritage Offset-5 (ACHO-5) as defined in the Mangoola Open Cut ACHMP (MANOC-1772150304-3098; July 2014) Figure 1:2, it was decided not to impact these sites at this stage to ensure that no harm occurs at these sites until an approved impact is in place. To ensure that the scientific values of sites in the Wybong Road Overpass area are appropriately managed, specific recommendations for this area are contained in **Section 8.4.2**.

As only one site located within the Proposed Disturbance Footprint had been assessed as having potential subsurface deposits, the test excavation program included the investigation of this site: BFC114a (37-2-5429). This site had been recorded as a PAD by EMM (2016), however, during the survey it was regarded that the location is unlikely to be a PAD for the following reasons:

- The location is currently overlooking an ephemeral waterway, but it was assessed that it is unlikely that this waterway would have been a distinguishable feature pre-1788. It is believed that the 'waterway' only formed following the clearance of vegetation and the increased inflow of water into the valley that then began to form a channel. As there was no 'waterway' in the pre-1788 period, it is unlikely that the PAD location as recorded by EMM would have attracted occupation
- There was little to differentiate the location of the PAD recorded by EMM from adjacent and contiguous landforms. As the PAD was contained within a broader landform, it would be difficult to say that one portion of the landform had greater archaeological sensitivity than another.

However, it was not possible to be sure of these reservations without excavation and the purpose of the test excavation program was to understand more completely the nature of sub-surface



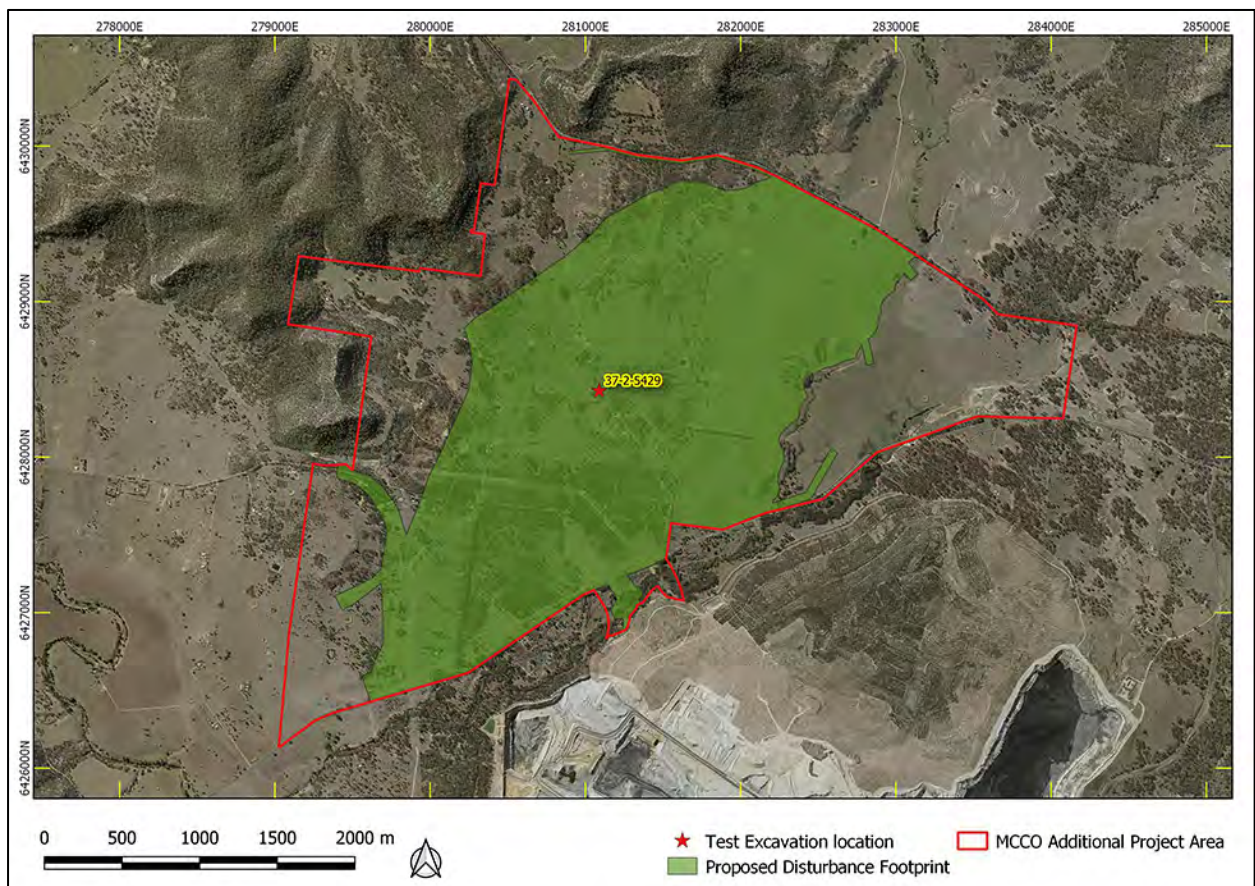
material at the site. Data obtained from the test excavation program informed the mitigation and management options outlined in **Section 8**.

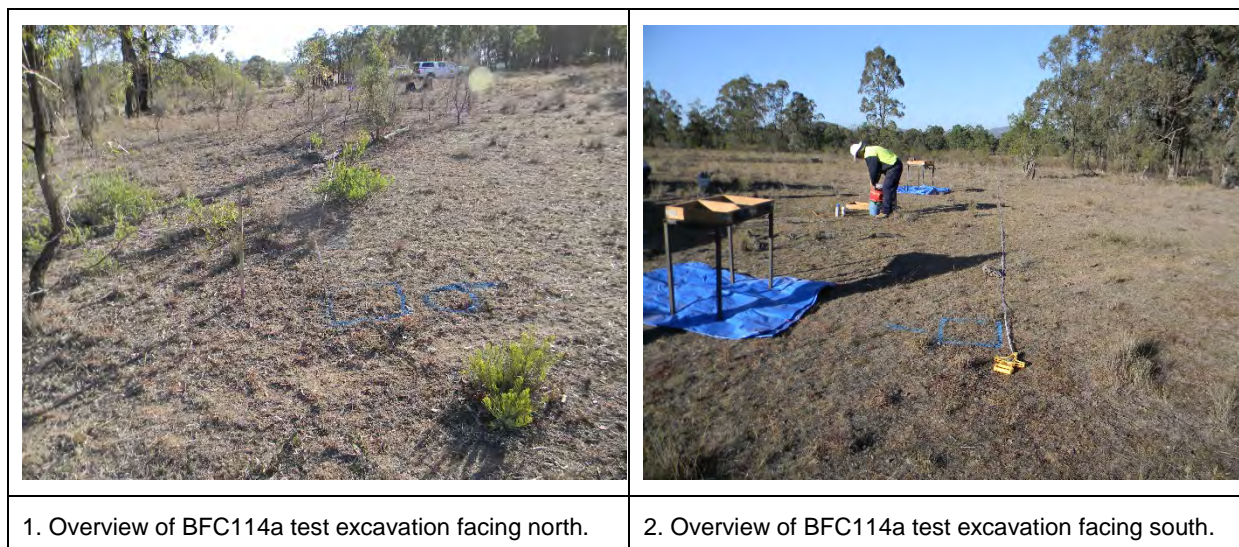
The aims of the test excavation program were therefore to:

1. Establish the extent and nature the of sub-surface archaeological deposits at the site
2. Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the site
3. Depending on the findings, develop, in consultation with the RAPs, an informed management strategy for the site to assist in mitigating the proposed impacts.

The location for the proposed test excavation program is mapped on **Figure 6-1** and photographs of the site's location is presented on **Figure 6-2**.

**Figure 6-1: Location of the test excavation program.**



**Figure 6-2: Photographs showing the location of the test excavation program.**

Excavations undertaken as per the Code of Practice do not require an AHIP under the NPW Act providing the test excavation methodology is supplied to OEH at least 14 days prior to the commencement of excavation. OEH was informed of the test excavation program by OzArk on 24 April 2018.

The test excavation program took place over one day on 15 May 2018.

## 6.2 FIELD METHODS

A single transect of six 0.5 by 0.5 m excavation squares at 10 m spacing were excavated to provide a representative sample of the deposits of BFC114a sufficient to characterise the site's subsurface archaeological potential (**Figure 6-3**). Excavation was initially conducted in 5 cm spits<sup>2</sup> until the nature of the subsurface deposits was identified, at which time the spits were extended to 10 cm.

All excavated material was dry sieved through un-nested 6–8 mm and 2.5–3.5 mm sieves (which is considered to satisfy the 5mm aperture wire-mesh sieve requirement in the Code of Practice requirements). A standard excavation recording form was used for each excavation square. Details recorded included; spit opening and closing depths, description of finds, description of soil, and a bucket tally.

<sup>2</sup> A 'spit' is an archaeological term used to describe an arbitrary depth of excavation. Excavation by spits is usually undertaken when there is no archaeological stratigraphy.



**Figure 6-3: Aerial showing locations of BFC114a test excavation squares.**





## 6.3 BFC114A TEST EXCAVATION RESULTS

### 6.3.1 Stratigraphy



**Table 6-1** shows the soil profile of the excavated squares at BFC114a. The soils and stratigraphy of the excavated transect were consistent across squares. The sampled deposit of BFC114a began with light-brown gravelly loam grading into orangey loam at between 15–20 cm depth before coming down to grey compacted clay with large gravel and ironstone nodule inclusions at approximately 40–50 cm depth. In each case, excavation of squares ceased upon reaching the lower compact layer as this was interpreted as signalling the termination of the archaeologically sensitive deposit.

Apart from the thin humic layer at the surface, the remainder of the deposit was interpreted as a colluvial wash probably originating from the slopes to the east of the excavation area.

**Table 6-1: Soil profiles at the BFC114a test excavation.**

Square Number	GDA 56 East	GDA 56 North	Description	2018 Site Photo
TR1 SQ1	281099	6428433	Excavated in eight 5 cm spits, coming down to compacted layer at a closing depth of 38 cm. 19 buckets (approx. 5L each) of deposit excavated. Root and ironstone inclusions. No Finds.	<b>VIEW OF SQUARE 1 WALL SECTION (20CM SCALE INCREMENTS).</b> 
TR1 SQ2	281098	6428423	Excavated in ten 5 cm spits, coming down to compacted layer at a closing depth of 50 cm. 30 buckets of deposit excavated. A single 17 mm distal mudstone blade fragment was recovered from Spit 1 (see <b>Section 6.3.2</b> ).	<b>VIEW OF SQUARE 2 WALL SECTION.</b> 
TR1 SQ3	281097	6428413	Excavated in four 10 cm spits, coming down to compacted layer at a closing depth of 40 cm. 16 buckets of deposit excavated. No Finds.	<b>VIEW OF SQUARE 3 WALL SECTION.</b> 
TR1 SQ4	281097	6428402	Excavated in three 10 cm spits, coming down to compacted layer at a closing depth of 30 cm. 15 buckets of deposit excavated. Ironstone and small cobble inclusions. No Finds.	<b>VIEW OF SQUARE 4 WALL SECTION.</b> 



Square Number	GDA 56 East	GDA 56 North	Description	2018 Site Photo
TR1 SQ5	281096	6428393	Excavated in three 10 cm spits, coming down to compacted layer at a closing depth of 30 cm. 12 buckets of deposit excavated. Ironstone and small cobble inclusions. No Finds.	<p><b>VIEW OF SQUARE 5 WALL SECTION.</b></p> 
TR1 SQ6	281095	6428382	Excavated in three 10 cm spits, coming down to compacted layer at a closing depth of 25 cm. 10 buckets of deposit excavated. Ironstone inclusions. No Finds.	<p><b>VIEW OF SQUARE 6 WALL SECTION.</b></p> 

### 6.3.2 Artefact assemblage

A single artefact was recorded as a result of the excavation. Details of the artefact are presented in **Table 6-2** and the artefact is shown on **Figure 6-4**.

The single excavated artefact was analysed on site and has been retained at the Mangoola Coal Mine. This artefact will be kept in a locked location until all salvage activities for the MCCO Project are complete (should the MCCO Project be approved), at which time the artefact will be amalgamated with other artefacts from the site and their ultimate management determined by an approved ACHMP.

**Table 6-2: Artefact details from the test excavation program.**

Square #	Spit #	Artefact type	Material	Integrity	Size	Termination
2	1	Blade	Mudstone	Distal fragment	17 mm	Feather

**Figure 6-4: View of artefact from the test excavation program.**



### **6.3.3 Results**

As the recording of one artefact in the top-most layer did not separate BFC114a from the general background signature of dispersed artefacts within any landscape, the site was re-assessed as 'not a site' and an *Aboriginal Site Impact Recording Form* (ASIRF) was submitted to AHIMS to record this determination.

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## 7 ASSESSMENT OF SIGNIFICANCE AND POTENTIAL IMPACTS

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### 7.1 SIGNIFICANCE ASSESSMENT

#### 7.1.1 Introduction

The appropriate management of cultural heritage items is usually determined on the basis of their assessed significance as well as the likely impacts of any proposed development. Social (cultural), scientific (archaeological), aesthetic and historical significance are identified as baseline elements of significance assessment, and it is through the combination of these elements that the overall cultural heritage values of a site, place or area are resolved.

In this AAIA, only the scientific values of the MCCO Additional Project Area will be considered. The social, aesthetic and historical values of the MCCO Additional Project Area will be discussed in the ACHAR to which this AAIA is an appendix.

#### Scientific/Archaeological Value

Assessing a site in this context involves placing it into a broader regional framework, as well as assessing the site's individual merits in view of current archaeological discourse. This type of value relates to the ability of a site to answer current research questions and is also based on a site's condition (integrity), content and representativeness.

The overriding aim of cultural heritage management is to preserve a representative sample of the archaeological resource. This will ensure that future research within the discipline can be based on a valid sample of the past. Establishing whether a site can contribute to current research also involves defining 'research potential' and 'representativeness'. Questions regularly asked when determining significance are: can this site contribute information that no other site can? Is this site representative of other sites in the region?

#### 7.1.2 Background to the assessment of scientific significance

This assessment will use the following terms where appropriate:

- High scientific significance or high archaeological values
- Moderate scientific significance or moderate archaeological values
- Low scientific significance or low archaeological values.

This hierarchy is used to categorise the archaeological landscape of the MCCO Additional Project Area based, in this report, on the assessed scientific or archaeological values at a particular location.

This is not to say that the author is unaware of possible social / cultural, aesthetic and historical values at a location, but the assessment here is of the scientific values alone while the other values will be examined in the ACHAR.

In terms of scientific significance, locations will primarily be assessed on their ability to add reliable archaeological information which can further our understanding of the archaeology at a local and regional level or a site type's rarity within the landscape. This assessment has been informed through surface observations/survey, sub-surface archaeological testing and review of previous site-specific reports.

Considerations taken in this scientific assessment include an understanding that a part of the archaeological value of a place is the general community's association to that place. This is often distinct from the social, aesthetic and historical criteria used to assess heritage significance as it relates to a person's relationship to the archaeology of the place. For the Aboriginal participants on the survey, for example, an archaeological site was appreciated as much for its archaeological values as it was for its cultural values. A site displaying either many artefacts or a number of interesting artefacts would engender fascination and discussion on purely archaeological grounds (Where did people live / eat? How did they live? How did they use the artefact and what does it tell us about the people who made it?).

It is therefore understood that many Aboriginal people, or people generally interested in pre-history, would see the sites recorded in this assessment to have higher archaeological values than may be given in this assessment. However, this assessment has attempted to distinguish between an artefact scatter with potential to yield further information (moderate–high scientific significance) and an artefact scatter in an eroded context that would yield little meaningful further information (low scientific significance).

Incorporating research on the rarity, representativeness and integrity or condition of a site, along with the considerations outlined above, this assessment defines the following categories when assessing scientific significance:

#### High Scientific Significance

Locations displaying this value would include one or more of the following features:

- The location would contain known areas of undisturbed archaeological deposits that are likely to add significantly to our knowledge concerning Aboriginal archaeology in the region
- Would contain archaeological information to address complex research questions about the region
- The site contains outstanding features that can be appreciated by non-specialists / enthusiasts
- The site type is rare in the region and / or in danger of becoming unrepresented in the region.



### Moderate Scientific Significance

Locations displaying this value would include one or more of the following features:

- The location would contain areas of archaeological deposits, sometimes disturbed, that are likely to add to our knowledge about the Aboriginal archaeology of the local area only
- Would contain archaeological information to address general research questions about the region
- The site contains features that would be appreciated by a specialist / enthusiast
- Portions of the site have been lost due to erosion or the landscape context of the site has been impacted.

### Low Scientific Significance

Locations displaying this value would include one or more of the following features:

- The location may contain areas of archaeological deposits, but they are likely to be disturbed and any information gained would only address limited research questions
- The site is largely displaced by erosion
- The landscape context of the site has been heavily modified
- The site exists in areas where A Horizon soil loss is extensive
- The site contains features that would be difficult to interpret in a meaningful way.

#### **7.1.3 Known Aboriginal sites in the MCCO Additional Project Area**

As BFC114a has been determined to be 'not a site' (see **Section 6.3.3**) and one isolated find recorded during the survey is located outside of the MCCO Additional Project Area (see **Figure 5-46**), there are 71 known Aboriginal sites in the MCCO Additional Project Area consisting of:

- 24 newly recorded sites (MN IF13 is located outside of the MCCO Additional Project Area)
- 47 previously recorded sites (of the 49 previously recorded sites registered with AHIMS, one [BFC98] has been salvaged under permit and another [BFC114a] has been determined to be 'not a site').

## **7.2 ASSESSED SCIENTIFIC SIGNIFICANCE OF KNOWN SITES**

### **7.2.1 Newly recorded sites**

25 sites were recorded during the survey consisting of 12 artefact scatters and 13 isolated finds. Of the artefact scatters, nine sites recorded less than 10 artefacts and only one site recorded a high artefact density of over 100 artefacts (MN OS12). Only at three locations was it assessed that there is potential for subsurface deposits: MN OS7 (low–moderate potential); MN OS11 (moderate potential); and MN OS12 (moderate potential). None of the recorded sites was

remarkable in its manifestation; either in terms of the types of artefacts recorded, the raw material the artefacts were manufactured from or the density and nature of the surface artefact manifestation. The recorded sites are also very representative of artefact sites in the upper Hunter Valley both in terms of the types of artefacts recorded and the raw materials from which the artefacts were manufactured.

As a result, most newly recorded sites have a low scientific significance as they generally have:

- A low artefact density
- No associated subsurface deposits
- No remarkable features and are generally representative of other artefact sites in the upper Hunter Valley
- A high likelihood of being in a secondary context
- A limited ability to inform on the nature and spatial extent of past Aboriginal occupation in the MCCO Additional Project Area.

**Table 7-1** lists the newly recorded sites and their associated scientific significance. **Table 7-1** also provides a justification for the significance assessment.

**Table 7-1: Scientific significance of newly recorded sites.**

AHIMS #	Site Name	Feature(s)	Potential for subsurface deposits	Scientific significance	Justification
37-2-5802	Mangoola North OS1	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
37-2-5803	Mangoola North OS2	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
37-2-5804	Mangoola North OS3	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
37-2-5805	Mangoola North OS4	Artefacts: 4	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
37-2-5806	Mangoola North OS5	Artefacts: 11	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
37-2-5807	Mangoola North OS6	Artefacts: 8	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
37-2-5808	Mangoola North OS7	Artefacts: 2	Low–moderate	Low–moderate	Low artefact density; some potential for associated subsurface deposits
37-2-5809	Mangoola North OS8	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
37-2-5810	Mangoola North OS9	Artefacts: 6	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context

AHIMS #	Site Name	Feature(s)	Potential for subsurface deposits	Scientific significance	Justification
37-2-5811	Mangoola North OS10	Artefacts: 2	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
37-2-5812	Mangoola North OS11	Artefacts: 12	Moderate	Low–moderate	Low–moderate artefact density; some potential for associated subsurface deposits
37-2-5813	Mangoola North OS12	Artefacts: 100+	Moderate	Moderate	High artefact density; some potential for associated subsurface deposits
37-2-5814	Mangoola North IF1	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5815	Mangoola North IF2	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5816	Mangoola North IF3	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5817	Mangoola North IF4	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5818	Mangoola North IF5	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5819	Mangoola North IF6	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5820	Mangoola North IF7	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5821	Mangoola North IF8	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5822	Mangoola North IF9	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5823	Mangoola North IF10	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5824	Mangoola North IF11	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5825	Mangoola North IF12	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5801	Mangoola North IF13	Isolated Find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context

## 7.2.2 Previously recorded sites

There are 47 previously recorded sites within the MCCO Additional Project Area (see explanation in **Section 7.1.3**). All these sites were re-assessed during the 2018 survey to determine their current condition and significance.

**Table 7-2** lists the 47 previously recorded sites in the MCCO Additional Project Area. The scientific significance of these sites includes the determination of 'unknown' at some sites, such as the five rockshelter sites, where a PAD has been registered but there is no surface manifestation of artefacts. To accurately determine the scientific values at these sites further investigation, most likely excavation, would be required. Other sites range from low scientific values (in the majority) to a few sites with moderate-high scientific values. These latter sites have been afforded higher scientific values due to the high density of surface artefacts and the high possibility that there are *in situ* archaeological deposits. However, as the sites are also heavily eroded in places, a determination of high scientific values is not made at these sites as there is a high chance, in areas, of disturbance.

**Table 7-2: Significance assessment of previously recorded sites.**

AHIMS	Site name	Site type	Scientific significance	Justification
37-2-0509	Sandy Hollow, Singleton 1	Artefact scatter	Low-moderate	Moderate density of surface artefacts. Some potential for subsurface deposits
37-2-0739	Manobalai-Castle Rock 2	Isolated artefact	Low	Precise location of site is unknown
37-2-0740	Manobalai-Castle Rock 3	Isolated artefact	Low	Precise location of site is unknown
37-2-0741	Manobalai-Castle Rock 4	Artefact scatter	Low	Precise location of site is unknown
37-2-0742	Manobalai-Castle Rock 5	Artefact scatter	Low-moderate	Moderate density of surface artefacts. Some potential for subsurface deposits
37-2-2164	BFC01	Artefact scatter	Low	Artefacts unable to be located
37-2-2190	BFC28	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-2191	BFC29	Artefact scatter	Low	Artefacts unable to be located
37-2-2193	BFC31	Artefact scatter	Moderate	Moderate surface artefact density and some potential for subsurface deposits. Some general disturbances in the area
37-2-3882	BFC69	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-3883	BFC70	Artefact scatter	Low	Artefacts unable to be located
37-2-3884	BFC71	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-3990	BFC90	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-3991	BFC91	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-4109	BFC96	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits



AHIMS	Site name	Site type	Scientific significance	Justification
37-2-4116	BFC92	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-4117	BFC93	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-4118	BFC94	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-4119	BFC95	Artefact scatter	Low-moderate	Moderate density of surface artefacts. Some potential for subsurface deposits
37-2-4491	BFC99	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-4492	BFC100	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-4563	BFC102	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-4580	BFC107(MDG1)	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-4582	BFC109 (MDG3)	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-4863	BFC111	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5425	BFC150	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5428	BCF113A	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-5430	BFC115	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5431	BFC116	Artefact scatter	Low	Moderate artefact density but highly disturbed (erosion) with a low probability of associated subsurface deposits
37-2-5432	BFC117	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5433	BFC118	PAD	Unknown	Undetermined until further investigation can take place
37-2-5434	BFC119	PAD	Unknown	Undetermined until further investigation can take place
37-2-5439	BFC124	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-5440	BFC125	Artefact scatter	Moderate	Moderate-high artefact density and moderate probability of associated subsurface deposits
37-2-5441	BFC126	Artefact scatter, PAD	Moderate-high	High artefact density and high probability of associated subsurface deposits
37-2-5442	BFC127	Artefact scatter, PAD	Moderate-high	High artefact density and high probability of associated subsurface deposits
37-2-5443	BFC128	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place. Preliminary assessment would indicate that PAD is unlikely due to the slope of the rockshelter floor and the restricted depth of potential deposit
37-2-5444	BFC129	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place. Preliminary assessment

AHIMS	Site name	Site type	Scientific significance	Justification
				would indicate that PAD is unlikely due to the slope of the rockshelter floor and the restricted depth of potential deposit
37-2-5445	BFC130	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place. Preliminary assessment would indicate that PAD is unlikely due to the slope of the rockshelter floor and the restricted depth of potential deposit
37-2-5446	BFC131	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place. Preliminary assessment would indicate that PAD is unlikely due to the small size of the rockshelter
37-2-5447	BFC132	Rockshelter, PAD	Unknown	Undetermined until further investigation can take place
37-2-5448	BFC133	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5449	BFC134	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5450	BFC135	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-5451	BFC136	Artefact scatter	Low	Low artefact density and low probability of associated subsurface deposits
37-2-5452	BFC137	Isolated artefact	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
37-2-5480	MCO001	Isolated artefact	Low-moderate	Now recorded as an artefact scatter with a moderate density of surface artefacts. Some potential for subsurface deposits

### 7.3 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE MCCO PROJECT

The preceding investigation has determined that there are 71 known Aboriginal sites in the MCCO Additional Project Area consisting of:

- 24 newly recorded sites (MN IF13 is located outside of the MCCO Additional Project Area)
- 47 previously recorded sites (BFC98 has been salvaged under permit and BFC114a has been determined to be 'not a site').

Of these 71 sites, 26 are located within the Proposed Disturbance Footprint and will be impacted should the MCCO Project be approved in its current form. 15 of these sites are artefact scatters and 11 are isolated finds. In general, the artefact scatters have a low artefact density with most sites recording less than 10 artefacts.

**Table 7-3** lists the 26 sites within the Proposed Disturbance Footprint and **Figure 7-1** shows the location of the sites. As shown in **Table 7-3**, most of the sites that will be impacted by the MCCO Project have a low scientific significance. Only two sites have higher values, with one having moderate scientific values and the other having low–moderate scientific values.

**Table 7-3: All known sites within the Proposed Disturbance Footprint.**

<b>AHIMS</b>	<b>Site name</b>	<b>GDA Zone 56 Easting</b>	<b>GDA Zone 56 Northing</b>	<b>Site type</b>	<b>Scientific significance</b>
37-2-0741	Manobalai-Castle Rock 4	282366	6429691	Artefact Scatter	Low
37-2-2193	BFC31	281240	6426955	Artefact Scatter	Moderate
37-2-3884	BFC71	279867	6427119	Isolated Find	Low
37-2-3990	BFC90	281031	6428000	Artefact Scatter	Low
37-2-4116	BFC92	281209	6427089	Artefact Scatter	Low
37-2-4117	BFC93	281221	6427043	Artefact Scatter	Low
37-2-4118	BFC94	281279	6427036	Artefact Scatter	Low
37-2-4119	BFC95	281295	6427016	Artefact Scatter	Low-moderate
37-2-4491	BFC99	280346	6427883	Isolated Find	Low
37-2-4492	BFC100	280903	6427775	Isolated find	Low
37-2-4563	BFC102	279819	6426539	Artefact Scatter	Low
37-2-5425	BFC150	281157	6427427	Isolated Find	Low
37-2-5428	BFC113A	280986	6428161	Isolated Find	Low
37-2-5430	BFC115	281046	6428510	Isolated Find	Low
37-2-5431	BFC116	280994	6428280	Artefact Scatter	Low
37-2-5432	BFC117	280935	6428081	Isolated Find	Low
37-2-5449	BFC134	280473	6428323	Artefact Scatter	Low
37-2-5802	MN OS1	281109	6429054	Artefact Scatter	Low
37-2-5805	MN OS4	280897	6428031	Artefact Scatter	Low
37-2-5807	MN OS6	281484	6427507	Artefact Scatter	Low
37-2-5809	MN OS8	281323	6427157	Artefact Scatter	Low
37-2-5810	MN OS9	280665	6426947	Artefact Scatter	Low
37-2-5816	MN IF3	282813	6428831	Isolated Find	Low
37-2-5818	MN IF5	281343	6428107	Isolated Find	Low
37-2-5819	MN IF6	281266	6427960	Isolated Find	Low
37-2-5824	MN IF11	281179	6427171	Isolated Find	Low

### 7.3.1 Impacts to a former portion of ACHOA-5

As part of the original approval for the Mangoola Coal Mine a conservation area was proposed along Big Flat Creek (ACHOA-5). During the planning phase for the MCCO Project it was identified that an access corridor would be required across Big Flat Creek and Wybong Road to link the two operational areas.

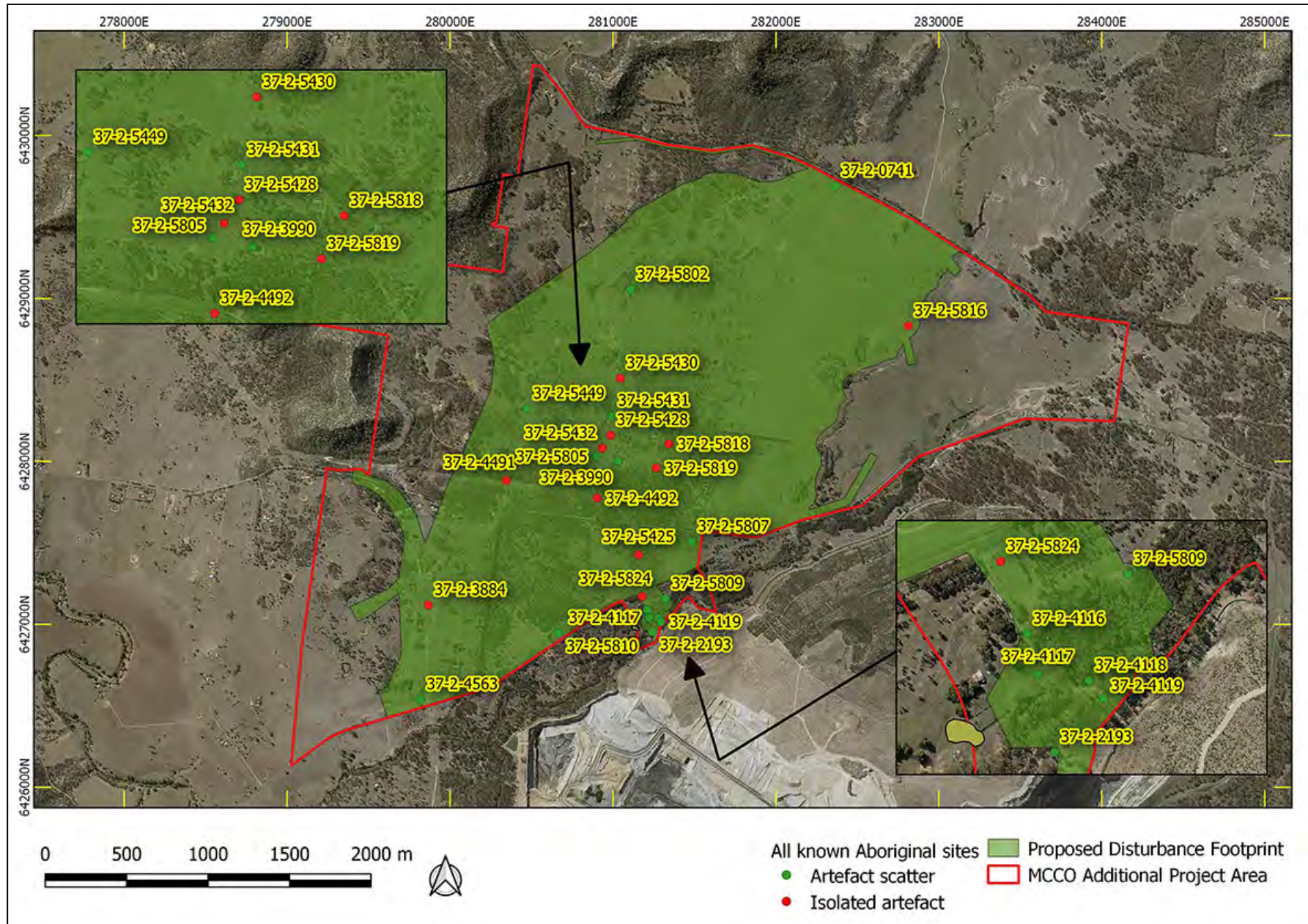
As such, approximately 11.5 ha of ACHOA-5 is located within the MCCO Additional Project Area and approximately 3.8 ha of this is within the Proposed Disturbance Footprint and is liable to be impacted by the MCCO Project. This portion of the former ACHOA has been excised from the Voluntary Conservation Agreement (VCA) that is currently being prepared. This VCA application will ensure the protection of the remaining portion of ACHOA-5 in perpetuity.

As explained in **Section 6.1**, the test excavation program avoided this former portion of ACHOA-5 until disturbance of this area is approved. This area contains five sites that are within the Proposed Disturbance Footprint and will be impacted by the MCCO Project: 37-2-4117 (BFC93: low scientific significance); 37-2-4116 (BFC92: low scientific significance); 37-2-4119 (BFC95: low-moderate scientific significance); 37-2-4118 (BFC94: low scientific significance); and 37-2-2193 (BFC31: moderate scientific significance).

To mitigate the loss of scientific values at these sites, a program of limited manual excavation is proposed to take place in the former portion of ACHOA-5 so that information regarding the nature and extent of these sites is captured (**Section 8.4.2**).



Figure 7-1: Aerial showing the location of all known sites within the Proposed Disturbance Footprint.



### **7.3.2 Ecological sustainable development principles**

The goal of ecological sustainable development (ESD) is:

- Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The core objectives of ESD are:

- To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations
- To provide for equity within and between generations
- To protect biological diversity and maintain essential ecological processes and life-support systems.

As such, the ESD principles have limited applicability to cultural heritage although the notion of inter-generational equity is relevant. This is understood to refer to future generations being able to enjoy, interact with and study aspects of cultural heritage that are available to current generations.

#### **7.3.2.1 *Applicability to the MCCO Project***

The MCCO Project will result in impacts to 26 recorded Aboriginal sites. How to quantify this loss of heritage value to future generations is difficult. To understand the overall impact to heritage values, an interplay between the nature and type of site, and its representativeness must be considered. Also, the cumulative harm of large scale mining in the district must be taken into account.

For example, in isolation, 26 sites may not sound like a large number, but when added to the approved destruction of 149 sites associated with the existing Mangoola Coal Mine and many hundreds more in the district from approved mining and infrastructure development impacts, the scale of the loss becomes more obvious. It is often stated that the piecemeal destruction of sites—project by project, modification by modification—mask the true nature of the cumulative impact. While this is true, it has also been noted in this report that the real harbinger of site destruction in the district is not mining but European agricultural practices and historical land use that have destroyed, dispersed or disturbed countless sites long before the local occurrence of mining.

Notwithstanding this observation, the current proposal to harm a further 26 sites cannot be summarily dismissed but needs to be acknowledged. While the sites themselves may be unremarkable in their manifestation, and while the site types are commonly represented across the district, their loss is a further diminution of the district's archaeological resource.

While this loss is palpable, most sites being destroyed have a very low artefact density and do not contain rare or unique features. Further, most have been previously disturbed and the MCCO Project is certainly not harming a pristine archaeological landscape.

It must also be borne in mind that the majority of recorded sites within the MCCO Additional Project Area will remain *in situ* and that the management and mitigation measures set out in **Section 8** will ensure that those sites out of the Proposed Disturbance Footprint will remain and be managed in the landscape.

In conclusion, the loss of the 26 sites contributes to the cumulative harm inflicted on Aboriginal sites in the region. However, as the sites are neither remarkable in their manifestation nor contain artefacts that are not commonly represented in the region, this loss of heritage value is manageable and the intergenerational loss arising from the MCCO Project is minimal at a regional level.

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## **8 MANAGEMENT AND MITIGATION: ABORIGINAL HERITAGE**

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### **8.1 GENERAL PRINCIPLES FOR THE MANAGEMENT OF ABORIGINAL SITES**

This report will concentrate on the management of the archaeological values present within the Proposed Disturbance Footprint, although given the cultural connection this archaeological landscape has for certain communities, an understanding of the RAP's cultural values in connection to the area is also embedded in the archaeological management recommendations that follow.

For example, from a purely archaeological perspective, much of the Proposed Disturbance Footprint is so altered from the area's agricultural phase that further archaeological investigation would only be able to address very basic research questions (i.e. artefacts found on a dam wall are obviously displaced, and apart from saying that there were once artefacts in the area, they do not have the ability to tell researchers much more). As no meaningful archaeological information could be gained from these sites, a purely archaeological recommendation should be that no further investigation is justified.

However, the basis of the following proposed archaeological management will be to understand that, even if a site is diminished in its archaeological values, that its physical manifestation may still have cultural value to certain communities. Therefore, the task of the management recommendations in this report will be to frame research questions that will enable a thorough study of all the Proposed Disturbance Footprint's remaining archaeological values: not only those locations displaying high archaeological values.

### **8.2 MANAGEMENT OPTIONS**

The management of any archaeological landscape must include the consideration of all available options and an evaluation of the viability of these options to achieve the best archaeological outcome.

In brief there are three main options available and the archaeological merits of each option will be discussed below.

#### **8.2.1 Option A: Do Nothing**

This option is a real possibility because if the MCCO Project is not approved then a 'do nothing' option will be followed probably with little more management of the archaeological landscape than is happening at present. A 'do nothing' option, in its purist sense, will mean no 'extra' management of the archaeological landscape.

Whilst no sites would be deliberately destroyed and would be captured as part of the existing site GIS database and GDP processes, this option will not stop the on-going natural deterioration of



sites in the MCCO Additional Project Area, and as a result, this option would contribute to the cumulative loss of sites in the region.

Option A makes a small contribution to intergenerational equity as, in theory, the landscape is preserved (albeit with on-going erosion) and would be available for future generations to visit.

However, all of the Proposed Disturbance Footprint is on Mangoola owned land. This does not allow, in the short term at least, for free access and use of any areas. Additionally, as discussed above, without management there will be a landscape surviving but one continuing to be denuded of A-Horizon soils and a landscape without, likely, many archaeological sites in good condition.

### **8.2.2 Option B: Modify project design to avoid harm**

Another option that can be considered is that certain areas, now within the Proposed Disturbance Footprint, could be excluded from the MCCO Project design and the areas conserved as archaeological / cultural zones.

However, no individual artefact scatter, or group of artefact scatters, within the Proposed Disturbance Footprint was assessed as of high enough archaeological significance that would justify major design changes to avoid particular areas.

While it is possible in theory to avoid mining activity in certain areas, the following questions need to be borne in mind:

- What is being saved?
- Does the item have high enough social or archaeological values to justify saving?
- What is the long-term advantage of saving such an item?
- How will the item ultimately be managed and used?
- Would the benefit of doing these works from an archaeological perspective be outweighed by other archaeological mitigation strategies?

Given the nature of the current recordings (low density artefact scatters), the past loss of archaeological landscape context and the impact of on-going erosion, it is difficult to justify major MCCO Project design changes on archaeological grounds alone.

It should also be noted that harm avoidance has been incorporated into the MCCO Project design from inception. For example, the Proposed Disturbance Footprint avoids impact to Big Flat Creek in the centre-east of the MCCO Additional Project Area and to the tributary to Big Flat Creek in the southeast of the MCCO Additional Project Area. Further, the disturbance corridor associated with the overpass from the existing operation to the MCCO Additional Project Area has been minimised as far as practical.

Should Option B be followed, the MCCO Project would contribute less to the cumulative loss of sites in the region by permanently preserving several sites. The MCCO Project could also add to intergenerational equity by following Option B as the preserved areas would potentially be available, at some time when mining concludes, for future generations to use and enjoy.

Elsewhere in the main volume of the EIS, the rationale behind the need to mine or modify areas within the Proposed Disturbance Footprint are discussed. Given the condition and context of the sites, the history of past impacts in their vicinity and their location in areas vital for the successful operation of the MCCO Project, the current assessment does not see an Option B approach for archaeological management as practical and therefore this option is not recommended.

### **8.2.3 Option C: No design change and mitigate archaeological impacts**

If the MCCO Project is granted development consent in its current form, then there is likely impact to 26 Aboriginal sites within the Proposed Disturbance Footprint.

Under the scenario of MCCO Project approval, Option C should be followed and the loss of archaeological value to the 26 impacted sites will be mitigated. This option would be carried out with the advice and involvement of the RAPs under the terms of an approved ACHMP. It would also follow all appropriate guidelines pertaining to the NPW Act. This option is also supported in Article 28 of *The Burra Charter* (Australia ICOMOS 2013) that reads:

#### *Article 28. Disturbance of fabric*

*28.1 Disturbance of significant fabric for study, or to obtain evidence, should be minimised. Study of a place by any disturbance of the fabric, including archaeological excavation, should only be undertaken to provide data essential for decisions on the conservation of the place, or to obtain important evidence about to be lost or made inaccessible.*

*28.2 Investigation of a place which requires disturbance of the fabric, apart from that necessary to make decisions, may be appropriate provided that it is consistent with the policy for the place. Such investigation should be based on important research questions which have potential to substantially add knowledge, which cannot be answered in other ways and which minimises disturbance to the fabric.*

*The Burra Charter* (2013) is the primary guideline policy document for the conservation and protection of Australian cultural heritage. According to the Burra Charter, the destruction of fabric is to be avoided although it is recognised that destruction of fabric is sometimes unavoidable. *The Burra Charter* recommends that mitigation studies be undertaken to offset the loss of fabric.

In the face of widespread disturbance, Option C is justified: “*to obtain important evidence about to be lost or made inaccessible*”. This loss of fabric (i.e. archaeological sites) will be minimised in the sense that only areas within the Proposed Disturbance Footprint will be investigated and all

archaeological investigations will be framed within research questions that will allow as much information to be captured before the sites are further impacted by erosion and “lost” forever. The “policy” to oversee and control this “destruction of fabric” would be an ACHMP that would be developed in consultation with the RAPs following MCCO Project approval.

Option C contributes to the cumulative loss of sites from the region because the relatively large Proposed Disturbance Footprint (623 ha) would be subject to archaeological salvage works. Option C also does not add substantially to intergenerational equity: apart from the fact that the salvage program, if conducted as described below, will capture further information about the archaeological landscape within the Proposed Disturbance Footprint that will be available to future generations and scholars seeking information about the area.

Should the MCCO Project be approved in its present form, Option C will form the basis of the management recommendations that follow.

### **8.3 MANAGEMENT AND MITIGATION OF RECORDED ABORIGINAL SITES**

#### **8.3.1 Archaeological salvage**

As a result of the current assessment, 26 sites have been recorded within the Proposed Disturbance Footprint.

45 sites in the MCCO Additional Project Area will be avoided as they are located outside of the Proposed Disturbance Footprint.

As seen in **Table 8-1**, the most common management strategy recommended on archaeological grounds alone is for the salvage of a site through the recording and collection of surface artefacts. This recommendation is made due to:

- The nature of the recorded sites (93% of sites are isolated finds or low-density artefact scatters with no associated subsurface deposits)
- Generally thin A-Horizon soils that preclude subsurface archaeological deposits
- Being generally located in landforms of lower archaeological potential (i.e. in areas distant to reliable water)
- Generally high previous disturbance from a range of factors including erosion and land use practices
- The low archaeological values assigned to the sites.

Sites designated for surface artefact collection have a very limited ability to further inform the community about the history and culture of the area. While any potential research questions are limited, some information can nevertheless be gained (see **Section 8.4.1**).

**Section 8.4.2** sets out the protocol for the limited archaeological salvage that is proposed at four locations within the Proposed Disturbance Footprint.

**Table 8-1** sets out the recommended archaeological management of all sites within or adjacent to the Proposed Disturbance Footprint.

**Table 8-1: Management recommendations for sites within the Proposed Disturbance Footprint.**

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
37-2-0741	Manobalai-Castle Rock 4	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-2193	BFC31	Artefact Scatter	Moderate	Total (Although the site spans the Proposed Disturbance Footprint boundary, it is recommended that the entire site be salvaged.)	Moderate surface artefact density and some potential for subsurface deposits. Some general disturbances in the area	Archaeological excavation as the site is located within a former portion of ACHO-5 and was intentionally not investigated during the test excavation program (see <b>Section 6.1</b> ). See <b>Section 8.4.2</b> for excavation methodology
37-2-3884	BFC71	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-3990	BFC90	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-4116	BFC92	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-4117	BFC93	Artefact Scatter	Low	Total	Low density artefact scatter	Archaeological excavation as the site is located within a former portion of ACHO-5 and was intentionally not investigated during the test excavation program (see <b>Section 6.1</b> ). Excavation at this site to sample northern bank of Big Flat Creek. See <b>Section 8.4.2</b> for excavation methodology
37-2-4118	BFC94	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-4119	BFC95	Artefact Scatter	Low-moderate	Total	Moderate surface artefact density and some potential for subsurface deposits. Some general disturbances in the area	Archaeological excavation as the site is located within a former portion of ACHO-5 and was intentionally not investigated during the test excavation program (see <b>Section 6.1</b> ). See <b>Section 8.4.2</b> for excavation methodology
37-2-4491	BFC99	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-4492	BFC100	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-4563	BFC102	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-5425	BFC150	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5428	BFC113A	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact



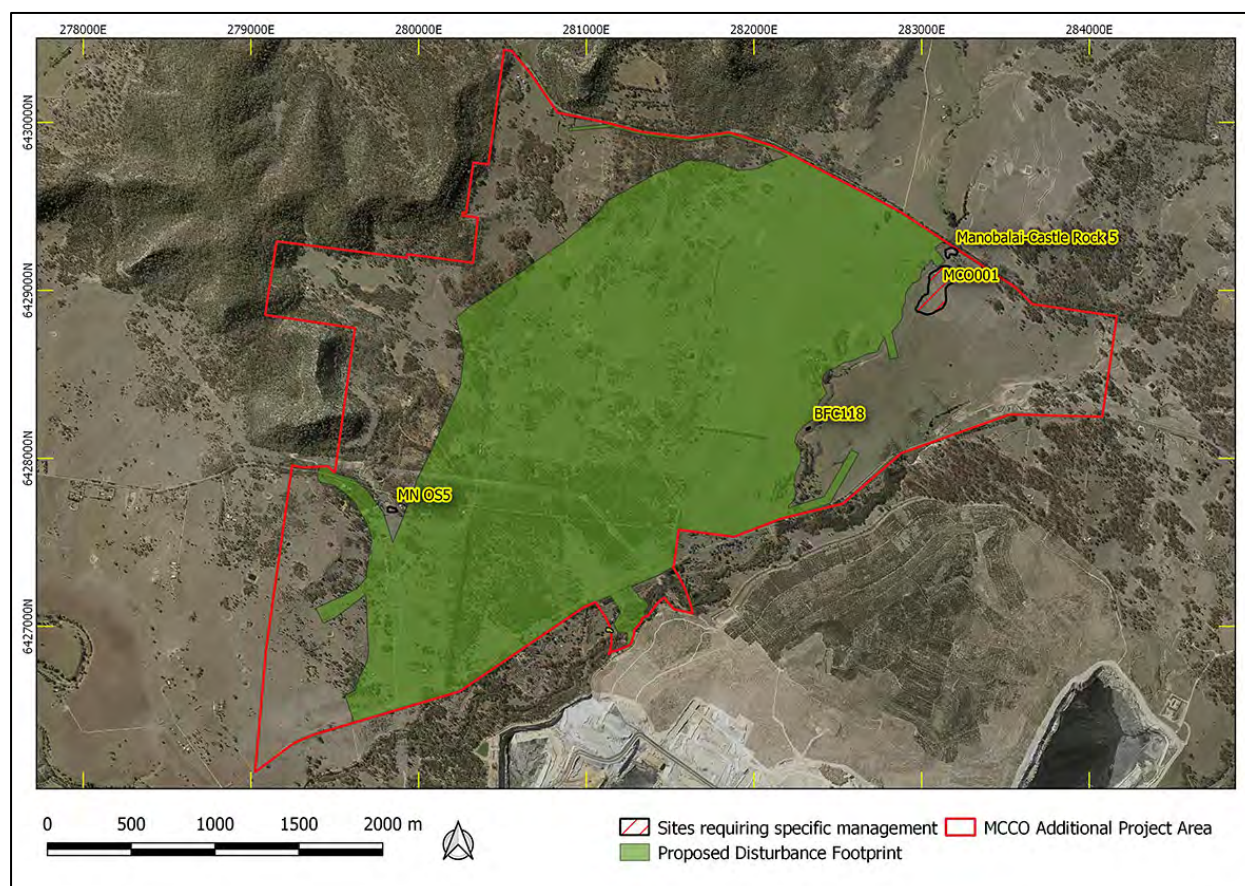
AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
37-2-5430	BFC115	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5431	BFC116	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-5432	BFC117	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5449	BFC134	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-5802	MN OS1	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-5805	MN OS4	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-5807	MN OS6	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-5809	MN OS8	Artefact Scatter	Low	Total	Low density artefact scatter	Archaeological excavation as the site is located within a former portion of ACHO-5 and was intentionally not investigated during the test excavation program (see <b>Section 6.1</b> ). Excavation at this site to sample northern bank of Big Flat Creek. See <b>Section 8.4.2</b> for excavation methodology
37-2-5810	MN OS9	Artefact Scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-2-5816	MN IF3	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5818	MN IF5	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5819	MN IF6	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-2-5824	MN IF11	Isolated Find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact

### 8.3.2 Sites requiring specific management to prevent harm

There are four sites that are closely adjacent to the Proposed Disturbance Footprint and may be unintentionally harmed by the MCCO Project unless specific management is undertaken to avoid impacts (**Table 8-2**). Due to their proximity to proposed works, these sites are at greater risk of unintentional impact when compared to sites located further away (**Figure 8-1**). These sites should be permanently fenced and signed prior to works beginning to provide adequate protection.

**Table 8-2: Sites requiring specific management to ensure conservation.**

AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Scientific significance
37-2-0742	Manobalai-Castle Rock 5	283181	6429240	Artefact Scatter	Low-moderate
37-2-5433	BFC118	282324	6428173	PAD	Unknown
37-2-5480	MCO001	283039	6428912	Artefact Scatter	Low
37-2-5806	MN OS5	279841	6427694	Artefact Scatter	Low

**Figure 8-1: Aerial showing the sites that require special management during the proposed works.**

### 8.3.3 Management of blast impacts

There are five registered rockshelters with PAD within the MCCO Additional Project Area: BFC128 (37-2-5443); BFC129 (37-2-5444); BFC130 (37-2-5445); BFC131 (37-2-5446); and BFC132 (37-2-5447).

The blast assessment completed by Enviro Strata Consulting as part of the MCCO EIS has not identified any significant ground vibration levels that are likely to cause impacts to identified rockshelter sites.

As such, these rockshelter sites will not be subject to specific blast monitoring.

### 8.3.4 Further investigation of rockshelter sites

All rockshelters were inspected during the survey and none recorded any evidence of Aboriginal occupation and all were regarded as being unlikely to contain PAD.

However, as there is uncertainty over the nature of the archaeological deposits in these rockshelters, it is recommended that limited manual excavation take place in each rockshelter so that the future management of the rockshelter can be effectively determined.

The manual excavation will consist of a single 50 by 50 cm excavation square being excavated at each shelter. These excavations will utilise the following methodology:

- Prior to commencing any investigation within a rockshelter, all RAPs will be provided notice of the upcoming works and a brief excavation methodology which will include the protocols below. The primary aim of this communication is to allow RAPs to comment on the methodology and/or to suggest an alternative methodology considering their cultural knowledge of how rockshelters were used in the past
- The excavation square should be placed at a location that will best provide information regarding the depth and nature of any archaeological deposits associated with the shelter. Ideally this location should be within the dripline of the shelter, but if such a location is not available, a location outside of the dripline is also permissible
- Depth of deposit should be tested with a thin wire probe to determine where the soil profile may be deeper
- The excavations will continue until bed rock is reached
- Should the excavations encounter roof collapse that can be clearly identified as not bed rock, the excavation of a second excavation square (50 by 50 cm) is permissible to sample the complete soil profile
- Should the initial 50 by 50 cm excavation square not encounter any archaeological deposits, a second excavation square (50 by 50 cm) is permissible in case there are variations in the location of archaeological deposits within the rockshelter
- The excavation protocols will also follow the methodology set out in **Section 8.4.2**. However, the aim of this excavation program is not to excavate the entirety of the rockshelter deposit but to simply determine if archaeological deposits are present. As such, the provisions for expansion as set out in **Section 8.4.2** should only occur if deemed absolutely necessary. The aim is to conserve as much as is possible of any archaeological deposit as the rockshelters themselves are out of the Proposed Disturbance Footprint and the excavation is to inform future management only.

Depending on the results of the excavations, the following outcomes will be followed:

- If these investigations demonstrate that there are associated archaeological deposits, the applicable shelters will have their site card updated to include this finding. These rockshelter sites will not be subject to specific blast monitoring (as geotechnical expert advice is that blast impacts are unlikely; see **Section 8.3.3**) but a photographic record should be maintained so that any deleterious changes to the condition of these sites is

recorded and, if possible, remedied. This photographic monitoring will be part of the existing monitoring program as set out in the ACHMP Section 3.6.1.1. The remaining deposits not disturbed by the limited archaeological investigation shall be maintained *in situ*

- If these investigations demonstrate that there are no associated archaeological deposits, the applicable shelters will be listed as 'not a site' by the agency of an Aboriginal Heritage Impact Recording Form and no further management is required.

### 8.3.5 Conservation management options

It should be stressed that the salvage measures set out in **Table 8-1** are assessed as sufficient to adequately mitigate impacts to the archaeological values of sites in the Proposed Disturbance Footprint. However, to address the cumulative loss of sites in the immediate vicinity of the Proposed Disturbance Footprint, the following conservation strategies will be followed by Mangoola in order to achieve further archaeological benefits arising from the MCCO Project.

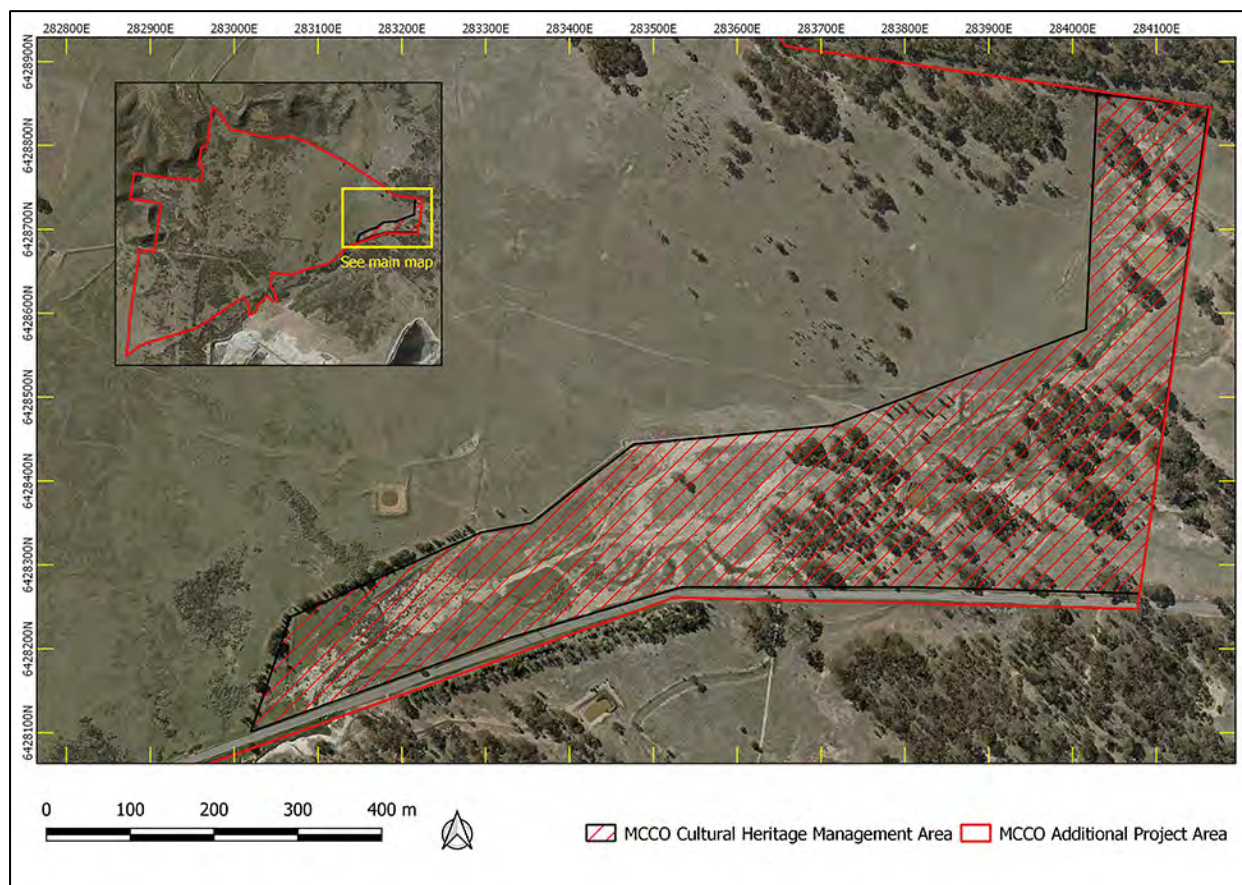
#### 8.3.5.1 MCCO Cultural Heritage Management Area

Mangoola will provide for the maintenance of the landscape in a 23.5 ha area termed here the 'MCCO Cultural Heritage Management Area' that encompasses landforms adjacent to the tributary to Big Flat Creek in the southeast of the MCCO Additional Project Area (**Figure 8-2**). This area contains seven known sites with some of the sites containing 100s of artefacts. It also contains sites with the highest archaeological values of the MCCO Additional Project Area including two sites (37-2-5441 [BFC126] and 37-2-5442 [BFC127]) that are assessed as having moderate–high archaeological values (**Section 7.2.2**). The MCCO Cultural Heritage Management Area will be fenced to exclude livestock and will be signed to recognise the area's cultural and archaeological values. Mangoola will allow natural landform rehabilitation to occur in this area but will also investigate non-intrusive erosion controls such as seeding or hand planting of trees. The area will be monitored by Mangoola to ensure weed and feral animal control is maintained. The area could be visited by Aboriginal community members during scheduled monitoring programs (as per ACHMP Section 3.6.1.1) or following a request to Mangoola.

#### 8.3.5.2 Management of sites out of impact

Mangoola will undertake to manage in the landscape the 45 known Aboriginal sites within the MCCO Additional Project Area but outside of the Proposed Disturbance Footprint listed in **Table 8-3**. Management of these sites will follow the procedures set out in the ACHMP Section 3.2.1.



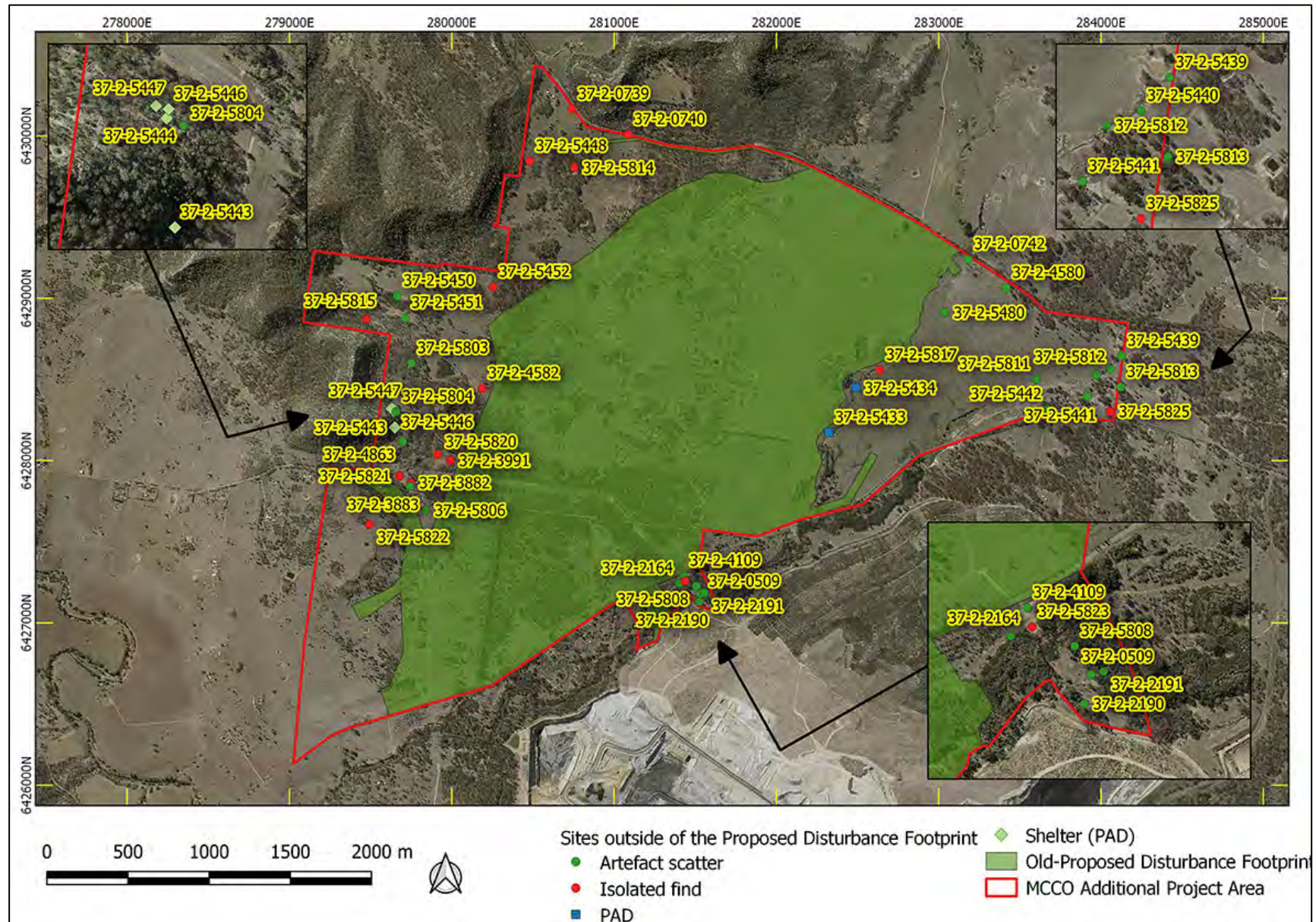
**Figure 8-2: Aerial showing the MCCO Cultural Heritage Management Area.****Table 8-3: Recorded Aboriginal sites inside the MCCO Additional Project Area but outside the Proposed Disturbance Footprint.**

AHIMS	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type
37-2-0509	Sandy Hollow, Singleton 1	281535	6427179	Artefact Scatter
37-2-0739	Manobalai-Castle Rock 2	280741	6430165	Isolated Find
37-2-0740	Manobalai-Castle Rock 3	281086	6430009	Isolated Find
37-2-0742	Manobalai-Castle Rock 5	283181	6429240	Artefact Scatter
37-2-2164	BFC01	281401	6427243	Artefact scatter
37-2-2190	BFC28	281524	6427130	Artefact Scatter
37-2-2191	BFC29	281556	6427184	Artefact scatter
37-2-3882	BFC69	279746	6427863	Isolated Find
37-2-3883	BFC70	279743	6427841	Artefact Scatter
37-2-3991	BFC91	279991	6428000	Isolated Find
37-2-4109	BFC96	281429	6427290	Artefact Scatter
37-2-4580	BFC107 (MDG1)	283416	6429064	Artefact Scatter
37-2-4582	BFC109 (MDG3)	280187	6428445	Isolated Find
37-2-4863	BFC111	279698	6428117	Artefact Scatter
37-2-5433	BFC118	282324	6428173	PAD
37-2-5434	BFC119	282490	6428448	PAD
37-2-5439	BFC124	284126	6428645	Artefact Scatter
37-2-5440	BFC125	284057	6428564	Artefact Scatter

37-2-5441	BFC126	283915	6428393	Artefact Scatter
37-2-5442	BFC127	283672	6428316	Artefact Scatter
37-2-5443	BFC128	279649	6428204	Shelter (PAD)
37-2-5444	BFC129	279641	6428309	Shelter (PAD)
37-2-5445	BFC130	279641	6428308	Shelter (PAD)
37-2-5446	BFC131	279643	6428317	Shelter (PAD)
37-2-5447	BFC132	279631	6428320	Shelter (PAD)
37-2-5448	BFC133	280480	6429845	Isolated Find
37-2-5450	BFC135	279665	6429015	Artefact Scatter
37-2-5451	BFC136	279714	6428879	Artefact Scatter
37-2-5452	BFC137	280253	6429070	Isolated Find
37-2-5480	MCO001	283039	6428912	Artefact Scatter
37-2-5803	MN OS2	279751	6428600	Artefact Scatter
37-2-5804	MN OS3	279657	6428301	Artefact Scatter
37-2-5806	MN OS5	279841	6427694	Artefact Scatter
37-2-5808	MN OS7	281508	6427226	Artefact Scatter
37-2-5811	MN OS10	283601	6428501	Artefact scatter
37-2-5812	MN OS11	283973	6428529	Artefact scatter
37-2-5813	MN OS12	284122	6428453	Artefact scatter
37-2-5814	MN IF1	280755	6429805	Isolated Find
37-2-5815	MN IF2	279476	6428873	Isolated Find
37-2-5817	MN IF4	282638	6428558	Isolated Find
37-2-5820	MN IF7	279912	6428038	Isolated Find
37-2-5821	MN IF8	279677	6427905	Isolated Find
37-2-5822	MN IF9	279494	6427608	Isolated Find
37-2-5823	MN IF10	281437	6427258	Isolated Find
37-2-5825	MN IF12	284056	6428302	Isolated find



173



### 8.3.6 Protocols related to the discovery of new sites

It is noted in **Section 1.5.3** that the OEH submission to the SEARs stated that:

- The EIS must outline procedures to be followed if Aboriginal objects are found at any stage of the life of the project to formulate appropriate measures to manage unforeseen impacts.

The protocols related to the discovery of new Aboriginal sites contained in Sections 3.3 and 3.4 of the ACHMP are adequate to cover this eventuality and will be implemented for the MCCO Project. The policy within the current ACHMP relating to new discoveries is set out in **Section 1.4.5.1** and these will be carried into the updated ACHMP.

### 8.3.7 Protocols related to the discovery of human skeletal material

It is noted in **Section 1.5.3** that the OEH submission to the SEARs stated that:

- The EIS must outline procedures to be followed in the event Aboriginal burials or skeletal material is uncovered during construction to formulate appropriate measures to manage the impacts to this material.

Protocols related to the discovery of human skeletal material will be set out in the approved ACHMP. However, the protocols contained in Section 3.5 of the ACHMP are adequate to cover this eventuality. These protocols are shown in **Section 1.4.5.2** and these will be carried into the updated ACHMP.

### 8.3.8 Care of salvaged artefacts

Following the completion of analysis and reporting, the location and type of final repository for the salvaged artefacts will be the subject of further consultation with relevant Aboriginal parties, DPE and OEH. Any such arrangements will be determined with reference to Section 85 of the NPW Act and the requirements outlined in the Code of Practice (Section 3.7). This may include the requirement for a Care Agreement to be submitted and endorsed by OEH for final artefact care arrangements.

Mangoola have submitted a Care Agreement permit to OEH (decision pending) associated with the relocation of previously salvaged artefacts to a safe storage location situated at the Mangoola Coal Mine. This location was selected in consultation with the existing RAPs and in accordance with the ACHMP.

This safe storage location is intended to be for all Aboriginal cultural heritage objects recovered from the Mangoola Coal Mine; including those that will be recovered from the salvage program associated with the MCCO Project.



## 8.4 MANAGEMENT PROCESS

### 8.4.1 Archaeological salvage: surface artefact collection

Research aim: Is there any variation, on a macro level, in the distribution of certain artefact attributes such as raw material type and artefact type across the Proposed Disturbance Footprint?

Action: To conduct an analysis of the raw materials and basic artefact features to determine whether there is site to site variation across the Proposed Disturbance Footprint, particularly in sites located away from water.

Aim: Archaeological data obtained will allow a local level analysis of distribution patterns within the Proposed Disturbance Footprint.

Research Design: All visible artefacts would be flagged in the field. On hand-held GIS units, the location, artefact class and artefact type will be catalogued in the field. A representative sample of artefacts and views of site and *in situ* artefacts will be photographed. When recorded, all artefacts from the surface of the site will be collected.

Stone artefact sites managed under this archaeological salvage will contribute to the research aim in that the sites will have surface artefacts mapped, catalogued, selectively photographed, collected and moved to a safe storage location situated at the Mangoola Coal Mine.

It is envisioned that these investigations would include the following methodology although the final form of any investigation would be done in consultation with the RAPs as part of development of the updated ACHMP.

#### Archaeological salvage: surface collection of artefacts

In order to fulfil the research aim, the following program is suggested:

- All visible artefacts at a site should be flagged in the field
- The site should be photographed after flagging and before recording
- All artefacts should have the following artefact information entered directly into a GPS unit, albeit one set up with all variable fields already entered to make the field recording job more efficient:
  - Location
  - Artefact Class
  - Artefact Type
  - Size
  - Reduction level
  - Raw Material

- Notes.
  - A selection of indicative and / or unusual artefacts from each site will be photographed
  - A sketch plan of the site will be completed indicating zones for the surface collection of artefacts
  - Once all recording is complete, the artefacts will be collected according to site zones with artefacts from each zone being kept separate.
- Should the collection team encounter a human burial, all work should cease in the area and advice from authorities and RAPs (should the remains be Aboriginal) sought
- The recording of the artefacts recovered will largely be completed in the field and this data would be incorporated into a report
- Analysis will attempt to answer the research aim which is to record a statistically valid artefact assemblage from across the Proposed Disturbance Footprint in order to better understand inter-site variations.

The sites recommended for archaeological salvage by means of surface collection are shown in **Table 8-1**.

#### **8.4.2 Archaeological salvage: limited manual excavation**

At the sites recommended for subsurface excavation in **Table 8-1**, it is recommended that the surface collection of artefacts occur first (**Section 8.4.1**) and that manual excavation at the sites should take place. The maximum area of excavation should be determined by the results of the excavations but a minimum of 2 m<sup>2</sup> at each site would be required in order to confirm the nature of the subsurface deposits.

The manual excavation at these locations should follow the following framework.

##### Archaeological Salvage: Limited Subsurface Investigations

Research Aim: Are there either subsurface artefacts or intact archaeological deposits at the location?

Action: To conduct targeted, limited archaeological excavations at the site.

Aim: To use the results of the limited manual excavation to confirm the nature of the subsurface deposits in the former portion of the ACHOA to be impacted by the Wybong Road Overpass.

Research Design: At locations indicated in **Table 8-1** limited manual excavation will take place to determine the nature and extent of any subsurface deposits within the former portion of the ACHOA to be impacted by the Wybong Road Overpass.

If the results of the limited manual excavations demonstrate that there is archaeological data that will enable a meaningful analytical analysis, then this analysis will be undertaken. This analysis could include, but not be limited to:

- Allowing the MCCO Additional Project Area to be placed within the broader Hunter Valley context
- Analysing if there are differences in artefact typology and range between the open and closed sites to be investigated (see **Section 8.3.4** for the investigations of the rockshelter sites)
- Analysing chronological changes that may occur in technology, raw materials, tool use, or the spatial patterns of site use
- Analysing whether stone tool manufacture paradigms such as Redbank A strategy are present at the sites investigated.

The methodology for the possible salvage by manual excavation at these sites is as follows:

- A minimum of eight 0.5 m by 0.5 m excavation squares (two square metres) would be excavated to culturally sterile soil levels such as the basal clays at each site. Should basal clays be too deep to be reasonably reached by manual excavation, the decision as to whether sufficient excavation has occurred will rest with the Excavation Director
- The eight excavation squares be spaced at no more than 5 m apart. Thus a 35 m transect will be investigated
- Spits at each area would start in 5 cm increments although 10 cm increments could be used once it is established it is archaeologically prudent to do so
- All deposits would be dry sieved at location
- All recording will be done in the field in standard context sheets and the archaeologist will ensure that all necessary photographs, section drawings and soil analysis shall take place
- The decision to expand from the initial two square metres shall be determined by the results of the eight 0.5 m by 0.5 m squares and would be done in consultation between the archaeologists and RAPs present. The final decision on whether expansion is desirable will rest with the Excavation Director
- The grounds for expansion would include:
  - The complete excavation of a feature (such as a hearth) that may have been intersected by an excavation square
  - The complete excavation of a concentration of artefacts such as a knapping floor that may have been intersected by an excavation square.
- Any expansion beyond the two square metres would include areas totalling no more than an additional two square metres
- In what is assessed as an unlikely event, should the excavations encounter high value archaeological deposits, it should be possible to commence larger scale manual

excavation at that location. Deposits or features that would characterise high value deposits include:

- Undisturbed deposits showing discernible archaeological stratigraphy;
  - Any exceptional finds (unusual materials, rare preservation, rare artefact type) believed to have archaeological context
  - A high density of artefacts<sup>3</sup> (more than 100 per square metre) in largely undisturbed contexts.
- Should the excavations encounter a human burial, all work should cease in the area and advice from authorities and RAPs (should the remains be Aboriginal) sought
  - All excavated material (stone tools, bone, shell etc.) will be fully analysed and a report of the findings prepared.

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<sup>3</sup> An artefact is regarded as any debitage with a maximum dimension greater than 15 mm.



## 9 RECOMMENDATIONS

The following recommendations are made based on:

- 24 newly recorded sites were identified within the MCCO Additional Project Area during the survey (12 artefact scatters and 12 isolated finds; noting that one newly recorded site is outside of the MCCO Additional Project Area)
- There are 47 registered, valid, sites within the MCCO Additional Project Area (noting that, following the test excavation program, site BCF114A (37-2-5429) was determined not to be a site)
- Collectively there are 71 extant Aboriginal sites located within the MCCO Additional Project Area
- Of the 71 sites in the MCCO Additional Project Area, 53 or 75 per cent were assessed as having low scientific significance. Seven sites have unknown scientific significance as they are PADs with no visible site manifestations. Eleven sites ranged from low-moderate scientific significance to moderate-high scientific significance
- 26 sites are located within the Proposed Disturbance Footprint and will be impacted by the MCCO Project
- The 26 sites that are liable to be impacted consist of 15 artefact scatters and 11 isolated finds. 24 sites (92 per cent) are assessed as having low scientific values due to low artefact densities, lack of associated subsurface deposits and observed disturbances. Two sites (eight per cent) have either low-moderate or moderate scientific significance with both being located in the previously planned portion of the ACHOA that will be impacted by the Wybong Road Overpass
- 45 sites are outside of the Proposed Disturbance Footprint and will not be impacted by the MCCO Project.

**Table 8-1** lists all sites that are likely to be impacted by the MCCO Project and tabulates the associated scientific values assessment and recommended archaeological management strategies.

Following granting of a development consent for the MCCO Project and because of the proposed impacts to Aboriginal cultural heritage sites within the Proposed Disturbance Footprint, the following archaeological recommendations are made in an effort to responsibly mitigate the loss of cultural heritage in the impact footprint.

1. The existing ACHMP will be updated in consultation with the RAPs and DPE (with input from OEH). The archaeological management recommendations within this report should be incorporated into the ACHMP.
2. 22 Aboriginal sites within the Proposed Disturbance Footprint are recommended to be salvaged through a surface artefact collection. The protocol for this salvage is set out in **Section 8.4.1**.

3. Four Aboriginal sites within the Proposed Disturbance Footprint (BFC31, BFC93, BFC95 and MN OS8) are recommended to be salvaged through a program of limited archaeological salvage. The protocol for this salvage is set out in **Section 8.4.2**.
4. Four sites (Manobalai-Castle Rock 5, BFC118, MCO001 and MN OS5) as set out in **Section 8.3.2** require fencing and signage to prevent inadvertent harm from the MCCO Project.
5. In order to address the issue of cumulative loss of sites in the district, the MCCO Project will ensure management of a 23.5 hectare area of land in the southeast of the MCCO Additional Project Area as discussed in **Section 8.3.5**. This MCCO Cultural Heritage Management Area will be fenced to exclude livestock and will be signed to recognise the area's cultural and archaeological values. Mangoola will allow natural landform rehabilitation to occur in this area but will also investigate non-intrusive erosion controls such as seeding or hand planting of trees. The area will be monitored by Mangoola to ensure weed and feral animal control is maintained. The area could be visited by Aboriginal community members during scheduled monitoring programs (as per ACHMP Section 3.6.1.1) or following a request to Mangoola.
6. The five registered rockshelters (37-2-5443 [BFC128]; 37-2-5444 [BFC129]; 37-2-5445 [BFC130]; 37-2-5446 [BFC131] and 37-2-5447 [BFC132] will be subjected to limited archaeological excavation as set out in **Section 8.3.4** to determine whether the shelters have associated archaeological deposits. Depending on the results of the excavations, the following outcomes will be followed:
  - a. If these investigations demonstrate that there are associated archaeological deposits, the applicable shelters will have their site card updated to include this finding. These rockshelter sites will not be subject to specific blast monitoring (as geotechnical expert advice is that blast impacts are unlikely) but a photographic record should be maintained so that any deleterious changes to the condition of these sites is recorded and, if possible, remedied. This photographic monitoring will be part of the existing monitoring program as set out in the ACHMP Section 3.6.1.1. The remaining deposits not disturbed by the limited archaeological investigation shall be maintained *in situ*.
  - b. If these investigations demonstrate that there are no associated archaeological deposits, the applicable shelters will be listed as 'not a site' by the agency of an Aboriginal Heritage Impact Recording Form and no further management is required.
7. Mangoola will undertake to manage the 45 known Aboriginal sites within the MCCO Additional Project Area but outside of the Proposed Disturbance Footprint listed in **Table 8-3**. Management of these sites will follow the procedures set out in the ACHMP Section 3.2.1.

8. Any salvaged artefacts will remain on site at the temporary artefact storage facility maintained by Mangoola. At the cessation of mining in the Additional MCCO Project Area, Mangoola will initiate consultation with RAPs to determine the ultimate fate of the artefacts that could include being placed back in the landscape near to where they originated. Any such decision would be subject to a Care and Control agreement between the RAPs and OEH (see ACHMP Section 4).

## REFERENCES

- Aiken 1985 Aiken, G. *An Archaeological Survey of the Bayswater to Mt. Piper Transmission Line*. An unpublished report to the NSW National Parks and Wildlife Service by ANU Archaeological Consultancies.
- AMBS 1997 Australian Museum Business Services. *Archaeological test Excavations of Aboriginal Sites at Bettys Creek Mt Owen Mine, Hunter Valley, NSW. Vol. 1–4*. Report for Mt Owen Mine, BHP Coal Australia.
- Attenbrow 2010 Attenbrow, Val. 2010. *Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records*. Second Edition. UNSW Press.
- Australia ICOMOS 2013 International Council on Monuments and Sites 2013. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*, 2013.
- BOM 2018 Bureau of Meteorology. 2016. *Summary statistics SCONE SCS*. [http://www.bom.gov.au/climate/averages/tables/cw\\_061089.shtml](http://www.bom.gov.au/climate/averages/tables/cw_061089.shtml) Accessed 03/07/18.
- Brayshaw 1981 Brayshaw, H. 1981. *Archaeological survey of Authorisation 89, proposed site of Bloomfield Collieries' Coal Mine at Rix's Creek, Singleton*. Report to NSW NPWS.
- Brayshaw 1986 Brayshaw, H. 1986. *Aborigines of the Hunter Valley: a study of colonial records*. Scone and Hunter Historical Society: Scone.
- Burke & Smith 2004 Burke, H. and Smith, C. 2004. *The Archaeologist's Field Handbook*, Blackwell, Oxford.
- Burton *et al.* 1990 Burton, C., Koettig, M. and Thorp, W. 1990. *Regional study of Heritage significance, Central Lowlands, Hunter Valley Electricity Holdings*. Report to the Electricity Commission of NSW in three volumes. Volume 1: Overview and recommendations.
- Dean-Jones 1992 Dean-Jones, P (Resource Planning Pty Ltd). *Archaeological Report Subsurface Analysis Swamp Creek, Mount Owen Mine Site*. Report to Hunter Valley Coal Corporation Pty.
- DECCW 2010 Department of Environment, Climate Change and Water, Sydney (now OEH). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*.
- EMM 2016 EMM Consulting Pty Limited. 2016. *Aboriginal and Historical Cultural Heritage Assessment. Mangoola Coal Continued Operations Project Pre-feasibility Study*. Report for Glencore Coal Assets Australia.



EMM 2017	EMM Consulting Pty Limited. 2017. <i>Appendix 8 Aboriginal due diligence site inspection results</i> . Report to Mangoola Coal Operations Pty Limited.
EMM 2018	EMM Consulting Pty Limited. 2016. <i>Soil Assessment. Mangoola Coal Operations Project</i> . Report for Mangoola Coal Operations Project Pty Ltd.
ERM 1999	ERM Mitchell McCotter Pty Limited. <i>Ravensworth East Mine Environmental Impact Statement</i> . Report for Peabody Resources Limited.
ERM 2004	ERM Environmental Resources Management Australia Pty Ltd. <i>Upper Hunter Valley Aboriginal Heritage Baseline Study</i> . Report Prepared for the Upper Hunter Aboriginal Heritage Trust.
Fawcett 1898	Fawcett, J.W. 1898. Notes on the customs and dialects of the Wonnahruah tribe. <i>Science of Man and Australasian Anthropological Journal</i> . 1(8):180-181.
GHD 2005	GHD (International) Pty Limited. 2005. <i>Proposed Coal Stockpile at Newpac No. 1 Colliery, Ravensworth. Environmental Impact Statement, Volume 1</i> . Report to Resource Pacific Ltd.
Hiscock 1993	Hiscock, P. 1993. Bondaian Technology in the Hunter Valley, New South Wales, <i>Archaeology in Oceania</i> 28(1993): 65–76.
Hiscock and Koettig 1985	Hiscock, P. and Koettig, M. 1985. <i>Archaeological investigations at Plashett Dam, Mount Arthur North and Mount Arthur South in the Hunter Valley, New South Wales. Volume 3A: The salvage excavation and collection of Archaeological sites</i> . Report for the Electricity Commission of New South Wales and Mount Arthur South Coal P/Ltd.
HLA-Envirosciences 2005	HLA Envirosciences. 2005. <i>Preliminary Research Permit #1982: Excavations and Findings at Newdell Junction, Ravensworth</i> . Report to Macquarie Generation.
Horton 1994	Horton, D. <i>The encyclopaedia of Aboriginal Australia: Aboriginal and Torres Strait Islander history, society and culture</i> . 2 Volumes. Aboriginal Studies Press Canberra.
Hughes 1981	Hughes, P.J. 1981 <i>An Archaeological survey of the Bayswater No. 2 colliery proposed lease extension area, Muswellbrook and Hunter Valley</i> . Unpublished report.
Hughes 1984	Hughes, P.J. 1984. <i>NSW National Parks and Wildlife Service Hunter Valley Region Archaeological Project Stage 1. Volume 1. An overview of the archaeology of the Hunter Valley, its environmental setting and the</i>

---

	<i>impact of development</i> . Report for the NSW National Parks and Wildlife Service.
Koettig 1990	Koettig, M. 1990. <i>Camberwell Coal Project - Glennies Creek Supplementary Report on Aboriginal Sites</i> . Report to Epps and Associates Pty Limited.
Kovac and Lawrie 1991	Kovac, M. and Lawrie, J.M. 1991. <i>Soil Landscapes of the Singleton 1:250,000 Sheet</i> , Soil Conservation Service of NSW, Sydney.
Mitchell 2002	Mitchell, P. 2002. <i>Description for NSW (Mitchell) Landscapes Version 2</i> . Department of Environment and Climate Change NSW.
NSW NPWS 2016	New South Wales National Parks and Wildlife Services. 2016. <i>Sydney Basin - Landform</i> . <a href="http://www.environment.nsw.gov.au/bioregions/SydneyBasin-Landform.htm">http://www.environment.nsw.gov.au/bioregions/SydneyBasin-Landform.htm</a> Accessed 03/07/18.
OEH 2011	Office of Environment and Heritage 2011. <i>Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW</i> .
Ruig 1993	Ruig, J. 1993. <i>An Archaeological Survey of the Proposed Optic Fibre Cable Route from Manobalai to Castle Rock, Upper Hunter, NSW</i> . Prepared for Telecom Australia.
Stern 1981	Stern, N. 1981. <i>Salvage excavation and surface collection at Nine Mile Creek, Saxonvale Coal Mine, Hunter Valley</i> . Report to the Central Engineering Division BHP, Sydney.
Tocomwall 2017	Tocomwall Pty Ltd. 2017. <i>Hillcrest Aboriginal Cultural Values Assessment Report</i> . Report to Glencore Coal Assets Australia.
Umwelt 2004	Umwelt Environmental & Social Consultants Pty Limited. <i>Survey of Aboriginal Archaeology in the Area of the Proposed C-Pit Extension and Overburden Dump, Eastern Rail Pit, Bettys Creek Diversion Canal and Dam, and Glendell to Mount Owen Haul Road. Mount Owen Mine, near Hebden, NSW</i> . A Report to Hunter Valley Coal Corporation.
Umwelt 2006	Umwelt Environmental & Social Consultants Pty Limited. 2006. <i>Aboriginal Archaeological Assessment – Anvil Hill Project</i> . Anvil Hill Project Environmental Assessment. Prepared for Centennial Hunter Pty Limited.
Umwelt 2007	Umwelt Environmental & Social Consultants Pty Limited. 2007. <i>Statement of Environmental Effects for the Bulga Underground Southern</i>

---

	<i>Mining Area Modification – Section 96(2) Application to Modify Consent DA 376-8-2003. Report for Bulga Coal Management Pty Limited.</i>
Umwelt 2008	Umwelt Environmental & Social Consultants Pty Limited. 2008. <i>Aboriginal Heritage Assessment of Proposed 66 kV Transmission Line, Denman to Mangoola Coal Mine, NSW. Report for EnergyAustralia.</i>
Umwelt 2010	Umwelt Environmental & Social Consultants Pty Limited. 2010. <i>Aboriginal Cultural Heritage and Archaeological Assessment – Proposed Relocation of 500kV Electricity Transmission Line, Mangoola Coal.</i> Report for Xstrata Mangoola Pty Limited and TransGrid.
Umwelt 2011	Umwelt Environmental & Social Consultants Pty Limited. 2011. Cultural heritage works conducted under AHIP#3220/110275, Denman to Mangoola 66kV Transmission Line. Report for Xstrata Mangoola Pty Limited.
Umwelt 2014a	Umwelt Environmental & Social Consultants Pty Limited. 2014. <i>Report on cultural heritage works conducted as part of PA 10_002, ETL relocation at Mangoola Coal.</i> Report for Transgrid/Mangoola Coal.
Umwelt 2014b	Umwelt Environmental & Social Consultants Pty Limited. 2014. <i>Mangoola Coal Aboriginal Archaeological Salvage Program.</i> Report for Mangoola Coal Operations Pty Limited.
Umwelt 2017	Umwelt Environmental & Social Consultants Pty Limited. 2017. <i>Aboriginal Archaeological and Ecological Due Diligence Assessment of Proposed Borehole Locations, Mangoola Continued Operations NSW.</i> Report to Mangoola Coal Operations Pty Limited.
Witter 2002	Witter, D. 2002. <i>Great Northern Coal Project Bulk Sample Pit Archaeological Survey.</i>

## APPENDIX 1: SURVEY METHODOLOGY



A view of the central portion of the MCCO Additional Project Area.

### ABORIGINAL CULTURAL HERITAGE SURVEY METHODOLOGY

#### Mangoola Coal Continued Operations

Muswellbrook LGA

January 2018

Prepared by  
OzArk Environmental & Heritage Management Pty Ltd  
for  
Umwelt Australia Pty Limited  
on behalf of  
Mangoola Coal Operations Pty Limited



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**DOCUMENT CONTROLS**

Proponent	Mangoola Coal Operations Pty Limited		
Client	Umwelt (Australia) Pty Limited		
Project No / Purchase Order No			
Document Description	<i>Aboriginal Cultural Heritage Survey Methodology. Mangoola Coal Continued Operations</i>		
	Name	Signed	Date
Clients Reviewing Officer			
Clients Representative Managing this Document	OzArk Person(s) Managing this Document		
	Ben Churcher		
Location	OzArk Job No.		
	1768		
Document Status <b>V3.1 FINAL</b>	Date 30 January 2018		
Draft V1.1 Author to Editor OzArk T <sup>st</sup> Internal (Series V1._ = OzArk internal edits)	V1.0 BC author 5/11/17		
Draft V2.0 Report Draft for release to client (Series V2._ = OzArk and Client edits)	V2.0 BC includes client comments 24/11/17 V2.1 BC accepts all changes 24/11/17		
FINAL V3._once latest version of draft approved by client	V3.0 BC incorporates RAP comments 30/1/18 V3.1 BC adds some client comments 30/1/18		
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## CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Project Overview .....	1
1.2	MCCO Additional Project Area .....	6
1.3	Aboriginal consultation .....	10
<b>2</b>	<b>ARCHAEOLOGICAL CONTEXT .....</b>	<b>14</b>
2.1	Antiquity of Aboriginal occupation .....	14
2.2	Investigations within the region of the MCCO Additional Project Area .....	14
2.2.1	Great Northern Coal Project Bulk Sample Pit, Archaeological Survey (Witter 2002) .....	15
2.2.2	Proposed 66 kV Transmission Line, Denman to Mangoola Coal Mine (Umwelt 2008) .....	15
2.2.3	Proposed Relocation of 500kV Electricity Transmission Line, Mangoola Coal (Umwelt 2010) .....	16
2.3	Investigations within the MCCO Additional Project Area .....	16
2.4	Previous salvage programs at Mangoola .....	21
<b>3</b>	<b>PREDICTIVE MODEL .....</b>	<b>22</b>
3.1	Background .....	22
3.2	Settlement strategies .....	22
3.3	Past land use .....	23
3.4	Previously recorded sites .....	23
3.5	Landform modelling .....	24
3.6	Previous studies .....	24
3.6.1	Upper Hunter Valley Aboriginal Heritage Baseline Study (ERM 2004) .....	24
3.6.2	Aboriginal and Historical Cultural Heritage Assessment, Mangoola Coal Continued Operations Project Pre-feasibility Study (EMM 2016) .....	25
3.7	Predictive model for the MCCO Additional Project Area .....	28
3.8	Research questions .....	30
<b>4</b>	<b>SURVEY METHODOLOGY .....</b>	<b>32</b>
4.1	Assessment approach .....	32
4.2	Background .....	32
4.2.1	Survey methodology .....	32
4.2.2	Test excavation .....	34
	<b>REFERENCES .....</b>	<b>35</b>

## FIGURES

Figure 1-1. Location of the MCCO Additional Project Area .....	3
Figure 1-2. Aerial showing the MCCO Additional Project Area, the MCCO Project Area and the currently approved disturbance area .....	4
Figure 1-3. MCCO Additional Project Area: Conceptual Project Layout .....	5
Figure 1-4. Aerial showing the MCCO Additional Project Area .....	7
Figure 1-5. Map showing topographical and hydrological features of the MCCO Additional Project Area ..	8
Figure 1-6. The MCCO Additional Project Area superimposed on a 1967 aerial image .....	9
Figure 2-1. Examples of sites within the MCCO Additional Project Area .....	19
Figure 2-2. Previously recorded sites within or adjacent to the MCCO Additional Project Area .....	20
Figure 3-3. Archaeological sensitivity of the MCCO Additional Project Area as mapped by EMM 2016 .....	27

## TABLES

Table 1-1. RAP responses to the draft survey methodology .....	11
Table 1-2. WLALC comments and OzArk responses .....	12
Table 2-1. Previous archaeological surveys within the MCCO Additional Project Area .....	17
Table 2-2. Site characteristics of previously recorded sites in the MCCO Additional Project Area .....	18

## 1 INTRODUCTION

OzArk Environmental & Heritage Management Pty Limited (OzArk) has been engaged by Umwelt Australia Pty Limited (Umwelt) on behalf of Mangoola Coal Operations Pty Limited (Mangoola) to complete an Aboriginal archaeological values impact assessment for the Mangoola Coal Continued Operations Project (MCCO Project). Australian Cultural Heritage Management Pty Limited (ACHM) will prepare the Aboriginal Cultural Heritage Assessment Report (ACHAR). The Aboriginal archaeological values impact assessment will be an appendix to the ACHAR. The purpose of the assessment is to form part of an Environmental Impact Statement (EIS) being prepared by Umwelt to accompany an application for development consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the MCCO Project.

### 1.1 PROJECT OVERVIEW

Mangoola Coal Mine is an open cut coal mine located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman in the Upper Hunter Valley of NSW (Figure 1-1). Mangoola has operated the Mangoola Coal Mine in accordance with Project Approval (PA) 06\_0014 (as modified) since mining commenced at the site in September 2010.

The MCCO Project will allow for the continuation of mining at Mangoola Coal Mine into a new mining area to the immediate north of the existing operations. The MCCO Project will utilise the existing infrastructure, emplacement areas and equipment at Mangoola Coal Mine. The MCCO Project will extend the life of the existing operation providing for ongoing employment opportunities for the existing Mangoola workforce. The MCCO Project Area includes the existing approved Project Area for Mangoola Coal Mine and the MCCO Additional Project Area as shown on Figure 1-2.

The MCCO Project generally comprises:

- Open cut mining at up to the same rate as that currently approved (13.5 Million tonnes per annum (Mtpa) of run of mine (ROM) coal) using truck and excavator mining methods
- Mining operations in a new mining area located north of the existing Mangoola Coal Mine, Wybong Road, south of Ridgeland Road and east of the 500 kV Electricity Transmission Line (ETL)
- Construction of a haul road overpass over Big Flat Creek and Wybong Road to provide access from the existing mine to the proposed Additional Mining Area
- Establishment of an out-of-pit overburden emplacement area
- Distribution of overburden between the proposed Additional Mining Area and the existing mine in order to optimise the final landform design of the integrated operation. The design

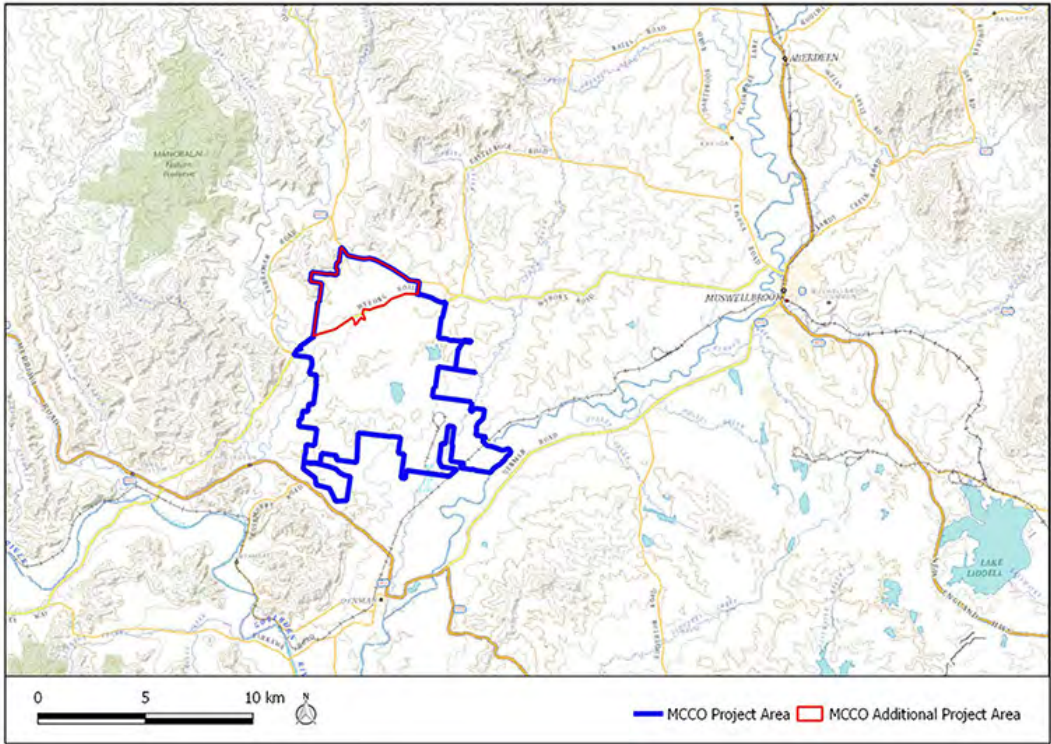


of the emplacement areas and final landform will be refined throughout the assessment process

- Realignment of a portion of Wybong Post Office Road
- The use of all existing or approved infrastructure and equipment for the Mangoola Coal Mine with some minor additions to the existing mobile equipment fleet
- Construction of a water management system to manage sediment laden water runoff, divert clean water catchment, provide flood protection from Big Flat Creek and provide for reticulation of mine water. The water management system will be connected to that of the existing mine
- Establishment of a final landform in line with current design standards at Mangoola Coal Mine including use of micro-relief consistent with the existing site
- Rehabilitation of the proposed Additional Mining Area using the same revegetation techniques as at the existing mine
- A likely construction workforce of approximately 120 persons. No change to the existing approved operational workforce
- Continued use of the mine access for the existing operational mine and access to/from Wybong Road, Wybong Post Office Road or Ridgeland Road to the MCCO Additional Project Area for construction, emergency services and ongoing operational environmental monitoring.

**Figure 1-3** illustrates the key features of the MCCO Project. Those areas within the proposed features illustrated on **Figure 1-3** are referred to as the Proposed Disturbance Footprint.

Figure 1-1. Location of the MCO Additional Project Area.



**Figure 1-2. Aerial showing the MCO Additional Project Area, the MCO Project Area and the currently approved disturbance area.**

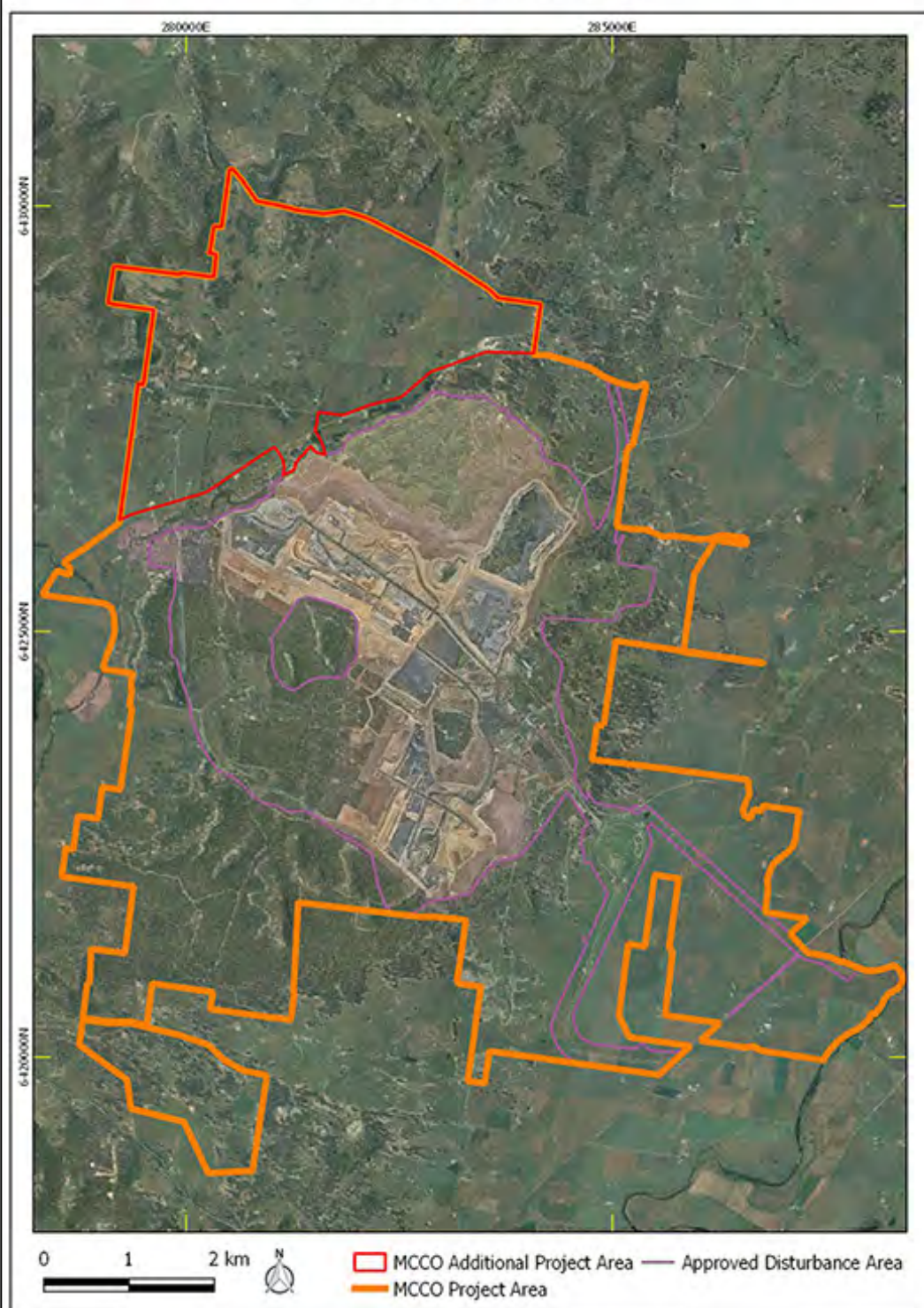
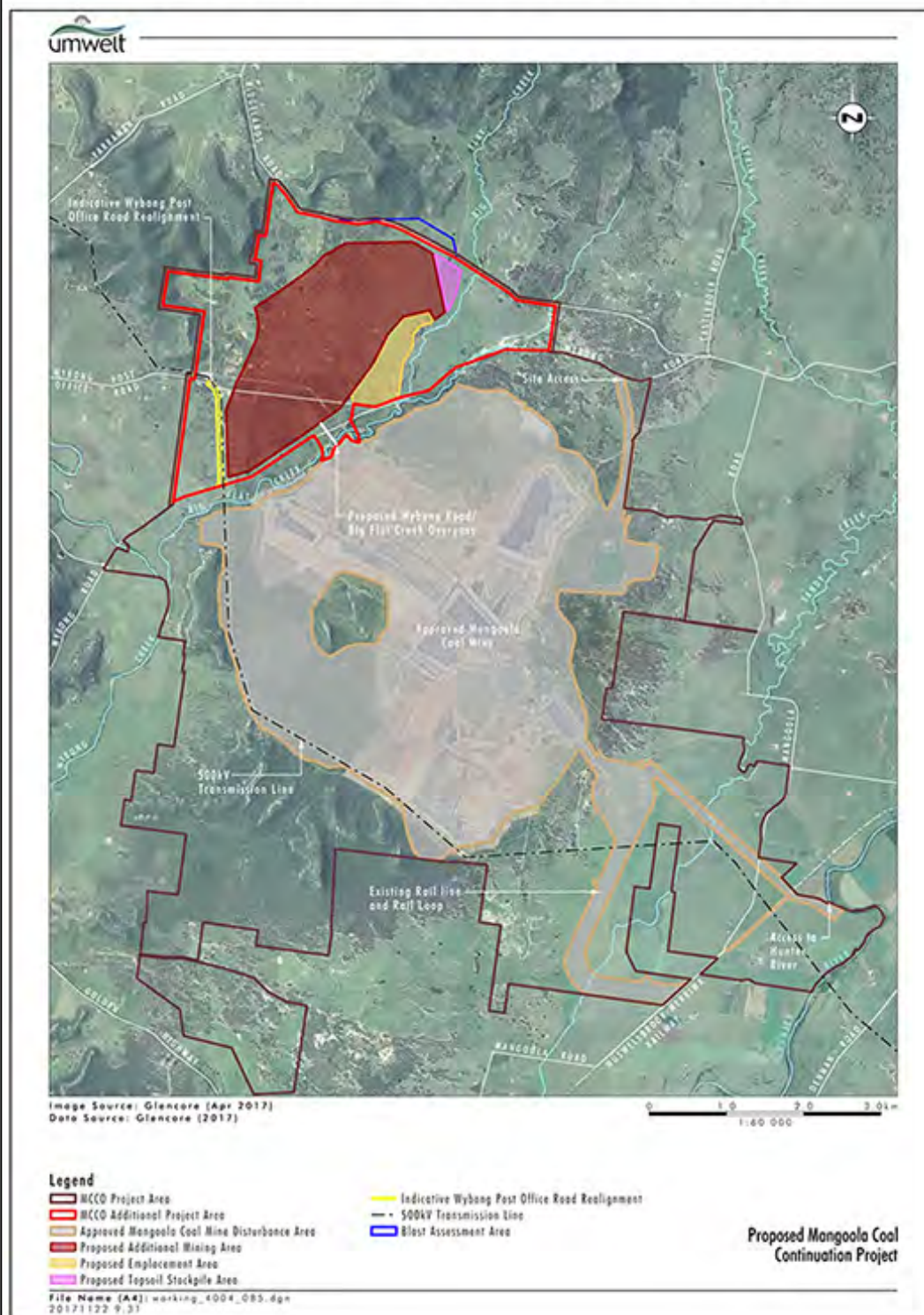




Figure 1-3. MCCO Additional Project Area: Conceptual Project Layout





## 1.2 MCCO ADDITIONAL PROJECT AREA

All proposed impacts related to construction and operation of the Project will be confined to the MCCO Additional Project Area shown on **Figure 1-4**. Further, based on an analysis of existing blast monitoring data collected by Mangoola and Terrock Blast Engineers a blast assessment radius offset from the mining area has been defined that will also be considered as part of the survey for sensitive features such as rock shelters. As such all archaeological survey will be confined to the MCCO Additional Project Area and the identified blast assessment area that falls outside of it as shown on **Figure 1-4**.

The MCCO Additional Project Area comprises approximately 1081.2 hectares (ha) located in largely cleared land to the north of the existing Mangoola operations.

The topography of the MCCO Additional Project Area is characterised by lower slopes, giving way to undulating hills and rocky outcrops to the north and west. Lower topographic areas are associated with drainage lines feeding Big Flat Creek to the south (**Figure 1-5**).

A dominant topographical feature in the surrounding landscape is the series of undulating wooded hills which occur outside and to the north of the MCCO Additional Project Area. These hills rise to a maximum height of approximately 360 metres (m) above sea level and are elevated approximately 200 m above the surrounding area.

Most of the MCCO Additional Project Area is within the catchment of Big Flat Creek. Big Flat Creek drains south-westerly through the MCCO Additional Project Area before it converges with a major tributary and continues below the southern boundary of the MCCO Additional Project Area. The MCCO Additional Project Area also contains a number of unnamed tributaries that drain south and westerly into Big Flat Creek. Big Flat Creek drains south-westerly into Wybong Creek, which is a significant tributary of the Goulburn River. A small number of ephemeral creeks drain directly into Wybong Creek in the western portion of the MCCO Additional Project Area. The majority of local Aboriginal sites have been recorded in proximity to Big Flat Creek south of the MCCO Additional Project Area.

The MCCO Additional Project Area has been subject to agricultural land uses, including intensive grazing and pasture improvement. Remnant native vegetation is generally confined to watercourses, roadsides and areas of steeper topography that are not suitable for agricultural purposes. Historical land use may have caused the following:

- Changes in stream morphology
- Scouring, gulying and bank collapse to streams
- Mixing of artefacts in soils (especially if in ploughed areas)
- The increase in down slope movement of soil (colluvium) as a result of clearing.

Figure 1-4: Aerial showing the MCO Additional Project Area.

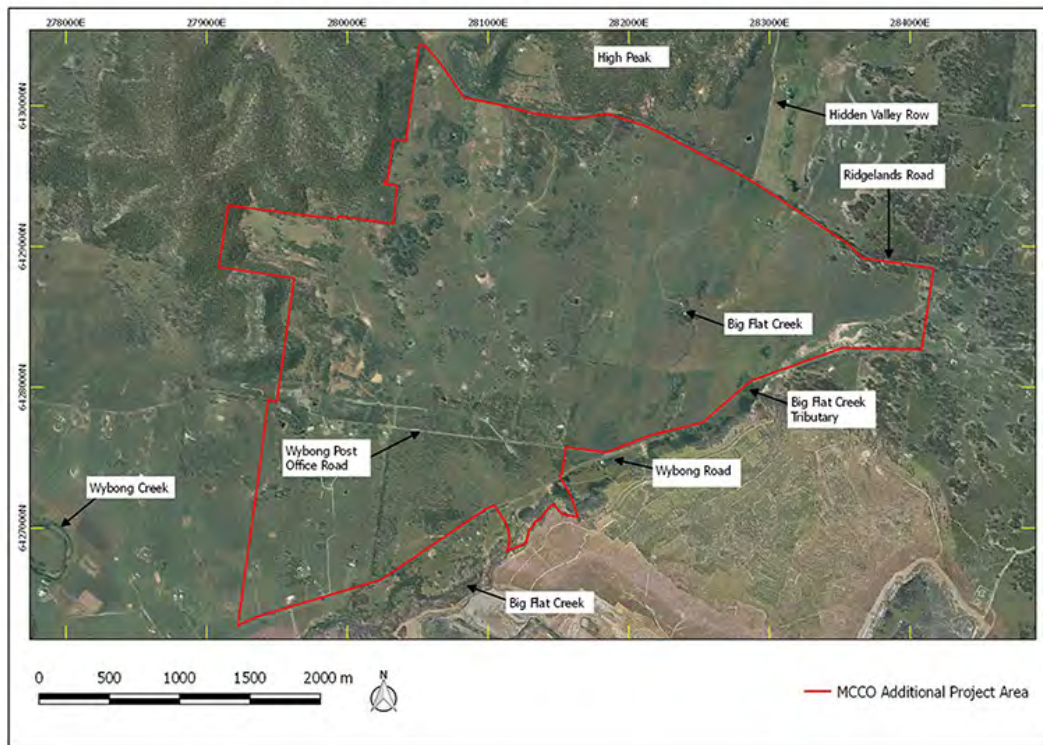


Figure 1-5: Map showing topographical and hydrological features of the MCO Additional Project Area.

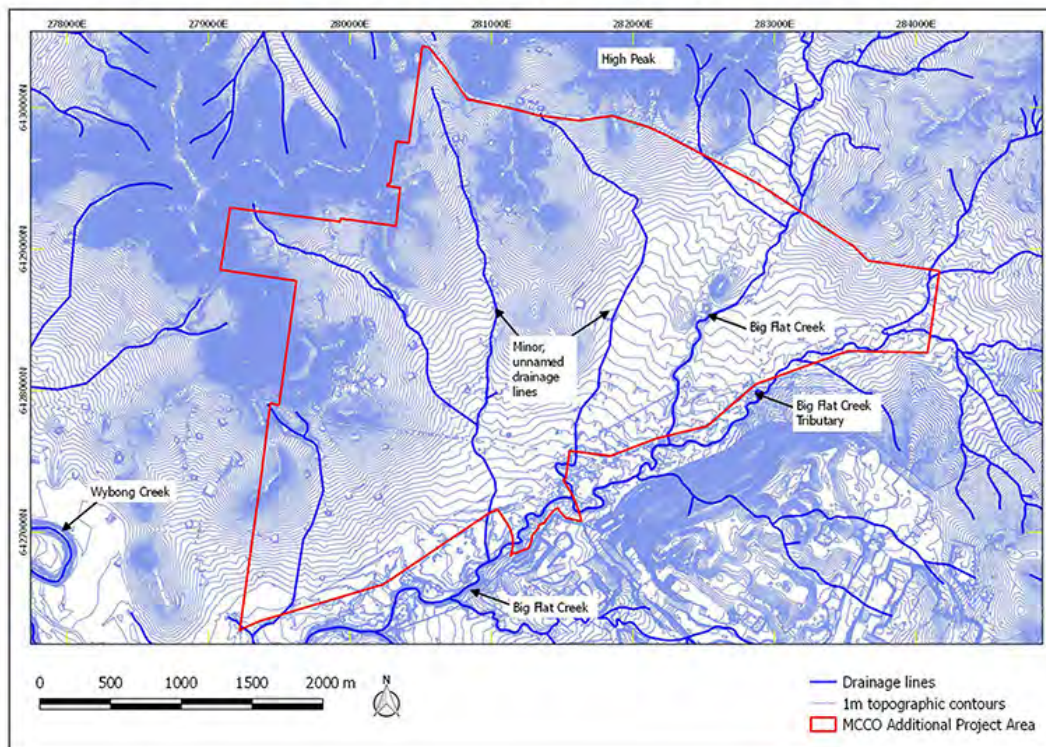
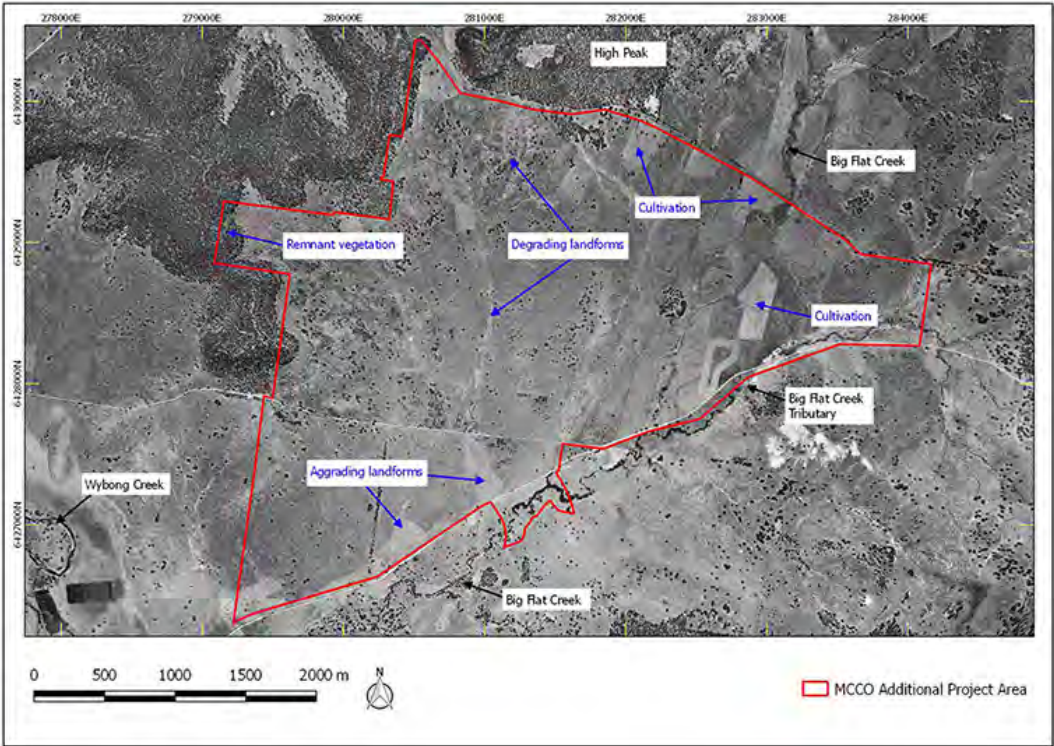




Figure 1-6. The MCCO Additional Project Area superimposed on a 1967 aerial image.



**Figure 1-5** shows the MCCO Additional Project Area superimposed on to a 1967 aerial image. This imagery allows an examination of the types of impacts that have occurred to the landforms within the MCCO Additional Project Area as a result of European farming practices. These include:

- **Extensive clearing of native vegetation.** Apart from some small pockets of vegetation in the western portions, the entirety of the MCCO Additional Project Area has been cleared. This would suggest that certain site types, such as scar trees, will be extremely rare within the MCCO Additional Project Area. In addition, extensive clearing will have encouraged downslope movement of soils. As the MCCO Additional Project Area is generally sloping from north to south (see **Figure 1-5**), this would indicate that soils, as well as the artefacts that may have been within them, have accumulated in the southern portions of the MCCO Additional Project Area.
- **Soil movement.** As noted above, landforms in the north of the MCCO Additional Project Area are within degrading environments, while landforms in the south adjacent to Big Flat Creek are within an aggrading environment. The archaeological implications are that sites in the north may have been displaced or destroyed, while sites in the south are either buried or are representations of artefacts that have accumulated in these more low lying areas.
- **Cultivation.** The 1967 aerial shows substantial areas of the MCCO Additional Project Area under cultivation. While cultivation may not completely remove archaeological material from an area, it will, at least in the upper-most levels, severely disturb any archaeological deposits.
- **Creek erosion.** The 1967 aerial shows that erosion adjacent to creeks is not extensive. While drainage systems such as Big Flat Creek have become channelised (perhaps losing their former Chain of Ponds morphology), there is no evidence in the 1967 aerial of extensive gully erosion of the creek banks, or of sheet wash erosion adjacent to the creek. The exception to this is erosion evident in the east of the MCCO Additional Project Area along the major tributary to Big Flat Creek. The ephemeral drainage lines (see **Figure 1-5**) that flow generally north-south through the MCCO Additional Project Area, show evidence of sheet wash erosion in the basin of the drainage gully.

In summary, the impact of European farming practices on areas such as the MCCO Additional Project Area have led to a significant modification of the pre-1788 environment. This includes a marked change in vegetation cover, increased erosion and morphological changes to the local creeks. The impact of all these disturbances on the archaeological record is profound and any archaeological investigations of areas such as the MCCO Additional Project Area are inevitably examining a depleted and disrupted archaeological landscape.

### 1.3 ABORIGINAL CONSULTATION

A draft of this survey methodology was sent to all Registered Aboriginal Parties (RAPs) for the Project on 15 December 2017 with a closing date for comments on 22 January 2018. This



information was part of Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents (ACHCRs)*.

By the closing date for comment, a number of responses had been received and these are tabulated in Table 1-1.

**Table 1-1. RAP responses to the draft survey methodology.**

Group/Organisation	Contact Person	Agree with Methodology	Methodology Comment
A1 Indigenous Services	Carolyn Hickey	Yes	22/1/18 – Project Approvals Officer (PAO) received verification via phone call
AGA Services	Ashley, Gregory & Adam Sampson	Yes	"Cacatua and AGA Services has discussed the Mangoola Coal continued Operations Project Survey methodology that was forwarded at our last meeting. Both AGA Services and Cacatua are in support of the information that was forwarded."
Amanda Hickey Cultural Services (AHCS)	Amanda Hickey	Yes	22/1/18 - PAO received verification via phone call
Cacatua General Services	George & Donna Sampson	Yes	22/1/18 - PAO received verification via phone call From email: "Cacatua and AGA Services has discussed the Mangoola Coal continued Operations Project Survey methodology that was forwarded at our last meeting. Both AGA Services and Cacatua are in support of the information that was forwarded."
Devine Diggers Aboriginal Cultural Consultants	Deldre Perkins	Yes	23/1/18 - PAO received verification via phone call
Didge Ngundawal Clan (DNC)	Paul Boyd & Lilylea Carroll (Directors)	Yes	"Didge Ngundawal Clan are happy for the approvals to go ahead and totally agree with the methodology. DNC has plenty of experience in all parts of fieldwork and has worked with nearly all archaeologists."
Gomerj Cultural Consultants	David Horton	Yes	(verbally acknowledge agreement)
Gringai Aboriginal Corporation	Gregory Heard	Yes	"I would like to send in expression of interest for the above said project. I agree with the methodology and would like to be involved in all areas of the project."
Hunter Traditional Owner Environmental Management Service	Paulette Ryan	Yes	Comments primarily relating to salvage activities. "...regarding the methodology, can we put that all artefacts coming out of the site go in to the buckets as this is a cultural matter as we would like to handle a arte before they are bag this as beena problem in the pass everything else seem fine"
Jarban & Mugrebea	Uncle Barry French	Yes	22/1/18 - PAO received verification via phone call
JLC Cultural Services	Jenny-Lee Chambers	Yes	"I have read the methodology and I have no comments to add."
Lower Hunter Aboriginal Incorporated	David Ahoy	Yes	"On behalf of LHA I agree with the draft ACHSM and have no further comments to add."
Murra Bidjee Mullangari Aboriginal Corporation	Ryan & Darleen Johnson (Carroll)	Yes	"I have read the Draft methodology review and the approach to the protocols for the management of sensitive cultural information for the above project. I endorse

Group/Organisation	Contact Person	Agree with Methodology	Methodology Comment
			<i>the proposed approach and method recommendations by OzArk Environmental &amp; Heritage Plan."</i>
Ungooroo Aboriginal Corporation	Taasha Layer	Yes	22/1/18 - PAO received verification via phone call
Wallangan Cultural Services	Maree Waugh	Yes	22/1/18 - PAO received verification via phone call
Widescope Indigenous Group Pty Ltd	Steven & Donna Hickey	Yes	"I agree with Methodology."
Wonn 1 Contracting (Kauwai)	Arthur Fletcher	Yes	"We wish to advise that we are in agreement with the draft methodologies and look forward to be included in the future fieldwork."
	Stephen Talbot	Yes	<i>As discussed, I agree with the methodology, however, community should be given the opportunity to identify significant areas. I would like to be given the opportunity to be involved in all phases of works.</i>

In addition, the Wanaruah Local Aboriginal Land Council (WLALC) gave a more detailed comment. This comment, along with OzArk's response, is tabulated in Table 1-2.

Table 1-2. WLALC comments and OzArk responses.

WLALC comment	OzArk response
Under section 2.2 WLALC would like to add:	
There is believed to be a bora ground near the current location of the Yarraman holiday stay. This bora's extents could be several kilometres it has not been studied. It could be linked to the Anvil Hill complex and Skull rock	OzArk cannot locate the Yarraman holiday stay. OzArk will attempt to find out the location of this site during the assessment so that it can be considered and to confirm that is not in the MCCO Additional Project Area.
Skull Rock formation has not rated a mention, this is of concern. It would have been of significance as an odd geological formation therefore a gift from the creator.	OzArk has asked the WLALC to locate this formation so that it can be considered during the assessment.
There were many micro blades found during the Mangoola study, excavations and salvages. This is believed by the community to show the area is potentially linked to a scarification area in the vicinity.	OzArk notes this observation.
There are reports of a water spring in a cave. Although often linked to evil places there is no local knowledge on whether it was considered such or if it was a women's site.	OzArk notes this observation and will take care to note if any of the shelters/caves in the MCCO Additional Project Area contain springs.
Under Section 3.8: Additional research questions:	
What did the environment/ landscape look like prior to settlement? What historical records are there to describe the area at the time of settlement?	This is of intrinsic interest to the archaeological assessment and will be considered in the AAIA.
What historical records are held by NSW State Library, National Archive, Universities, Local residents and Local Historical societies relating to the area that may have information about the local Aboriginal people in the area. We know the Marowancal were over near Denman on the Eastern side of the Hunter River, were these the same people or were these Tooloompikital, the Gundical (the Gundical are possibly from over near Gunda and describing the Tullong and Murrain Clans) or the Paninipikital?	While of interest anthropologically and perhaps applicable to a fuller understanding of the historical values of the MCCO Additional Project Area, such information is not relevant to the AAIA. However, this comment will be passed on to ACHM to be considered in the ACHAR.
Do these records detail local Aboriginal Place Names?	While of interest anthropologically and perhaps applicable to a fuller understanding of the historical values of the MCCO Additional Project Area, such information is not relevant to the AAIA. However, this comment will be passed on to ACHM to be considered in the ACHAR.
What 3D landscape mapping of the area can be completed prior to any destruction?	Such activity is not relevant to the AAIA. However, this comment will be passed on to ACHM to be considered in the ACHAR.

OzArk Environmental & Heritage Management	
WLALC comment	OzArk response
General comments	
What methodologies are to be implemented to protect the wetland aquifer?	Not applicable to the AAIA. OzArk is unaware of any wetland in the MCCO Additional Project Area.
The methodology for the survey is to include 100% Coverage	No survey can offer "100% coverage", however, all portions of the MCCO Additional Project Area will be assessed at a level that allows a robust characterisation of the archaeological resource to be understood.
In areas where visibility is restricted there is to be a Maintenance burn and a revisit to the areas concerned.	OzArk does not agree with this request. Not only would it be logistically difficult with considerable safety risks, the result would not allow a markedly improved view of the ground surface. Instead, in landforms of archaeological sensitivity where ground surface visibility is low, a test excavation program will be used to determine the nature and extent of any archaeological deposits. If it is warranted, a test excavation program will be considered following completion of the field assessment.
Survey and Test excavations will inform further research design and management of sites and landscape.	OzArk agrees with this statement. If it is warranted, a test excavation program will be considered following completion of the field assessment. Should a test excavation program be required, a separate methodology will be developed and sent to all RAPs for their consideration.
<p>Aboriginal Cultural Heritage Survey Methodology: Mangoola Coal Continued Operations</p> <p>13</p>	

## 2 ARCHAEOLOGICAL CONTEXT

### 2.1 ANTIQUITY OF ABORIGINAL OCCUPATION

The Aboriginal occupation of Australia begins prior to 40,000 BP (years before present) and possibly earlier than 50,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period, poor preservation of archaeological materials (particularly dateable organic materials) and significant coastline change over the past 18,000 years.

In 1986, Koettig undertook an archaeological survey between Glennies Creek and Singleton (cited in Umwelt 2003). Following that survey, Koettig carried out several excavations at six locations along Glennies Creek. Koettig considered artefacts found in Site SGCD 16 (about one metre deep in Unit B of an old alluvial terrace) were 'markedly different' to artefacts recovered from the artefacts in Unit A. Her conclusion was formed on the basis of the raw material used, large number of cores, the large percentage of cortex remaining on artefacts and larger sizes of artefacts. Artefacts from Unit B were from volcanic rocks while those in Unit A were predominantly mudstone and silcrete. Later, a date of >20,200 BP was obtained from a hearth associated with the artefacts placing the site well into the Pleistocene.

### 2.2 INVESTIGATIONS WITHIN THE REGION OF THE MCCO ADDITIONAL PROJECT AREA

There have been numerous archaeological investigations in the local area with a small number undertaken in the MCCO Additional Project Area. The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (Section 3). This section refers to archaeological investigations in areas outside of, but close to, the MCCO Additional Project Area. Section 2.3 refers to those investigations that were entirely or partially within the MCCO Additional Project Area and Section 2.4 reviews the salvage programs that have taken place at Mangoola.

The previous investigations did not identify any specific socio-cultural heritage values unrelated to the Aboriginal sites identified. No historical connection has been identified specifically pertaining to the MCCO Additional Project Area and its surrounds that have been investigated. No declared Aboriginal places (under section 84 of the *National Parks and Wildlife Act 1974*) have been identified in the MCCO Additional Project Area or its surrounds.

Aboriginal cultural heritage values may be identified through further Aboriginal consultation concerning the MCCO Additional Project Area. These may relate to social, cultural or historic values associated with Aboriginal sites and objects or places with intangible values.



### 2.2.1 Great Northern Coal Project Bulk Sample Pit, Archaeological Survey (Witter 2002)

Witter (2002) conducted an archaeological survey for the Great Northern Coal Project, located within the Approved Project Area boundary. The survey retraced an area covered by Aiken (1985), although the area was surveyed in greater detail and artefact scatters were defined and grouped into larger sites. As a result, nine sites containing a total of 144 artefacts were identified, being four artefact scatters and five isolated finds. The three largest sites identified were:

- Anvil Vale, which contained 79 artefacts on a creek terrace/pasture and included site #37-2-0509
- Big Flat Creek, which contained 24 artefacts on a creek/pasture and including site #37-2-0510. Despite its name, this site is located 1.3 km south of Big Flat Creek on a tributary to Big Flat Creek
- Clarks Gully, which contained 31 artefacts on tributary flats, pasture and woodland.

Witter discusses two other sites of interest beyond the larger site groupings. One was a small microblade workshop (EWA 19) located in a small scald of the valley bottom north of Big Flat Creek (the site is located approximately 110 m outside the MCCO Additional Project Area). This workshop is isolated and consisted of five silcrete flakes, four of which were blades. Witter suggests that the site may represent a 'quick repair event' servicing backed blade tools when away from the camp. In addition, there was a small elouera of orange chert which was found on the foot-slopes below Anvil Hill (located 2 km south of the MCCO Additional Project Area in an area that is not currently mined); this was assessed as an uncommon and interesting artefact type manufactured from unusual stone material. It was described as part of a hafted flake tool and had probably been transported extensively.

### 2.2.2 Proposed 66 kV Transmission Line, Denman to Mangoola Coal Mine (Umwelt 2008)

Umwelt was commissioned to undertake an Aboriginal heritage assessment of a proposed 66kV transmission alignment to connect the existing Denman substation and the Mangoola Coal Mine.

Following completion of the survey, a review of the proposal identified that three poles (Poles 53, 54 and 63) were within recorded archaeological sites and areas, two poles (Poles 63 and 64) were within 5 m of recorded sites, two poles (Poles 52 and 57) were located within 20 m of recorded sites, and that heavy vehicle movement over site SC48 would be required. To reduce the extent of impact associated with the project, Energy Australia subsequently relocated three poles (Poles 52, 53 and 63) to avoid direct impacts to archaeological sites. However, site SC48 and the associated area of archaeological potential (Area #1) could not be avoided as the site/area was approximately 420 m in length and the maximum pole span for the transmission line was 150 metres. Opportunities for alternative alignments to avoid these sites were

investigated, however, there was no practical alternative and impacts to Site SC48 and Area #1 were unavoidable. These impacts were subject to an Aboriginal Heritage Impact Permit (AHIP) application and salvage program (see Section 2.5).

### **2.2.3 Proposed Relocation of 500kV Electricity Transmission Line, Mangoola Coal (Umwelt 2010)**

Umwelt was engaged by Mangoola, on behalf of TransGrid, to undertake the necessary environmental assessments associated with the relocation of a 500kV powerline. This project was to improve the efficiency of mining at Mangoola as it was proposed to remove an existing 500kV powerline that bisected the site and to relocate the powerline to a route within the southern and western boundaries of the Approved Project Area's disturbance area.

Two sections of the relocated powerline and five associated designated access tracks were outside the Approved Project Area's disturbance area and were the subject of the Umwelt assessment. Fourteen sites (SC56, SC57, BFC69 to BFC73 and SC60 to SC66) were located within the assessment areas and consisted of five isolated finds and nine artefact scatters containing a total of 166 artefacts. The largest artefact scatter (SC56) contained 49 artefacts, followed by SC57 (36 artefacts) and BFC72 (31 artefacts). No areas of potential archaeological deposit (PAD) were identified in association with the recorded sites or any other portion of the assessment areas.

A total of 15 new Aboriginal archaeological sites (BFC74 to BFC88) were recorded within a Habitat Enhancement Area that was inspected to evaluate its suitability as a cultural heritage offset. The sites consisted of six isolated finds and ten artefact scatters (including BFC49) containing a combined total of 44 artefacts. The largest artefact scatter was BFC75 (11 artefacts), followed by BFC80, BFC81 and BFC87, all of which contained five artefacts each. No areas of PAD were identified in association with the recorded sites or any other portion of the Habitat Enhancement Area. Ultimately it was assessed that the Habitat Enhancement Area lacked archaeological values of suitable significance to qualify it as a cultural heritage offset.

Unavoidable impacts to Aboriginal cultural heritage were managed under a Cultural Heritage Management Plan (CHMP) that provided the methodology for the salvage of certain sites (see Section 2.4).

## **2.3 INVESTIGATIONS WITHIN THE MCCO ADDITIONAL PROJECT AREA**

There have been numerous archaeological investigations in the local area with a small number undertaken in the MCCO Additional Project Area itself (Table 2-1). The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (see Section 3.7). The most

applicable survey was by EMM Consulting Pty Limited (EMM) in 2016 as part of a pre-feasibility study for the MCCO Project (EMM 2016).

**Table 2-1. Previous archaeological surveys within the MCCO Additional Project Area.**

Author	Year	Project	Results	Within the MCCO Additional Project Area?
Jill Ruig	1993	Fibre optic cable route Manabralai to Castle Rock	An archaeological survey identified 35 artefacts in five site locations. Eight artefacts were retouched flakes. The dominant raw material was mudstone (25 of the 35) with silcrete (8) and quartz (1) also recorded. Most of the sites (AHIMS #37-2-0738) had low cultural, education and scientific significance and one site (#37-2-0742) had moderate significance due to a higher than average artefact density (1 artefact per 15m <sup>2</sup> ).	Yes; in the northern portions
Umwelt	2006	Anvil Hill Project	In 2006 Umwelt conducted a survey of the Approved Project Area's disturbance boundary and its surrounds, and Aboriginal Cultural Heritage Offset Areas (ACHOAs). A total of 173 sites were identified with 69 sites in the Approved Project Area's disturbance area, 98 in the ACHOAs and six where no impacts would occur. All rock shelter sites were within ACHOAs. The surveys indicated repeated and long term occupation related to reliable watercourses. High density areas were localised at the confluences of creeks (such as the confluence of Wybong and Big Flat Creek).  The site distributions were divided into the catchment areas of Anvil Creek (44 sites), Big Flat Creek (49 sites), Clarks Gully (18 sites), Sandy Creek (14 sites) and Wybong Creek (48 sites).	Yes; in the area where the proposed Wybong Road/Big Flat Creek overpass.
Umwelt	2014a	Works conducted as part of the 500kV powerline relocation (PA 10_002 Modification 4)	An Aboriginal Cultural Heritage Management Plan (ACHMP) was prepared as part of PA 10_002 (referred to as MOD4 this approval was specifically for the construction of a 500 kilovolt (kV) powerline and was not a modification to PA_06_0014 under which Mangoola operates). The ACHMP specified management measures for sites within the proposed powerline and for sites subject to impacts from the dismantling of the existing powerline. This included demarcating sites to be avoided, temporary and permanent collection of sites within the proposed and existing 500kV powerline and salvage excavations.  In 2012, a survey team inspected an existing 500kV powerline north of Wybong Road (which identified sites BFC97-100). Site BFC98 was permanently salvaged.  Site BFC96 within the proposed disturbance area for the Wybong Road/Big Flat Creek overpass was subject to temporary surface collection during the dismantling of the existing powerline. Although the nine artefacts were returned to the site following the completion of works, the site is listed as 'partially destroyed' with the Aboriginal Heritage Information Management System (AHIMS).	Yes; portions north of Wybong Road.
EMM	2016	Pre-feasibility study for the MCCO Project	EMM conducted an opportunistic archaeological field survey in an indicative project footprint and its surrounds from 15 to 19 September 2014. This indicative project footprint included large areas of the MCCO	Opportunistic survey over large areas of the MCCO Additional Project Area.

Author	Year	Project	Results	Within the MCCO Additional Project Area?
			Additional Project Area including the indicative connecting corridor between the Approved Project Area and the MCCO Additional Project Area where it crosses the ACHOA. The survey recorded 38 sites (which, with the 20 sites previously recorded in the MCCO Additional Project Area, make 58 sites in total).	

As a result of these previous assessments, there are 58 Aboriginal sites that have been recorded within or immediately adjacent to the MCCO Additional Project Area. Table 2-2 displays the site characteristics of the 58 previously known sites within or closely adjacent to the MCCO Additional Project Area.

**Table 2-2. Site characteristics of previously recorded sites in the MCCO Additional Project Area.**

Site type	Frequency
Artefact scatter	26
Isolated artefact	22
PAD	3
Artefact scatter with PAD	2
Rock shelter with PAD	5

Of the 58 sites, 52% (30) occur within 50 m of a watercourse. These sites are typically artefact scatters and isolated identified on eroding creek banks and spurs and elevated flat areas overlooking watercourses. This pattern may be partly the result of a sampling bias as most of the EMM 2016 field survey transects (which recorded the bulk of the sites in the MCCO Additional Project Area) were confined to 50 m of a watercourse which were predicted to have the highest archaeological sensitivity. There is a significant drop-off in site frequency over 100 m from watercourses with only 16 sites identified at distances greater than 100 m of watercourses. Of these 16 sites over 100 m from watercourses; nine are isolated finds, two are artefact scatters and the remaining five sites comprise rock shelters with PAD.

Figure 2-1 illustrates an example of some of the sites previously recorded in the MCCO Additional Project Area and Figure 2-2 illustrates the location of the 58 previously recorded sites within or adjacent to the MCCO Additional Project Area.



**Figure 2-1. Examples of sites within the MCCO Additional Project Area.****1. BFC126 artefact scatter adjacent to a tributary to Big Flat Creek.****2. *In situ* artefacts at BFC126.****3. BFC136 artefact scatter located adjacent to an unnamed drainage line in the northwest of the MCCO Additional Project Area.****4. Artefacts recorded at BFC136.****5. A rock shelter with PAD recorded at BFC128 in the west of the MCCO Additional Project Area.****6. A rock shelter with PAD recorded at BFC129 in the west of the MCCO Additional Project Area.**



## 2.4 PREVIOUS SALVAGE PROGRAMS AT MANGOOLA

All sites within the Approved Project Area disturbance boundary at Mangoola were subject to salvage in a program of works conducted between September and November 2008 (Umwelt 2014b). A total of 132 sites were subject to salvage over the course of this program, which included:

- Surface collection of 107 artefact scatter/isolated artefacts located within the approved disturbance boundary (or which extended across the project disturbance boundary)
- Surface collection and grader scrapes at 23 artefact scatter/isolated artefact sites
- Geomorphological investigation of site AC13 and Clarks Gully
- Surface collection, test excavation and subsequent subsurface salvage (including archaeological excavation and grader scrapes) at site AC13
- Salvage of a scarred tree (site SC-ST-01).

Following a modification to PA 06\_0014 (referred to as MOD2), additional salvage works were undertaken in relation to the construction of a pipeline from the Hunter River. This involved the surface collection of site SC03 and the completion of geomorphic excavations at three locations within the Hunter River floodplain. The outcomes of these works are reported in Umwelt 2012.

In relation to works outside the Approved Project Area but directly associated with the operation, Mangoola Coal Operations was granted an AHIP #1110275 (AHIMS reference #3220) by the NSW Office of Environment and Heritage (OEH) in relation to works associated with the construction of a new 66kV powerline extending from Denman to the Approved Project Area. In accordance with the requirements of AHIP #1110275, surface collection and subsurface salvage were undertaken within the sections of site SC48 as detailed in Umwelt 2011.

In 2012, project approval (PA 10\_0002) was issued to TransGrid in relation to the relocation of a section of the Bayswater to Mt Piper 500kV powerline that bisected the Approved Project Area. The conditions of PA 10\_0002 required the development of a CHMP that incorporated the management of Aboriginal cultural heritage within the PA 10\_0002 approval area. In accordance with this CHMP, 10 sites (SC60-66, 91-93) have been subject to surface collection and cultural salvage activities have been undertaken at three tower locations. Temporary surface collections were also conducted within the SC10 Management Zone, at site BFC96 within the Big Flat Creek ACHOA and at site BFC98 in the existing powerline easement, with artefacts to be returned to these locations following the completion of construction works (Umwelt 2014a).

In summary, a total of 149 sites at Mangoola have been subject to salvage activities and within the MCCO Additional Project Area one site has been completely salvaged and two sites have been partially salvaged. All of these works have been conducted in accordance with the requirements of relevant management plans and approvals.



### 3 PREDICTIVE MODEL

#### 3.1 BACKGROUND

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rock shelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport: both over short and long time scales or (b) the historical impacts associated with the introduction of European farming practices including: grazing and cropping; land degradation associated with exotic pests such as goats and rabbits and the installation of farm related infrastructure including water-storage, utilities, roads, fences, stockyards and residential quarters. Scarred trees may survive for up to several hundred years but rarely beyond.

#### 3.2 SETTLEMENT STRATEGIES

The large number of archaeological studies undertaken within the vicinity of the MCCO Additional Project Area provides information to obtain a sound understanding of the nature and distribution of archaeological sites within the area. Although there is some conjecture about the relationship between stream order, site numbers and densities, the general pattern is that the majority of sites are present within 30 m of watercourses (Dean-Jones 1992: 26–27; AMBS 1997: 29). Although sites are present in locations at a greater distance from water, these sites are limited in terms of both number and size, constituting a lower density scatter than is found along the creek lines (Dean-Jones 1992: 24; ERM 1999: 22–23). The majority of sites are small, with larger sites typically found in association with permanent watercourses. Reduced visibility has been proffered as an explanation for the higher number of sites and artefacts present along the more heavily eroded and less vegetated minor watercourses as compared to major creeks (Umwelt 2004: 7.7; ERM 1999: 84).



### 3.3 PAST LAND USE

Crucial for the preservation of archaeological deposits is the history of past land use in a particular area. In particular, the European history of the Hunter Valley lowlands, where the MCCO Additional Project Area is located, is a stark example of historic land mismanagement leading to wide-spread erosion as the dispersible soils were exposed to rain.

An analysis of aerial photography of the MCCO Additional Project Area 50 years ago in 1967 (see **Section 1.2** and **Figure 1-6**) shows that there is very little tree cover within the MCCO Additional Project Area and evidence of sheet wash erosion with the majority of the area impacted either by degrading or aggrading factors. The 1967 image shows de-vegetated creek lines with noticeable gully erosion within the channel (channelisation) and, in places, extensive sheet wash erosion at their margins.

Such widespread impacts have undoubtedly affected the archaeological landscape in that many tens of centimetres of topsoils have been removed from areas such as the MCCO Additional Project Area, along with any archaeological deposits they may have contained. With such widespread soil movement it is also important to remember that accumulations of artefacts that may be termed a 'site' today may have, in fact, been washed into that location during the historic period and bear no relationship to past Aboriginal occupation patterns in the area.

### 3.4 PREVIOUSLY RECORDED SITES

Due to the history of archaeological investigation in the vicinity of the MCCO Additional Project Area, there have been a number of sites recorded either within the MCCO Additional Project Area, or in close proximity. 58 sites remain extant within the MCCO Additional Project Area as one of the sites (BFC98) has been previously salvaged.

As discussed in **Section 2** and below in **Section 3.5.2.2**, the results of previous investigations would suggest that:

- The most common site type will be stone artefact sites; either low density artefact scatters or isolated finds
- Culturally modified trees will be extremely rare due to the level of historical clearing and the fact that they are a regionally rare site type
- Grinding grooves will be unlikely to occur in the MCCO Additional Project Area as the major creek lines have been subject to previous assessment and it would be expected that these site types would have already been recorded
- Other site types such as burials or stone arrangements will be very rare due to the long-term agricultural disturbances that have occurred in the MCCO Additional Project Area
- Rock shelters are possible in the west of the MCCO Additional Project Area. However, while the MCCO Additional Project Area contains five rock shelters with PAD, the veracity of there being PADs associated with these shelters will be further examined during this

investigation as the photographs tend to indicate that PADs would be unlikely at such rock shelters (see Figure 2-1).

### 3.5 LANDFORM MODELLING

The MCCO Additional Project Area is entirely contained within lower slope landforms between 280 m and 140 m in altitude (see Figure 1-5). Generally the land is sloping towards the south and is part of the Big Flat Creek catchment. In the northern and western portions of the MCCO Additional Project Area there are localised ridges with some associated steeper slopes, however, generally the MCCO Additional Project Area has a relatively gentle gradient.

Hydrological resources are generally limited to Big Flat Creek along the southern boundary of the MCCO Additional Project Area (see Figure 1-5).

As such there are a variety of topographic features within the MCCO Additional Project Area that would have encouraged past Aboriginal occupation; namely:

- The elevated sandstone landforms in the north and west of the MCCO Additional Project Area have the capability to provide rock shelters for habitation and/or ceremonial purposes
- The landforms adjacent to Big Flat Creek have the capability of providing elevated landforms adjacent to water; landforms recognised in the area as having archaeological sensitivity.

### 3.6 PREVIOUS STUDIES

#### 3.6.1 Upper Hunter Valley Aboriginal Heritage Baseline Study (ERM 2004)

ERM (2004) undertook a review of the archaeology in the Upper Hunter Valley on behalf of Upper Hunter Aboriginal Heritage Trust. Following is a number of ERM's conclusions about archaeological sites in the Upper Hunter Valley of relevance to this assessment:

- Artefact assemblages will typically be comprised of flaked stone with a component associated with the manufacture of backed artefacts. Backed artefacts typically make up less than 2 per cent (and up to 5 per cent in rare cases) of an assemblage
- Evidence of backed artefacts is generally found wherever large numbers of artefacts have been recorded
- Cores and flakes associated with backed artefact manufacture typically show evidence of platform modification to increase platform angles. This modification is sometimes referred to as faceting, and is typical of open site assemblages between Singleton and Muswellbrook
- The backed artefact component may typically include a larger proportion of asymmetric, elongate (Bondi point) forms and a smaller proportion of symmetric (geometric microlith) forms in the same assemblage

- Eloueras occur occasionally and sometimes exhibit use-wear chipping and polishing along the chord
- Artefact assemblages have, on rare occasions, included small grindstones or fragments thereof, and ground-edge hatchet heads made on flat ovate water rolled small cobbles
- Hearths, comprising tight concentrations of heat-retainer stones clearly distinguishable from the natural environment are rare
- Sites along creek lines have potential for subsurface archaeological deposit. Topsoil is often quite deep, commonly between 100 and 300 millimetres (mm)
- The small numbers of artefacts found on slopes and ridge crests generally do not allow identification of particular activities, but do provide evidence for occupation of these areas and at the very least transient movement over, and use of, all parts of the landscape
- In areas close to the Hunter River (very likely to have been the major foci of occupation) alluvial deposits may have buried sites, or periods of flooding may have eroded and displaced archaeological material. Nevertheless excavations at a number of sites indicate that high density subsurface assemblages may occur in this context
- Sites on or within colluvial deposits are also rare, however, they do occur and may represent stratified cultural deposits providing evidence of chronological change
- Archaeological sites other than artefact scatters or isolated artefacts are not common
- Quarry sites have been identified where silcrete outcrops; however, the vast majority of raw material used in the manufacture of stone artefacts would have been derived (quarried/collected) from the Hunter River
- Axe-grinding grooves often occur where suitable sandstone is located in association with water or a creek line
- Scarred trees are rare, presumably because most trees that may be old enough to have been scarred have been cleared or died naturally (and rotted away or been burnt in fires)
- Art sites, ceremonial sites or Bora grounds are also rare and are either deteriorating or can no longer be located.

### **3.6.2 Aboriginal and Historical Cultural Heritage Assessment, Mangoola Coal Continued Operations Project Pre-feasibility Study (EMM 2016)**

Based on previous reports and Aboriginal site data contained on AHIMS, the EMM 2016 study concluded that the following site characteristics are likely to occur in the MCCO Additional Project Area:

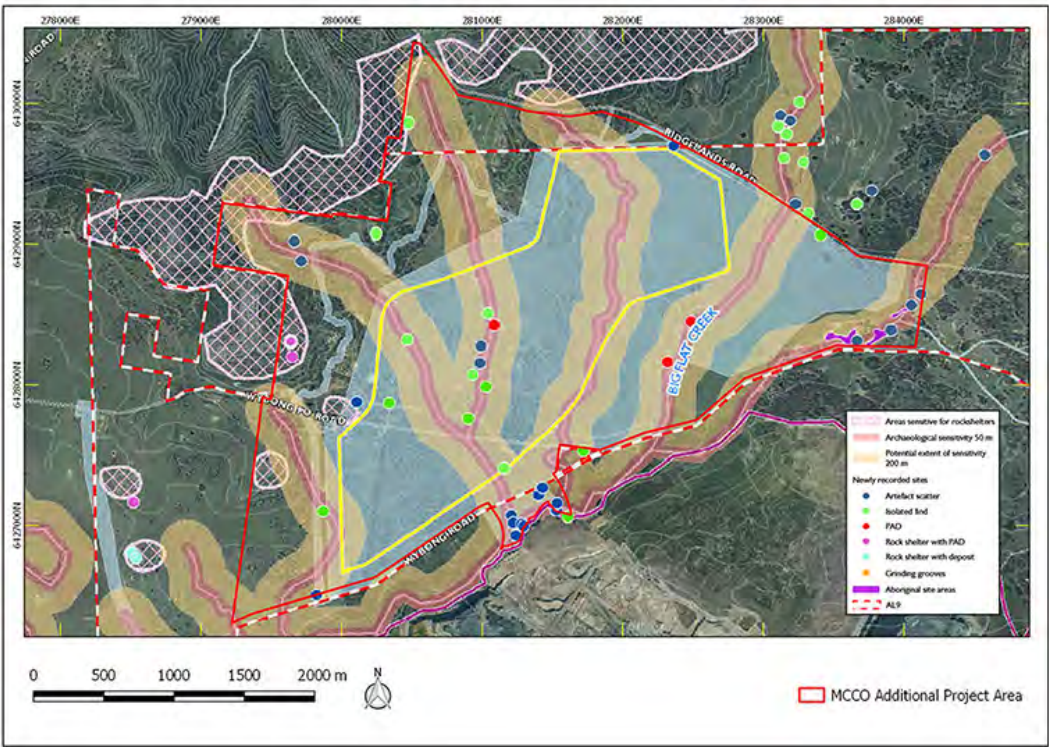
- Stone artefact sites (ie artefact scatters and isolated finds) dominate the archaeological record of this area, accounting for over 90% of all known sites in the immediate area
- Most artefact scatters contain less than 10 artefacts. Scatters with over 50 artefacts are uncommon

- Site types other than artefact scatters and isolated finds are poorly represented in the local area and restricted to rock shelters, grinding grooves and scarred trees
- The dominant raw material for stone artefact production in the area is indurated mudstone/tuff followed by silcrete. Both raw materials were sourced from gravel bars and/or terraces associated with the Hunter and/or Goulburn Rivers
- Stone artefact assemblages are dominated by flake and non-flake debitage. Retouched implements are comparatively rare in the local area
- Potential archaeological deposits (PADs) are primarily identified near watercourses on elevated, level to gently inclined landforms with good outlook over the surrounding landscape
- Rock shelters occur along the sandstone escarpments that surround the valleys below.

EMM 2016 mapped the archaeological sensitivity of the MCCO Additional Project Area and this is reproduced on **Figure 3-3**. As can be seen, the areas where EMM predict rock shelters to be located are restricted to small areas in the west of the MCCO Additional Project Area. Other than the areas of sensitivity related to this site type, other archaeologically sensitive areas are confined to the drainage lines within the MCCO Additional Project Area with the most sensitive areas being within 50 m of drainage lines and a general archaeological sensitivity within 200 m of waterways.



Figure 3-1. Archaeological sensitivity of the MCCO Additional Project Area as mapped by EMM 2016.



### 3.7 PREDICTIVE MODEL FOR THE MCCO ADDITIONAL PROJECT AREA

- **Isolated finds** may be indicative of: random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or sub-surface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
  - As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the MCCO Additional Project Area. It is noted in Section 3.6 that isolated finds are commonly recorded in the vicinity of the MCCO Additional Project Area.
- **Open artefact scatters** are here defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short or long term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools, but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

- As a majority of the MCCO Additional Project Area is within undifferentiated sloping landforms distant to permanent water, this site type is not predicted to be common. However, within 50 m of drainage features this site type is possible. The high degree of impact from past agricultural practices (see Figure 1-6) in the MCCO Additional Project Area will probably mean that the scatter has become displaced. It is likely that any sites associated with landforms within the MCCO Additional Project Area are likely to have a low artefact density and a low complexity of tool types as the sites are either one-off events or only infrequently used. It is noted that the MCCO Additional Project Area already has a number of artefact scatters recorded by investigations over the years. This leads to the conclusion that all larger sites have probably been previously recorded and that the MCCO Additional Project Area will probably not record more large sites. The evidence of past salvage activities in the vicinity of the MCCO Additional Project Area (Section 2.4) show that artefact scatters in the area tend to have a low artefact density.

- Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed as a consequence of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting or bark removal. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any particular example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently the distinction between European and Aboriginal scarred trees may not be clear.
  - Due to the near-total clearance of trees from within the MCCO Additional Project Area (see Section 1.2), this site type is not predicted to occur. It is also noted that this site type is very rare at a regional level due to historical tree clearance.
- Quarry sites and stone procurement sites typically consist of exposures of stone material where evidence for human collection, extraction and/or preliminary processing has survived. Typically these involve the extraction of siliceous or fine grained igneous and meta-sedimentary rock types for the manufacture of artefacts. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations.
  - This site type could be recorded within the MCCO Additional Project Area should suitable rock outcroppings be available.
- Burials are generally found in soft sediments such as aeolian sand, alluvial silts and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.
  - Although it is possible that this site type could be found within the MCCO Additional Project Area, it is considered a rare site type especially given the disturbance that has occurred within the MCCO Additional Project Area.
- Rock shelters were utilised in the past for both habitation and ceremonial purposes. The term 'rock shelter site' refers to rock shelters/rock overhangs that contain evidence such as stone artefacts and/or bones and/or plant remains (from meals eaten at the site) and/or hearths (fireplaces). Most rock shelter sites are secular in nature, however, those that also contain rock art or engravings are often believed to be non-secular in nature. The term 'rock art site' generally refers to Aboriginal ochre paintings or ochre or charcoal drawings located on a rock slab (generally in a sheltered place like the floor of a cave or rock shelter), boulder, cliff-face, cave or rock shelter wall or roof, or wall of a rock overhang. The majority of rock art sites are found in positions that are sheltered from the elements. This observation, however, is probably biased to some extent, as rock art would not

preserve well in open positions. Rock art sites are generally believed to be non-secular in nature.

- Rock shelters have been recorded in the MCCO Additional Project Area, however, none are associated with evidence of Aboriginal occupation. From the evidence available at a desktop level (i.e. photographs on site cards), it would appear that none of the recorded rock shelters have a morphology to enable archaeological deposits to form and be retained. As such, rock shelters are contained within the MCCO Additional Project Area but whether or not they contain evidence of Aboriginal occupation remains to be determined. No rock art sites have been recorded in the vicinity of the MCCO Additional Project Area and as the rock shelters within the MCCO Additional Project Area have been recently inspected (EMM 2016), it is unlikely that rock art sites will be discovered in the MCCO Additional Project Area.

An examination of the landforms within the MCCO Additional Project Area (Section 3.5) indicate that the northern portions of the MCCO Additional Project Area is in a degrading environment where soils have been moved from the slopes towards the creek systems in the south where aggrading landforms are evident. This would have the effect of displacing or impacting archaeological deposits had they existed in the north of the MCCO Additional Project Area. Landforms adjacent to Big Flat Creek are in an aggrading environment. This may mean that archaeological deposits may have become buried, or mixed with objects, such as artefacts, being washed down from adjoining hill slopes. Additionally, given the changes in hydrology within the area it is possible that the bed of Big Flat Creek has shifted in historic times, further impacting and disturbing the small areas of aggrading landforms adjacent to the creek.

### 3.8 RESEARCH QUESTIONS

A number of research questions can meaningfully be applied to the investigation of the MCCO Additional Project Area. These research questions include:

- What resources were available to the Aboriginal people using the MCCO Additional Project Area (food, stone and water)?
- How do the artefact assemblages from the sites along the slopes and ridge crests in the MCCO Additional Project Area differ from sites that are located along Big Flat Creek?
- What tasks were Aboriginal people undertaking at the sites?
- Did the Aboriginal people use the MCCO Additional Project Area at any particular time of the year?
- Are there hearths in the area?
- If there are hearths, do they contain remains (animal/plant) that may indicate what people were cooking/eating?
- Are there burials in the area?



- Is there evidence to suggest that Aboriginal people were using the area earlier than the mid to late Holocene?
- Can dates be obtained for the Aboriginal use of the area?
- What resources were transported to the area and where?

The survey methodology set out in **Section 4** will be framed to help answer these questions; should sites of sufficient significance be encountered within the MCCO Additional Project Area. However, based on the results of previous assessments (**Section 3.6**), it not expected that the MCCO Additional Project Area will contain sites of sufficient significance to help answer those research questions that require a robust data set.

## 4 SURVEY METHODOLOGY

### 4.1 ASSESSMENT APPROACH

The Aboriginal cultural heritage assessment of the MCCO Additional Project Area will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). The field inspection will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011).

### 4.2 BACKGROUND

The following archaeological methodology is based on the understanding that portions of the MCCO Additional Project Area have been previously surveyed and, in some areas, salvaged as a result of past archaeological assessments and works related to mining approvals. There is, therefore, significant knowledge for much of the MCCO Additional Project Area regarding the likelihood of further unidentified Aboriginal objects or sites. However, the most extensive previous survey of the MCCO Additional Project Area was the 2014 EMM survey (see Section 2.3) and this was opportunistic and took place without the assistance of the Aboriginal community. As such, while data from previous reports, site cards and permits will be used to interpret the landscape if ground surface visibility is poor, the entire MCCO Additional Project Area will be systematically surveyed by pedestrian transects to ensure that the archaeological characteristics of the MCCO Additional Project Area are understood.

All survey will be undertaken with the assistance of Registered Aboriginal Parties (RAP)/Knowledge Holder representatives. Apart from their valuable experience in recognising and recording archaeological sites, the RAP/Knowledge Holder representatives will be able to acquaint themselves with the MCCO Additional Project Area in order to inform their cultural value assessment of the MCCO Additional Project Area. Any cultural values relating to the MCCO Additional Project Area will be captured by the OzArk archaeologist (if such information is provided during the survey) and included in the ACHAR that will be developed by ACHM following the survey.

#### 4.2.1 Survey methodology

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004).

Field survey will, wherever possible, be conducted in transects of 50 m intervals (with up to six recorders spaced five metres apart). If field conditions do not allow straight transects, some areas may be investigated more opportunistically where exposures and/or vegetation allow.

If areas have significant levels of ground cover and pedestrian survey is considered by the archaeologist and RAP/Knowledge Holder representatives to yield no results, then assessment

will be made, based in part on knowledge gained from past archaeological research in the area, of the potential of the area to have Aboriginal artefacts present.

It should be noted that the aim of any archaeological survey is not to locate each and every artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within a study area are known. Therefore the aims of the survey will be to:

- Reinspect the location of all 58 previously recorded sites within the MCCO Additional Project Area so that their current condition and scientific heritage values can be assessed
- Conduct pedestrian transects across all landforms in the MCCO Additional Project Area so that their archaeological potential can be determined
- Evaluate whether the predictive model set out in Section 3.7 is valid
- Determine if the research questions set out in Section 3.8 can be answered
- Determine if any portions of the MCCO Additional Project Area require test excavation in order to understand the archaeological potential at a particular location
- Undertake sufficient assessment in order to satisfy Sections 2.2, 2.4 (as it pertains to scientific values), 2.5, 2.6, and 2.7 in the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011)
- Collecting sufficient data so that the results can be presented in an ACHAR as set out in Section 3 in the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011)
- Undertaking survey and record keeping to satisfy Requirements 1–13 of the Code of Practice.

The field assessment will be undertaken over the entire MCCO Additional Project Area and will also cover the blast assessment area that falls outside this. The primary focus of investigations within the blast assessment area will be to determine whether rock shelters will be impacted by blast related vibrations. The known rock shelters in the west of the MCCO Additional Project Area are greater than 500 m from the proposed pit shell and should not be impacted by blast vibrations.

The field assessment will also include the re-visiting and re-recording of any previously recorded sites within 100 m of the MCCO Additional Project Area to ensure that the site does not extend into areas where proposed impacts are to occur.

It is envisioned that fieldwork for the survey would be completed in two weeks by two teams of surveyors working concurrently. Each team would consist of two archaeologists and up to four RAP/Knowledge Holder representatives.

#### 4.2.2 Test excavation

It is possible that the survey may identify landforms where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, the test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.



## REFERENCES

- Aiken 1985                      Aiken, G. An Archaeological Survey of the Bayswater to Mt. Piper Transmission Line. An unpublished report to the NSW National Parks and Wildlife Service by ANU Archaeological Consultancies.
- AMBS 1997                      Australian Museum Business Services. *Archaeological test Excavations of Aboriginal Sites at Bettys Creek Mt Owen Mine, Hunter Valley, NSW, Vol. 1-4*. Report for Mt Owen Mine, BHP Coal Australia.
- Burke & Smith 2004              Burke, H. and Smith, C. 2004. *The Archaeologist's Field Handbook*, Blackwell, Oxford.
- Dean-Jones 1992                Dean-Jones, P (Resource Planning Pty Ltd). *Archaeological Report Subsurface Analysis Swamp Creek, Mount Owen Mine Site*. Report to Hunter Valley Coal Corporation Pty.
- DECCW 2010                    DECCW. 2010. *Code of Practice for the Investigation of Aboriginal Objects in New South Wales*. Department of Environment, Climate Change and Water, Sydney.
- EMM 2016                        EMM Consulting Pty Limited. *Aboriginal and Historical Cultural Heritage Assessment, Mangoola Coal Continued Operations Project Pre-feasibility Study*. Report for Glencore Coal Assets Australia.
- ERM 1999                        ERM Mitchell McCotter Pty Limited. *Ravensworth East Mine Environmental Impact Statement*. Report for Peabody Resources Limited.
- ERM 2004                        ERM Environmental Resources Management Australia Pty Ltd. *Upper Hunter Valley Aboriginal Heritage Baseline Study*. Report Prepared for the Upper Hunter Aboriginal Heritage Trust.
- OEH 2011                        Office of Environment and Heritage. 2011. *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales*. Department of Environment, Climate Change and Water, Sydney.
- Ruig 1993                        Ruig, J.L. *An Archaeological Survey of the Proposed Optic Fibre Cable Route from Manobalai to Castle Rock, Upper Hunter, NSW*. Prepared for Telecom Australia.
- Umwelt 2003                      Umwelt (Australia) Pty Limited. *Survey and Assessment of Impact on Aboriginal Cultural Heritage and Archaeological Values, Main Creek, Hunter Valley, NSW*. Report for Glennies Creek Coal Management Pty Limited.

OzArk Environmental & Heritage Management	
Umwelt 2004	Umwelt (Australia) Pty Limited. <i>Survey of Aboriginal Archaeology in the Area of the Proposed C-Pit Extension and Overburden Dump, Eastern Rail Pit, Bettys Creek Diversion Canal and Dam, and Glendell to Mount Owen Haul Road, Mount Owen Mine, near Hebdon, NSW.</i> A Report to Hunter Valley Coal Corporation.
Umwelt 2006	Umwelt (Australia) Pty Limited. <i>Aboriginal Archaeological Assessment – Anvil Hill Project.</i> Anvil Hill Project Environmental Assessment. Prepared for Centennial Hunter Pty Limited.
Umwelt 2008	Umwelt (Australia) Pty Limited. <i>Aboriginal Heritage Assessment of Proposed 66 kV Transmission Line, Denman to Mangoola Coal Mine, NSW.</i> Report for EnergyAustralia.
Umwelt 2010	Umwelt (Australia) Pty Limited. <i>Aboriginal Cultural Heritage and Archaeological Assessment – Proposed Relocation of 500kV Electricity Transmission Line, Mangoola Coal.</i> Report for Xstrata Mangoola Pty Limited and TransGrid.
Umwelt 2011	Umwelt (Australia) Pty Limited. <i>Cultural heritage works conducted under AHIP#3220/110275, Denman to Mangoola 66kV Transmission Line.</i> Report for Xstrata Mangoola Pty Limited.
Umwelt 2012	Umwelt (Australia) Pty Limited. <i>Hunter River Pipeline Aboriginal Cultural Heritage Salvage.</i> Report for Xstrata Mangoola Pty Limited.
Umwelt 2014a	Umwelt (Australia) Pty Limited. <i>Report on cultural heritage works conducted as part of PA 10_002, ETL relocation at Mangoola Coal.</i> Report for Transgrid/Mangoola Coal.
Umwelt 2014b	Umwelt (Australia) Pty Limited. <i>Mangoola Coal Aboriginal Archaeological Salvage Program.</i> Report for Mangoola Coal Operations Pty Limited.
Witter 2002	Witter, D. <i>Great Northern Coal Project Bulk Sample Pit Archaeological Survey.</i>
Aboriginal Cultural Heritage Survey Methodology: Mangoola Coal Continued Operations	
36	

## APPENDIX 2: TEST EXCAVATION METHODOLOGY



ARTEFACT RECORDED ADJACENT TO BIG FLAT CREEK DURING THE 2018 SURVEY.

### ARCHAEOLOGICAL TEST EXCAVATION METHODOLOGY

Mangoola Coal Continued Operations Project

April 2018

Prepared by  
**OzArk Environmental and Heritage Management Pty Ltd**  
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## CONTENTS

1	Introduction .....	1
1.1	Preamble .....	1
1.2	Background to the Test Excavation Program .....	1
1.3	Code requirements for the Test Excavation Program .....	2
2	The MCCO Additional Project Area .....	4
3	Background to the Test Excavation Program .....	7
3.1	Archaeological Context .....	7
3.2	Background to the Test Excavation Methodology .....	11
4	Proposed Methods .....	14
4.1	Purpose of the Test Excavation Program .....	14
4.2	Sampling Strategy .....	14
4.2.1	Sampling strategy compliance with the Code: Requirement 16 .....	16
5	References .....	19

## FIGURES

Figure 2-1.	The MCCO Additional Project Area. Indicative impacts and landscape features. ....	5
Figure 2-2.	The MCCO Additional Project Area. Landscape zones and archaeological recordings. ....	5
Figure 2-3.	The MCCO Additional Project Area overlain on a 1967 aerial image .....	6
Figure 3-1.	The MCCO Additional Project Area showing all previously recorded sites. ....	8
Figure 3-2.	View of BFC114a in 2018. ....	13

## TABLES

Table 3-1.	Details of previous salvage activities within the MCCO Additional Project Area. ....	8
Table 3-2.	Summary of manual salvage excavation at AC13. ....	9



## 1 INTRODUCTION

### 1.1 PREAMBLE

OzArk Environmental & Heritage Management (OzArk) would like to acknowledge the Traditional Owners of the area—the Wonnarua and Gomeroi peoples—and pay respect to their cultural heritage, beliefs and continuing relationship with the land.

We pay respect to the Elders, both past and present, for they hold the memories, traditions, culture and hopes of Aboriginal people in the area.

### 1.2 BACKGROUND TO THE TEST EXCAVATION PROGRAM

Mangoola Coal Mine is an open cut coal mine located approximately 20 kilometres (km) west of Muswellbrook and 10 km north of Denman in the Upper Hunter Valley of NSW. Mangoola has operated the Mangoola Coal Mine in accordance with Project Approval (PA) 06\_0014 (as modified) since mining commenced at the site in September 2010.

The Mangoola Coal Continued Operations (MCCO) Project (the MCCO Project) will allow for the continuation of mining at Mangoola Coal Mine into a new mining area to the immediate north of the existing operations. The Project will extend the life of the existing operation providing for ongoing employment opportunities for the existing Mangoola workforce.

Mangoola Coal Operations Pty Limited (the proponent) is currently in the process of preparing an Environmental Impact Statement (EIS) for the MCCO Project which involves the development of an Aboriginal and Cultural Heritage Impact Assessment (ACHA).

As part of the ACHA, OzArk have been engaged to undertake the archaeological assessment of the areas that will be potentially impacted by the MCCO Project. The surface archaeological assessment has already been completed over the majority of proposed impact areas of the MCCO Additional Project Area during February 2018. Additional surveys are planned for May 2018 for areas outside of the impact areas to complete the assessment coverage.

As a result of the surface archaeological assessment of the MCCO Additional Project Area, one location has been identified that requires subsurface test excavations in order to determine the integrity and/or extent of sites recorded during the field assessment.

This document sets out the proposed methodology for the test excavation and follows the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* under Part 6 *National Parks and Wildlife Act 1974* (NPW Act; Code of Practice).

### 1.3 CODE REQUIREMENTS FOR THE TEST EXCAVATION PROGRAM

The Code of Practice lists a number of requirements pertaining to test excavation. These requirements are enumerated below and further information pertaining to these requirements follow in subsequent sections of this document.

**Requirement 14** (Test excavation which is not excluded from the definition of harm):

*Sub-surface investigation will not be excluded from harm where they are carried out in the following areas:*

- *in or within 50m of an area where burial sites are known or are likely to exist*
- *in or within 50m of a declared Aboriginal place*
- *in or within 50m of a rock shelter, shell midden or earth mound*
- *in areas known or suspected to be Aboriginal missions or previous Aboriginal reserves or institutes*
- *in areas known or suspected to be conflict or contact sites.*
  - The test excavation location is not located within the vicinity of the items listed under Requirement 14 of the Code.
- **Requirement 15a** (Consultation): As the proposed archaeological test excavation program is part of the MCCO Project, consultation has been ongoing with the Registered Aboriginal Parties (RAPs) and has been completed to the stage described in subclause 80C (6) of the *National Parks and Wildlife Regulation 2009* (NPW Regulation).
- **Requirement 15b** (Test excavation sampling strategy): This document sets out the proposed sampling strategy for the test excavation program.
- **Requirement 15c** (Notification):
  - *the location of the proposed test excavation and the subject area.*
    - This document sets out the proposed location of the test excavation program.
  - *the name and contact details of the legal entity with overall responsibility for the project.*
    - Mangoola Coal Operations Pty Limited, PO Box 495. MUSWELLBROOK NSW 2333
  - *the name and contact details of the person who will be carrying out the test excavations where this is different to the legal entity with overall responsibility for the project.*
    - OzArk Environmental & Heritage Management, 145 Wingewarra St, DUBBO, NSW, 2830

- *the proposed date of commencement, and estimated date of completion, of the test excavations.*

- Anticipated Commencement: 15/05/18

- Anticipated Completion: 15/05/18

Weather permitting, the projected period for the excavation is one day.

- *the location of the temporary storage location for any Aboriginal objects uncovered during the test excavations.*

- Aboriginal objects recovered during the excavations will be temporarily housed in a locked container at 21 Agnes Ave, CRESTWOOD, NSW, 2620 (OzArk branch office) for analysis. Following analysis the artefacts will be stored in a locked container at the Mangoola Coal Mine until such time as a Care Agreement is reached between an individual or organisation and the Office of Environment and Heritage (OEH). If no analysis is required (i.e. all analysis is completed in the field), the artefacts will go directly to a locked container at Mangoola Coal Mine.

- **Requirement 16a** (Test Excavation): The test excavation program will adhere to Requirement 16a of the Code as set out in this document (see **Section 4.2**).
- **Requirement 16b** (Objects recovered during test excavations): Aboriginal objects recovered during the excavations will be temporarily housed in a locked container at 21 Agnes Ave, CRESTWOOD, NSW, 2620 (OzArk branch office) as the objects undergo analysis. Following analysis they will be stored in a locked container at Mangoola Coal Mine. If no analysis is required (i.e. all analysis is completed in the field), the artefacts will go directly to a locked container at Mangoola Coal Mine until such time as a Care Agreement is reached between an individual or organisation and OEH.
- **Requirement 17** (When to stop test excavations): the test excavation program will adhere to the requirements set out in the Code: *Any test excavation carried out under this requirement will cease when suspected human remains area encountered; or when enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.*

The test excavation methodology for the Project was written by Ben Churcher (Principal Archaeologist, OzArk)

## 2 THE MCCO ADDITIONAL PROJECT AREA

Figure 2-1 shows the proposed MCCO Additional Project Area and the main impacts that are proposed for this area. The MCCO Additional Project Area covers approximately 1050 hectares (ha) and is the area in which all proposed impacts associated with the Project will be contained within (impact footprint). For the purposes of this investigation it is assumed (as a worst case) that all areas within the MCCO Additional Project Area will be impacted by the proposed Project apart from approximately 138 ha located to the east of Big Flat Creek where no Project elements are proposed.

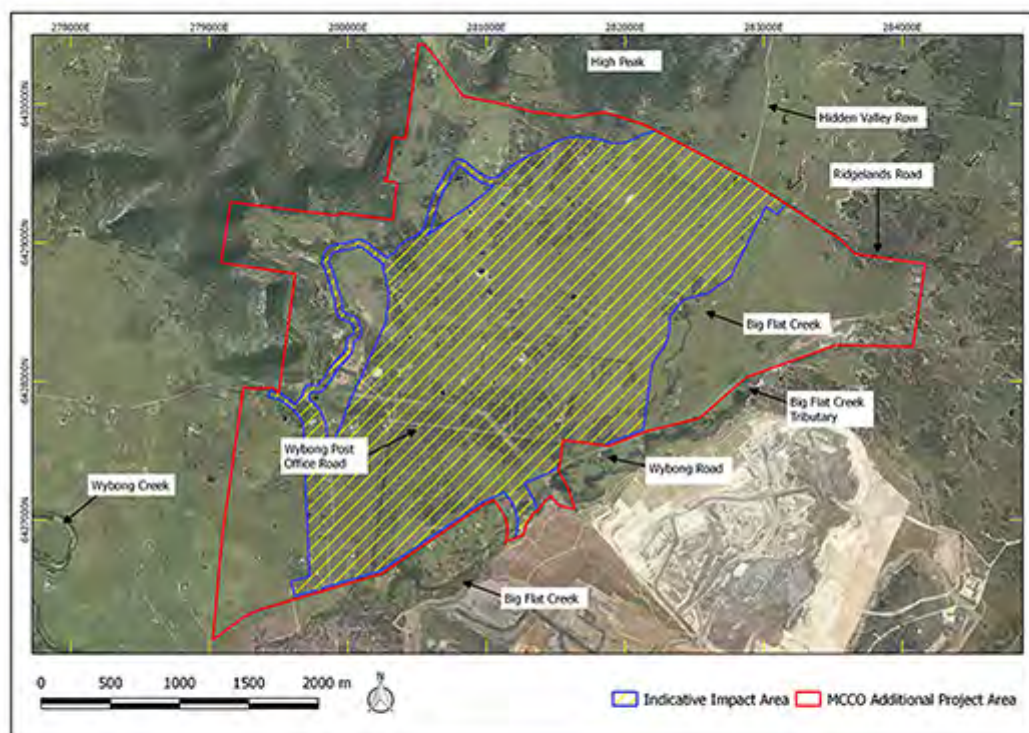
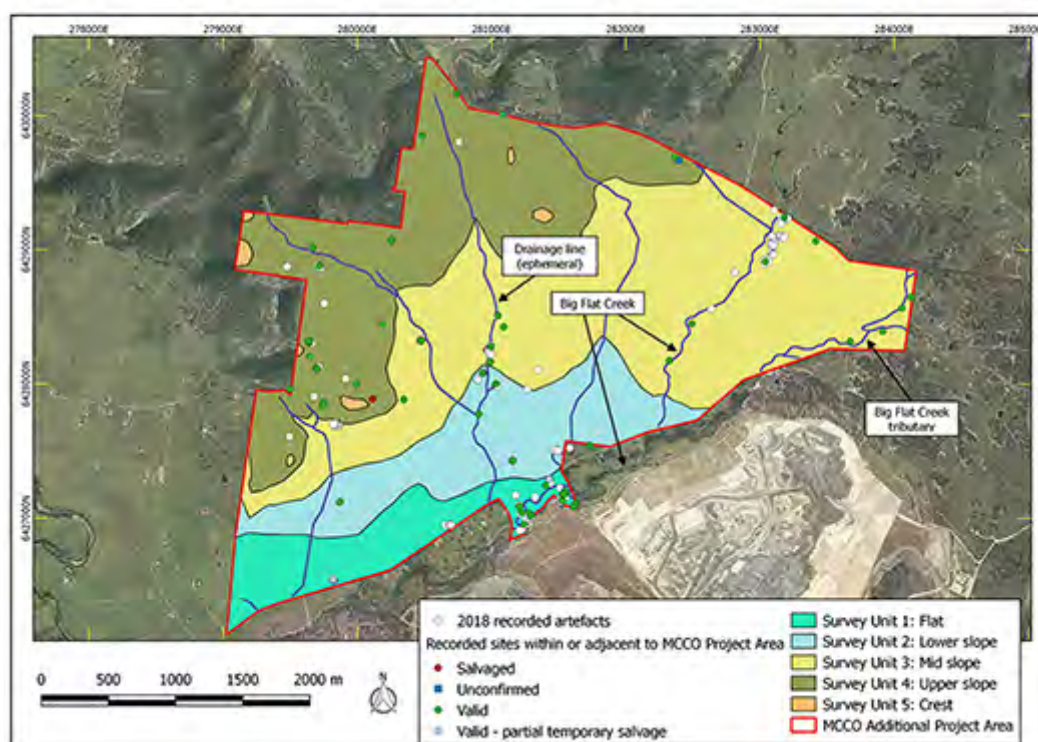
For convenience, the MCCO Additional Project Area can be divided into two main areas: hilly terrain and flat terrain. These contiguous areas can be briefly characterised as follows:

- **Hilly terrain:** Approximately 335 ha or 32 per cent of the MCCO Additional Project Area consists mostly of elevated landforms (upper slopes and crests) and is predominantly located in the west of the Study Area. This topography contains steep slopes in places but is more generally characterised by moderate slopes and ridge lines. This region currently supports an open woodland of regenerated trees with very few mature trees. Rock outcrops are common and in places, particularly in the far west, the lower reaches of escarpments are included in the MCCO Additional Project Area. Soils tend to be very thin due to soil loss when this area was historically cleared of vegetation.
- **Flat terrain:** Approximately 715 ha or 68 per cent of the MCCO Additional Project Area consists of flat terrain or gently undulating terrain (flat, lower slope and mid slope landform units). This terrain contains the only named waterway within the MCCO Additional Project Area: Big Flat Creek. However, Big Flat Creek is not a developed waterway in the MCCO Additional Project Area and there are few landforms that could be characterised as 'drainage landforms' (i.e. creek flats/floodplains). The majority of this landscape zone is currently cleared and either consists of grass paddocks or small stands of regenerating woodland. Soil depths are variable and it is only in the south of the MCCO Additional Project Area adjacent to Big Flat Creek where aggrading conditions have allowed some soil depth to accumulate.

Figure 2-2 shows the major topographic zones of the MCCO Additional Project Area overlain with the results of archaeological investigations in the area including the current 2018 assessment. This figure indicates:

- The majority of Aboriginal sites/artefacts have been recorded in close association with waterways;
- In flat, lower slope or mid slope landforms, sites/artefacts are rarely recorded away from waterways; and
- Upper slope landforms do record a low density and diffuse scatter of sites/artefacts, presumably associated with the ecotone or a transition area where two ecological communities—flat landforms to the east, escarpment landforms to the west—meet and interact.



**Figure 2-1. The MCCO Additional Project Area. Indicative impacts and landscape features.****Figure 2-2. The MCCO Additional Project Area. Landscape zones and archaeological recordings.**

The MCCO Additional Project Area has been affected by a high degree of disturbance over the past 200 years, primarily as a result of the agricultural history of the region.

Overlaying the MCCO Additional Project Area on a 1967 aerial (Figure 2-3) displays the following landscape features:

- Extensive vegetation clearing has occurred;
- Stands of vegetation are extant only in isolated pockets in the west of the MCCO Additional Project Area;
- Big Flat Creek displays a channel morphology and signs of extensive erosion; and
- There are large areas of sheetwash exposures in the north of the MCCO Additional Project Area.

Figure 2-3. The MCCO Additional Project Area overlain on a 1967 aerial image.



### 3 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The test excavation program follows an extensive program of surface survey across areas that will be potentially impacted by the MCCO Project. The Aboriginal heritage surface survey commenced on 5 February 2018 and included 10 days of assessment. The assessment consisted of full pedestrian assessment of potentially impacted areas.

The results of the Aboriginal heritage assessment will be contained in the forthcoming ACHA that will provide full details of all sites recorded.

The results of the current proposed test excavation will also form part of the ACHA and will help inform the mitigation and management options for the MCCO Project.

#### 3.1 ARCHAEOLOGICAL CONTEXT

The MCCO Additional Project Area has been subject to some Aboriginal archaeological survey and assessment in the recent past resulting in the recording of multiple Aboriginal sites.

Based on current information from the OEH managed Aboriginal Heritage Information Management System (AHIMS) database, 58 Aboriginal sites have been recorded within or immediately adjacent to the MCCO Additional Project Area. This total comprises 26 artefact scatters, 22 isolated finds, three potential archaeological deposit (PAD) and two artefact scatters with PAD and five rock shelters with PAD.

Of these 58 sites, six have not been registered with AHIMS, one has been salvaged, two have been partially salvaged and one is 'unconfirmed' as the site data is ambiguous (**Figure 3-1**).

During the course of the survey all valid and partially valid sites were revisited and the majority recorded currently visible artefacts. This is likely due to the fact that the majority of sites were recorded within the past few years and therefore there has been less time for natural impacts to occur at the sites. At those sites where there were no visible surface artefacts, possible explanations include:

- The sites have a low artefact density and it is therefore easier to understand that a low number of artefacts could be obscured whereas larger, more-dense artefact sites would retain a surface manifestation; and
- The high degree of water movement in some areas that has probably removed artefacts from their find location. This reinforces how dynamic any landscape is and how difficult it is to re-locate low density sites after a passage of time.



Figure 3-1. The MCCO Additional Project Area showing all previously recorded sites.



There have not been any previous subsurface investigations within the MCCO Additional Project Area and the small amount of archaeological salvage that has occurred has been restricted to surface collections of visible artefacts (Table 3-1). As such, very little information on the nature of subsurface archaeological deposits within the MCCO Additional Project Area is known.

Table 3-1. Details of previous salvage activities within the MCCO Additional Project Area.

AHIMS ID	Site name	Mangoola Coal status	Notes
37-2-4109	BFC96	Valid - partial temporary salvage	Umwelt 2014b: 5 records that nine artefacts were collected, stored for safekeeping, and returned to the site on 31/7/14 during works to dismantle the 500kV electricity line approved under PA 10_002. Table 3.1 in Umwelt 2014b records that there were eleven artefacts at BFC96 that were managed in this way. Whether nine or eleven, the site has been disturbed by this activity but all artefacts are back at their original find location. There are no details of the artefacts managed this way at BFC96 in Umwelt 2014b. The 2018 inspection recorded a number of surface artefacts at the site.
37-2-4490	BFC98	Salvaged	BFC98 was permanently salvaged (surface collection) during works to dismantle the 500kV electricity line approved under PA 10_002. The recorded artefact at BFC98 is provided in Umwelt 2014b: Appendix 1 – a quartzite pebble core. The 2018 inspection recorded no further surface artefacts at the site.
37-2-4563	BFC102	Valid - partial temporary salvage	Umwelt 2014b: 12 notes that the site was recorded as a result of inspections around T28 during works to dismantle the 500kV electricity line approved under PA 10_002. The report and the site card do not mention any impact (i.e. excavation) at the site. AHIMS records the site as 'valid'. However, in Umwelt 2014b: Appendix 1 there is a record of five artefacts being recorded in excavation squares at particular spit depths. This implies that these artefacts were recovered from a cultural salvage.



AHIMS ID	Site name	Mangoola Coal status	Notes
			Artefacts recorded were four flakes and one broken flake manufactured from a range of raw materials: mudstone (n=2), silcrete (n=1), chert (n=1) and quartz (n=1). Therefore the data held by Mangoola Coal is correct and BFC102 is a 'partially valid' site. The 2018 inspection recorded a number of surface artefacts at the site.

An examination of Umwelt's investigations at site AC13 (37-2-2253) located approximately 3.5 km south of the MCCO Additional Project Area (Umwelt 2014a) can be examined to gain an appreciation of previous archaeological investigations that included a large subsurface component.

During late 2008, a total of over 250 square metres (surface area) was excavated at AC13 during a test excavation program located on either side of Anvil Creek. These investigations resulted in the recovery of over 9,000 artefacts. Artefact densities were variable, ranging from a low of 16.5 artefacts per surface square metre to a high of 53 artefacts per surface square metre. Artefact distribution within each area was also variable, with some clustering of artefacts within adjoining squares, possibly indicating the presence of some activity areas. During sub-surface investigations, it became apparent that geomorphic factors heavily influenced the nature of deposits, with clear evidence of both recent deposition of alluvial sediments and earlier deposition of point bar/channel deposits such that they have had time to form an A1/A2 soil profile that has subsequently eroded. The inference being that recorded artefacts were subject to a degree of water transport. These artefacts may represent a mix of those that have been transported relatively long distances from their place of initial deposition (and therefore have lost all context) and those that have only travelled relatively short distances (and therefore may retain association with artefacts from related events). Umwelt concluded that all excavations within site AC13 reflected the statement by geomorphologist Peter Mitchell that the '*artefacts are confined to a bio-mantle, none of them can be placed in a reliable temporal context and no material suitable for dating has been recovered*'.

Following further discussions and site visits, it was decided that salvage excavations should occur at six locations at AC13. This resulted in the excavation of 245.5 square metres and the recovery of a further 8,687 artefacts (Table 3-2).

**Table 3-2. Summary of manual salvage excavation at AC13.**

Excavation area	Square metres excavated	Maximum depth of deposits (cm)	Notes
Excavation Area 37	71	3.5–16	A total of 3,062 artefacts were recovered, with the majority of these present within spit 2, which was the average maximum depth of excavation within this area. The distribution of artefacts was continuous across the excavation area, with some notable increases in artefact concentration associated with some squares.
Excavation Area 46	20	2–6	A total of 345 artefacts were recovered from this area, with the majority located in Spit 1. This reflects the shallow depth of remnant soil profile within this

Excavation area	Square metres excavated	Maximum depth of deposits (cm)	Notes
			excavation area rather than any level of stratigraphic separation. There is a small concentration of artefacts that peaked in square Y which is surrounded by depressions within the B soil horizon associated with former tree roots, which may in part explain this concentration.
Excavation Areas 47 and 48	32.5	4–16	A total of 535 artefacts were recovered from Areas 47 and 48, with over half of these located within square 48F. There were no anomalies (such as depressions in the B horizon or former tree roots) that could account for increased accumulation of artefacts within this square. With the exception of the expanded test pit 48, all other squares within this area contained relatively low numbers of artefacts.
Excavation Area 113	10	4–120	A total of 170 artefacts were recovered from this excavation area, with no squares containing more than 35 artefacts.
Excavation Area 121	76	3–36	The soil profile at squares EB, EC, EG and EI showed that a deep, infilled former channel of Anvil Creek passed through Excavation Area 121. It was also identified that the deposits within Area 121 were alluvial in nature (although had aged sufficiently in sections to form a duplex soil profile) and that the majority of artefacts within this excavation area had been subject to some level of alluvial transport.  A total of 4,028 artefacts were recovered from this area, with the majority of these artefacts located within Spits 1 and 2 (up to 10 centimetres in depth) but smaller numbers of artefacts present through to Spit 5.
Excavation Area 151	36	7–50	A total of 892 artefacts were recovered from this excavation area, with the majority of these artefacts located in spits 2 and 3 (up to 15 centimetres in depth). Almost one quarter of recovered artefacts were located within square F, which was not associated with any notable depressions or variations within the soil profile.

The archaeological investigations at AC13 suggested:

- AC13 is associated with a section of Anvil Creek that has been significantly impacted by post-European land use. Despite this, there is evidence that a 'chain-of-ponds' formation existed in this section of Anvil Creek and thus water resources would have been available for longer periods of time. This is further supported by the presence of two former wells, which indicates that water resources in this area were sufficient that non-Aboriginal people justified the investment of time and resources in the excavation of wells;
- The section of Anvil Creek containing AC13 was relatively dynamic, with clear evidence of both recent deposition of alluvial sediments and earlier deposition of point bar/channel deposits such that they have had time to form an A1/A2 soil profile that has subsequently eroded;
- The test excavation program indicated that the sub-surface distribution of artefacts was not continuous, with artefacts absent from over 50 per cent of test pits and only eight test pits containing more than 10 artefacts;
- Artefact distribution within the areas subject to further salvage excavation was also variable, with some clustering of artefacts within adjoining squares, possibly indicating the presence of some activity areas; and

- Artefact densities were also variable between excavation areas.

As a result of these investigations, the following broad conclusions of the archaeological characteristics at Mangoola can be made:

- Archaeological deposits at Mangoola are shallow, probably due to soil loss following vegetation removal during the early agricultural phases of the location's history;
- There was evidence at AC13 of disruption to archaeological deposits from 'water movement' to the extent that little confidence can be placed as to the original depositional location of artefacts and this is likely to be replicated elsewhere at Mangoola; and
- While large numbers of artefacts were recorded at AC13, this probably represents a concentration of artefacts that have been washed into the area in the past 200 years, rather than representing an *in situ* site with a high artefact density.

### 3.2 BACKGROUND TO THE TEST EXCAVATION METHODOLOGY

The 2018 OzArk assessment of the MCCO Additional Project Area has reached the following preliminary conclusions at this stage of the archaeological investigations:

- There are few landforms within the MCCO Additional Project Area that displayed high archaeological potential because there are only limited areas associated with permanent waterways;
- Previous archaeological assessments, as well as the 2018 assessment, concluded that landforms located away from Big Flat Creek are likely to only record sites with a low artefact density;
- Sites within the MCCO Additional Project Area are likely to be displaced due to the area's agricultural history that has encouraged erosion leading to degradation in some areas, and aggradation in others; and
- The 2018 assessment occurred during a very dry period that provided excellent ground surface visibility across most of the MCCO Additional Project Area. The lack of ground cover vastly increased the survey efficacy of the assessment and gave increased confidence in determinations of the archaeological potential of landforms.

As a result, locations initially considered for the test excavation program were limited to:

- Five previously recorded rock shelters with PAD where no surface artefacts were recorded in 2018;
- Three previously recorded locations where the site designation is PAD and where no surface artefacts were recorded in 2018; and
- Areas along Big Flat Creek where the Big Flat Creek overpass is proposed to be located.

However, most of these locations have not been included in the test excavation program for the following reasons:

- Requirement 14 of the Code of Practice states that test excavation is not permissible 'in or within 50 m of a rock shelter, shell midden or earth mound' (Section 1.3). As such, while it would be of archaeological interest to precisely determine the nature of the deposits within these recorded shelters, any such investigation, if required, will have to occur under an approved *Aboriginal Cultural Heritage Management Plan* (ACHMP) following Project approval, should this occur. Further investigation would be required if it is considered that these shelters could be impacted by indirect impacts such as vibrations from blasting;
- Two of the three previously recorded PADs within the MCCO Additional Project Area are located outside of areas where impacts are currently planned. As these locations are unlikely to be impacted, it was decided that it would be best practice not to impact these locations unnecessarily; and
- The areas along Big Flat Creek where the Big Flat Creek overpass is proposed to be located crosses an area that has been identified in the existing Mangoola ACHMP as an Aboriginal Cultural Heritage Offset Area (ACHOA). Until approval for the overpass corridor to be constructed in this portion of the ACHOA is consented, it is felt that it would be best practice not to disturb these locations at this stage. Further consideration and recommendations in this regard will be included in the draft ACHA for consultation with the MCCO Project RAPs and Knowledge Holders.

While the rock shelters and areas within the ACHOA are excluded from the test excavation program, they will be further investigated; but only at a time following Project approval, should this occur. Any requirements for further excavations will be described in detail in the updated ACHMP to be developed for the MCCO Project and prepared in consultation with the RAPs, knowledge holders and OEH.

As such, there is only one location remaining that requires test excavation: BFC114a (37-2-5429, 37-3-5389<sup>1</sup>). This site, registered with AHIMS as a PAD, recorded no surface artefacts at the time of the 2018 survey and therefore the precise nature of this site is unknown (Figure 3-2). It is also located within the MCCO Project Disturbance Boundary and would be impacted should the Project be approved.

<sup>1</sup> Many sites in the MCCO Additional Project Area have duplicate AHIMS numbers as they have been entered into AHIMS twice. OzArk is trying to get this rectified with AHIMS.



**Figure 3-2. View of BFC114a in 2018.**



## 4 PROPOSED METHODS

### 4.1 PURPOSE OF THE TEST EXCAVATION PROGRAM

The purpose of the test excavation program is to understand more completely the nature of the sub-surface material within the proposed Disturbance Boundary. Data obtained from the test excavation program will inform the mitigation and management options in the forthcoming ACHA.

The aims are therefore to:

1. Establish the extent and nature the of sub-surface archaeological deposits at the site;
2. Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the site; and
3. Develop, in consultation with the RAPs, an informed management strategy for the site to assist in mitigating the proposed impacts.

Excavations undertaken as per the Code do not require an Aboriginal Heritage Impact Permit (AHIP) under the NPW Act.

### 4.2 SAMPLING STRATEGY

The excavation program will be undertaken by archaeologists and representatives of RAPs and will include the following aspects:

1. One area will be investigated by the test excavation program: site BFC114a.
2. The location for the proposed test excavation program is provided in **Figure 3-1**.
3. Prior to any excavation, the site will be recorded via digital photography.
4. A minimum of six 0.5m x 0.5m excavation squares will be excavated although the methodology allows for additional squares to be excavated should the results indicate that this is warranted. The excavation squares will be positioned so as a valid sample of the impact area is obtained so that the archaeological values of the area can be characterised.
5. Initial excavation squares will be excavated in 5cm spits to determine whether archaeological stratigraphy is present. If not, spit size will be increased to 10cm. If archaeological stratigraphy is present, this will be used rather than spits.
6. The excavated material from all pits will be sieved on site using dry sieving through nested sieves of 6–8mm and 2.5–3.5mm mesh (which is considered to satisfy the 5mm aperture wire-mesh sieve requirement).
7. Each excavator (by hand) will be responsible for sieving the deposit from their excavation square, retrieving the artefacts and, in conjunction with the supervising archaeologist, correctly recording their provenance. There could be some room for assistance with the

sieving but a self-contained approach is preferable. Deposits will be sieved on to tarpaulins and the spoil used to backfill the excavation square.

8. A standard excavation recording form will be used for each excavation square. Details will include; date, site recorder, spit number and depth, description of finds, description of soil, sketch plan of excavation (if relevant to show structure), end of spit levels, soil pH (when necessary or appropriate) and a bucket tally.
9. It is envisioned that the excavation crew will consist of two archaeologists and four cultural heritage field workers. The excavator of each excavation square, in conjunction with the supervising archaeologist, will be responsible for ensuring any forms are correctly completed. It will be the site archaeologist's responsibility to perform all photographic tasks, undertake any planning and section drawing if required and to ensure that a correct location of each excavation square is maintained.
10. Given that the work will be reasonably physical, all persons participating on the test excavation program should be aware of this and be 'fit for work'.
11. If intact archaeological deposits or archaeological features are encountered, then additional archaeological excavation squares may be excavated to ensure documentation of any features and/or retrieval of artefacts and other relevant archaeological material. A feature would include a high density of artefacts within a square, or a square containing rare or unusual artefacts (such as artefacts constructed from a stone type rarely represented in the area or less-common tool forms such as ground edge axes, hammerstones etc), or other signs of human occupation i.e. ground ovens/hearths or charcoal concentrations.
12. If appropriate (i.e. intact archaeological stratigraphy is recorded) section drawings will be completed for appropriate excavation square. If no archaeological stratigraphy is recorded then digital photographs shall be taken of a representative section of each excavation square and a suitably representative drawing made of the excavation square section to show the soil profile.
13. Analysis of all excavated lithics will be made in order to determine the site's characteristics and to enable the site to be compared with other sites in the region. Analysis will also assist in determining what type of activities the Aboriginal people carried out at the site and their relationship with local resources (fauna, flora, water and stone). All artefacts will be analysed and selectively photographed. If charcoal from a secure context is obtained, it may be sent to a laboratory for C14 dating (subject to proponent's agreement).
14. Select faunal remains, if recovered, will be analysed by a fauna specialist. Remnant shell and bone fragments may assist in determining what foods Aboriginal people may have eaten at the specific site and may elucidate possible foraging strategies. In conjunction with

*in situ* stone tools, bone/shell fragments may also provide evidence of specific usage of stone tools for food processing.

15. Artefacts will remain in the care of OzArk until such time as the analysis is complete. Every effort will be made to analyse artefacts on-site to ensure that the artefacts do not have to leave the Mangoola Coal Mine. However, in the case of large artefact numbers or artefacts requiring further research, it may be necessary to take artefacts off-site. If taken off-site, the artefacts would be the responsibility of OzArk and every effort would be made to return all artefacts to the Mangoola Coal Mine as quickly as is possible. At the completion of analysis (whether on-site or off-site) artefacts will be returned to the Mangoola Coal Mine where they will be kept in a locked location until point 17 below is enacted.
16. The results of the test excavation program will inform the forthcoming ACHA. Excavation results will be used to advise further courses of action in relation to the management and mitigation options for the MCCO Project.
17. Once all salvage activities for the MCCO Project are complete (should the MCCO Project be approved), artefacts will be amalgamated and their ultimate fate will be subject to a Care agreement between an individual or organisation and OEH.

#### **4.2.1 Sampling strategy compliance with the Code: Requirement 16**

1 *Test excavation units must be placed on a systematic grid appropriate to the scale of the area—either PAD or site—being investigated e.g. 10m intervals, 20m intervals, or other justifiable and regular spacing.*

- The sampling strategy outlined in **Section 4.2** complies with this requirement.

2 *Any test excavation point must be separated by at least 5m.*

- The sampling strategy outlined in **Section 4.2** complies with this requirement. It should be noted that while the initial transect will have 10m intervals, the Code allows expansion around pits displaying notable concentrations of artefacts (i.e. more than 60 artefacts per square metre) or archaeological features. These 'expansions' are limited to a maximum area of 3m<sup>2</sup>.

3 *Test excavations units must be excavated using hand tools only.*

- The sampling strategy outlined in **Section 4.2** complies with this requirement.

4 *Test excavations must be excavated in 0.5m x 0.5m units.*

- The sampling strategy outlined in **Section 4.2** complies with this requirement.

5 *Test excavations units may be combined and excavated as necessary to understand the site characteristics, however:*



*i) the maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3m<sup>2</sup>;*

- The sampling strategy outlined in **Section 4.2** complies with this requirement.

*ii) the maximum surface area of all test excavation units must be no greater than 0.5% of the area—either PAD or site—being investigated.*

- The number and size of test excavations undertaken as part of this program will be managed to ensure that this requirements is satisfied.

**6** *Where the 0.5m x 0.5m excavation unit is greater than 0.5% of the area then point 5 (ii) (above) does not apply.*

- Not applicable. As the potential archaeological deposit is spatially large, less than 0.5% of the known potential archaeological deposits dimensions will be investigated.

**7** *The first excavation unit must be excavated and documented in 5cm spits at each area—either PAD or site—being investigated. Based on the evidence of the first excavation unit, 10cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.*

- Complies. See in **Section 4.2** point 5.

**8** *All material excavated from the test excavation units must be sieved using a 5mm aperture wire-mesh sieve.*

- Complies. See in **Section 4.2** point 6.

**9** *Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.*

- This requirement will be fulfilled in the field and all excavation squares will be excavated to the B-Horizon basal clays. To ensure that, as suspected, these basal clays are culturally sterile, several deeper probes in each excavation area will be excavated into these clays to ensure that they are, in fact, culturally sterile.

**11** *Photographic and scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects must be made for each single excavation point.*

- Complies. See in **Section 4.2** points 8, 9, 12, 13 and 14.

**12** *Test excavations units must be backfilled as soon as practicable.*

- Complies. See in **Section 4.2** point 7.

**13** *Following test excavation, an Aboriginal Site Impact Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each AHIMS site that has been the subject of test excavation in accordance with the requirements of the Code.*

- It will be the responsibility of OzArk to ensure that this requirement is met.

## 5 REFERENCES

- Umwelt 2014a                      Umwelt (Australia) Pty Ltd. *Mangoola Coal Aboriginal Archaeological Salvage Program*. Report for Mangoola Coal.
- Umwelt 2014b                      Umwelt (Australia) Pty Ltd. *Report on Cultural Heritage works conducted as part of PA 10\_002, ETL Relocation at Mangoola Coal*. Report for TransGrid/Mangoola Coal.

## APPENDIX 3: SURVEY UPDATE

### MANGOOLA COAL CONTINUED OPERATIONS

#### PRELIMINARY ARCHAEOLOGICAL ASSESSMENT SUMMARY



A RETOUCED CHERT FLAKE RECORDED ALONG BIG FLAT CREEK.

The archaeological survey of all areas likely to be impacted by the proposed Mangoola Coal Continued Operations (MCCO) Project was successfully completed from 5 to 16 February 2018.

The following summary is designed to inform all Registered Aboriginal Parties (RAPs) and Knowledge Holders of the preliminary results of the two week survey. Precise detail on the location and nature of recorded archaeological sites will be included in the draft archaeological report.

The survey area was assessed by two independent teams, each consisting of two archaeologists from OzArk Environmental & Heritage Management and up to four representatives of the RAPs/Knowledge Holders. The weather for the survey was fine and hot. The prolonged dry period preceding the survey provided the teams with excellent ground surface visibility (**Figure 1**).



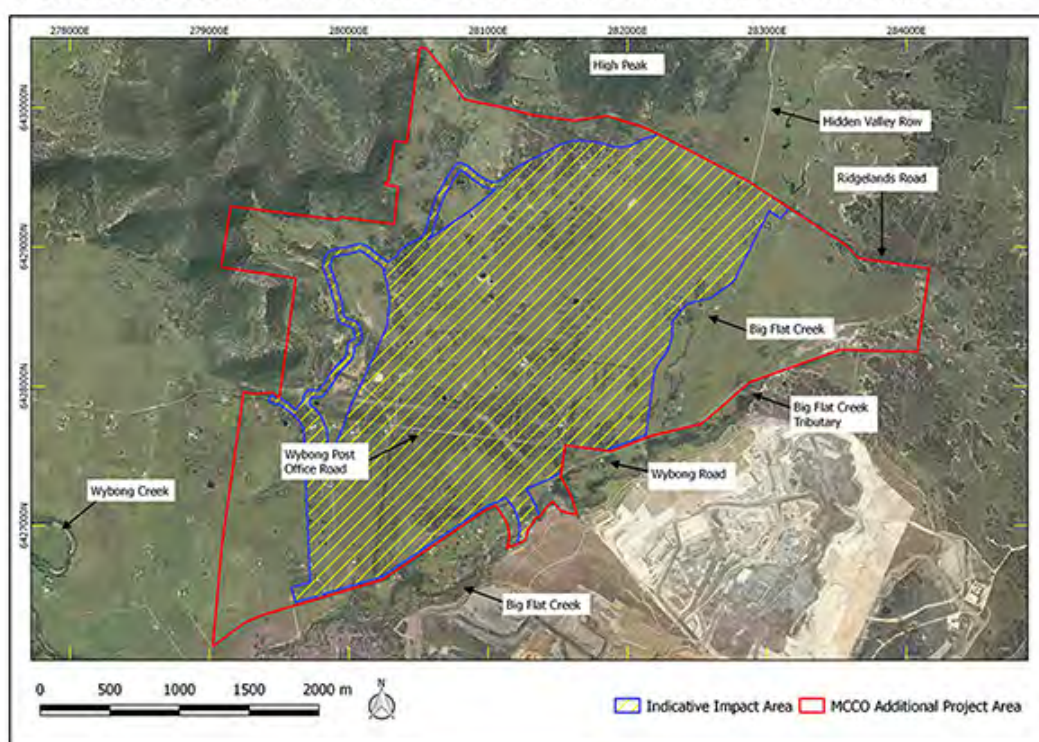
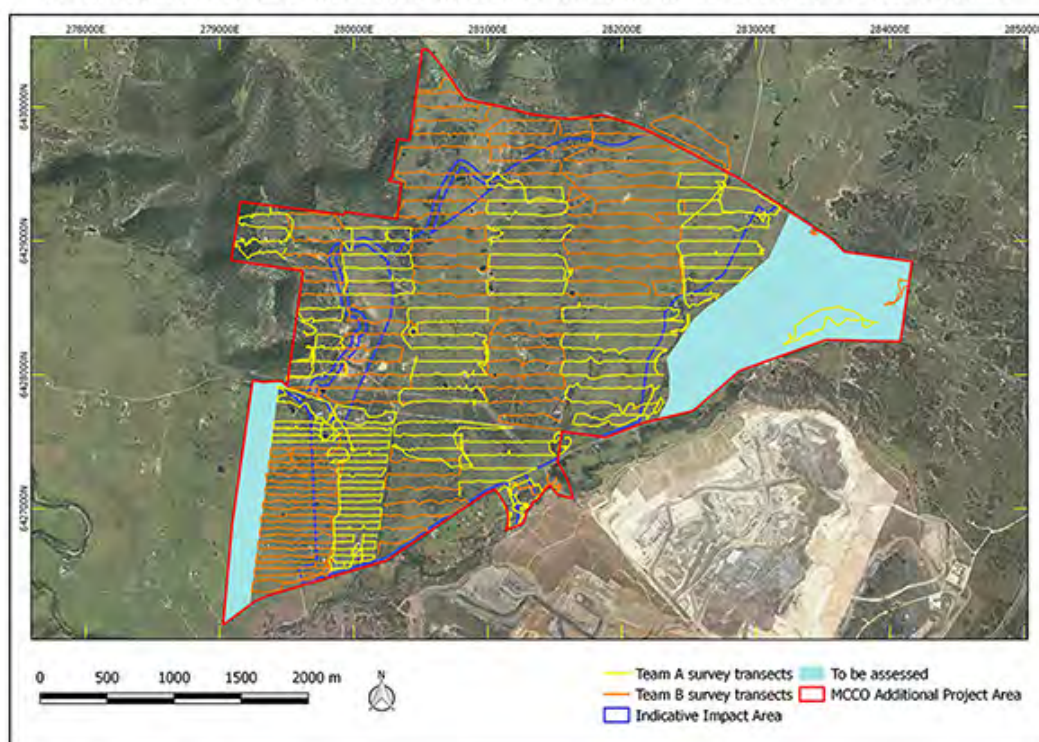
**FIGURE 1**

A TYPICAL SCENE  
FROM THE SURVEY  
SHOWING  
SURVEYORS  
TRAVERSING  
GENERALLY FLAT,  
PARCHED,  
LANDFORMS WITH  
EXCELLENT GROUND  
SURFACE VISIBILITY.

All disturbance arising from the MCCO Project will be located to the west of Big Flat Creek (Figure 2). The major components of the MCCO Project include an open cut pit (Proposed Additional Mining Area), overburden emplacement area, soil stockpiles, drainage and water management infrastructure, road realignment and an overpass across Big Flat Creek.

The February survey concentrated on landforms to the north and west of Big Flat Creek where the MCCO Project disturbance will be located (Figure 3). To the east of Big Flat Creek, approximately 126 hectares remains unassessed and approximately 35 hectares remain unassessed in the west of the MCCO Additional Project Area (Figure 4). These areas will be subject to survey in May 2018 so that the entirety of the MCCO Additional Project Area is fully assessed.

The survey began in the southwest corner of the MCCO Additional Project Area and was undertaken in transects spaced 50 metres apart. Due to the nature of the landforms (generally flat landforms distant to permanent water), as well as the excellent ground surface visibility, it was decided to increase the transect spacing to a 100 metres for the remainder of the survey. With up to six surveyors in each team spaced 10–15 metres apart, each transect covered approximately 100 metres, and as a result, the survey area was assessed in detail.

**FIGURE 2. AERIAL SHOWING THE INDICATIVE IMPACT AREA WITHIN THE MCCO ADDITIONAL PROJECT AREA.****FIGURE 3. AERIAL SHOWING THE SURVEY TRANSECTS WITHIN THE MCCO ADDITIONAL PROJECT AREA.**



### Summary of survey results

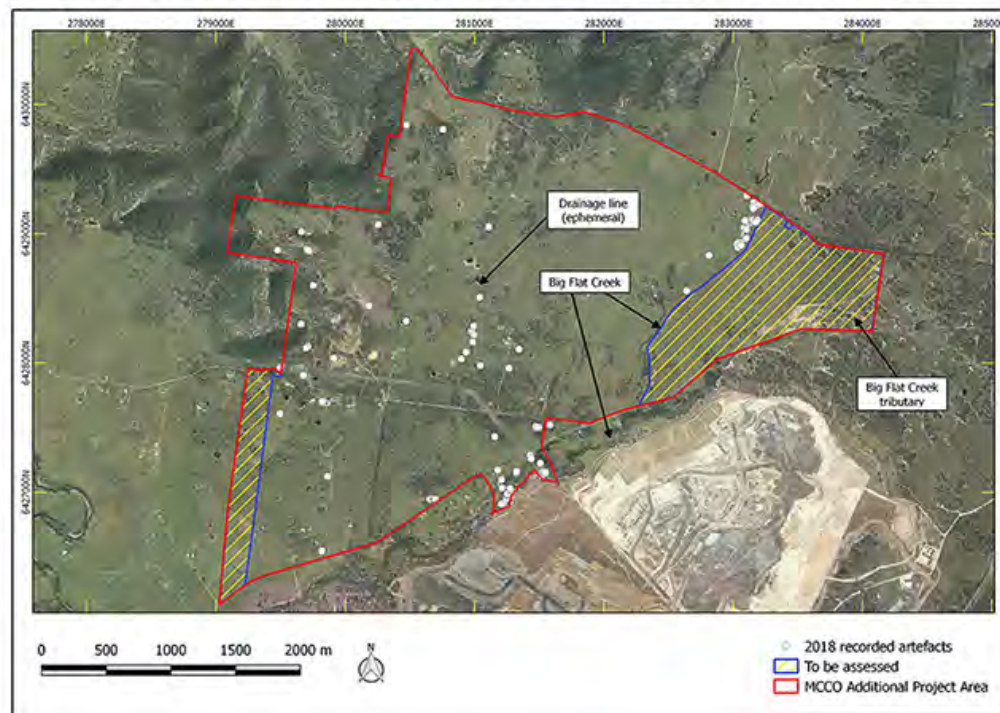
The survey only recorded artefact scatters and isolated finds. No other site type, such as modified trees, were recorded. At present the survey of the MCCO Additional Project Area has not been fully completed so the number of sites recorded has not yet been finalised. It is likely that a number of the recorded artefacts shown on **Figure 4** will be associated with some of the previously recorded sites that have been recorded in the MCCO Additional Project Area.

As shown in **Figure 4** the survey did not record a large number of sites and the majority of recorded artefacts cluster into two areas:

- Landforms associated with Big Flat Creek both in the south-centre and the northeast of the MCCO Additional Project Area; and
- Landforms associated with an ephemeral drainage line in the centre of the MCCO Additional Project Area.

Outside of these areas, the recordings of artefacts, in spite of the excellent visibility, was sporadic and at a very low density.

**FIGURE 4. AERIAL SHOWING THE SURVEY RESULTS WITHIN THE MCCO ADDITIONAL PROJECT AREA.**



### **Analysis of the results of the survey**

Regarding the results of the survey, overlying the 2018 findings on a 1967 aerial is illustrative (**Figure 5**). The view of the MCCO Additional Project Area 51 years ago shows:

- The low density of artefact recordings in the far west of the MCCO Additional Project Area may be associated with the topography (i.e. this area is an ecotone or a transition area where two ecological communities—the environment associated with flat landforms to the east and the environment of the escarpment landforms to the west—meet and interact). Alternatively, from the evidence in **Figure 5** this area was left slightly wooded and was perhaps less disturbed than other areas. This may mean that more of the general background of artefacts that exist in most landforms may remain in this area rather than having been removed by erosion.
- The artefact recordings in the central drainage feature are likely not to be in their original location as there is ample evidence of wide-spread erosion in this system. This includes an extensive sediment plume as it nears Big Flat Creek and an extensive area of sheet wash erosion in its northern reaches. This would indicate that the recorded artefacts have probably been moved to their find location by water movement.
- The artefact recordings associated with Big Flat Creek are likely to be in, or close to, their original location as there is little evidence of widespread erosion in the vicinity of the clusters of artefact recordings.
- The area along the tributary to Big Flat Creek (**Figure 4**) is likely to have been subject to historical disturbance associated with agricultural practices due to ample evidence of widespread erosion in this south-eastern corner of the MCCO Additional Project Area.
- At least half of the currently unassessed area (**Figure 4**) has been historically cultivated. Areas of cultivation also exist on the western bank of Big Flat Creek within the currently assessed area. Despite thorough survey, no artefacts were recorded in these previously cultivated landforms and it is likely that the formerly cultivated landforms in the currently unassessed area will also be poor preservers of Aboriginal cultural heritage. It should be noted that the cluster of recorded artefacts along the northern reach of Big Flat Creek within the MCCO Additional Project Area are in landforms that have not been cultivated.



Figure 5. Aerial showing the survey results overlain on a 1967 aerial.



### Conclusions

The two week survey program successfully completed the major objective of thoroughly surveying all landforms where proposed impacts associated with the MCOO Project will be located. This phase will be supplemented by additional survey in May 2018 that will assess the remaining currently unassessed portions of the MCOO Additional Project Area.

Generally the surveyed landforms were distant from permanent water (Big Flat Creek is unlikely to have been a permanent system in the vicinity of the MCOO Additional Project Area) and were flat to gently sloping. In the west of the survey area steeper topography was surveyed but generally the escarpments that can be seen in aerial photography are located either west or north of the MCOO Additional Project Area. Nevertheless, there are five previously recorded rock shelters with potential archaeological deposit (PAD) recorded in the very west of the MCOO Additional Project Area. All shelters were visited by the survey team but none revealed evidence of past occupation on the surface. While this does not preclude PADs, the form and location of the shelters did not suggest that any PADs present are likely to be deep or extensive.

It is envisioned that there will be a test excavation program to help better understand the archaeological characteristics of the MCOO Additional Project Area at one location:


- There is one registered PAD in the centre of the MCOO Additional Project Area associated with the ephemeral tributary to Big Flat Creek discussed above. As no surface artefacts were noted at this location during the assessment, test excavation will demonstrate if the area is indeed a PAD.

A separate test excavation methodology has been prepared and accompanies this summary setting out the location and methodology of the proposed investigation.


OzArk would like to thank all participants in the survey. Although the assessment occurred during a very hot period of the year, all involved maintained a professional attitude that ensured that the MCOO Additional Project Area was robustly and systematically inspected.

Ben Churcher  
Principal Archaeologist: OzArk EHM

## APPENDIX 4: AHIMS SEARCH RESULTS


 <b>AHIMS Web Services (AWS)</b> Extensive search - Site list report										
										Your Ref/PO Number : Mangoola 2041_8 Client Service ID : 363934
SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2310	WC40	AGD	56	279301	6424556	Open site	Valid	Artefact : 1		
	Contact	Recorders	McMillan Ford					Permits		
37-2-2311	WC41	AGD	56	279207	6424293	Open site	Valid	Artefact : 2		102131
	Contact	Recorders	McMillan Ford					Permits		
37-2-2312	WC42	AGD	56	279329	6424307	Open site	Valid	Artefact : 5		102131
	Contact	Recorders	McMillan Ford					Permits		
37-2-2313	WC43	AGD	56	279188	6424427	Open site	Valid	Artefact : 1		
	Contact	Recorders	McMillan Ford					Permits		
37-2-2292	AC19	AGD	56	279638	6424929	Open site	Valid	Artefact : 1		
	Contact	Recorders	McMillan Ford					Permits		
37-2-2292	AC41	AGD	56	280062	6426101	Open site	Valid	Artefact : 19		102131
	Contact	Recorders	McMillan Ford					Permits		
37-2-2293	AC42	AGD	56	279493	6424894	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	McMillan Ford					Permits		
37-2-2301	WC1	AGD	56	279060	6424420	Open site	Valid	Artefact : 1		
	Contact	Recorders	McMillan Ford					Permits		
37-2-2402	WC32	AGD	56	279999	6424645	Open site	Valid	Artefact : 4		102131
	Contact	Recorders	McMillan Ford					Permits		
37-2-3979	BFC59	AGD	56	279552	6426139	Open site	Valid	Artefact : 4		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-3980	BFC60	AGD	56	279678	6426159	Open site	Valid	Artefact : 24		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-3981	BFC61	AGD	56	279772	6426208	Open site	Valid	Artefact : 6		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-3982	BFC62	AGD	56	279816	6426198	Open site	Valid	Artefact : 2		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-3987	BFC67	AGD	56	279749	6426101	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-3991	BFC91	GDA	56	279991	6426000	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited, Miss Nicola Beeche					Permits		
37-2-3970	BFC50	GDA	56	279719	6425834	Open site	Destroyed	Artefact : 2		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-4016	WC47	AGD	56	279374	6424780	Closed site	Valid	Artefact : 3, Potential Archaeological Deposit (FAD) :-		
Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 276176 - 280227, Northings : 6424048 - 6429711 with a Buffer of 0 meters. Additional Info : Rectification, Number of Aboriginal sites and Aboriginal objects found is 117 This information is not guaranteed to be free from error or omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any and all damage or loss resulting from the use of this information and/or any other information.										

Page 1 of 8

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										Your Ref/PO Number : Mangoola 2041_8 Client Service ID : 363934
SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-3971	BFC51	GDA	56	279652	6425927	Open site	Destroyed	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-3972	BFC52	AGD	56	279778	6426029	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-3977	BFC57	AGD	56	279599	6426070	Open site	Valid	Artefact : 8		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-3978	BFC58	AGD	56	279632	6426137	Open site	Valid	Artefact : 4		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-4409	BFC97	GDA	56	279497	6427963	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds					Permits		
37-2-4490	BFC98	GDA	56	280112	6427888	Open site	Destroyed	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds					Permits		
37-2-4131	Wybong Creek GC	GDA	56	277286	6427094	Open site	Valid	Overlying Oversee		
	Contact	Recorders	Human Local Land Services - Patterson					Permits		
37-2-4120	WC30	GDA	56	278154	6424608	Closed site	Valid	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited, Miss Nicola Beeche					Permits		
37-2-4121	WC31	GDA	56	277925	6424224	Closed site	Valid	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited, Miss Nicola Beeche					Permits		
37-2-4123	WC33	GDA	56	278293	6424436	Closed site	Valid	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited, Miss Nicola Beeche					Permits		
37-2-4124	WC34	GDA	56	278285	6424415	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited, Miss Nicola Beeche					Permits		
37-2-4125	WC35	GDA	56	278276	6424520	Closed site	Valid	Artefact : 4		
	Contact	Recorders	Unswit (Australia) Pty Limited, Miss Nicola Beeche					Permits		
37-2-4126	WC36	GDA	56	278280	6424374	Closed site	Valid	Artefact : 18		
	Contact	Recorders	Unswit (Australia) Pty Limited, Angus Wilson					Permits		
37-2-4127	WC37	GDA	56	278276	6424332	Closed site	Valid	Artefact : 1		
	Contact	Recorders	Unswit (Australia) Pty Limited, Miss Nicola Beeche					Permits		
37-2-4130	WC30	GDA	56	278467	6424897	Closed site	Valid	Artefact : 2, Shell :-		
	Contact	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds					Permits		
37-2-4918	WC71	GDA	56	279234	6425217	Open site	Valid	Artefact : 1		
	Contact	Recorders	Miss Nicola Beeche					Permits		
37-2-4426	BFC112	GDA	56	279194	6425373	Open site	Valid	Artefact : 1		
Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 276176 - 280227, Northings : 6424048 - 6429711 with a Buffer of 0 meters. Additional Info : Rectification, Number of Aboriginal sites and Aboriginal objects found is 117 This information is not guaranteed to be free from error or omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any and all damage or loss resulting from the use of this information and/or any other information.										

Page 1 of 8




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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports	
37-2-5791	Contact Wybang Creek-7	Recorders	Miss Norma Roche	GDA	56	278594	6424418	Open site	Valid	Artifact : -	Permits
37-2-5792	Contact Wybang Creek-6	Recorders	OzArk Environmental and Heritage Management/Miss Philippa Sokol	GDA	56	278650	6424469	Open site	Valid	Artifact : -	Permits
37-2-5793	Contact Wybang Creek-5	Recorders	OzArk Environmental and Heritage Management/Miss Philippa Sokol	GDA	56	278555	6424506	Open site	Valid	Artifact : -	Permits
37-2-5794	Contact Wybang Creek-4	Recorders	OzArk Environmental and Heritage Management/Miss Philippa Sokol	GDA	56	278613	6424261	Open site	Valid	Artifact : -	Permits
37-2-5795	Contact Wybang Creek-3	Recorders	OzArk Environmental and Heritage Management/Miss Philippa Sokol	GDA	56	278552	6424523	Open site	Valid	Artifact : -	Permits
37-2-5553	Contact Wybang Creek-2	Recorders	OzArk Environmental and Heritage Management/Miss Philippa Sokol	GDA	56	277973	6425603	Open site	Valid	Artifact : -	Permits
37-2-5554	Contact Wybang Creek-1	Recorders	OzArk Environmental and Heritage Management/Miss Philippa Sokol	GDA	56	277710	6425919	Open site	Valid	Artifact : -	Permits
37-2-2130	Contact WC01	Recorders	Ms Mary-Jean Sutton	AGD	56	279095	6424616	Open site	Valid	Artifact : 18	Permits
37-2-2131	Contact WC02	Recorders	Ms Mary-Jean Sutton	AGD	56	279071	6424623	Open site	Valid	Artifact : 22	102131
37-2-2132	Contact WC03	Recorders	Ms Mary-Jean Sutton	AGD	56	279106	6424674	Open site	Valid	Artifact : 3	102131
37-2-2133	Contact WC04	Recorders	Ms Mary-Jean Sutton	AGD	56	279046	6424650	Open site	Valid	Artifact : 3	102131
37-2-2134	Contact WC05	Recorders	Ms Mary-Jean Sutton	GDA	56	274485	6424938	Closed site	Valid	Artifact : 2, 11 Excavation Structure	102131
37-2-2135	Contact WC06	Recorders	Unswell (Australia) Pty Limited/OzArk Environmental and Heritage Management/Mr	AGD	56	279354	6424718	Open site	Valid	Artifact : 2	102131
37-2-2136	Contact WC07	Recorders	Unswell (Australia) Pty Limited/Ms Mary-Jean Sutton	AGD	56	279355	6424650	Open site	Valid	Artifact : 1	Permits
37-2-2137	Contact WC08	Recorders	Ms Mary-Jean Sutton	AGD	56	279256	6424604	Open site	Valid	Artifact : 21	Permits
37-2-2138	Contact WC09	Recorders	Ms Mary-Jean Sutton	AGD	56	279256	6424531	Open site	Valid	Artifact : 11	102131
	Contact Search	Recorders	Ms Mary-Jean Sutton								Permits

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Page 3 of 8


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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2139	WC10	AGD	56	279208	6424484	Open site	Valid	Artifact : 1		
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2140	WC11	AGD	56	279206	6424478	Open site	Valid	Artifact : 1		
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2141	WC12	AGD	56	279195	6424480	Open site	Valid	Artifact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2142	WC13	AGD	56	279195	6424482	Open site	Valid	Artifact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2143	WC14	AGD	56	279155	6424399	Open site	Valid	Artifact : 2		
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2144	WC15	AGD	56	279155	6424466	Open site	Valid	Artifact : 2		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2145	WC16	AGD	56	279067	6424505	Open site	Valid	Artifact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2146	WC17	AGD	56	279126	6424456	Open site	Valid	Artifact : 3		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2147	WC18	AGD	56	279169	6424608	Open site	Valid	Artifact : 2		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2148	WC19	AGD	56	279122	6424584	Open site	Valid	Artifact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2149	WC20	AGD	56	279107	6424568	Open site	Valid	Artifact : 32		102131
	Contact	Recorders	Ms Mary-Jean Sutton/Western Australia Aboriginal Corporation					Permits		
37-2-2150	WC21	AGD	56	278790	6425444	Open site	Valid	Artifact : 190		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2151	WC23	AGD	56	279519	6425147	Closed site	Valid	Artifact : 4		102131
	Contact	Recorders	Ms Mary-Jean Sutton/Hunter Valley Aboriginal Corporation					Permits		
37-2-2160	WC44	AGD	56	279283	6425639	Open site	Valid	Artifact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton/Hunter Valley Aboriginal Corporation					Permits		
37-2-2161	WC45	GDA	56	279408	6425184	Closed site	Valid	Artifact : 6		102131
	Contact	Recorders	OzArk Environmental and Heritage Management/Ms Mary-Jean Sutton/Hunter Valley					Permits		
37-2-2162	WC46	GDA	56	278447	6425109	Closed site	Valid	Artifact : 39		102131
	Contact	Recorders	OzArk Environmental and Heritage Management/Ms Mary-Jean Sutton/Hunter Valley					Permits		
37-2-2163	WC47	GDA	56	279514	6425433	Closed site	Valid	Artifact : 32		
	Contact	Recorders	OzArk Environmental and Heritage Management/Ms Mary-Jean Sutton/Hunter Valley					Permits		

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Page 4 of 8


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SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-2165	BFC02	AGD	56	279082	6425271	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2166	BFC09	AGD	56	279520	6425510	Open site	Valid	Artefact : 8		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2168	BFC03	AGD	56	279182	6425302	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2169	BFC04	AGD	56	279180	6425325	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2170	BFC05	AGD	56	279159	6425440	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2171	BFC06	AGD	56	279204	6425490	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2172	BFC07	AGD	56	279086	6425526	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2197	BFC35	AGD	56	279362	6425335	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Gillian Ford					Permits		
37-2-2198	BFC36	AGD	56	279087	6425301	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Gillian Ford					Permits		
37-2-2199	BFC37	AGD	56	279074	6425293	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Gillian Ford					Permits		
37-2-2204	BFC12	AGD	56	279402	6425500	Closed site	Valid	Artefact : 20 Potential Archaeological Deposits (PAD) :-		
	Contact	Recorders	Ms Mary-Jean Sutton, Hunter Valley Aboriginal Corporation					Permits		
37-2-2173	BFC10	AGD	56	279523	6425534	Open site	Valid	Artefact : 10		
	Contact	Recorders	Ms Mary-Jean Sutton, Hunter Valley Aboriginal Corporation					Permits		
37-2-2174	BFC08	AGD	56	279510	6425495	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		
37-2-2175	BFC14	AGD	56	279505	6425523	Open site	Valid	Artefact : 14		102131
	Contact	Recorders	Ms Mary-Jean Sutton, Hunter Valley Aboriginal Corporation					Permits		
37-2-2176	BFC13	AGD	56	279527	6425519	Open site	Valid	Artefact : 1		102131
	Contact	Recorders	Ms Mary-Jean Sutton, Hunter Valley Aboriginal Corporation					Permits		
37-2-2184	BFC14	AGD	56	279508	6425500	Open site	Valid	Artefact : 5		102131
	Contact	Recorders	Ms Mary-Jean Sutton					Permits		

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum : GDA, Zone : 56, Eastings : 276176 - 280227, Northings : 6424048 - 6429711 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 117

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Page 3 of 3

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Client/Service ID : 363934

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-3882	BFC69	GDA	56	279746	6427803	Open site	Valid	Artefact : 1		
37-2-3883	BFC70	GDA	56	279743	6427841	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unswest (Australia) Pty Limited							
37-2-3884	BFC71	GDA	56	279862	6427179	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unswest (Australia) Pty Limited							
37-2-3885	BFC72	GDA	56	279871	6426199	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unswest (Australia) Pty Limited							
37-2-3886	BFC73	GDA	56	279829	6426211	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unswest (Australia) Pty Limited							
37-2-4582	BFC109	GDA	56	280107	6426445	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Ryan Desic							
37-2-4583	WC68	GDA	56	278142	6427156	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Ryan Desic							
37-2-4584	WC69	GDA	56	278067	6426992	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Ryan Desic							
37-2-4585	WC71	GDA	56	278058	6426984	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Ryan Desic							
37-2-4582	MCP3 duplicate of WC70	GDA	56	278962	6426987	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Ryan Desic							
37-2-4583	BFC102	GDA	56	279019	6426539	Open site	Partially Destroyed	Artefact : -		
	Contact	Recorders	Miss Stephanie Howson							
37-2-4863	BFC111	GDA	56	279698	6420117	Open site	Valid	Artefact : -		
	Contact	Recorders	Miss Nicola Roche							
37-2-4866	Mangoola A11	GDA	56	277848	6425578	Open site	Valid	Artefact : -		
	Contact	Recorders	Mrs.Jillian Huntley							
37-2-4884	WC72	GDA	56	278774	6425401	Open site	Valid	Artefact : -		
	Contact	Recorders	Miss Nicola Roche							
37-2-3403	BFC128 (Duplicate of 37-2-5433)	GDA	56	279639	6428004	Open site	Not a Site	Potential Archaeological Deposits (PAD) :-		
	Contact	Recorders	Mr.Ryan Desic,EMGA Mitchell McLennan							
37-2-5104	BFC129 (Duplicate of 37-2-5444)	GDA	56	279641	6428009	Open site	Not a Site	Potential Archaeological Deposits (PAD) :-		
	Contact	Recorders	Mr.Ryan Desic,EMGA Mitchell McLennan							


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Client/Service ID : 363934

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-5405	BFC 130 (Duplicate of 37-2-5415)	GDA	56	279641	6428068	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1	Permits	
	Contact	Recorders	Mr.Ryan Desic:EMGA Mitchell McLennan							
37-2-5406	BFC 131 (Duplicate of 37-2-5416)	GDA	56	279643	6428317	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1	Permits	
	Contact	Recorders	Mr.Ryan Desic:EMGA Mitchell McLennan							
37-2-5407	BFC 132 (Duplicate of 37-2-5417)	GDA	56	279651	6428920	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1	Permits	
	Contact	Recorders	Mr.Ryan Desic:EMGA Mitchell McLennan							
37-2-5410	BFC 135 (Duplicate of 37-2-5410)	GDA	56	279665	6429015	Open site	Not a Site	Artifact : 1	Permits	
	Contact	Recorders	Mr.Ryan Desic:EMGA Mitchell McLennan							
37-2-5411	BFC 136 (Duplicate of 37-2-5411)	GDA	56	279714	6428879	Open site	Not a Site	Artifact : 1	Permits	
	Contact	Recorders	Mr.Ryan Desic:EMGA Mitchell McLennan							
37-2-5420	BFC 145 (Duplicate of 37-2-5460)	GDA	56	278523	6427168	Open site	Not a Site	Artifact : 1	Permits	
	Contact	Recorders	Mr.Ryan Desic:EMGA Mitchell McLennan							
37-2-5421	BFC 146 (Duplicate of 37-2-5461)	GDA	56	278512	6426831	Open site	Not a Site	Artifact : 1, Potential Archaeological Deposit (PAD) : 1	Permits	
	Contact	Recorders	Mr.Ryan Desic:EMGA Mitchell McLennan							
37-2-5422	BFC 147 (Duplicate of 37-2-5462)	GDA	56	278546	6426791	Open site	Not a Site	Artifact : 1, Potential Archaeological Deposit (PAD) : 1	Permits	
	Contact	Recorders	Mr.Ryan Desic:EMGA Mitchell McLennan							
37-2-5460	BFC 149	GDA	56	278527	6427186	Open site	Valid	Potential Archaeological Deposit (PAD) : 1	Permits	
	Contact	Recorders	EMGAMM-St Leonards (previously EMGA) Mr.Ryan Desic							
37-2-5461	BFC 149	GDA	56	278512	6426833	Open site	Valid	Artifact : 1, Potential Archaeological Deposit (PAD) : 1	Permits	
	Contact	Recorders	EMGAMM-St Leonards (previously EMGA) Mr.Ryan Desic							
37-2-5462	BFC 147	GDA	56	278546	6426791	Open site	Valid	Artifact : 1, Potential Archaeological Deposit (PAD) : 1	Permits	
	Contact	Recorders	EMGAMM-St Leonards (previously EMGA) Mr.Ryan Desic							

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Roden for the following area at Datum :GDA, Zone : 56, Eastings : 276176 - 290227, Northings : 6424048 - 6429711 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 117

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Page 7 of 8



Office of Environment & Heritage

# AHIMS Web Services (AWS)

## Extensive search - Site list report


Your Ref/PO Number : Mangoola 2041\_8  
Client/Service ID : 363934

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-5443	BFC 128	GDA	56	279699	6428291	Open site	Valid	Potential Archaeological Deposit (PAD) : 1	Permits	
Contact		Recorders EMGAM-St Leonards (previously EMGA) Mr.Ryan Desic								
37-2-5444	BFC 129	GDA	56	279641	6428068	Open site	Valid	Potential Archaeological Deposit (PAD) : 1	Permits	
Contact		Recorders EMGAM-St Leonards (previously EMGA) Mr.Ryan Desic								
37-2-5445	BFC 130	GDA	56	279643	6428317	Open site	Valid	Potential Archaeological Deposit (PAD) : 1	Permits	
Contact		Recorders EMGAM-St Leonards (previously EMGA) Mr.Ryan Desic								
37-2-5446	BFC 131	GDA	56	279643	6428317	Open site	Valid	Potential Archaeological Deposit (PAD) : 1	Permits	
Contact		Recorders EMGAM-St Leonards (previously EMGA) Mr.Ryan Desic								
37-2-5447	BFC 132	GDA	56	279651	6428920	Open site	Valid	Potential Archaeological Deposit (PAD) : 1	Permits	
Contact		Recorders EMGAM-St Leonards (previously EMGA) Mr.Ryan Desic								
37-2-5450	BFC 138	GDA	56	279668	6429015	Open site	Valid	Artifact : 1	Permits	
Contact		Recorders EMGAM-St Leonards (previously EMGA) Mr.Ryan Desic								
37-2-5451	BFC 136	GDA	56	279714	6428879	Open site	Valid	Artifact : 1	Permits	
Contact		Recorders EMGAM-St Leonards (previously EMGA) Mr.Ryan Desic								

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Roden for the following area at Datum :GDA, Zone : 56, Eastings : 276176 - 290227, Northings : 6424048 - 6429711 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 117

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(1/15/11/

		AHIMS Web Services (AWS)				Your Ref/PO Number : Mangoola 2041_7 Client Service ID : 363918				
Extensive search - Site list report										
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-0867	Castle Rock/Spring Creek	AGD	56	288954	6432130	Open site	Valid	Modified Tree (Clipped or Scarred) - Environmental Risk (Stone or Earth) -	Bora/Ceremonial/Cave/Ten	
Contact		Recorders		David Bell						
37-2-2563	Mixed Pitman 203	AGD	56	285702	6429154	Open site	Valid	Artefact - 2		
Contact		Recorders		Mr Leonard (Lennie) Anderson						
37-2-9989	BFC09	GDA	56	285936	6427551	Open site	Destroyed	Artefact -	Permits	4005
Contact		Recorders		Unswell (Australia) Pty Limited, Ms Mary Jean Sutton						
37-2-9990	BFC06	GDA	56	281031	6428000	Open site	Valid	Artefact -	Permits	
Contact		Recorders		Unswell (Australia) Pty Limited, Miss Nicola Beche						
37-2-1491	BFC05	GDA	56	283346	6427883	Open site	Valid	Artefact - 1	Permits	
Contact		Recorders		Unswell (Australia) Pty Limited, Ms Amanda Reynolds						
37-2-4482	BFC105	GDA	56	280903	6422729	Open site	Valid	Artefact - 1	Permits	
Contact		Recorders		Unswell (Australia) Pty Limited, Ms Amanda Reynolds						
37-2-0739	Mangoola Castle Rock 2	GDA	56	288741	6430165	Open site	Valid	Artefact -	Isolated Find	26/07/09170
Contact		Recorders		Mr Jill King, OzArk Environmental and Heritage Management, OzArk Environmental						
37-2-0740	Mangoola Castle Rock 3	GDA	56	281086	6430009	Open site	Valid	Artefact -	Isolated Find	26/07/09170
Contact		Recorders		Mr Jill King, OzArk Environmental and Heritage Management, Miss Stephanie Rinde						
37-2-0741	Mangoola Castle Rock 4	GDA	56	282346	6429491	Open site	Valid	Artefact -	Isolated Find	26/07/09170
Contact		Recorders		Mr Jill King, OzArk Environmental and Heritage Management, Miss Stephanie Rinde						
37-2-0742	Mangoola Castle Rock 5	GDA	56	281181	6429240	Open site	Valid	Artefact -	Open Camp Site	26/07/09170
Contact		Recorders		Mr Jill King, OzArk Environmental and Heritage Management, Miss Stephanie Rinde						
37-2-2200	BFC18	AGD	56	282523	6427416	Open site	Valid	Artefact - 9	Permits	
Contact		Recorders		Mr William Ford						
37-2-2201	BFC19	AGD	56	282502	6427466	Open site	Valid	Artefact - 12	Permits	
Contact		Recorders		Mr William Ford						
37-2-2202	BFC40	AGD	56	282883	6427790	Open site	Valid	Artefact - 7	Permits	
Contact		Recorders		Mr William Ford						
37-2-2203	BFC41	AGD	56	282714	6427773	Open site	Valid	Artefact - 1	Permits	
Contact		Recorders		Mr William Ford						
37-2-2205	BFL42	AGD	56	282685	6427555	Open site	Valid	Artefact - 2	Permits	
Contact		Recorders		Mr William Ford						
37-2-2206	BFL43	AGD	56	282680	6427640	Open site	Valid	Artefact - 2	Permits	
Contact		Recorders		Mr William Ford						

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rinden for the following area at Datum :GDA, Zone : 56, Eastings : 280227 - 288231, Northings : 6427331 - 6432714 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 99

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Page 1 of 7



Office of Environment & Heritage

# AHIMS Web Services (AWS)

## Extensive search - Site list report


Your Ref/PO Number : Mangoola 2041\_7  
Client Service ID : 363918

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-3888	BFG75	GDA	56	284377	6427479	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3890	BFC77	GDA	56	284359	6427865	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3891	BFG78	GDA	56	284367	6428811	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3892	BFC79	GDA	56	284314	6428192	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3893	BFC80	GDA	56	284470	6428152	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3894	BFC81	GDA	56	284371	6428617	Open site	Valid	Artefact - 2	Permits	
	Contact									
37-2-3895	BFC82	GDA	56	284526	6428401	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3896	BFC83	GDA	56	284508	6427981	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3897	BFC84	GDA	56	284668	6427893	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3898	BFC85	GDA	56	284770	6427793	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3899	BFC86	GDA	56	284699	6427349	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-3901	BFC88	GDA	56	284016	6427856	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-4580	BFC107	GDA	56	283416	6429064	Open site	Valid	Artefact -	Permits	
	Contact									
37-2-4581	BFC108	GDA	56	283500	6429314	Open site	Valid	Artefact -	Permits	
	Contact									
37-2-4539	BFC101	GDA	56	283581	6430293	Open site	Valid	Artefact - 1	Permits	
	Contact									
37-2-4561	MDG2	GDA	56	283500	6429314	Open site	Valid	Art (Flamboyant or Engraved) -	Permits	
	Contact									
37-2-4564	BFC103	GDA	56	284574	6420373	Open site	Valid	Artefact -	Permits	
	Contact									

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rinden for the following area at Datum :GDA, Zone : 56, Eastings : 280227 - 288231, Northings : 6427331 - 6432714 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 99

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Page 1 of 7


 Office of Environment & Heritage		AHIMS Web Services (AWS)				Your Ref/PO Number: Mangoola 2041_7				
		Extensive search - Site list report				Client Service ID : 363918				
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4565	BFC164	GDA	56	284635	6429614	Open site	Valid	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-4566	BFC165	GDA	56	284831	6429751	Open site	Valid	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-4567	BFC166	GDA	56	284661	6429689	Open site	Valid	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-4867	Mangoola IF 1	GDA	56	281211	6427542	Open site	Valid	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5388	BFC113 (Duplicate of 37-2-5428)	GDA	56	281908	6428161	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5389	BFC114 Duplicate site record to 37-2-5429	GDA	56	281009	6428425	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1		
	Contact								Permits	
	Recorders									
37-2-5390	BFC115 (Duplicate of 37-2-5430)	GDA	56	281046	6428510	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5391	BFC116 (Duplicate of 37-2-5431)	GDA	56	280994	6428280	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5392	BFC117 (Duplicate of 37-2-5432)	GDA	56	280935	6428081	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5393	BFC118 (Duplicate of 37-2-5433)	GDA	56	282124	6428173	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1		
	Contact								Permits	
	Recorders									
37-2-5394	BFC119 (Duplicate of 37-2-5434)	GDA	56	282190	6428448	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1		
	Contact								Permits	
	Recorders									
37-2-5395	BFC120 (Duplicate of 37-2-5435)	GDA	56	281229	6429277	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5396	BFC121 (Duplicate of 37-2-5436)	GDA	56	281322	6429200	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5397	BFC122 (Duplicate of 37-2-5437)	GDA	56	281671	6429269	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5398	BFC123 (Duplicate of 37-2-5438)	GDA	56	281738	6429370	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 280227 - 288231, Northings : 6427331 - 6432714 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 99

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Page 1 of 1

Page 3 of 7



Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number: Mangoola 2041\_7

Client Service ID : 363918

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-5399	BFC 124 (Duplicate of 37-2-5439)	GDA	56	281126	6428645	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5400	BFC 125 (Duplicate of 37-2-5440)	GDA	56	281057	6428564	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5401	BFC 126 (Duplicate of 37-2-5441)	GDA	56	281915	6428393	Open site	Not a Site	Artifact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact								Permits	
	Recorders									
37-2-5402	BFC 127 (Duplicate of 37-2-5442)	GDA	56	283672	6428316	Open site	Not a Site	Artifact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact								Permits	
	Recorders									
37-2-5403	BFC 133 (Duplicate of 37-2-5448)	GDA	56	281400	6427845	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1		
	Contact								Permits	
	Recorders									
37-2-5404	BFC 134 (Duplicate of 37-2-5449)	GDA	56	281423	6428023	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1		
	Contact								Permits	
	Recorders									
37-2-5405	MCD001	GDA	56	281839	6428912	Open site	Valid	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5406	MCD002	GDA	56	281796	6427829	Open site	Valid	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5412	BFC 137 (Duplicate of 37-2-5452)	GDA	56	280253	6427870	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5413	BFC 138 (Duplicate of 37-2-5453)	GDA	56	281109	6427917	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5414	BFC 139 (Duplicate of 37-2-5454)	GDA	56	281123	6427897	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5415	BFC 140 (Duplicate of 37-2-5455)	GDA	56	281259	6427987	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5416	BFC 141 (Duplicate of 37-2-5456)	GDA	56	281192	6427858	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5417	BFC 142 (Duplicate of 37-2-5457)	GDA	56	281167	6427771	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									
37-2-5418	BFC 143 (Duplicate of 37-2-5458)	GDA	56	281146	6427661	Open site	Not a Site	Artifact : 1		
	Contact								Permits	
	Recorders									

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 280227 - 288231, Northings : 6427331 - 6432714 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 99

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Page 4 of 4

Page 4 of 7




SiteID	SiteName	Datum	Zone	Easting	Northing	Context	SiteStatus	SiteFeatures	SiteTypes	Reports	
37-2-5419	Contact	Recorders	Mr.Ryan Desic EMGA Mitchell McLennan	GDA	56	284577	6429572	Open site	Not a Site	Artefact : 1	Permits
	Contact	Recorders	Mr.Ryan Desic EMGA Mitchell McLennan	GDA	56	284577	6429623	Open site	Not a Site	Artefact : 1, Potential Archaeological Deposit (PAD) : 1	Permits
37-2-5424	Contact	Recorders	Mr.Ryan Desic EMGA Mitchell McLennan	GDA	56	284577	6429623	Open site	Not a Site	Artefact : 1	Permits
	Contact	Recorders	Mr.Ryan Desic EMGA Mitchell McLennan	GDA	56	281157	6427427	Open site	Valid	Artefact : 1	Permits
37-2-5425	Contact	Recorders	Mr.Ryan Desic EMGA Mitchell McLennan	GDA	56	281100	6429617	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	EMGAMM-St Leonarda (previously EMGA), Mr.Ryan Desic	GDA	56	281123	6429697	Open site	Valid	Artefact : 1	Permits
37-2-5435	Contact	Recorders	EMGAMM-St Leonarda (previously EMGA), Mr.Ryan Desic	GDA	56	282359	6429707	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	EMGAMM-St Leonarda (previously EMGA), Mr.Ryan Desic	GDA	56	281192	6429550	Open site	Valid	Artefact : 1	Permits
37-2-5457	Contact	Recorders	EMGAMM-St Leonarda (previously EMGA), Mr.Ryan Desic	GDA	56	283167	6429771	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	EMGAMM-St Leonarda (previously EMGA), Mr.Ryan Desic	GDA	56	281148	6429401	Open site	Valid	Artefact : 1	Permits
37-2-5459	Contact	Recorders	EMGAMM-St Leonarda (previously EMGA), Mr.Ryan Desic	GDA	56	283207	6429572	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	EMGAMM-St Leonarda (previously EMGA), Mr.Ryan Desic	GDA	56	284577	6429623	Open site	Valid	Artefact : 1	Permits
37-2-5463	Contact	Recorders	EMGAMM-St Leonarda (previously EMGA), Mr.Ryan Desic	GDA	56	284457	6429523	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	EMGAMM-St Leonarda (previously EMGA), Mr.Ryan Desic	GDA	56	284931	6429930	Open site	Valid	Artefact : 1	Permits
37-2-5467	Contact	Recorders	OrArk Environmental and Heritage Management, OrArk Environmental and Heritage	GDA	56	284610	6429555	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	OrArk Environmental and Heritage Management, OrArk Environmental and Heritage	GDA	56	282996	6430711	Open site	Valid	Artefact : 1	Permits

Report generated by AIHMS Web Service on 14/08/2018 for Stephanie Haxton for the following area at Datum :GDA, Zone : 56, Eastings : 280227 - 288231, Northings : 6427331 - 6432714 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 09

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Page 13



# AHIMS Web Services (AWS)

## Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_7

Client Service ID : 363918


SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-5476	BFC152	GDA	56	281219	6430350	Open site	Valid	- Artifact :		
Contact		Recorders	OnArk Environmental and Heritage Management/OnArk Environmental and Herita							
37-2-5477	BFC153	GDA	56	283107	6430591	Open site	Valid	- Artifact :		
Contact		Recorders	OnArk Environmental and Heritage Management/OnArk Environmental and Herita							
37-2-5428	BFC118a	GDA	56	290996	6428161	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5429	BFC16A	GDA	56	281889	6429425	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1		
Contact		Recorders	OnArk Environmental and Heritage Management/EMGAMM-St Leonards (previous							
37-2-5430	BFC119	GDA	56	281046	6428510	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5431	BFC11A	GDA	56	280994	6428280	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5432	BFC117	GDA	56	280995	6428083	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5433	BFC118	GDA	56	282324	6428173	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5434	BFC119	GDA	56	282490	6428444	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5435	BFC120	GDA	56	283429	6429277	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5436	BFC121	GDA	56	283322	6429208	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5437	BFC122	GDA	56	283673	6429269	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5438	BFC128	GDA	56	283728	6429370	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5439	BFC124	GDA	56	284126	6429645	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							
37-2-5440	BFC125	GDA	56	284057	6429564	Open site	Valid	- Artifact :		
Contact		Recorders	EMGAMM-St Leonards (previously EMGA)/Mr Ryan Desic							

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rodden for the following area at Datum :GDA, Zone: 56, Eastings : 280227 - 288231, Northings : 6427331 - 6432714 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 99

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Page 1





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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number: Mangoola 2041\_7

Client/Service ID : 363918


SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-5441	BFC_124	GDA	56	283915	6426593	Open site	Valid	Artefact : 1 Potential Archaeological Impact (PAI) : 1		
Contact		Recorders EMGAMM-St Leonards (previously EMCA) Mr Ryan Derry								
37-2-5442	BFC_127	GDA	56	283972	6426816	Open site	Valid	Artefact : 1 Potential Archaeological Impact (PAI) : 1		
Contact		Recorders EMGAMM-St Leonards (previously EMCA) Mr Ryan Derry								
37-2-5448	BFC_133	GDA	56	283980	6426843	Open site	Valid	Artefact : 1		
Contact		Recorders EMGAMM-St Leonards (previously EMCA) Mr Ryan Derry								
37-2-5449	BFC_134	GDA	56	283973	6426823	Open site	Valid	Artefact : 1		
Contact		Recorders EMGAMM-St Leonards (previously EMCA) Mr Ryan Derry								
37-2-5452	BFC_137	GDA	56	283953	6426970	Open site	Valid	Artefact : 1		
Contact		Recorders EMGAMM-St Leonards (previously EMCA) Mr Ryan Derry								

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 280227 - 286231, Northings : 6427331 - 6432714 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 99

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Page 7 of 10

Page 7 of 7



Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_6

Client/Service ID : 363915


SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2243	AC92	GDA	56	280276	6425538	Open site	Valid	Artefact : 1		
	Contact - Searle	Recorders OzArk Environmental and Heritage Management Ms Mary-Jean Sutton, Mrs Stephanie Rouden								
37-2-2244	AC93	GDA	56	280325	6425528	Open site	Valid	Artefact : 1		
	Contact - Searle	Recorders Hensolt (Australia) Pty Limited, OzArk Environmental and Heritage Management Ms Mary-Jean Sutton, Mrs Stephanie Rouden								
37-2-2245	AC94	GDA	56	280306	6425481	Open site	Destroyed	Artefact : 1		
	Contact - Searle	Recorders OzArk Environmental and Heritage Management Ms Mary-Jean Sutton, Mrs Stephanie Rouden								
37-2-2246	AC95	GDA	56	280326	6425482	Open site	Valid	Artefact : 26		
	Contact - Searle	Recorders OzArk Environmental and Heritage Management Ms Mary-Jean Sutton, Mrs Stephanie Rouden								
37-2-2242	AC91	GDA	56	280102	6425392	Open site	Destroyed	Artefact : 2		
	Contact - Searle	Recorders Ms Mary-Jean Sutton								
37-2-2280	SC17 - Sooty Hollow	GDA	56	284803	6425391	Open site	Destroyed	Artefact : 1		
	Contact - Searle	Recorders Ms Jillian Ford								
37-2-2281	AC18	GDA	56	281207	6424953	Open site	Valid	Artefact : 1		
	Contact - Searle	Recorders Ms Jillian Ford								
37-2-2294	AC43	GDA	56	280395	6426136	Open site	Valid	Artefact : 2		
	Contact - Searle	Recorders OzArk Environmental and Heritage Management Ms Jillian Ford, Mrs Stephanie Rouden								
37-2-2295	AC48	GDA	56	280476	6426173	Open site	Destroyed	Artefact : 1		
	Contact - Searle	Recorders Ms Jillian Ford								
37-2-2296	CG36	GDA	56	281126	6426272	Open site	Valid	Artefact : 6		
	Contact - Searle	Recorders OzArk Environmental and Heritage Management Ms Jillian Ford, Mrs Stephanie Rouden								
37-2-2297	CG17	GDA	56	281036	6426690	Open site	Destroyed	Artefact : 1		
	Contact - Searle	Recorders Ms Jillian Ford								
37-2-2298	SC11	GDA	56	284722	6425150	Open site	Destroyed	Artefact : 1		
	Contact - Searle	Recorders OzArk Environmental and Heritage Management Ms Jillian Ford, Mrs Stephanie Rouden								
37-2-2299	SC12	GDA	56	284691	6425577	Open site	Destroyed	Artefact : 2		
	Contact - Searle	Recorders OzArk Environmental and Heritage Management Ms Jillian Ford, Mrs Stephanie Rouden								
37-2-2300	SC14	GDA	56	284811	6425295	Open site	Valid	Artefact : 21		
	Contact - Searle	Recorders OzArk Environmental and Heritage Management Ms Jillian Ford, Mrs Stephanie Rouden								
37-2-2274	SC05	GDA	56	283903	6425318	Open site	Destroyed	Artefact : 1		
	Contact - Searle	Recorders Ms Mary-Jean Sutton								
37-2-2275	SC06	GDA	56	284100	6425444	Open site	Destroyed	Artefact : 8		
	Contact - Searle	Recorders Ms Mary-Jean Sutton								
37-2-2276	SC07	GDA	56	284700	6425488	Open site	Destroyed	Artefact : 4		
	Contact - Searle	Recorders Ms Mary-Jean Sutton								

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289099, Northings : 6425005 - 6427331 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 1 of 1

Page 1 of 1



Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_6


Client Service ID : 363915

SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2277	SC08	GDA	56	284992	6425982	Open site	Destroyed	Artefact : 10		
	Contact : Suele	Recorders	Ms Mary-Jean Sutton							
37-2-2270	SC09	GDA	56	284903	6425471	Open site	Destroyed	Artefact : 1		
	Contact : Suele	Recorders	Ms Mary-Jean Sutton, Wonnarua Native Aboriginal Corporation							
37-2-2314	AC20	GDA	56	284349	6425968	Open site	Valid	Artefact : 1		
	Contact : Suele	Recorders	OzArk Environmental and Heritage Management & Ms John Ford, Monash Regional							
37-2-3983	BFG63	AGD	56	280129	6426483	Open site	Valid	Artefact : 27		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3984	BFG64	AGD	56	280374	6426309	Open site	Valid	Artefact : 10		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3985	BFG65	AGD	56	280207	6426421	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3986	BFG66	AGD	56	280174	6426314	Open site	Valid	Artefact : 51		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3988	BFG68	GDA	56	280335	6426850	Open site	Valid	Artefact : 2		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4026	SC70	GDA	56	284710	6425333	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4031	SC73	GDA	56	285561	6425260	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
37-2-4032	SC74	GDA	56	285460	6425262	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
37-2-4033	SC75	GDA	56	285365	6425283	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
37-2-4037	SC08	GDA	56	284847	6425262	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4022	SC43	GDA	56	284224	6426037	Open site	Valid	Artefact : 20		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4023	SC-ST-01	GDA	56	284258	6425935	Open site	Valid	Modified Yrce - (Curved or Scarred)		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4024	SC-ST-01	GDA	56	282503	6426122	Open site	Destroyed	Modified Yrce - (Curved or Scarred)		
	Contact :	Recorders	Unswit (Australia) Pty Limited							

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289099, Northings : 6425005 - 6427331 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 3 of 3



Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_6


Client Service ID : 363915

SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4005	AC49	GDA	56	280280	6425810	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Mary-Jean Sutton							
								Permits		
37-2-4008	AC52	GDA	56	280507	6426210	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Mary-Jean Sutton							
								Permits		
37-2-4013	CG03	GDA	56	282523	6426167	Open site	Destroyed	Artefact : 50		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
								Permits		
37-2-4014	CG19	AGD	56	281552	6424980	Closed site	Valid	Artefact : 2		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
								Permits		
37-2-3973	BFG53	GDA	56	284643	6426441	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
								Permits		
37-2-3974	BFG54	GDA	56	284417	6426400	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
								Permits		
37-2-3976	BFG56	GDA	56	284164	6426301	Open site	Destroyed	Artefact : 2		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
								Permits		
37-2-3502	SC06	GDA	56	283763	6426888	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
								Permits		
37-2-4503	SC07	GDA	56	284829	6426130	Open site	Partially Destroyed	Artefact : 1		
	Contact :	Recorders	Ms Amanda Reynolds							
								Permits		
37-2-4505	SC09	GDA	56	285296	6426813	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Nicola Becker							
								Permits		
37-2-4145	SC26 (Wyboong)	AGD	56	284720	6425677	Open site	Destroyed	Artefact : 7		
	Contact :	Recorders	Ms Mary-Jean Sutton							
								Permits		
37-2-4136	SC27 (Wyboong)	GDA	56	284673	6425697	Open site	Valid	Artefact : 5		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
								Permits		
37-2-4109	BFG56	GDA	56	284329	6427290	Open site	Valid	Artefact : 11		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Nicola Becker							
								Permits		
37-2-4516	AB12	GDA	56	282750	6426866	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
								Permits		
37-2-4518	Enfiling Site 01	GDA	56	282435	6426499	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
								Permits		
37-2-4519	EW03	GDA	56	281904	6426677	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
								Permits		
37-2-4520	EW02	GDA	56	282222	6426361	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
								Permits		

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289099, Northings : 6425005 - 6427331 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115


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Page 1 of 1

 Office of Environment & Heritage		AHIMS Web Services (AWS)				Your Ref/PO Number : Mangoola 2041_6				
		Extensive search - Site list report				Client/Service ID : 363915				
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4521	EW43	GDA	56	282169	6426393	Open site	Destroyed	Artifact : 1		
37-2-4522	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW44	GDA	56	282209	6426309	Open site	Destroyed	Artifact : 1	Permits	
37-2-4523	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW46	GDA	56	282237	6426766	Open site	Destroyed	Artifact : 1	Permits	
37-2-4524	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW47	GDA	56	282180	6426268	Open site	Destroyed	Artifact : 1	Permits	
37-2-4525	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW48	GDA	56	281948	6427192	Open site	Destroyed	Artifact : 1	Permits	
37-2-4526	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW49	GDA	56	281970	6427224	Open site	Destroyed	Artifact : 1	Permits	
37-2-4529	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW410	GDA	56	281932	6427110	Open site	Destroyed	Artifact : 1	Permits	
37-2-4528	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW417	GDA	56	281634	6426944	Open site	Destroyed	Artifact : 1	Permits	
37-2-4116	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC92	GDA	56	281209	6427089	Open site	Valid	Artifact : 2	Permits	
37-2-4117	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC93	GDA	56	281221	6427013	Open site	Valid	Artifact : 3	Permits	
37-2-4118	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC94	GDA	56	281279	6427036	Open site	Valid	Artifact : 3	Permits	
37-2-4119	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC95	GDA	56	281395	6427016	Open site	Valid	Artifact : 2	Permits	
37-2-0509	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	Sandy Hollow, Sangham 1	AGD	56	281430	6426990	Open site	Valid	Artifact : 1	Open Camp Site	109798170/86 642102131
37-2-0510	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	Sandy Hollow, Sangham 2	GDA	56	282178	6426279	Open site	Destroyed	Artifact : 1	Open Camp Site	109798170/86 642102131
37-2-2266	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	AC96	GDA	56	283399	6426869	Open site	Destroyed	Artifact : 5	Permits	
37-2-2183	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC81	AGD	56	281296	6427054	Open site	Valid	Artifact : 2	Permits	102228
37-2-2167	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC84	AGD	56	280719	6426431	Open site	Valid	Artifact : 4	Permits	

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289099, Northings : 6425005 - 6427331 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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		<b>AHIMS Web Services (AWS)</b>				Your Ref/PO Number : Mangoola 2041_6				
		Extensive search - Site list report				Client/Service ID : 363915				
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2107	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC25	AGD	56	280912	6426670	Open site	Valid	Artifact : 5	Permits	102131
37-2-2188	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC26	AGD	56	281582	6426930	Open site	Valid	Artifact : 2	Permits	
37-2-2189	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC27	AGD	56	281923	6426924	Open site	Valid	Artifact : 1	Permits	
37-2-2190	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC28	AGD	56	281419	6426941	Open site	Valid	Artifact : 4	Permits	
37-2-2191	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC29	AGD	56	281451	6426995	Open site	Valid	Artifact : 8	Permits	
37-2-2192	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC30	GDA	56	281482	6427095	Open site	Destroyed	Artifact : 22	Permits	102131
37-2-2193	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC31	AGD	56	281135	6426766	Open site	Valid	Artifact : 77	Permits	102131
37-2-2194	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC32	AGD	56	280869	6426569	Open site	Valid	Artifact : 4	Permits	
37-2-2195	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC33	AGD	56	280548	6426315	Open site	Valid	Artifact : 2	Permits	
37-2-2196	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Mary-Jean Sutton/Ms.Margaret Matthews							
	BFC34	AGD	56	280565	6426294	Open site	Valid	Artifact : 2	Permits	
37-2-2207	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Mary-Jean Sutton/Ms.Margaret Matthews							
	BFC36	GDA	56	282594	6427161	Open site	Destroyed	Artifact : 1	Permits	102131
37-2-2208	Contact	Recorders	Ms.Jillian Forth							
	BFC35	GDA	56	282617	6427116	Open site	Destroyed	Artifact : 5	Permits	
37-2-2209	Contact	Recorders	Ms.Jillian Forth							
	BFC36	GDA	56	282608	6427168	Open site	Destroyed	Artifact : 1	Permits	
37-2-2210	Contact	Recorders	Ms.Jillian Forth							
	BFC37	GDA	56	282425	6427290	Open site	Destroyed	Artifact : 49	Permits	
37-2-2211	Contact	Recorders	Ms.Jillian Forth							
	BFC38	GDA	56	281929	6427011	Open site	Destroyed	Artifact : 2	Permits	
37-2-2212	Contact	Recorders	Ms.Jillian Forth							
	BFC39	AGD	56	281831	6426854	Open site	Valid	Artifact : 4	Permits	
37-2-2197	BFC15	AGD	56	281492	6427054	Open site	Valid	Artifact : 4	Permits	102131

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289099, Northings : 6425005 - 6427331 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 1 of 1





Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_6

Client/Service ID : 363915

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-2178	Contact	Recorders	McMary-Jean Sutton, Hunter Valley Council Consultants					Permits		
	BFC16	AGD	56- 289969	6426707	Open site	Valid	Artefact : 1	Permits		102131
37-2-2179	Contact	Recorders	McMary-Jean Sutton					Permits		
	BFC17	AGD	56- 289925	6426717	Open site	Valid	Artefact : 4	Permits		102131
37-2-2180	Contact	Recorders	McMary-Jean Sutton					Permits		
	BFC18	AGD	56- 289925	6426686	Open site	Valid	Artefact : 3	Permits		102131
37-2-2181	Contact	Recorders	Hinewit (Australia) Pty Limited, McMary-Jean Sutton					Permits		
	BFC20	AGD	56- 289869	6426762	Open site	Valid	Artefact : 1	Permits		
37-2-2182	Contact	Recorders	McMary-Jean Sutton					Permits		
	BFC21	AGD	56- 289870	6426717	Open site	Valid	Artefact : 3	Permits		102131
37-2-2183	Contact	Recorders	McMary-Jean Sutton					Permits		
	BFC22	AGD	56- 289794	6426609	Open site	Valid	Artefact : 1	Permits		
37-2-2185	Contact	Recorders	McMary-Jean Sutton					Permits		
	BFC19	AGD	56- 289896	6426638	Open site	Valid	Artefact : 32	Permits		
37-2-2186	Contact	Recorders	McMary-Jean Sutton					Permits		
	BFC23	AGD	56- 289792	6426540	Open site	Valid	Artefact : 3	Permits		
37-2-2219	Contact	Recorders	McMary-Jean Sutton					Permits		
	CG01	AGD	56- 281419	6425606	Closed site	Valid	Artefact : 3	Permits		
37-2-2220	Contact	Recorders	McMary-Jean Sutton, Ms Jillian Ford, Mr Darrell Matthews					Permits		
	CG02	GDA	56- 283120	6425541	Open site	Valid	Artefact : 1	Permits		
37-2-2221	Contact	Recorders	OzArk Environmental and Heritage Management, McMary-Jean Sutton, Valery Guba					Permits		
	CG03	GDA	56- 283182	6425798	Open site	Destroyed	Artefact : 3	Permits		
37-2-2232	Contact	Recorders	McMary-Jean Sutton, Valley Culture					Permits		
	CG04	GDA	56- 281282	6426279	Open site	Destroyed	Artefact : 1	Permits		
37-2-2233	Contact	Recorders	Hinewit (Australia) Pty Limited, McMary-Jean Sutton					Permits		
	CG05	GDA	56- 281134	6426390	Open site	Destroyed	Artefact : 4	Permits		
37-2-2234	Contact	Recorders	McMary-Jean Sutton, Civil Consultants					Permits		
	CG06	GDA	56- 281105	6426386	Open site	Destroyed	Artefact : 1	Permits		
37-2-2225	Contact	Recorders	McMary-Jean Sutton					Permits		
	CG07	GDA	56- 282110	6426251	Open site	Destroyed	Habitat Structure 1	Permits		
37-2-2226	Contact	Recorders	McMary-Jean Sutton					Permits		
	CG08	AGD	56- 281709	6424885	Closed site	Valid	Artefact : 1, Potential Archaeological Deposits (PAD) :-	Permits		

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289999, Northings : 6425005 - 6427331 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 4 of 6

Page 6 of 8

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Your Ref/PO Number : Mangoola 2041\_6

Client/Service ID : 363915

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-2227	Contact	Recorders	McMary-Jean Sutton, Mr Darrell Matthews					Permits		
	CG09	AGD	56- 281726	6424881	Open site	Valid	Potential Archaeological Deposits (PAD) :-	Permits		
37-2-2228	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	CG10	AGD	56- 281632	6424865	Closed site	Valid	Potential Archaeological Deposits (PAD) :- Artefact : 9	Permits		
37-2-2229	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	CG11	AGD	56- 281603	6424981	Open site	Valid	Artefact : 1	Permits		
37-2-2240	Contact	Recorders	McMary-Jean Sutton, Hunter Valley Council Consultants					Permits		
	CG12	AGD	56- 289968	6426692	Open site	Destroyed	Artefact : 7	Permits		
37-2-2231	Contact	Recorders	McMary-Jean Sutton					Permits		
	CG13	GDA	56- 281206	6426380	Open site	Destroyed	Artefact : 4	Permits		
37-2-2232	Contact	Recorders	McMary-Jean Sutton					Permits		
	CG14	GDA	56- 281229	6426360	Open site	Destroyed	Artefact : 9	Permits		
37-2-2234	Contact	Recorders	McMary-Jean Sutton					Permits		
	CG15	GDA	56- 281278	6426351	Open site	Destroyed	Artefact : 4	Permits		
37-2-3887	Contact	Recorders	McMary-Jean Sutton					Permits		
	BFC74	GDA	56- 284210	6427689	Open site	Valid	Artefact : 1	Permits		
37-2-3889	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	BFC76	GDA	56- 284310	6427267	Open site	Valid	Artefact : 1	Permits		
37-2-3900	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	BFC17	GDA	56- 284332	6427644	Open site	Valid	Artefact : 1	Permits		
37-2-3906	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	SC59	GDA	56- 285055	6425984	Open site	Destroyed	Artefact : 1	Permits		
37-2-3913	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	SC-ST-02	GDA	56- 285023	6426030	Open site	Valid	Modified Tree (Cleared or Scarred) :- 1	Permits		
37-2-4802	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	BFC110	GDA	56- 281338	6426975	Open site	Destroyed	Artefact : 1	Permits		
37-2-4577	Contact	Recorders	Miss Nicola Roche					Permits		
	CG20	GDA	56- 281886	6425829	Open site	Valid	Artefact : 1	Permits		
37-2-4577	Contact	Recorders	Miss Stephanie Hinden					Permits		
	CG20	GDA	56- 281886	6425829	Open site	Valid	Artefact : 1	Permits		

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289999, Northings : 6425005 - 6427331 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 7 of 14

Page 7 of 8



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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_6

Client/Service ID : 367915


SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status	Site Features	Site Types	Reports	
37-2-2242	SC108	GDA	56	284554	6425011	Open site	Valid	Artifact : 1			
	Contact	Recorders	Hewlett (Australia) Pty Limited, OzArk Environmental and Heritage Management Ltd								Permits

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Page 1 of 1000000

Page 1 of 1000000



Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_6


Client/Service ID : 367915

SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2243	AC92 Contact	GDA	56	280276	6425538	Open site	Valid	Artifact : 1		
		Recorders	OzArk Environmental and Heritage Management Ms Mary-Jean Sutton, Mrs. Steph							
37-2-2244	AC93 Contact	GDA	56	280325	6425528	Open site	Valid	Artifact : 1		
		Recorders	Hewlett (Australia) Pty Limited, OzArk Environmental and Heritage Management Ms							
37-2-2245	AC94 Contact	GDA	56	280106	6425481	Open site	Destroyed	Artifact : 1		
		Recorders	OzArk Environmental and Heritage Management Ms Mary-Jean Sutton, Ms Mary-Jean							
37-2-2246	AC95 Contact	GDA	56	280326	6426082	Open site	Valid	Artifact : 26		
		Recorders	OzArk Environmental and Heritage Management Ms Mary-Jean Sutton, Mrs. Steph							
37-2-2242	AC91 Contact	GDA	56	280102	6425392	Open site	Destroyed	Artifact : 2		
		Recorders	Ms Mary-Jean Sutton							
37-2-2280	SC17 - Sooty Hollow Contact	GDA	56	284803	6425371	Open site	Destroyed	Artifact : 1		
		Recorders	Ms Jillian Ford							
37-2-2281	AC18 Contact	GDA	56	281207	6424953	Open site	Valid	Artifact : 1		
		Recorders	Ms Jillian Ford							
37-2-2294	AC43 Contact	GDA	56	283495	6426136	Open site	Valid	Artifact : 2		
		Recorders	OzArk Environmental and Heritage Management Ms Jillian Ford, Ms Stephanie Rod							
37-2-2295	AC48 Contact	GDA	56	280576	6426173	Open site	Destroyed	Artifact : 1		
		Recorders	Ms Jillian Ford							
37-2-2296	CG16 Contact	GDA	56	281126	6426272	Open site	Valid	Artifact : 6		
		Recorders	OzArk Environmental and Heritage Management Ms Jillian Ford, Ms Stephanie Rod							
37-2-2297	CG17 Contact	GDA	56	281036	6426070	Open site	Destroyed	Artifact : 1		
		Recorders	Ms Jillian Ford							
37-2-2298	SC11 Contact	GDA	56	284722	6425150	Open site	Destroyed	Artifact : 1		
		Recorders	OzArk Environmental and Heritage Management Ms Jillian Ford, Ms Stephanie Rod							
37-2-2299	SC12 Contact	GDA	56	284691	6425577	Open site	Destroyed	Artifact : 2		
		Recorders	OzArk Environmental and Heritage Management Ms Jillian Ford, Ms Stephanie Rod							
37-2-2300	SC14 Contact	GDA	56	284811	6425295	Open site	Valid	Artifact : 21		
		Recorders	OzArk Environmental and Heritage Management Ms Jillian Ford, Ms Stephanie Rod							
37-2-2274	SC05 Contact	GDA	56	283903	6425318	Open site	Destroyed	Artifact : 1		
		Recorders	Ms Mary-Jean Sutton							
37-2-2275	SC06 Contact	GDA	56	284100	6425444	Open site	Destroyed	Artifact : 8		
		Recorders	Ms Mary-Jean Sutton							
37-2-2276	SC07 Contact	GDA	56	284700	6425488	Open site	Destroyed	Artifact : 4		
		Recorders	Ms Mary-Jean Sutton							
			Permits							

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Page 1 of 1

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		<b>Extensive search - Site list report</b>					Client Service ID : 363915			
SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-2177	SC08	GDA	56	284992	6425982	Open site	Destroyed	Artefact : 10		
	Contact : Suele	Recorders	Ms Mary-Jean Sutton							
37-2-2270	SC09	GDA	56	284903	6425471	Open site	Destroyed	Artefact : 1		
	Contact : Suele	Recorders	Ms Mary-Jean Sutton, Wonnarua Native Aboriginal Corporation							
37-2-2314	AC20	GDA	56	284349	6425968	Open site	Valid	Artefact : -		
	Contact : Suele	Recorders	OzArk Environmental and Heritage Management & Ms John Ford, Monash Regional							
37-2-3983	BFG63	AGD	56	280129	6426483	Open site	Valid	Artefact : 27		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3984	BFG64	AGD	56	280374	6426309	Open site	Valid	Artefact : 10		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3985	BFG65	AGD	56	280207	6426421	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3986	BFG66	AGD	56	280174	6426314	Open site	Valid	Artefact : 51		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3988	BFG68	GDA	56	280335	6426880	Open site	Valid	Artefact : 2		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4026	SC70	GDA	56	284710	6425333	Open site	Destroyed	Artefact : -		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4031	SC73	GDA	56	285561	6425260	Open site	Valid	Artefact : -		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
37-2-4032	SC74	GDA	56	285460	6425262	Open site	Valid	Artefact : -		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
37-2-4033	SC75	GDA	56	285365	6425283	Open site	Valid	Artefact : -		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
37-2-4037	SC88	GDA	56	284847	6425262	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4022	SC43	GDA	56	284224	6426037	Open site	Valid	Artefact : 20		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4023	SC-ST-01	GDA	56	284258	6425935	Open site	Valid	Modified Yr - (Curved or Scarred)		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4024	SC-ST-01	GDA	56	282503	6426122	Open site	Destroyed	Modified Yr - (Curved or Scarred)		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
	Contact :	Recorders	Unswit (Australia) Pty Limited							
	Contact :	Recorders	Unswit (Australia) Pty Limited							

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Page 3 of 10

 <b>Office of Environment &amp; Heritage</b>		<b>AHIMS Web Services (AWS)</b>					Your Ref/PO Number : Mangoola 2041_6			
		<b>Extensive search - Site list report</b>					Client Service ID : 363915			
SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-4005	AC49	GDA	56	280280	6425810	Open site	Destroyed	Artefact : -		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Mary-Jean Sutton							
37-2-4008	AC52	GDA	56	280507	6426210	Open site	Destroyed	Artefact : -		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Mary-Jean Sutton							
37-2-4013	CG10	GDA	56	282523	6426167	Open site	Destroyed	Artefact : 50		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-4014	CG19	AGD	56	281552	6424980	Closed site	Valid	Artefact : 2		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3973	BFG53	GDA	56	284643	6426441	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3974	BFG54	GDA	56	284417	6426400	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3976	BFG56	GDA	56	284164	6426301	Open site	Destroyed	Artefact : 2		
	Contact :	Recorders	Unswit (Australia) Pty Limited							
37-2-3502	SC66	GDA	56	283763	6426888	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
37-2-3503	SC67	GDA	56	284829	6426130	Open site	Partially Destroyed	Artefact : 1		
	Contact :	Recorders	Ms Amanda Reynolds							
37-2-4505	SC09	GDA	56	285296	6426813	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Nicola Becker							
37-2-4135	SC26 (Wyong)	AGD	56	284720	6425677	Open site	Destroyed	Artefact : 7		
	Contact :	Recorders	Ms Mary-Jean Sutton							
37-2-4136	SC27 (Wyong)	GDA	56	284673	6425697	Open site	Valid	Artefact : 5		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4109	BFG56	GDA	56	284329	6427290	Open site	Valid	Artefact : 11		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Nicola Becker							
37-2-4516	AB12	GDA	56	282750	6426866	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
37-2-4518	Enabling Site 01	GDA	56	282435	6426499	Open site	Valid	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management &							
37-2-4519	EW43	GDA	56	281904	6426677	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
37-2-4520	EW42	GDA	56	282222	6426361	Open site	Destroyed	Artefact : 1		
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							
	Contact :	Recorders	Unswit (Australia) Pty Limited, Ms Amanda Reynolds							

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Page 4 of 10

 Office of Environment & Heritage		AHIMS Web Services (AWS)				Your Ref/PO Number : Mangoola 2041_6				
		Extensive search - Site list report				Client/Service ID : 363915				
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4521	EW43	GDA	56	282169	6426393	Open site	Destroyed	Artefact : 1		
37-2-4522	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW44	GDA	56	282209	6426309	Open site	Destroyed	Artefact : 1	Permits	
37-2-4523	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW46	GDA	56	282237	6426766	Open site	Destroyed	Artefact : 1	Permits	
37-2-4524	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW47	GDA	56	282180	6426268	Open site	Destroyed	Artefact : 1	Permits	
37-2-4525	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW48	GDA	56	281948	6427192	Open site	Destroyed	Artefact : 1	Permits	
37-2-4526	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW49	GDA	56	281970	6427224	Open site	Destroyed	Artefact : 1	Permits	
37-2-4529	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW410	GDA	56	281932	6427110	Open site	Destroyed	Artefact : 1	Permits	
37-2-4528	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	EW417	GDA	56	281634	6426944	Open site	Destroyed	Artefact : 1	Permits	
37-2-4116	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC92	GDA	56	281209	6427089	Open site	Valid	Artefact : 2	Permits	
37-2-4117	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC93	GDA	56	281221	6427013	Open site	Valid	Artefact : 3	Permits	
37-2-4118	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC94	GDA	56	281279	6427036	Open site	Valid	Artefact : 3	Permits	
37-2-4119	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC95	GDA	56	281395	6427016	Open site	Valid	Artefact : 4	Permits	
37-2-0509	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	Sandy Hollow, Sanglums 1	AGD	56	281430	6426990	Open site	Valid	Artefact : 1	Open Camp Site	109798170/86 642102131
37-2-0510	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	Sandy Hollow, Sanglums 2	AGD	56	282178	6426279	Open site	Destroyed	Artefact : 1	Open Camp Site	109798170/86 642102131
37-2-2266	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	AC96	GDA	56	280399	6426869	Open site	Destroyed	Artefact : 5	Permits	
37-2-2183	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC81	AGD	56	281296	6427054	Open site	Valid	Artefact : 2	Permits	102228
37-2-2167	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Amanda Reynolds							
	BFC84	AGD	56	280719	6426431	Open site	Valid	Artefact : 4	Permits	

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Page 6 of 6


	Office of Environment & Heritage	AHIMS Web Services (AWS)				Your Ref/PO Number : Mangoola 2041_6				
		Extensive search - Site list report				Client/Service ID : 363915				
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2107	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC25	AGD	56	280912	6426870	Open site	Valid	Artefact : 5	Permits	102131
37-2-2188	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC26	AGD	56	281582	6426930	Open site	Valid	Artefact : 2	Permits	
37-2-2189	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC27	AGD	56	281923	6426924	Open site	Valid	Artefact : 1	Permits	
37-2-2190	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC28	AGD	56	281419	6426941	Open site	Valid	Artefact : 4	Permits	
37-2-2191	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC29	AGD	56	281451	6426995	Open site	Valid	Artefact : 8	Permits	
37-2-2192	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC30	GDA	56	281482	6427095	Open site	Destroyed	Artefact : 22	Permits	102131
37-2-2193	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC31	AGD	56	281135	6426766	Open site	Valid	Artefact : 77	Permits	102131
37-2-2194	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC32	AGD	56	280869	6426569	Open site	Valid	Artefact : 4	Permits	
37-2-2195	Contact	Recorders	Ms.Mary-Jean Sutton							
	BFC33	AGD	56	280548	6426315	Open site	Valid	Artefact : 2	Permits	
37-2-2196	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Mary-Jean Sutton/Ms.Margaret Matthews							
	BFC34	AGD	56	280565	6426294	Open site	Valid	Artefact : 2	Permits	
37-2-2207	Contact	Recorders	Unswit (Australia) Pty Limited/Ms.Mary-Jean Sutton/Ms.Margaret Matthews							
	BFC36	GDA	56	282594	6427161	Open site	Destroyed	Artefact : 1	Permits	102131
37-2-2208	Contact	Recorders	Ms.Jillian Forth							
	BFC35	GDA	56	282617	6427116	Open site	Destroyed	Artefact : 5	Permits	
37-2-2209	Contact	Recorders	Ms.Jillian Forth							
	BFC36	GDA	56	282608	6427168	Open site	Destroyed	Artefact : 1	Permits	
37-2-2210	Contact	Recorders	Ms.Jillian Forth							
	BFC37	GDA	56	282425	6427290	Open site	Destroyed	Artefact : 49	Permits	
37-2-2211	Contact	Recorders	Ms.Jillian Forth							
	BFC38	GDA	56	281929	6427011	Open site	Destroyed	Artefact : 2	Permits	
37-2-2212	Contact	Recorders	Ms.Jillian Forth							
	BFC39	AGD	56	281831	6426854	Open site	Valid	Artefact : 4	Permits	
37-2-2197	BFC15	AGD	56	281492	6427054	Open site	Valid	Artefact : 4	Permits	102131

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Page 1 of 1





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Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_6

Client/Service ID : 363915

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-2178	Contact	Recorders	Mrs Mary-Jean Sutton, Historic Valley Group of Consultants					Permits		
	BFC16	AGD	56- 289969	6426707	Open site	Valid	Artefact : 1	Permits		102131
37-2-2179	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	BFC17	AGD	56- 289925	6426717	Open site	Valid	Artefact : 4	Permits		102131
37-2-2180	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	BFC18	AGD	56- 289925	6426686	Open site	Valid	Artefact : 3	Permits		102131
37-2-2181	Contact	Recorders	Hinewit (Australia) Pty Limited, Mrs Mary-Jean Sutton					Permits		
	BFC20	AGD	56- 289869	6426762	Open site	Valid	Artefact : 1	Permits		
37-2-2182	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	BFC21	AGD	56- 289870	6426717	Open site	Valid	Artefact : 3	Permits		102131
37-2-2183	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	BFC22	AGD	56- 289794	6426609	Open site	Valid	Artefact : 1	Permits		
37-2-2185	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	BFC19	AGD	56- 289806	6426638	Open site	Valid	Artefact : 32	Permits		
37-2-2186	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	BFC23	AGD	56- 289792	6426540	Open site	Valid	Artefact : 3	Permits		
37-2-2219	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	CG01	AGD	56- 281419	6425606	Closed site	Valid	Artefact : 3	Permits		
37-2-2220	Contact	Recorders	Mrs Mary-Jean Sutton, Ms Jillian Ford, Mr Darrell Matthews					Permits		
	CG02	GDA	56- 283120	6425541	Open site	Valid	Artefact : 1	Permits		
37-2-2221	Contact	Recorders	OzArk Environmental and Heritage Management, Mrs Mary-Jean Sutton, Valley Gals					Permits		
	CG03	GDA	56- 283182	6425798	Open site	Destroyed	Artefact : 3	Permits		
37-2-2232	Contact	Recorders	Mrs Mary-Jean Sutton, Valley Culture					Permits		
	CG04	GDA	56- 281282	6426279	Open site	Destroyed	Artefact : 1	Permits		
37-2-2233	Contact	Recorders	Hinewit (Australia) Pty Limited, Mrs Mary-Jean Sutton					Permits		
	CG05	GDA	56- 281134	6426390	Open site	Destroyed	Artefact : 4	Permits		
37-2-2234	Contact	Recorders	Mrs Mary-Jean Sutton, Civilis Consultants					Permits		
	CG06	GDA	56- 281105	6426386	Open site	Destroyed	Artefact : 1	Permits		
37-2-2225	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	CG07	GDA	56- 282110	6426251	Open site	Destroyed	Habitat Structure 1	Permits		
37-2-2226	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	CG08	AGD	56- 281709	6424885	Closed site	Valid	Artefact : 1, Potential Archaeological Deposits (PAD) :-	Permits		

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289999, Northings : 6425005 - 6427331 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 4 of 6

Page 6 of 8

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AHIMS Web Services (AWS)  
Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_6

Client/Service ID : 363915

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-2227	Contact	Recorders	Mrs Mary-Jean Sutton, Mr Darrell Matthews					Permits		
	CG09	AGD	56- 281726	6424881	Open site	Valid	Potential Archaeological Deposits (PAD) :-	Permits		
37-2-2228	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	CG10	AGD	56- 281632	6424865	Closed site	Valid	Potential Archaeological Deposits (PAD) :- Artefact : 9	Permits		
37-2-2229	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	CG11	AGD	56- 281603	6424981	Open site	Valid	Artefact : 1	Permits		
37-2-2230	Contact	Recorders	Mrs Mary-Jean Sutton, Upper Hunter Heritage Consultants					Permits		
	CG12	AGD	56- 289968	6426692	Open site	Destroyed	Artefact : 7	Permits		
37-2-2231	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	CG13	GDA	56- 281206	6426380	Open site	Destroyed	Artefact : 4	Permits		
37-2-2232	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	CG14	GDA	56- 281229	6426360	Open site	Destroyed	Artefact : 9	Permits		
37-2-2234	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	CG15	GDA	56- 281278	6426351	Open site	Destroyed	Artefact : 4	Permits		
37-2-3887	Contact	Recorders	Mrs Mary-Jean Sutton					Permits		
	BFC74	GDA	56- 284210	6427689	Open site	Valid	Artefact : 1	Permits		
37-2-3889	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	BFC76	GDA	56- 284310	6427267	Open site	Valid	Artefact : 1	Permits		
37-2-3900	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	BFC17	GDA	56- 284332	6427644	Open site	Valid	Artefact : 1	Permits		
37-2-3906	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	SC59	GDA	56- 285055	6425984	Open site	Destroyed	Artefact : 1	Permits		
37-2-3913	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	SC-ST-02	GDA	56- 285023	6426070	Open site	Valid	Modified Tree (Clipped or Scarred) :- 1	Permits		
37-2-4802	Contact	Recorders	Hinewit (Australia) Pty Limited					Permits		
	BFC110	GDA	56- 281338	6426975	Open site	Destroyed	Artefact : 1	Permits		
37-2-4577	Contact	Recorders	Mrs Nicola Roche					Permits		
	CG20	GDA	56- 281886	6425829	Open site	Valid	Artefact : 1	Permits		
37-2-4577	Contact	Recorders	Mrs Stephanie Hinden					Permits		
	CG20	GDA	56- 281886	6425829	Open site	Valid	Artefact : 1	Permits		

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289999, Northings : 6425005 - 6427331 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 7 of 10

Page 7 of 8



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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_5

Client/Service ID : 363915


SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-5627	SC108	GDA	56	284554	6425011	Open site	Valid	Artifact : 1		
	Contact	Recorders	Howard (Australia) Pty Limited,Ms,Mary-Jean Sutton,Ms,Julian Ford						Permits	

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 280204 - 289099, Northings : 6422005 - 6423111 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115.

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Page 1 of 1000000

Page 1 of 1000000



Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_5


Client/Service ID : 363909

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2247	AC07	GDA	56	282480	6423921	Open site	Valid	Artifact : 1		
	Contact	Recorders	OzArk Environmental and Heritage Management,Ms,Mary-Jean Sutton,Ms,Steph							
	Source	Permits								
37-2-2248	AC08	GDA	56	282477	6423860	Open site	Valid	Artifact : 6		
	Contact	Recorders	OzArk Environmental and Heritage Management,Ms,Mary-Jean Sutton,Ms,Steph							
	Source	Permits								
37-2-2249	AC09	GDA	56	282297	6423810	Open site	Valid	Artifact : 1		
	Contact	Recorders	OzArk Environmental and Heritage Management,Ms,Mary-Jean Sutton,Ms,Steph							
	Source	Permits								
37-2-2267	WC37	AGD	56	280517	6421732	Open site	Valid	Artifact : 5		
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2260	WC38	AGD	56	280516	6421680	Open site	Valid	Artifact : 2		102111
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2263	AC21	GDA	56	282451	6423944	Open site	Destroyed	Artifact : 1		
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2264	AC22	GDA	56	282390	6423866	Open site	Destroyed	Artifact : 1		
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2265	AC23	GDA	56	282456	6423824	Open site	Destroyed	Artifact : 2		
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2266	AC24	GDA	56	282163	6423836	Open site	Destroyed	Artifact : 1		
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2267	AC25	GDA	56	282263	6423174	Open site	Destroyed	Artifact : 1		
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2268	AC26	AGD	56	282314	6424255	Open site	Destroyed	Artifact : 1		
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2269	AC27	AGD	56	282812	6423822	Open site	Destroyed	Artifact : 1		
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2290	AC28	AGD	56	284260	6423740	Open site	Destroyed	Artifact : 6		
	Contact	Recorders	Ms,Julian Ford							
	Source	Permits								
37-2-2291	AC29	GDA	56	281865	6423898	Open site	Valid	Artifact : 2		
	Contact	Recorders	OzArk Environmental and Heritage Management,Ms,Julian Ford,Ms,Stephanie R							
	Source	Permits								
37-2-2272	SC03 same site as 37-2-3902 - different coordinates	GDA	56	285200	6422893	Open site	Destroyed	Artifact : 4		
	Contact	Recorders	Ms,Mary-Jean Sutton							
	Source	Permits								
37-2-2279	SC10	AGD	56	284850	6422973	Open site	Valid	Artifact : 500		
	Contact	Recorders	Ms,Mary-Jean Sutton							
	Source	Permits								
37-2-4997	SC22	AGD	56	284905	6421968	Open site	Valid	Artifact : 1		
	Contact	Recorders	Howard (Australia) Pty Limited,Ms,Mary-Jean Sutton,Ms,Julian Ford							
	Source	Permits	4005							

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 280101 - 289185, Northings : 6421806 - 6425805 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 1 of 1



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Extensive search - Site list report

Your Ref/PO Number: Mangoola 2041\_5

Client/Service ID: 363909


SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4025	SC67	GDA	56	207222	6423090	Open site	Valid	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Miss Nicola Roche				Permits		
37-2-4026	SC68	GDA	56	207173	6423254	Open site	Valid	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Miss Nicola Roche				Permits		
37-2-4027	SC69	GDA	56	207190	6423344	Open site	Valid	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Miss Nicola Roche				Permits		
37-2-4030	SC72	GDA	56	208191	6421444	Open site	Valid	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Miss Nicola Roche				Permits		
37-2-4036	AC36	GDA	56	208014	6424230	Open site	Valid	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	OzArk Environmental and Heritage Management Ltd				Permits		
37-2-4039	AC38	GDA	56	201900	6422271	Closed site	Valid	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited					Permits		
37-2-4060	AC40	GDA	56	202390	6423050	Open site	Valid	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	OzArk Environmental and Heritage Management Ltd				Permits		
37-2-4061	AC45	GDA	56	200156	6423351	Open site	Valid	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	OzArk Environmental and Heritage Management Ltd				Permits		
37-2-4062	AC46	GDA	56	200476	6424176	Open site	Valid	Artifact: 16		
	Contact	Recorders	Unswit (Australia) Pty Limited	OzArk Environmental and Heritage Management Ltd				Permits		
37-2-4063	AC47	GDA	56	203408	6424456	Open site	Valid	Artifact: 61		
	Contact	Recorders	Unswit (Australia) Pty Limited	OzArk Environmental and Heritage Management Ltd				Permits		
37-2-4064	AC48	GDA	56	203618	6424150	Open site	Valid	Artifact: 12		
	Contact	Recorders	Unswit (Australia) Pty Limited	OzArk Environmental and Heritage Management Ltd				Permits		
37-2-4066	AC50	GDA	56	202070	6423721	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Mrs Mary Jean Sutton				Permits		
37-2-4067	AC51	GDA	56	202547	6423935	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Mrs Mary Jean Sutton				Permits		
37-2-4069	AC53	GDA	56	200578	6424198	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Mrs Mary Jean Sutton				Permits		
37-2-4010	AC54	GDA	56	202452	6423913	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Mrs Jillian Hundey				Permits		
37-2-4011	AC55	GDA	56	202262	6424171	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Mrs Jillian Hundey				Permits		
37-2-4012	AC56	GDA	56	202551	6423993	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited	Mrs Jillian Hundey				Permits		

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum: GDA, Zone: 56, Eastings: 200101 - 209145, Northings: 6421406 - 6425005 with a Buffer of 0 meters. Additional Info: Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 1 of 1

Page 1 of 7



Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number: Mangoola 2041\_5

Client/Service ID: 363909


SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4015	WC27	GDA	56	204906	6422524	Closed site	Valid	Artifact: 4		
	Contact	Recorders	Unswit (Australia) Pty Limited, Mrs Mary Jean Sutton							
37-2-4075	BPC28	GDA	56	204100	6422711	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited							
37-2-2150	AC10	GDA	56	202263	6424077	Open site	Valid	Artifact: 1		
	Contact	Recorders	OzArk Environmental and Heritage Management, Mrs Mary Jean Sutton, Mrs. Stephen							
37-2-2151	AC11	GDA	56	202294	6424177	Open site	Valid	Artifact: 20		
	Contact	Recorders	OzArk Environmental and Heritage Management, Mrs Mary Jean Sutton, Mrs. Stephen							
37-2-2152	AC12	GDA	56	202205	6424189	Open site	Valid	Artifact: 1		
	Contact	Recorders	OzArk Environmental and Heritage Management, Mrs Mary Jean Sutton, Mrs. Stephen							
37-2-2153	AC13	GDA	56	202767	6423924	Open site	Valid	Artifact: 100		
	Contact	Recorders	Barry French, Warranah LALC, OzArk Environmental and Heritage Management, Mrs Mary Jean Sutton, Mrs. Stephen							
37-2-2154	AC14	GDA	56	202736	6423857	Open site	Valid	Artifact: 1		
	Contact	Recorders	OzArk Environmental and Heritage Management, OzArk Environmental and Heritage Management							
37-2-2155	AC15	GDA	56	202814	6423765	Open site	Valid	Artifact: 1		
	Contact	Recorders	OzArk Environmental and Heritage Management, OzArk Environmental and Heritage Management							
37-2-2156	AC16	GDA	56	202668	6422543	Open site	Valid	Artifact: 1		
	Contact	Recorders	OzArk Environmental and Heritage Management, OzArk Environmental and Heritage Management							
37-2-2157	AC17	GDA	56	201433	6423943	Open site	Valid	Artifact: 1		
	Contact	Recorders	OzArk Environmental and Heritage Management, OzArk Environmental and Heritage Management							
37-2-2165	SC19	GDA	56	204926	6421545	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Mrs Mary Jean Sutton, Mrs. Jillian Ford							
37-2-2166	SC20	GDA	56	204989	6421640	Open site	Destroyed	Artifact: 1		(R0610)
	Contact	Recorders	Unswit (Australia) Pty Limited, Mrs Mary Jean Sutton, Mrs. Jillian Ford							
37-2-2167	SC21	GDA	56	205093	6421954	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Unswit (Australia) Pty Limited, Mrs Mary Jean Sutton, Mrs. Jillian Ford							
37-2-2176	SC33	GDA	56	204862	6422880	Open site	Destroyed	Artifact: 7		
	Contact	Recorders	Mrs Mary Jean Sutton							
37-2-2177	SC34	GDA	56	204882	6422860	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Mrs Mary Jean Sutton							
37-2-2178	SC35	GDA	56	204884	6422873	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Mrs Mary Jean Sutton							
37-2-2179	SC36	GDA	56	204782	6422729	Open site	Destroyed	Artifact: 1		
	Contact	Recorders	Mrs Mary Jean Sutton							

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum: GDA, Zone: 56, Eastings: 200101 - 209145, Northings: 6421406 - 6425005 with a Buffer of 0 meters. Additional Info: Rectification. Number of Aboriginal sites and Aboriginal objects found is 115


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Page 1 of 1

Page 1 of 7

		AHIMS Web Services (AWS)				Your Ref/PO Number: Mangoola 2041_5 Client Service ID : 363909				
Extensive search - Site list report										
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2736	SC17	AGD	56	284660	6422733	Open site	Destroyed	Artefact : 14		
Contact		Recorders				Ms Mary-Jean Sutton		Permits		
37-2-2738	SC18	GDA	56	284771	6423600	Open site	Valid	Artefact : 1		
Contact		Recorders				OzArk Environmental and Heritage Management, Ms Mary-Jean Sutton, Miss Sophia AGD		Permits		
37-2-2732	SC19	AGD	56	284657	6422884	Open site	Destroyed	Artefact : 1		
Contact		Recorders				Ms Mary-Jean Sutton		Permits		
37-2-2733	SC40	AGD	56	284661	6422888	Open site	Destroyed	Artefact : 1		
Contact		Recorders				Ms Mary-Jean Sutton		Permits		
37-2-2734	SC41	AGD	56	284653	6422810	Open site	Destroyed	Artefact : 1		
Contact		Recorders				Ms Mary-Jean Sutton		Permits		
37-2-2735	SC42	GDA	56	284746	6422875	Open site	Valid	Artefact : 3		
Contact		Recorders				OzArk Environmental and Heritage Management, Ms Mary-Jean Sutton, Miss Sophia AGD		Permits		
37-2-2693	SC14	AGD	56	283600	6421304	Open site	Valid	Artefact : 1		
Contact		Recorders				Ms Mary-Jean Sutton		Permits		
37-2-2694	SC55	AGD	56	283633	6421318	Open site	Valid	Artefact : 1		
Contact		Recorders				Ms Mary-Jean Sutton		Permits		
37-2-4504	SC88	GDA	56	284395	6424975	Open site	Valid	Artefact : 1		
Contact		Recorders				Unswit (Australia) Pty Limited, Ms Amanda Reynolds		Permits		
37-2-4506	SC90	GDA	56	284759	6422634	Open site	Partially Destroyed	Artefact : 1		
Contact		Recorders				Unswit (Australia) Pty Limited, Ms Amanda Reynolds		Permits		
37-2-4132	SC23 (Wyong)	AGD	56	284907	6422037	Open site	Destroyed	Artefact : 1		
Contact		Recorders				Unswit (Australia) Pty Limited, Ms Mary-Jean Sutton, Ms Julian Ford		Permits		
37-2-4133	SC24 (Wyong)	AGD	56	284936	6422119	Open site	Destroyed	Artefact : 1		
Contact		Recorders				Unswit (Australia) Pty Limited, Ms Mary-Jean Sutton, Ms Julian Ford		Permits		
37-2-4134	SC25 (Wyong)	GDA	56	284894	6422671	Open site	Valid	Artefact : 100, Potential Archaeological Deposit (PAD) : 1		
Contact		Recorders				Unswit (Australia) Pty Limited, OzArk Environmental and Heritage Management, Ms Mary-Jean Sutton		Permits		
37-2-4497	SC - ST : 04	GDA	56	283970	6421677	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders				Andrew Long & Associates, Mr Andrew Long		Permits		
37-2-4108	SC - ST : 09	GDA	56	283994	6421712	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
<hr/>										
Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum :GDA, Zone : 56, Eastings : 280101 - 289145, Northings : 6421406 - 6425805 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115										
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Page 4 of 7


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## Extensive search - Site list report

Your Ref/PO Number: Mangoola 2041\_5  
 Client Service ID : 363909

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4493	SC76	GDA	56	282809	6424495	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Andrew Long & Associates, Mr Andrew Long								
37-2-4494	SC77	GDA	56	282805	6424456	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited, Ms Amanda Reynolds								
37-2-4495	SC78	GDA	56	282798	6424234	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited, Ms Amanda Reynolds								
37-2-4496	SC79	GDA	56	282754	6424609	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited, Ms Amanda Reynolds								
37-2-4497	SC80	GDA	56	282743	6423904	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited, Ms Amanda Reynolds								
37-2-4498	SC81	GDA	56	282724	6423768	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited, Ms Amanda Reynolds								
37-2-4499	SC82	GDA	56	281925	6423928	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited, Ms Amanda Reynolds								
37-2-4511	SC83	GDA	56	281851	6421602	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited, Ms Amanda Reynolds								
37-2-4517	Evilling Site C	GDA	56	281555	6422989	Open site	Destroyed	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited, Ms Amanda Reynolds								
37-2-4529	SC91	GDA	56	284520	6423822	Open site	Destroyed	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited								
37-2-4530	SC92	GDA	56	284509	6423749	Open site	Destroyed	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited								
37-2-4531	SC93	GDA	56	284190	6423581	Open site	Destroyed	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Unswit (Australia) Pty Limited								
37-2-4975	AC57	GDA	56	281604	6422547	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Mrs Nicola Roche								
37-2-4977	SC106	GDA	56	286249	6424292	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> Mrs Nicola Roche								
37-2-5796	SC109	GDA	56	284664	6422750	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b> OzArk Environmental and Heritage Management, Mrs Philippa Sobol								
37-2-0511	Sandy Hollow, Singleton 3	AGD	56	284970	6421840	Open site	Valid	Artefact : 1	Open Camp Site	1097/0170
	<b>Contact</b>	<b>Recorders</b> Rex Silcox								
37-2-0542	Sandy Hollow, Singleton 4	AGD	56	285900	6422950	Open site	Valid	Artefact : 1	Open Camp Site	1097/0170


Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum :GDA, Zone : 56, Eastings : 280101 - 289145, Northings : 6421406 - 6425805 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 1 of 1

Page 5 of 7



 Office of Environment & Heritage		AHIMS Web Services (AWS)				Your Ref/PO Number: Mangoola 2041_5 Client Service ID : 363909					
Extensive search - Site list report											
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports	
37-2-0513	Contact Sandy Hollow, Singleton S	Recorders Rex Silcox	GDA	56	285280	6422800	Open site	Valid	Artefact : 1	Open Camp Site	10/7/2017
37-2-2150	Contact AC29	Recorders GDA	GDA	56	283108	6422809	Open site	Valid	Artefact : 1		
37-2-2259	Contact AC30	Recorders GDA	GDA	56	281663	6422798	Open site	Valid	Artefact : 14		
37-2-2260	Contact AC31	Recorders GDA	GDA	56	281716	6422825	Open site	Valid	Artefact : 2		
37-2-2261	Contact AC32	Recorders GDA	GDA	56	281715	6422664	Open site	Destroyed	Artefact : 2		
37-2-2262	Contact AC33	Recorders GDA	GDA	56	281909	6422761	Open site	Valid	Artefact : 10		
37-2-2263	Contact AC34	Recorders GDA	GDA	56	283907	6422118	Open site	Destroyed	Artefact : 3		
37-2-2264	Contact AC35	Recorders GDA	GDA	56	283900	6422446	Open site	Valid	Artefact : 1		
37-2-2265	Contact AC37	Recorders GDA	GDA	56	283704	6422281	Open site	Destroyed	Artefact : 56		
37-2-2154	Contact WC25 (warrenbrook)	Recorders GDA	GDA	56	283101	6422719	Closed site	Valid	Artefact : 4		10/1/11
37-2-2155	Contact WC26 (warrenbrook)	Recorders GDA	GDA	56	283101	6422719	Closed site	Valid	Artefact : 1		10/1/11
37-2-2156	Contact WC28	Recorders GDA	GDA	56	283192	6422329	Open site	Valid	Artefact : 1		10/1/11
37-2-9901	Contact SC53 duplicate copy 37-2-2273 still in the area	Recorders GDA	GDA	56	285280	6422803	Open site	Destroyed	Artefact : 1		
37-2-9903	Contact SC56	Recorders GDA	GDA	56	284452	6421808	Open site	Partially Destroyed	Artefact : 1		
37-2-9904	Contact SC57	Recorders GDA	GDA	56	283657	6421733	Open site	Valid	Artefact : 1		
37-2-9905	Contact SC58	Recorders GDA	GDA	56	284698	6422283	Open site	Valid	Artefact : 1		
37-2-9906	Contact SC60	Recorders GDA	GDA	56	284491	6422684	Open site	Destroyed	Artefact : 2		

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum : GDA, Zone : 56, Eastings : 280101 - 289145, Northings : 6421406 - 6425805 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 6 of 7

Office of  
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AHIMS Web Services (AWS)  
Extensive search - Site list report

Your Ref/PO Number: Mangoola 2041\_5

Client Service ID : 363909


SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-9907	Contact	Recorders	GDA	56	281808	6422406	Open site	Destroyed	Artefact : 1	Permits
	Contact	Recorders	GDA	56	281816	6422519	Open site	Destroyed	Artefact : 1	Permits
37-2-9908	Contact	Recorders	GDA	56	281813	6422199	Open site	Destroyed	Artefact : 1	Permits
	Contact	Recorders	GDA	56	281859	6421951	Open site	Destroyed	Artefact : 1	Permits
37-2-9910	Contact	Recorders	GDA	56	283511	6421921	Open site	Destroyed	Artefact : 1	Permits
	Contact	Recorders	GDA	56	283443	6421763	Open site	Destroyed	Artefact : 1	Permits
37-2-9912	Contact	Recorders	GDA	56	282232	6422239	Open site	Not a Site	Modified Tree (Carved or Scarred)	Permits
	Contact	Recorders	GDA	56	283636	6421858	Open site	Valid	Artefact : 1	Permits
37-2-4507	Contact	Recorders	GDA	56	283510	6421683	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	GDA	56	284690	6422848	Open site	Valid	Artefact : 1	Permits
37-2-4508	Contact	Recorders	GDA	56	284233	6421685	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	GDA	56	283760	6421630	Open site	Valid	Artefact : 1	Permits
37-2-4509	Contact	Recorders	GDA	56	285911	6424905	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	GDA	56	285917	6424903	Open site	Valid	Artefact : 1	Permits
37-2-4510	Contact	Recorders	GDA	56	284582	6422765	Open site	Valid	Artefact : 1	Permits
	Contact	Recorders	GDA	56	285917	6424903	Open site	Valid	Artefact : 1	Permits

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rudden for the following area at Datum : GDA, Zone : 56, Eastings : 280101 - 289145, Northings : 6421406 - 6425805 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 115

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Page 7 of 7




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# AHIMS Web Services (AWS)

## Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_3

Client Service ID : 363898


SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-1967	MR-05-1	AGD	56	281070	6416625	Open site	Destroyed	Artifact : -	Permits	1847,1646
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-2270	SC01	AGD	56	282039	6420063	Open site	Valid	Artifact : -	Permits	
	<b>Contact</b> Saurle									
		<b>Recorders</b>								
37-2-2271	SC02	AGD	56	284996	6421192	Open site	Valid	Artifact : -4	Permits	
	<b>Contact</b> Saurle									
		<b>Recorders</b>								
37-2-2273	SC04	AGD	56	285154	6420061	Open site	Valid	Artifact : -	Permits	
	<b>Contact</b> Saurle									
		<b>Recorders</b>								
37-2-3906	Devonian Road (P63)	GDA	56	286837	6417158	Open site	Partially Destroyed	Artifact : -	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-4929	AC71	GDA	56	284817	6421369	Open site	Valid	Artifact : -	Permits	1864
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-3994	Devonian Rd 2 (P62)	GDA	56	284831	6415943	Open site	Valid	Artifact : -	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-4946	SC29	AGD	56	284693	6420437	Open site	Valid	Artifact : 9	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-4949	SC30	AGD	56	284613	6420522	Open site	Valid	Artifact : 1	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-4920	SC31	AGD	56	284719	6420516	Open site	Valid	Artifact : 1	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-4921	SC32	AGD	56	284753	6420700	Open site	Valid	Artifact : 1	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-4102	FAD Area 1	GDA	56	284481	6419851	Open site	Valid	Potential Archaeological Deposit (PAD) : -	Permits	101696
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-5068	SPUR HILL 271	GDA	56	284426	6416602	Open site	Valid	Artifact : -	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-5069	SPUR HILL 272	GDA	56	286864	6417764	Open site	Valid	Artifact : -	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-5070	SPUR HILL 273	GDA	56	286787	6417679	Open site	Valid	Artifact : -	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								
37-2-5071	SPUR HILL 274	GDA	56	286794	6417693	Open site	Valid	Artifact : -	Permits	
	<b>Contact</b>									
		<b>Recorders</b>								

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Roden for the following area at Datum : GDA, Zone : 56, Eastings : 270461 - 286497, Northings : 6416160 - 6421406 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 107

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Page 3 of 3

Page 1 of 7


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**AHIMS Web Services (AWS)**  
 Extensive search - Site list report

Your Ref/PO Number: Mangoola 2041\_3  
 Client/Service ID : 363898


SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status	Site Features	Site Types	Reports
37-2-5066	WC75	GDA	56	279296	6420219	Open site	Valid	Artifact : -		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Miss Nicola Roche								
37-2-5067	WC76	GDA	56	279150	6419977	Open site	Valid	Artifact : -		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Miss Nicola Roche								
37-2-2621	SC15	GDA	56	284415	6420258	Open site	Destroyed	Artifact : 22		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Humeit (Australia) Pty Limited, Ms Mary Jean Sutton, Ms Julian Ford								
37-2-2622	SC16	GDA	56	284442	6420587	Open site	Valid	Artifact : 16		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Humeit (Australia) Pty Limited, Ms Nicola Roche, Ms Nicola Roche, Ms Nicola Roche								
37-2-2623	SC17	GDA	56	284593	6420699	Open site	Destroyed	Artifact : 1		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Humeit (Australia) Pty Limited, Ms Mary Jean Sutton, Ms Julian Ford								
37-2-2624	SC18	GDA	56	284646	6421117	Open site	Destroyed	Artifact : 1		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Humeit (Australia) Pty Limited, Ms Mary Jean Sutton, Ms Julian Ford								
37-2-2685	SC45	AGD	56	283107	6417601	Open site	Valid	Artifact : -		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Ms Meghan Russell								
37-2-2686	SC46	AGD	56	283129	6417721	Open site	Valid	Artifact : -		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Ms Meghan Russell								
37-2-2687	SC47 with PAD	AGD	56	283143	6417589	Open site	Valid	Potential Archaeological Deposit (PAD) : - Artifact : 26		102400
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Ms Meghan Russell								
37-2-2688	SC48 with PAD	GDA	56	283423	6419910	Open site	Partially Destroyed	Potential Archaeological Deposit (PAD) : - Artifact : 100		102400
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Ms Meghan Russell, Miss Nicola Roche								
37-2-2689	SC49	AGD	56	283441	6420313	Open site	Valid	Artifact : -		2220
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Ms Meghan Russell								
37-2-2690	SC50	AGD	56	283485	6420403	Open site	Valid	Artifact : 1		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Ms Meghan Russell								
37-2-2691	SC51	AGD	56	283513	6420497	Open site	Valid	Artifact : -		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Ms Meghan Russell								
37-2-2692	SC52	GDA	56	283530	6420410	Open site	Valid	Artifact : 1		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Ms Meghan Russell								
37-2-2692	SC53	AGD	56	283507	6421185	Open site	Valid	Artifact : 1		
	<b>Contact</b>								<b>Permits</b>	
	<b>Recorders</b>	Ms Meghan Russell								

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Roden for the following area at Datum : GDA, Zone : 56, Eastings : 270461 - 286497, Northings : 6416160 - 6421406 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 107


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Page 3 of 3

Page 1 of 7

		AHIMS Web Services (AWS)				Your Ref/PO Number : Mangoola 2041_3				
		Extensive search - Site list report				Client Service ID : 363898				
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4501	SO05	GDA	56	284122	6420910	Open site	Valid	Artefact : 1		
	Contact	Recorders	Unweitt (Australia) Pty Limited/Ms.Amanda Reynolds							
37-2-4506	SO04	GDA	56	284007	6420617	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Unweitt (Australia) Pty Limited/Ms.Amanda Reynolds							
37-2-4720	Dunmace Quarry 1	GDA	56	278564	6419582	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Penny McGarrick							
37-2-5007	Dunmace Quarry 2	GDA	56	278725	6420267	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr.Oliver McCarthy							
37-2-5018	Dunmace Quarry 3	GDA	56	278641	6420429	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Penny McGarrick							
37-2-5041	SC107	GDA	56	284164	6420347	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Miss Nicola Roche							
37-2-5700	Wybong Creek-8	GDA	56	278900	6420671	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	OzArk Environmental and Heritage Management/Miss.Philippa Solari							
37-2-5797	WC77	GDA	56	278576	6420591	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	OzArk Environmental and Heritage Management/Miss.Philippa Solari							
37-2-5798	WC78	GDA	56	278507	6420109	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	OzArk Environmental and Heritage Management/Miss.Philippa Solari							
37-2-5799	WC79	GDA	56	278483	6419900	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	OzArk Environmental and Heritage Management/Miss.Philippa Solari							
37-2-5800	WC80	GDA	56	278450	6419685	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	OzArk Environmental and Heritage Management/Miss.Philippa Solari							
37-2-2077	Lot 168 DP 750966 (Brady Lane Driveway)	AGD	56	281700	6420550	Open site	Valid	Artefact : 216		Permits
	Contact	Recorders	T.L. White Cultural Heritage Services							
37-2-4590	Spur Hill 2	GDA	56	287840	6417296	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr.Peter Kuvicki							
37-2-4594	Spur Hill 3	GDA	56	288402	6417238	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr.Peter Kuvicki							
37-2-4595	Spur Hill 4	GDA	56	288356	6417169	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr.Peter Kuvicki							
37-2-4596	Spur Hill 5	GDA	56	287502	6417163	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr Jason Barr							
37-2-4597	Spur Hill 6	GDA	56	287422	6417081	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 278461 - 288487, Northings : 6416160 - 6421406 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 107										
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Page 3 of 7


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## Extensive search - Site list report

Your Ref/PO Number : Mangoola 2041\_3  
 Client Service ID : 363898


SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4598	Spur Hill 7	GDA	56	287861	6417025	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
37-2-4599	Spur Hill 8	GDA	56	287604	6416944	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr.Jason Barr							
37-2-4600	Spur Hill 9	GDA	56	288406	6416819	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr.Jason Barr							
37-2-4601	Spur Hill 10	GDA	56	287915	6416915	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
37-2-4602	Spur Hill 11	GDA	56	287886	6416821	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr Jason Barr							
37-2-4603	Spur Hill 12	GDA	56	287718	6416600	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr.Jason Barr							
37-2-4604	Spur Hill 12	GDA	56	286906	6416750	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
37-2-4605	Spur Hill 14	GDA	56	288945	6416728	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
37-2-4606	Spur Hill 15	GDA	56	287740	6416751	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr Jason Barr							
37-2-4607	Spur Hill 16	GDA	56	287283	6416708	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
37-2-4608	Spur Hill 17	GDA	56	287140	6416699	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
37-2-4609	Spur Hill 18	GDA	56	287099	6416647	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
37-2-4610	Spur Hill 19	GDA	56	286927	6416676	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr Jason Barr							
37-2-4611	Spur Hill 20	GDA	56	288995	6416614	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Mr Jason Barr							
37-2-4612	Spur Hill 21	GDA	56	287349	6416633	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
37-2-4613	Spur Hill 22	GDA	56	288994	6416561	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							
37-2-4615	Spur Hill 23	GDA	56	287028	6416482	Open site	Valid	Artefact : 1		Permits
	Contact	Recorders	Ms.Brigitta Stephenson							

Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Rouden for the following area at Datum :GDA, Zone : 56, Eastings : 278461 - 288487, Northings : 6416160 - 6421406 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 107

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Page 4 of 4

Page 4 of 7



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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number: Mangoola 2041\_3

Client/Service ID :363898


SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-2-4616	Spur Hill 25	GDA	56	267003	6416401	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4617	Spur Hill 26	GDA	56	267276	6416414	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4618	Spur Hill 27	GDA	56	267470	6416470	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4619	Spur Hill 28	GDA	56	267171	6416484	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4620	Spur Hill 29	GDA	56	266948	6416429	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4621	Spur Hill 30	GDA	56	268103	6416272	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4622	Spur Hill 31	GDA	56	267110	6416280	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4623	Spur Hill 32	GDA	56	267344	6416473	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4624	Spur Hill 33	GDA	56	268234	6416241	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4625	Spur Hill 34	GDA	56	268100	6416210	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4627	Spur Hill 36	GDA	56	267040	6416326	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4628	Spur Hill 37	GDA	56	267223	6416223	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4629	Spur Hill 38	GDA	56	266510	6416373	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4630	Spur Hill 39	GDA	56	265551	6416270	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4631	Spur Hill 40	GDA	56	266573	6416250	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4632	Spur Hill 41	GDA	56	266642	6416249	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4633	Spur Hill 42	GDA	56	267052	6416181	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		

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Page 1 of 1

Page 3 of 7



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Client/Service ID :363898

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-2-4636	Spur Hill 45	GDA	56	267044	6416195	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4637	Spur Hill 47	GDA	56	266397	6416216	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4640	Spur Hill 50	GDA	56	267182	6416533	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4642	Spur Hill 1	GDA	56	268167	6417442	Open site	Valid	Artefact : +		
	Contact	Recorders	Ms.Brygida Stephenson					Permits		
37-2-4555	WC66	GDA	56	279423	6420637	Open site	Valid	Artefact : +		
	Contact	Recorders	Howarth (Australia) Pty Limited,Mrs. Stephanie Howarth					Permits		
37-2-4556	WC67	GDA	56	279374	6420371	Open site	Valid	Artefact : +		
	Contact	Recorders	Howarth (Australia) Pty Limited,Mrs. Stephanie Howarth					Permits		
37-2-4842	Spur Hill 250	GDA	56	266574	6417386	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4843	Spur Hill 259	GDA	56	266938	6417628	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4844	Spur Hill 260	GDA	56	266739	6416793	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Peter Kusko					Permits		
37-2-4845	Spur Hill 261	GDA	56	266681	6416893	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Peter Kusko					Permits		
37-2-4846	Spur Hill 262	GDA	56	266555	6416788	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Peter Kusko					Permits		
37-2-4847	Spur Hill 263	GDA	56	266410	6416960	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Peter Kusko					Permits		
37-2-4848	Spur Hill 264	GDA	56	266386	6417294	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4849	Spur Hill 265	GDA	56	266321	6417302	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Peter Kusko					Permits		
37-2-4850	Spur Hill 266	GDA	56	264204	6417490	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Peter Kusko					Permits		
37-2-4851	Spur Hill 267	GDA	56	263700	6417713	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		
37-2-4852	Spur Hill 268	GDA	56	266514	6416212	Open site	Valid	Artefact : +		
	Contact	Recorders	Mr.Jason Barr					Permits		


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Page 6 of 6

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-4835	Spur Hill 251	GDA	56	267253	6417807	Open site	Valid	Artifact : -		
	Contact	Recorders	Mr James Barr					Permits		
37-2-4836	Spur Hill 252	GDA	56	266993	6417606	Open site	Valid	Artifact : -		
	Contact	Recorders	Mr Peter Kusko					Permits		
37-2-4837	Spur Hill 253	GDA	56	266967	6417587	Open site	Valid	Artifact : -		
	Contact	Recorders	Mr James Barr					Permits		
37-2-4838	Spur Hill 254	GDA	56	266818	6417556	Open site	Valid	Artifact : -		
	Contact	Recorders	Mr Peter Kusko					Permits		
37-2-4839	Spur Hill 255	GDA	56	267139	6417497	Open site	Valid	Artifact : -		
	Contact	Recorders	Mr James Barr					Permits		
37-2-4840	Spur Hill 256	GDA	56	266946	6417469	Open site	Valid	Artifact : -		
	Contact	Recorders	Mr Peter Kusko					Permits		
37-2-4841	Spur Hill 257	GDA	56	267117	6417435	Open site	Valid	Artifact : -		
	Contact	Recorders	Mr James Barr					Permits		
37-2-4843	Spur Hill 229	GDA	56	267773	6418877	Open site	Valid	Artifact : -		
	Contact	Recorders	Ms Hoppita Stephenson					Permits		

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Page 7 of 11

Page 7 of 7


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Your Ref/PO Number : Mangoola 2041\_9  
 Client/Service ID : 363929

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	Site Features	Site Types	Reports
37-2-2306	WC36	AGD	56	279884	6421873	Open site	Valid	Artifact : 1		
	Contact	Recorders	Ms Julian Ford					Permits		
37-2-2309	WC39	AGD	56	280022	6421857	Open site	Valid	Artifact : 2		
	Contact	Recorders	Ms Julian Ford					Permits		
37-2-2310	WC35	AGD	56	279587	6421956	Open site	Valid	Artifact : 2		102131
	Contact	Recorders	Ms Julian Ford					Permits		
37-2-2303	WC33	AGD	56	278786	6422344	Closed site	Valid	Artifact : 50		
	Contact	Recorders	Ms Julian Ford					Permits		
37-2-2304	WC34	AGD	56	279245	6422682	Open site	Valid	Artifact : 1		102131
	Contact	Recorders	Ms Julian Ford					Permits		
37-2-4507	WC61	GDA	56	277769	6423348	Open site	Valid	Artifact : 1		
	Contact	Recorders	Unweir (Australia) Pty Limited, Ms Amanda Reynolds					Permits		
37-2-4508	WC62	GDA	56	277724	6423383	Open site	Valid	Artifact : 1		
	Contact	Recorders	Unweir (Australia) Pty Limited, Ms Amanda Reynolds					Permits		
37-2-4509	WC63	GDA	56	277662	6423270	Open site	Valid	Artifact : 1		
	Contact	Recorders	Unweir (Australia) Pty Limited, Ms Amanda Reynolds					Permits		
37-2-4510	WC64	GDA	56	278944	6422940	Open site	Valid	Artifact : 1		
	Contact	Recorders	Unweir (Australia) Pty Limited, Ms Amanda Reynolds					Permits		
37-2-4122	WC52	GDA	56	277933	6423900	Closed site	Valid	Shell : 1		
	Contact	Recorders	Unweir (Australia) Pty Limited, Miss Nicola Becker					Permits		
37-2-4128	WC58	GDA	56	278027	6423658	Closed site	Valid	Artifact : 7		
	Contact	Recorders	Unweir (Australia) Pty Limited, Miss Nicola Becker					Permits		
37-2-4129	WC59	GDA	56	278034	6423803	Closed site	Valid	Shell : -		
	Contact	Recorders	Unweir (Australia) Pty Limited, Miss Nicola Becker					Permits		
37-2-4473	WC74	GDA	56	279228	6423058	Open site	Valid	Artifact : -		
	Contact	Recorders	Miss Nicola Becker					Permits		
37-2-2151	WC2	AGD	56	278733	6422546	Open site	Valid	Artifact : 3		102131
	Contact	Recorders	Upper Hunter Women's Council Inc, Ms Mary Jean Sutton					Permits		
37-2-2152	WC3	AGD	56	279169	6422282	Open site	Valid	Artifact : 1		102131
	Contact	Recorders	Upper Hunter Women's Council Inc, Ms Mary Jean Sutton					Permits		
37-2-2157	WC29	AGD	56	279971	6422329	Open site	Valid	Artifact : 1		
	Contact	Recorders	Ms Mary Jean Sutton					Permits		
37-2-2158	WC40	AGD	56	278635	6422566	Open site	Valid	Artifact : 1		102131
	Contact	Recorders	Ms Mary Jean Sutton					Permits		


Report generated by AHIMS Web Service on 14/08/2018 for Stephanie Roden for the following area at Datum :GDA, Zone : 56, Eastings : 276122 - 280174, Northings : 6421430 - 6424957 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 19

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Your Ref/PO Number : Mangoola 2041\_3

Client/Service ID : 362929

SiteID	SiteName	Datum	Zone	Eastings	Northings	Contact	Site Status	Site Features	Site Types	Reports
37-2-2153	WC24	AD63	56	276252	6422232	Open site	Valid	Artifact : 1		042111
	<b>Contact :</b> Charlie									
	<b>Recorders :</b> Mr/Mrs John Sumner (Indigenous Aboriginal Corporation)								<b>Permits :</b>	
37-2-4554	WC65	AD63	56	280372	6423707	Open site	Valid	Artifact : 1		
	<b>Contact :</b>					<b>Recorders :</b> Dr/Mr (Aust) Mr. Prof/Lt/Mr/Ms/Stephanie Hinton			<b>Permits :</b>	

Report generated by AHIMS Web Service on 14/08/2010 for Stephanie Hinton for the following area at Datum :GDA, Zone : 56, Eastings : 276122 - 280174, Northings : 6421430 - 6424057 with a Buffer of 0 meters. Additional Info : Rectification. Number of Aboriginal sites and Aboriginal objects found is 19

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Page: 3 of 3

## APPENDIX 5: SUPPLEMENTARY SITE LOCATION AND ARTEFACT PHOTOS

	
37-2-0509: VIEW OF ARTEFACT LOCATIONS IN SCALD	37-2-0509: VIEW OF SAMPLE MUDSTONE FLAKES
	
37-2-0509: VIEW OF SAMPLE MUDSTONE SHATTER	37-2-0742: VIEW OF ERODED CREEK BANK
	
37-2-0742: VIEW OF CHERT BACKED BLADE	37-2-0742: VIEW OF SAMPLE ARTEFACTS





37-2-0742: VIEW OF SAMPLE ARTEFACTS



37-2-2190: VIEW OF DISUSED TRACK



37-2-2190: VIEW OF SAMPLE ARTEFACTS



37-2-2190: VIEW OF SAMPLE ARTEFACTS



37-2-2193: VIEW OF ERODED GULLIES



37-2-2193: VIEW OF SAMPLE ARTEFACTS





37-2-2193: VIEW OF SAMPLE BACKED ARTEFACT



37-2-2193: VIEW OF SAMPLE CORE



37-2-3884: VIEW OF MUDSTONE FLAKE



37-2-3990: VIEW OF DAM WALL



37-2-3990: VIEW OF ORIGINALLY RECORDED MUDSTONE FLAKE



37-2-3990: VIEW OF SAMPLE ARTEFACTS





37-2-4109: VIEW OF VEHICLE TRACK



37-2-4109: VIEW OF MUDSTONE BLADE AND FLAKE



37-2-4109: VIEW OF HAMMERSTONE



37-2-4116: VIEW OF VEHICLE TRACK



37-2-4116: VIEW OF RERECORDED ARTEFACTS



37-2-4117: VIEW OF VEHICLE TRACK





37-2-4117: VIEW OF MUDSTONE FLAKE



37-2-4118: VIEW OF VEHICLE TRACK



37-2-4118: VIEW OF SAMPLE ARTEFACTS



37-2-4119: VIEW OF VEHICLE TRACK



37-2-4119: VIEW OF SAMPLE ARTEFACTS

INTENTIONALLY BLANK





37-2-4563: OVERVIEW OF SITE



37-2-4563: VIEW OF SAMPLE ARTEFACTS



37-2-4563: VIEW OF SAMPLE ARTEFACT



37-2-4582: VIEW OF QUARTZ CORE



37-2-4863: OVERVIEW OF SITE



37-2-4863: VIEW OF QUARTZ FLAKES





37-2-4863: VIEW OF MUDSTONE CORE



37-2-5425: VIEW OF MUDSTONE FLAKE



37-2-5428: VIEW OF MUDSTONE AND QUARTZ FLAKES



37-2-5429: OVERVIEW OF SITE



37-2-5430: OVERVIEW OF SITE



37-2-5430: VIEW OF MUDSTONE CORE FRAGMENT





37-2-5431: OVERVIEW OF SITE



37-2-5431: VIEW OF BACKED FLAKE



37-2-5431: VIEW OF SAMPLE ARTEFACTS



37-2-5431: VIEW OF SAMPLE ARTEFACTS



37-2-5432: OVERVIEW OF SITE



37-2-5432: VIEW OF QUARTZITE CORE





37-2-5433: OVERVIEW OF SITE



37-2-5434: OVERVIEW OF SITE



37-2-5439: OVERVIEW OF SITE



37-2-5439: VIEW OF MUDSTONE BLADE



37-2-5440: OVERVIEW OF SITE



37-2-5440: VIEW OF SAMPLE ARTEFACTS





37-2-5440: VIEW OF SAMPLE CORE



37-2-5440: VIEW OF BLADE BACKING



37-2-5440: VIEW OF ARTEFACT DENSITY



37-2-5441: VIEW OF HIGH DENSITY AREA

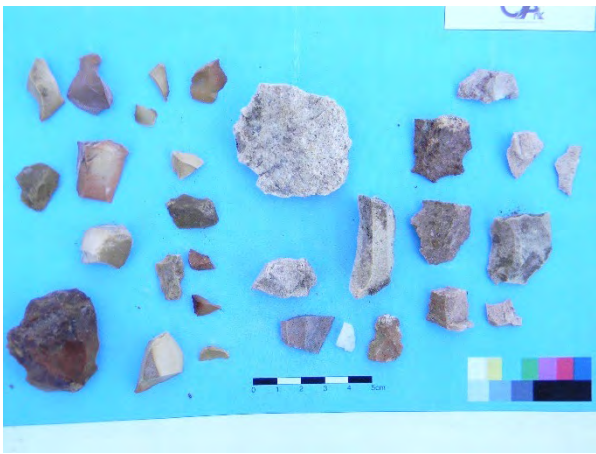


37-2-5441: VIEW OF HIGH DENSITY AREA



37-2-5441: VIEW OF KNAPPING AREA





37-2-5441: VIEW OF SAMPLE ARTEFACTS



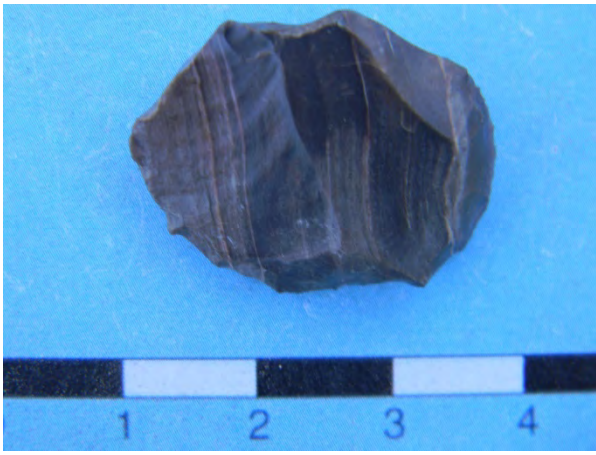
37-2-5441: VIEW OF SAMPLE ARTEFACTS



37-2-5441: VIEW OF PETRIFIED WOOD BLADE



37-2-5441: VIEW OF BLADE BACKING



37-2-5441: VIEW OF CHERT SCRAPER



37-2-5441: VIEW OF AN ASYMMETRICAL MUDSTONE BLADE





37-2-5441: VIEW OF SILCRETE CORE



37-2-5442: OVERVIEW OF LOCI



37-2-5442: VIEW OF SAMPLE GROUND SURFACE



37-2-5442: VIEW OF BACKING



37-2-5442: VIEW OF QUARTZ TOOL



37-2-5443: VIEW OF DEPOSIT





37-2-5443: OVERVIEW OF SITE



37-2-5444: OVERVIEW OF SITE



37-2-5444: VIEW OF DEPOSIT



37-2-5445: OVERVIEW OF SITE



37-2-5445: VIEW OF DEPOSIT



37-2-5446: OVERVIEW OF SITE





37-2-5446: VIEW OF DRIPLINE



37-2-5447: OVERVIEW OF SITE



37-2-5447: VIEW OF DEPOSIT



37-2-5448: VIEW OF MUDSTONE FLAKE



37-2-5449: OVERVIEW OF SITE



37-2-5449: VIEW OF FLAKES





37-2-5450: VIEW OF MUDSTONE FLAKE



37-2-5451: OVERVIEW OF SITE



37-2-5451: VIEW OF SAMPLE ARTEFACTS



37-2-5451: VIEW OF QUARTZ FLAKE



37-2-5452: VIEW OF ARTEFACT



37-2-5480: OVERVIEW OF SITE





37-2-5480: VIEW OF RETOUCED FLAKE



37-2-5480: VIEW OF RETOUCED FLAKE



37-2-5480: VIEW OF SAMPLE ARTEFACTS

## 11.6 Plains Clans of the Wonnarua Peoples ACHAR

# MANGOOLA ABORIGINAL CULTURAL VALUES ASSESSMENT REPORT

<b>Company</b>	Glencore Coal Assets Australia
<b>Contact</b>	Jason Martin
<b>Date</b>	19/09/2018

## Contents

<b>1</b>	<b>Introduction.....</b>	<b>6</b>
1.1	Background.....	6
1.2	The Study Area.....	7
1.3	Document Purpose.....	7
1.4	Aims and Objectives.....	7
1.5	Limitations of Study .....	9
1.6	Report Format and Authorship.....	12
<b>2</b>	<b>The Plains Clans of the Wonnarua Peoples.....</b>	<b>13</b>
2.1	Who are the Plains Clans of the Wonnarua People (PCWP).....	13
2.2	The Traditional Lands of the Wonnarua People .....	13
2.3	An introduction to the Heads of Families of the PCWP.....	16
2.3.1	Charlie Franks .....	16
2.3.2	Maria Stocks.....	17
2.3.3	Rhonda Ward.....	17
2.3.4	Rob Lester .....	18
<b>3</b>	<b>Historical Sources .....</b>	<b>19</b>
3.1	A Brief History of Contact and Post-Contact Settlement in Wonnarua Country.....	19
3.2	Historical Accounts of Wonnarua People .....	24
3.3	Cultural Practices.....	25
3.4	Subsistence Strategies.....	27
3.5	Material Culture.....	28
<b>4</b>	<b>Landscape Context .....</b>	<b>30</b>
4.1	Overview .....	30
4.2	Geomorphology.....	30
4.2.1	Historical Accounts of the Hunter Valley Landscape .....	31
4.2.2	The Hunter River Valley: Post-Contact Changes.....	33
4.2.3	Geomorphic Expectations.....	34
4.2.4	Comparative Study: Terrace Development on Widden Brook, Upper Hunter Valley, NSW	35
4.3	Geomorphology of the Hunter Valley: Discussion .....	38
4.3.1	Landscape Archaeology and Cultural Significance.....	38
<b>5</b>	<b>Hunter Gatherer Studies.....</b>	<b>42</b>
5.1	Aboriginal Hunter-Gatherers: an introduction .....	42
5.2	Tangible and Intangible Aboriginal Cultural Heritage .....	42
5.3	Cultural Landscapes and Intangible Sites.....	43
<b>6</b>	<b>Documenting the PCWP Cultural Values for the Study Area .....</b>	<b>45</b>
6.1	Introduction.....	45
6.2	A Holistic Approach.....	46



6.3	Cultural values.....	49
6.4	PCWP Consultation and Participation .....	50
7	Recognising the PCWP Values in the Study Area: Results.....	51
7.1	Introduction.....	51
7.2	Historical values.....	51
7.2.1	Social values .....	52
7.2.2	Spiritual values .....	52
7.2.3	Biami and the creation of Wonnarua Country.....	52
7.2.4	Lizard Mountain.....	56
7.2.5	Biami and Sentinel Mountain .....	56
7.2.6	Tiddilick the Frog .....	57
7.2.7	The 'Hairy Men and Other Leery People.....	58
7.2.8	Totems and Taboos.....	60
7.2.9	Ceremonial places and pathways.....	60
7.2.10	The Bulga Bora Ground.....	63
7.2.11	The Gold Ochre Site .....	65
7.3	Cultural Mapping of the Cultural Landscape .....	66
7.4	Landscape and Environmental Context.....	69
7.4.1	Background.....	69
7.4.2	Geology and Topography.....	69
7.4.3	The Hunter Valley Region .....	69
7.5	Predictive Modelling for the Hunter Valley Based on Previous Archaeological Studies...	71
8	Significance Assessment.....	74
8.1	Introduction.....	74
8.2	Aesthetic values.....	74
8.2.1	Positive Aesthetic Values .....	74
8.2.2	Negative Aesthetic Values.....	75
8.2.3	Individual Artefacts.....	75
8.2.4	Artefact Scatters .....	75
8.3	Archaeological Values.....	76
8.4	The Cultural Values of the PCWP in the Study Area: A Synthesis.....	78
8.4.1	An Overview Statement of Cultural Value.....	79
8.5	Summary Statements of Value Relative to Burra Charter Criteria.....	81
8.5.1	Summary Statement of Historical Value.....	81
8.5.2	Summary Statement of Social Value .....	81
8.5.3	Summary Statement of Aesthetic Value.....	82
8.5.4	Summary Statement of Scientific Value.....	82
8.5.5	Statement of Cultural Heritage Significance.....	82
8.6	Possible Mitigation Measures: The PCWP Viewpoint .....	83
8.7	Discussion and Recommendations.....	83
9	Bibliography.....	85

## Table of Figures

Figure 1: General Map showing the location of the Study Area within the Hunter Valley (Aerial image ©Department Finance, Services & Innovation. Date of extraction 19/09/2018.)	11
Figure 2: Location of the PCWP Traditional Country (Source NNTT 2014)	15
Figure 3: Charlie Franks (Photograph courtesy Charlie Franks)	17
Figure 4: Maria Stocks in the arms of her mother Barbara Foot c. 1962. (Photograph: courtesy Maria Stocks).	17
Figure 5: Rhonda Ward	18
Figure 6: Robert Lester.	18
Figure 7: Detail from the Map of the River Hunter and its Branches...showing the land grants (Extract from Dangar 1828a).	20
Figure 8: Representative cross-sections for each terrace sequence on Widden Brook. Cross-sections of the Widden terrace sequence include interpretational changes based on a revised chronology (source Cheetham 2010).	36
Figure 9: Illustrated phases of floodplain abandonment and terrace development for the Baramul, Widden and Kewarra sequences on Widden Brook (source Cheetham 2010: 115).	37
Figure 10: A buried soil on the New England Tablelands: red arrow pointing to the dark grey deposit beneath the light brown overburden.	40
Figure 11: Example of a buried soil, Redbank Creek, Hunter Valley, NSW. Scale is 2m. The blue arrows demarcate the buried soil, the red arrow the overburden.	40
Figure 12: An example of an entrenched creek illustrating erosion, Redbank Creek, Hunter Valley, NSW. Scale is 2m.	41
Figure 13: An artefact scatter exposed through erosion, Hunter Valley, NSW. This reflects geomorphic processes rather than human behavior. Such locations should be considered 'lag gravels' rather than archaeological sites. Pink flags represent surface artefacts. Scale is 2m.	41
Figure 14: A schematic diagram of the structural elements of landscape and the variable trajectories in space-time that manifest as places(s) in the present (from Cotter 2009: xxiv).	47
Figure 15: Biami the Creator, Milbrodale, Hunter Valley, NSW.	56
Figure 16: Sacred Lizard Mountain: Little Biami, a creation being, placed a giant Lizard (Wirramin Kooaran) to sleep on the mountain between Broke and Cessnock to warn all others to stay out of Wonnarua lands.	56
Figure 17: Mary Franks. c. 1980s photographed near the giant form of Tiddilick the Frog, Wollombi. Photograph courtesy Alma Franks.	58
Figure 18: Image of carved tree associated with the 'Bulga Bora ground' Image courtesy of Mr Stewart Mitchell.	64
Figure 19: Ceremonial and song lines, as reported by Mr Franks 2015, and recorded in Tocomwall 2013. Also showing some key regional Aboriginal aspects, places and sites. Source: Scott Franks 2015, Tocomwall 2013, with GML 2015, and AHIMS additions. (Aerial image ©Department Finance, Services & Innovation. Date of extraction 19/09/2018.)	68
Figure 20: A copy of the drawing Mathews (1893: 356) produced of a figure he describes as ' <i>The figure of Baiamai, or Devil Devil or whatever the image represents</i> ' as published in the Journal of the Royal Society of NSW.	71

Prepared by	Will Moon
Approved by	Scott Franks
Version	1.1
Date	19/09/2018

## 1 Introduction

---

### 1.1 Background

As Registered Native Title Claimants the Plains Clans of the Wonnarua People (PCWP) acknowledges the ongoing responsibilities and obligations of their rightful custodianship especially in regard to the preservation, maintenance and renewal of the Aboriginal cultural landscape values in, and knowledge(s) of Wonnarua Country and the transfer of these values and knowledge(s) to future generations.

As traditional custodians of Wonnarua Country the PCWP are only too well aware of the loss of places, items and natural resource use areas of cultural importance to Wonnarua people that have, and continue to occur across the Hunter Valley. Without dispute this is a function of land use changes that have occurred since the commencement of European settlement in the Hunter Valley, in or about the early to mid-1820s. In recent decades the scale of loss has increased as a result of the expansion of coal mining and related infrastructure development across the Valley. During this time members of the PCWP have actively involved themselves in Aboriginal archaeological survey and assessment of resource and infrastructure development projects with a view to fulfilling their responsibilities and obligations to their traditional lands. It has sometimes been a difficult task as it usually involves Aboriginal archaeological site clearance and salvage works that have resulted in the, albeit permitted<sup>1</sup>, destruction of Aboriginal objects and sites throughout the Hunter Valley. Moreover disproportionate emphasis on the investigation and protection of items and places of Aboriginal archaeological significance has also been problematic for the PCWP, who have attempted to articulate other tangible and intangible cultural values within 'their country' without recognition or support<sup>2</sup>. It remains of concern to the PCWP that there is no current regulatory requirement for a proponent to consult with the Aboriginal community regarding their values unless a tangible Aboriginal object is identified within the proposed development area and it is considered likely to be subject to harm or impact by the proposed development activities.

Despite these limitations the PCWP continues to participate wherever possible in Aboriginal cultural heritage projects and development works of likely impact to Aboriginal cultural resources within Wonnarua country. The identification and assessment of the Aboriginal cultural values for the Mangoola Coal Continued Operations Project - (hereafter referred to as 'the project') is one such project in which the PCWP has been engaged. This project reflects the ongoing support of Glencore Coal Assets Australia (Glencore) in actively seeking and allowing the PCWP scope to identify more than the Aboriginal archaeological values of the Project.

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<sup>1</sup> In the terms of an Aboriginal Heritage Impact Permit (AHIP) authorised under the Part 6 (Section 90) provisions of the *National Parks and Wildlife Act 1974*.

<sup>2</sup> The L and E Court actions of PCWP member Mr Robert Lester being pertinent (i.e. *Lester vs Ashton Coal Pty Ltd and Anor*, 2011).





## 1.2 The Study Area

The study area includes the MCCO Project Area and, more broadly, the surrounding lands. The study area is located approximately 10 kilometres to the north of Denman, between Wybong Creek and the Hunter River, in the Hunter Valley of New South Wales. It is within the Local Government Area of Muswellbrook as shown in Figure 1.

## 1.3 Document Purpose

Tocomwall Pty Ltd (Tocomwall) has been engaged by Glencore to prepare a cultural values assessment of the Mangoola Coal Continued Operations (MCCO) Project. Tocomwall Pty Ltd (Tocomwall) has been engaged by Glencore to undertake a cultural values assessment of the project from the perspective of the PCWP. The intent is to provide Glencore with information regarding PCWP specific cultural values identified in the lands and creek systems of the project. However, cultural values as they apply to cultural landscapes are not necessarily restricted to a particular geographic location but includes a wider geographical focus outside the study area.

Tocomwall is committed to the principles and practices of cultural heritage assessment and management outlined in the Burra Charter (ICOMOS Australia, 1999). Hence, the more specific purpose of this document is to identify and report the following Aboriginal cultural heritage values of the MCCO Project in so far as they are articulated by the PCWP:

- Aesthetic values (where applicable at the individual site/local area and/or landscape scale);
- Social values (including traditional, contemporary, spiritual and secular values);
- Scientific values (including the archaeological, as well as the environmental values, as they apply and inform the archaeological context); and
- Historic values.

The latter may include values derived from archival records that have an association with Aboriginal individuals or groups of importance at the local and/or State level. These may include direct testimony (oral histories) derived from PCWP members associated with historic events or factors that have affected and influenced Aboriginal knowledge of, and engagement with, the MCCO project. In so far as these values are to be identified and reported by Tocomwall, the purpose of this document is also to ensure that it is both a stand-alone account of the cultural values of the PCWP in the project that meets all the requirements and expectations of the PCWP (and Tocomwall) with respect to issues of confidentiality and intellectual property. An ancillary function for the document is to allow the findings and recommendations to be integrated into the MCCO Project Aboriginal Cultural Heritage Assessment Report (ACHAR). The objective is to provide Glencore with a balanced and informative cultural values assessment report to guide any future land management of the study area.

## 1.4 Aims and Objectives

The aim of the following report is to present a PCWP perspective of the study area and its environs from a cultural perspective. However, in order to inform the study with regards to the PCWP cultural perspective, it is also necessary to review archaeological, historical and environmental data to provide a scientific background to compliment the cultural assessment. The purpose of this

document will be to weld these perspectives and present a common thread that incorporates both viewpoints.

As important and fundamental as the cultural perspective is to assess the significance of cultural values of Aboriginal people with respect to their 'Country', this cannot be done in isolation from the paradigms that are used by regulatory bodies and heritage professionals particularly during an approvals process. In fact, one of the primary objectives of this document is to illustrate the importance of the cultural perspective, but at the same time, acknowledge the 'scientific' evidence in order to provide an interpretative platform that heritage professionals and regulatory bodies can use to assess *both* cultural and scientific values in tandem. These two aspects – cultural and scientific significance – cannot be assessed in isolation. Furthermore, cultural values evolve, hence the importance of growing the scientific database and continually informing and updating the cultural values. Therefore, there is a requirement for holistic archaeological approaches that incorporate landscape histories via the earth sciences and chronometric techniques, and Quaternary methods. This encapsulate aspects like climate and vegetation change or hydrological regimes. It includes historical methods to investigate Contact and post-Contact accounts of Aboriginal people and anthropological perspectives to provide human behavioural ecological models based on ethnographic assessments of hunter-gatherer societies in order to aid in the interpretation of archaeological patterning.

The following aims of this assessment are:

1. To undertake a cultural values assessment for the MCCO project area from the perspective of the PCWP that is:
  - I. Compliant with the requirements of the *National Parks and Wildlife Act 1974* (NPW Act);
  - II. Consistent with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011); and
  - III. Complimentary to the NSW Minerals Industry *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (NSWMC, 2010).
2. To conduct this PCWP specific cultural values assessment in accord with the requirements of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010a), especially as a stand-alone contribution to Stage 3, whereby information about cultural significance is exclusively derived and determined from the perspective of the PCWP.
3. To use the information obtained from this heritage assessment of the Project area and to consult with PCWP family representatives to prepare a report that outlines the PCWP specific cultural heritage values of the Project area, that evaluates the cultural significance of items and places within the Project, in light of these values.
4. To contextualise the cultural values identified and their significance with respect to the archaeological (scientific) values and complying with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010).

5. To make recommendations that enable the cultural values and cultural considerations determined through the abovementioned PCWP specific cultural values assessment process to inform the protection and management of cultural heritage values within the project area.

The following seven primary project tasks were identified as necessary to achieve these aims:

- I. Consultation with PCWP members in alignment with regulatory requirements, policy standards and approved consultation guidelines;
- II. Participate in the field assessment of the MCCO Additional Project Area with the view to understand the nature of the physical environment and to identify the full range of PCWP specific cultural values within it;
- III. Archival research and other desktop review as required to ensure appropriate understanding of the ethnographic, environmental and historical land use contexts associated with the MMCO Project;
- IV. Documentation of oral histories and/or other commentaries from PCWP members relating to the cultural values of the study area;
- V. Description or mapping of the cultural values of the study area in context of the surrounding landscape;
- VI. Synthesis of the PCWP cultural values and determination of the significance of items, places, natural resources and/or landscapes of the study area in accordance with accepted significance criteria; and
- VII. Articulation of management options for the identified Aboriginal cultural values and resources within the study area. These options are expected to address such aspects as land management and conservation of those Aboriginal cultural values from the perspective of the PCWP whose cultural heritage it is.

Upon completion of this report, it is expected that it will be a baseline study that can be used to inform the future management of both cultural and biodiversity values across the study area.

### 1.5 Limitations of Study

Tocomwall recognises that for the cultural values of the PCWP to be identified and assessed, it is necessary to provide sufficient biophysical and sociocultural data relating to the study area so that there is a context for the values described. The document is further limited to the use of this material only for characterisation of those parameters of relevance to the specific articulation of the cultural values of the PCWP.

The document will also be used to inform Glencore's intended process to collate the values of interested Aboriginal stakeholders as they relate to the MCCO Project Area.

This document reports the methods used and the outcomes from the PCWP to record and evaluate its own cultural values for the purposes of managing, conserving and promoting those values in the

long-term. To the extent that information from previous Cultural Heritage Assessments (CHA) was undertaken to document the PCWP values in Wonnarua Country (Tocomwall 2012; 2013; 2016; 2017) is relevant, it has been included here, sometimes with limited or no alteration. This is purposeful and a result of the fact that the cultural heritage values the PCWP hold in the study area are those from the same physical, spiritual and perceptual realms as those derived from previous assessments. Likewise, the PCWP is a recognised native title claimant group, with verifiable cultural connections to Wonnarua Country that derive from genealogical links that are constant as to people and places of storied reference.

Preparation of this document has been challenging. The majority of this challenge has related to (a) the need to gather and collate disparate sources of evidence, (b) time-pressure arising from PCWP involvement in activities focused on protecting their cultural heritage from other mine and infrastructure related developments; and (c) the variable availability of key informants. Overall these have had an impact on the timeliness of reporting. With regard to this issue Tocomwall acknowledges the flexibility and patience demonstrated by Glencore in enabling this document and its primary goal of comprehensively documenting the PCWP cultural values in the project, to be realised. Tim Walls and Jason Martin are acknowledged for their commitment to supporting the delivery of a document reflective of the depth of cultural knowledge and value of the PCWP in the study area.



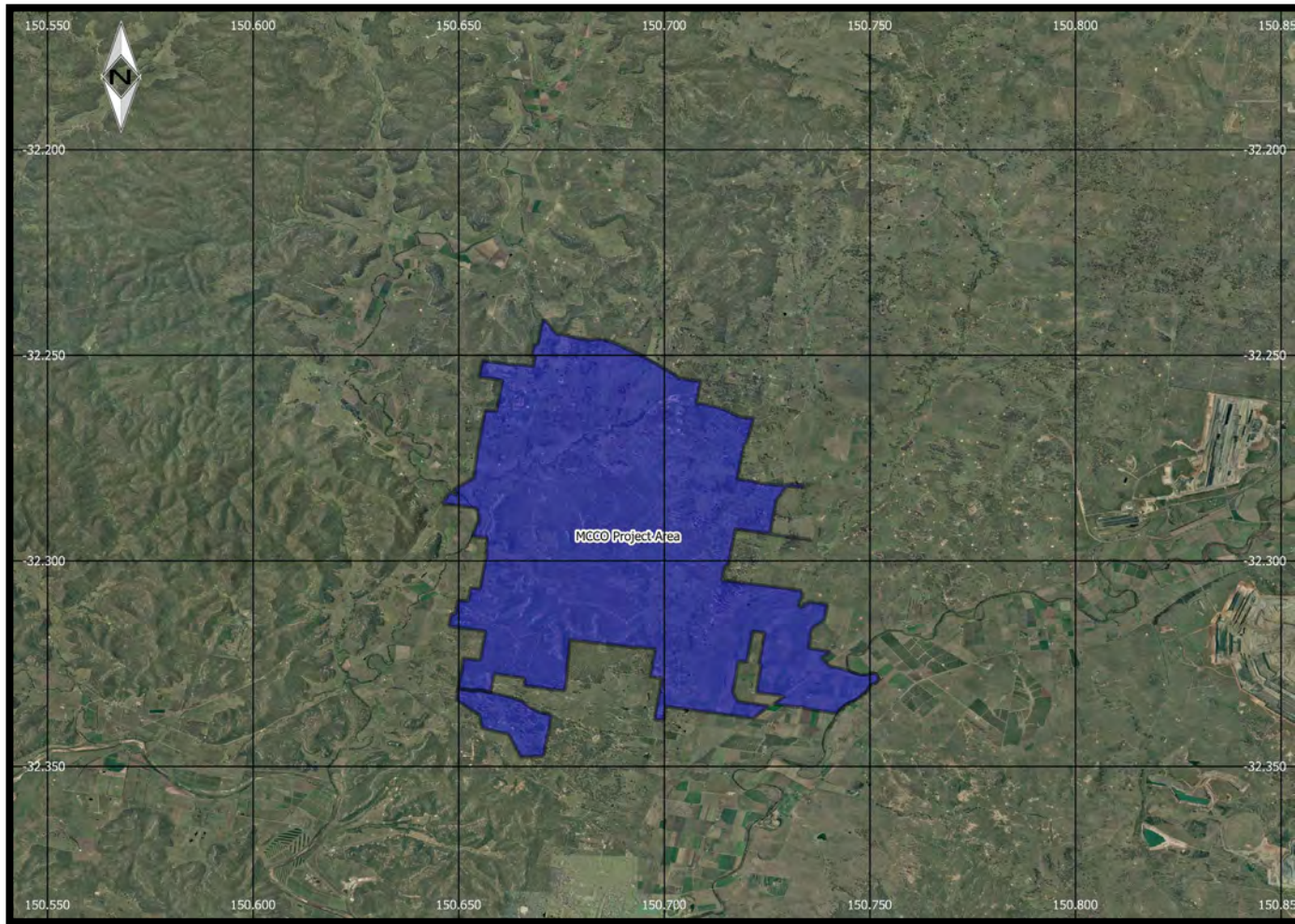


Figure 1: General Map showing the location of the Study Area within the Hunter Valley (Aerial image ©Department Finance, Services & Innovation. Date of extraction 19/09/2018.)

## 1.6 Report Format and Authorship

The document is presented in a conventional report format so as to facilitate its inclusion in any future management of the study area. Though mindful of meeting PCWP protocols with regard to the sharing of information about Wonnarua country, wherever practicable, the document has sought to adhere to the reporting conventions outlined in the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011a). The language of the report is styled so as to enable it to be subject to agency review. It is not language targeted at the broader membership of the PCWP but has been subject to editing and evaluation by the respective Heads of Family of the PCWP.

This report has been prepared by Will Moon (Tocomwall). The cultural values used in this report have come from various testimonies and interviews with the PCWP heads of family Charlie Franks, Maria Stocks, Robert Lester and Rhonda Ward, with additional information from Danny and Scott Franks.

The report was reviewed by Scott Franks and the Heads of the PCWP families.

## 2 The Plains Clans of the Wonnarua Peoples

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### 2.1 Who are the Plains Clans of the Wonnarua People (PCWP)

The PCWP are a registered Native Title Claimant group with extended familial or clan links to the hills and plains of the central and upper Hunter Valley. The PCWP assert that these clan links provide a continuity of connection with the Hunter Valley that extends back to the time at or before first sovereignty. This connection is based on well-established societal norms including the recognition of spiritual beings and places, rights and responsibility in 'Country' and the hunting, gathering and sharing of resources within the boundaries of 'Wonnarua' country. The PCWP recognises two apical ancestors namely 'Mary' the mother of Matilda Smith (nee Hughes) and 'Emily', the mother of Henry "Harry" Taggart as providing these traditional and continuing genealogical links to their claimant lands. The absence of further apical ancestors with both traditional and continuing links to Wonnarua country within the claimant group is readily attributed to issues associated with the first contact and later engagements of the PCWP with European settlers including:

- The active military suppression of the Wonnarua in the 1820s (see Gollan 1993; Millis 1994);
- Health issues, including susceptibility to introduced diseases such as smallpox as well as inherent factors like high infant mortality rates (Le Maistre 1996);
- The decline in access to habitable areas due to alienation of land by white settlers and reduction in food resources as native animals were culled to increase the stocking rates of domestic animals (Threlkeld c. 1828-1846; Noble N.D);
- The need to cohabit on pastoral properties, or to move off country and into fringe camps and / or Aboriginal Reserves (Noble N.D); and the
- Resistance to actions of the settler community to try and Christianise the Wonnarua people and devalue their customary ways (Lester 2012).

### 2.2 The Traditional Lands of the Wonnarua People

Ethnographic accounts and anthropological notes written in the mid-to late 19th century indicate that the traditional territory of the Wonnarua extended over a two thousand square mile area of land that included the Hunter River and all its tributaries from within ten miles of Maitland to the apex of the Liverpool Ranges (e.g. Miller 1886, Fawcett 1898a; 1898b). This is the territory within which the PCWP claim Native Title interest (Figure 2). The early European records describe the smaller social and/or family groups of the Wonnarua with reference to the place names of the areas in which they gathered and/or were to be found (Le Maistre 1996). Thus for example, those Aboriginals first noted in the diary entries of John Brown (Brown c.1825) as being within the vicinity of Glendon Estate later became known as the 'Glendon Blacks'; those within the area about Singleton were described as the 'natives of Patrick Plains' (Le Maistre 1996); and those near Wollombi as the 'Wollombi blacks' (e.g. by Breton 1834: 219). These are of course colonial attributions of names to apparent community aggregations that may or may not have accurately reflected the kinship units and group ranges that existed at this time within Wonnarua society.

Hence in the 1826 Sydney newspaper reportage of an attack by Aboriginals on Captain Lethbridge's Station, Bridgman (to the south east of the study area) the following description was supplied:

*'The Mountain Blacks, in the neighbourhood of Glenny's Creek [sic], in one of the more remote districts of Hunter's River, have again not only been troublesome, but also evinced a spirit of revenge...(The Sydney Gazette and New South Wales Advertiser, Saturday 9 September 1826).'*

In this case the choice of naming the Aboriginal group involved as either 'Mountain Blacks' or "Glennys Creek Blacks" appears quite arbitrary. It is an attribution of geographic association that shows no comprehension of the likelihood that for the Aboriginal party involved the entire course of "Glenny's Creek", from its more mountainous headwaters to its lower floodplain adjoining the Hunter River, was part of their traditional home base and resource range.



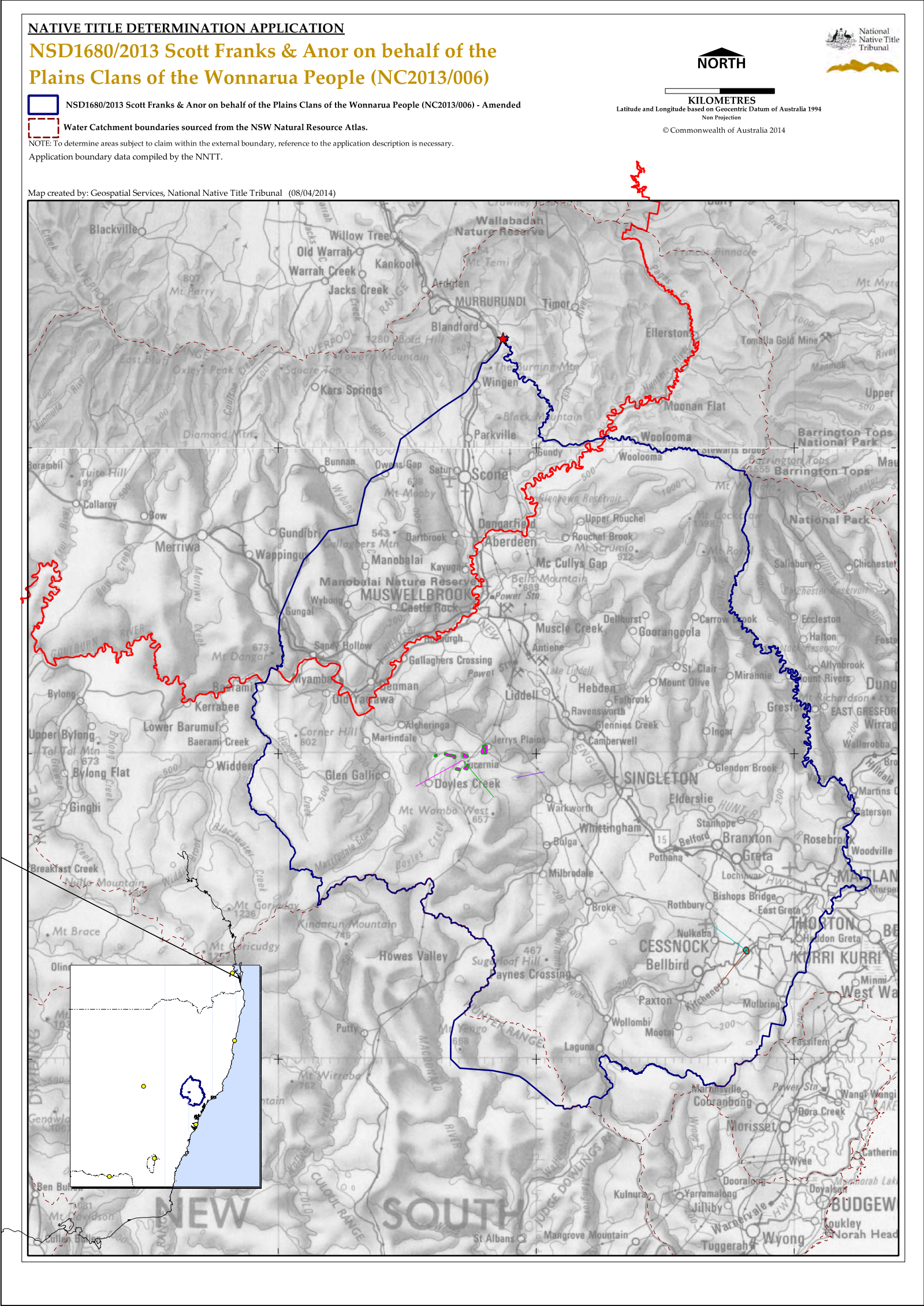


Figure 2: Location of the PCWP Traditional Country (Source NNTT 2014)

## 2.3 An introduction to the Heads of Families of the PCWP

In the context of the agreed terms of an advertised meeting held in 2010 to consider authorisation and lodgement of the PCWP's first Native Title Claim, the descendants of either Mary Shoe or Henry 'Harry' Taggart jointly confirmed that the PCWP would follow customary lore with respect to the rights and responsibilities of individuals to speak for family. This would ensure continuance of customary practices and ensure that decisions regarding matters of cultural heritage within the country of the PCWP were determined by the right family group(s). It was also expected to ensure that each family group had a voice in the process. Systems of silent voting and/or 'show of hands' mechanisms for decision making were flatly rejected as being in no way representative of the traditional rites, lores and customs of the PCWP. As Maria Stocks (2012: para. 4) explains it:

*'The lores and customs of our family groups were not voted upon but were handed down, usually by the passing of an elder. It was usually a man's role to be the Head of Family but if for whatever reason a male person didn't accept the responsibility it would be transferred 'down the line'. My mother Barbara Foot was our family Elder and spokesperson as she had been the 'next in line' upon the passing of her father. In this way the Head of Family role was handed down to me. I accepted the role from my mother and I am now the Elder and spokesperson for our family.'*

At this initial authorisation meeting - having agreed to customary lore mechanisms - four family lines were identified from within the descendant group of the two named apical ancestors (i.e. Mary Shoe and Henry 'Harry' Taggart) and 'Heads of Family' for each family line were established. It was also re-affirmed that the 'right to speak' was (and forever is) handed down by each 'Head of Family' to the next in line. Moreover, once this transference of rights and responsibilities has occurred within a family (by whatever happenstance) it is accepted and never challenged. It is only ill-health, death and/or by an agreement from the Head of Family to pass on his/her role and responsibility to another individual that allows for the transference of such rights. Within the current Claimant group the four Heads of Family named below have been identified. Notably whilst Charlie Franks remains the recognised Head of Family for the Franks/Smith Family Line, by verbal agreement he has ceded his role to negotiate on behalf of the Franks Family to his younger brother Scott.

### 2.3.1 Charlie Franks

Charlie Franks: Was born in 1963, the eldest son of Alma and Claude Franks of Mt Olive. He has three brothers (Malcolm, Scott and Thomas) and two sisters (Ann and Mary). His paternal grandmother Sarah Ann Smith was a Wonnarua woman. She was born at Falbrook near the village of Camberwell, in 1894. In 1914, Sarah married Charles Henry Franks. Her father, William "Billy" Smith was born at Sydenham in 1858, the son of James Smith a non- Aboriginal labourer and Matilda Hughes an Aboriginal woman who was born in about 1832. In turn, Matilda was the daughter of Joseph Hughes a brick maker and Mary Shoe an Aboriginal woman who was born in about 1800. James Smith and Matilda Hughes were married in the St Clements Anglican Church at Falbrook in 1856 (Source: Franks 2012 and Charlie Franks 2012.)





Figure 3: Charlie Franks (Photograph courtesy Charlie Franks)

### 2.3.2 Maria Stocks

Maria Stocks: Maria was born in 1961 and has lived in the Singleton district all her life. She is a mother of six children (Melissa, Douglas, Miranda, Brittany, Jeremiah and Annastasia) and a grandmother to six. She is a proud Wonnarua woman who has always known of and been told about her Aboriginal heritage. Her Aboriginality derives from the ancestral line of her mother Barbara Foot (nee Smith) born in Singleton in 1937, the eldest daughter of Alma Mabel Lester and James 'Leslie' Smith who, in turn, were both descendants of Matilda Hughes (Source: Stocks 2012).



Figure 4: Maria Stocks in the arms of her mother Barbara Foot c. 1962. (Photograph: courtesy Maria Stocks).

### 2.3.3 Rhonda Ward

Rhonda Ward: Is the daughter of Bill and Ila Faulder (nee Taggart). She is almost 60 years old and has lived in Singleton all her life. She has three adult children (Samantha, Shaleen and Dean) and ten grand children or "grannies" as she likes to call them. Rhonda claims her Aboriginal heritage through her maternal family line of Taggart. Her mum Ila was born in 1937 and was the third eldest of six children born to George and Ivy Taggart of Broke. Rhonda's grandfather George was the eldest son of Henry 'Harry' Frederick Taggart - a Wonnarua man - and Mary Ann Lawrence who were married in the village of Broke in 1891. Harry was born in 1860 to nineteen year old Emily (or possibly Polly), a Wonnarua woman from the Sandy Hollow area (Source Ward, 2012).



Figure 5: Rhonda Ward

#### 2.3.4 Rob Lester

Rob Lester: Is a 68 year old father of four and grandfather of six. He was born in Paddington Sydney but is joined directly to his birth right country of Wonnarua lands through the ancestral bloodline of his paternal grandfather, Edward Robert “Bob” Lester. His grandfather was born at Bridgman, Patrick Plains in 1893, the son of Mary Anne Smith and Edward Lester. Mary Anne Smith was the daughter of Matilda Hughes, a Wonnarua woman who herself was born at Patrick Plains in 1832. Rob also claims an historical connection to Wonnarua lands through his paternal grandmother Ada Waters/Miller who was the grand-daughter of Sarah Madoo. As Rob explains it, Sarah Madoo his great great-grandmother was a Worimi person, born on the Allyn River at Eccleston in 1847, then moving from Eccleston to Singleton in later years (Source: Lester 2012).



Figure 6: Robert Lester.



### 3 Historical Sources

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#### 3.1 A Brief History of Contact and Post-Contact Settlement in Wonnarua Country

The first permanent settlement in the Hunter Valley was a penal settlement, which was established in 1804 at the mouth of the Hunter River and was then known as the Coal River. At this time, the population of the settlement consisted only of the military garrison, convicts and civilian officials and the only transport between this settlement and Sydney was by water (Karskens 1985). Convicts were employed in coal mining, timber getting, lime-burning and labouring in the penal settlement and its wharves. The lands in the region of the Hunter River were initially closed to free settlement and the resources therein were reserved for the use or the profit of the Government (Wood 1972). Nevertheless by 1812 some small-farms had been established and a few well-behaved convicts occupied grants at Patterson's and Wallis Plains (Maitland).

In 1819 John Howe, a grazier and constable at Windsor, located the first overland route between Windsor and Jerrys Plains in the Upper Hunter (Karskens 1985). This route passed through the area occupied by the current village of Bulga, it being the first place reached by Howe, Singleton, Thorley and others in leaving the ranges (Eather 1921). A second expedition led by Howe in 1820 followed a slightly different route and it was this later route that was officially opened to the public in 1823 as it rapidly developed as the main thoroughfare for travelling stock from the northern districts of New South Wales (Karskens 1985; Eather 1921). Soon after, when Cunningham traversed the route, he described it in less than glowing terms maintaining that it was:

*'A rugged bridle track over a mountain ridge called Bulga, quite unfit to take an empty cart by (Cunningham 1827: 75).'*

Despite the difficult and circuitous nature of the route identified by Howe in 1820, he was subsequently granted land at Jerrys Plains for his discovery of the Bulga Road (Karskens 1985). Thus began the alienation of Wonnarua land. In March 1821 there were just 21 settlers in the Hunter Valley including John Howe and Benjamin Singleton. Within four years this had increased ten-fold to 283 settlers spread along the river as far as Segenhoe in the north, creating a farming district second only to the district of the Cumberland Plains (Karskens 1985: 23). During the period from 1823- 1827 approximately 25% of the land available along the Hunter was converted to freehold title by Crown grant (Robinson and Burley 1962). [Figure 7](#) shows the land granted along the Hunter River at 1828.

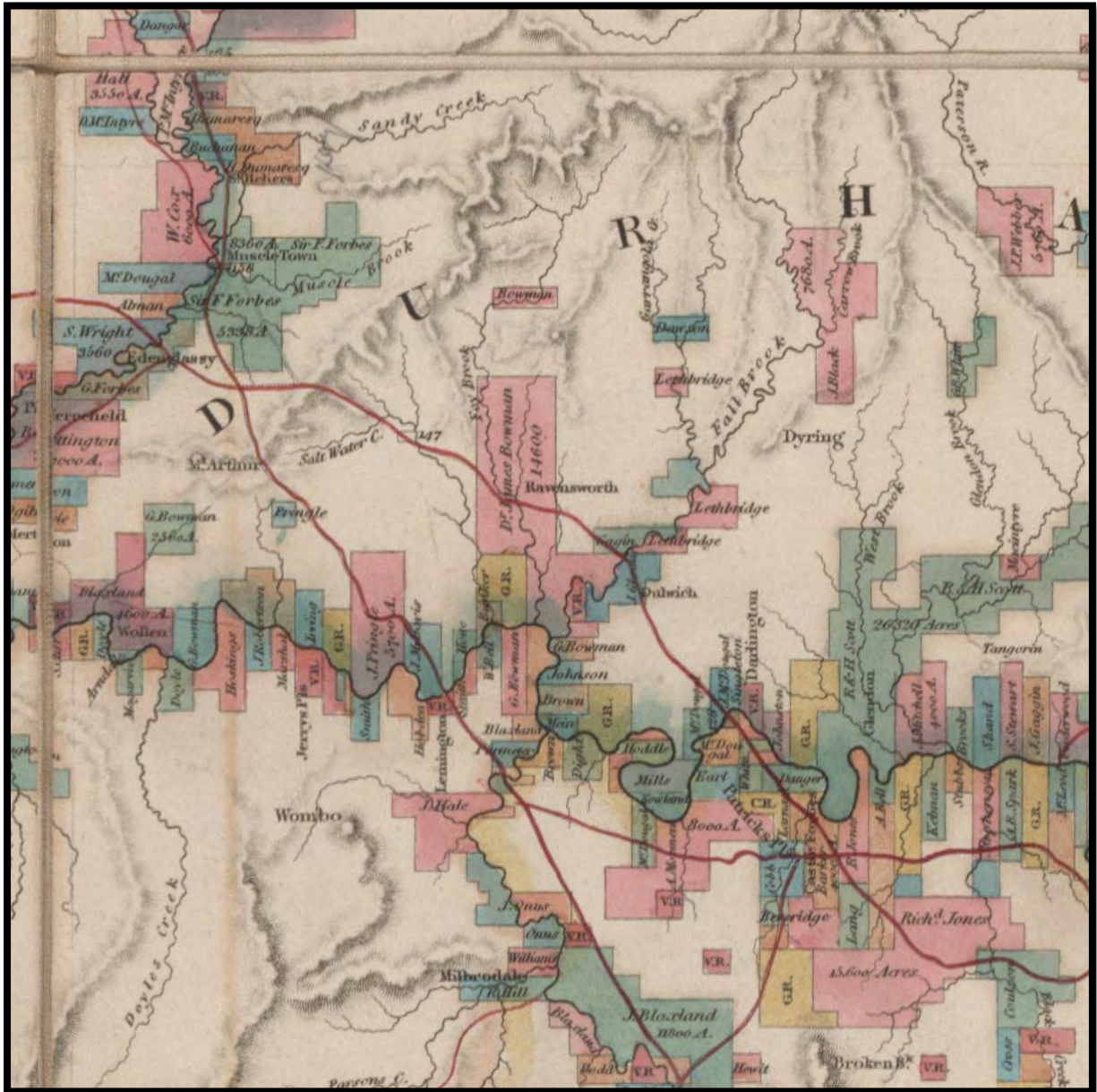


Figure 7: Detail from the Map of the River Hunter and its Branches...showing the land grants (Extract from Dangar 1828a).

By the mid-1820s, Sydney's maritime economy was sufficiently developed to provide reliable and regular shipping and communications between the Hunter and Sydney. Consequently, from the beginning of European settlement of the Hunter, Wonnarua people faced a more developed and established colonial world than their Aboriginal neighbours faced earlier in Sydney and the Coal River. The Hunter was within a long night's steaming and was in easy reach of Sydney, so far as settlers were concerned (Karskens 1985). New South Wales population had grown through natural increase and immigration to provide a free labour market. The convict assignment system also provided labour. The growth in numbers of 'native born' in the colony (this phrase is used to refer to

the locally born children of Europeans in NSW and not indigenous people who were usually referred to as the native blacks) meant there was no shortage of labour and therefore few opportunities for Aboriginal people, unless they had relevant skills and local knowledge valued by settlers. Capital was available for new areas and land-based ventures supporting extensive farming activities in the Hunter (Le Maistre 1996).

Likewise, the growing population of Sydney provided a market for produce. As a result, European settlers rapidly displaced Wonnarua people on the Hunter River. Aboriginal people's resources were seriously depleted immediately and the Wonnarua people experienced harsh times. The records indicate that at first Aboriginal people fought literally to be able to continue some of their life habits and resorted to predatory behaviour to protect access to water and food (Le Maistre 1996).

In 1826 district magistrate Robert Scott (who with his brother Helenus received a grant of 2000 acres at Glendon which he commenced to occupy in c. 1823), reported to the Governor outlining Aboriginal aggression within the area of his jurisdiction over a 10 month period (Le Maistre 1996:34). According to his report Wiradjuri people (i.e. the 'Mudgee Blacks') cooperated with the Wonnarua at the Wollombi Brook - deep in the territory of the antecedents of the PCWP - despite earlier conflict between the two groups. The cooperative effort of these two tribal groups, including the significant penetration of the Wiradjuri within Wonnarua territory was to combat a common enemy: the settlers (Le Maistre 1996).

Robert Scott also took a deposition from George Claris, assigned servant, working as a hut keeper for Mr Howe, on 25 March 1827, that demonstrated the cooperative stance of the Aboriginal groups within the Hunter Valley against the settlers at this time:

*'Tuesday last natives assembled, including Bit of Bread carrying a poisoned spear and threatening vengeance for accusing him wrongfully — King Jerry told me that if Bit of Bread was hurt by the white men that he would assemble a thousand Black fellows and spear every white man they fell in with, that the Soldiers were all gone away, that they were not afraid and desired me to inform white men at the plains so. One showed me how they surround the huts of the settlers and with a frying pan handle how they would spear us through the Slabs of the Hut, being in an unprotected state we gave them Bread, Milk and Tobacco but they would not be satisfied and I am confident that had it not been for the two strong men that we persuaded to stop, Death would have been the result (NSW State Records 5/1161; Le Maistre 1996: 54).'*

The challenging mood of the colonial frontier and the particular circumstances faced by the Wonnarua was captured and editorialised in the Sydney Press at this time:

*'Three blacks at Hunter's River have been shot, it appears, by the mounted police. We hope it is true, that they were all shot in the act of running away. But still we think their keepers ought to be severely punished for giving them the opportunity to run, and thereby cause their slaughter to be an act of justifiable homicide. There ought to be a solemn investigation. The laws of England will not justify a constable in killing a thief, if by any other means he might have secured him. A constable or a horse patrol is not to be careless about securing a prisoner, and say to himself, "it's no matter—if he attempts to run, I'll shoot him." The*

*Australian says, that two of the natives slipped their ropes and would not return, even though the horse patrol kindly requested them so to do; and therefore they shot them! Now, we suppose when they were shot, the distance at which these carrion crows were winged, could not have exceeded 100 yards. Amid yet the Australian editor, a barrister, a humane English lawyer says, with the most revolting flippancy, "They", the poor blacks, "were hailed by the party, but ineffectually and, as the "police men saw no means of securing their prisoners " alive, they deemed it advisable to secure them dead "and so they fired upon them and shot them, and shot them dead too!!!" Again, gentle reader. "Another black native, who had committed depredations on a stock-man of Mr McIntyres, was also taken, and also shot by the mounted police. When the fellow approached the river, in the way to Wallis's Plains, he slipped the rope and took to his heels, intending to take to the river —just as he reached the banks of the river, he received a ball, which was considered the only measure capable of arresting his flight, and which proved fatal. He was shot dead, and thus secured!!! (The Monitor, September 1, 1826).'*

In the oral tradition of the PCWP - and in historical reviews of the colonial record (Gollan 1993; Millis 1994) - the declaration of martial law, the dispatching of troops and the punitive expeditions conducted by members of the mounted police resulted in many massacres of Wonnarua people at this time. Ultimately, this crushed the resistance and led to a massive decrease in the numbers of Wonnarua people in the Upper Hunter, such that in 1831 when the Surveyor General Thomas Mitchell entered the valley he observed that:

*'The natives have almost all disappeared from the valley of the Hunter (cited in Millis 1994: 69).'*

The Wonnarua response to displacement from their land, including the concomitant reduction in quantity and access to traditional food resources, as well as the apparent military suppression, was not uniform. Among the Wonnarua, some individuals and family groups, including antecedents of the PCWP, clung to their Aboriginal ways. Others entered the white economy in their youth and adjusted many of their life habits while still strongly identifying as Aboriginal. Writing in a collection of missionary papers, Reverend Boodle (1874) observed remnant members of the Wonnarua that he had encountered at Muswellbrook at the end of the 1840s, noting that this group maintained much of its cultural independence:

*'Occasionally in a long bush ride, a few might be overtaken (with their hatchet, boomerang and waddy stuck in their girdle), with a lump or two of fat twisted among the curls of their hair, and perhaps their gins, or wives, following, carrying by the tail the newly killed opossums. The clothing of the men was sometimes a striped shirt, sometimes a blanket given by Government, sometimes nothing but their girdle. The women usually wore a blanket or opossum rug, unless some white woman had given them a gown (Reverend Boodle 1874: 160-161).'*

Yet, not all the Wonnarua remained culturally independent even in the first generation after European settlement. Reverend Boodle (1874) also provides some comment on those that were among the first absorbed into European working habits:



*'There are always individuals among the tribes who will, with more or less regularity, join themselves to the white man, tend or wash sheep, act as stockmen (for they are very fond of riding), work about a house or garden, reap, or take part in many of the other occupations of civilised life (Reverend Boodle, 1874:158).'*

Some young women found domestic work. Emily, the Aboriginal progenitor of the Taggart family was working as a domestic when she conceived her son, Henry Frederick Taggart (Ward 2012). Young Aboriginal men also found employment locally when there was a strong exodus to the gold fields and local vacancies occurred for young men. George Boyle White, Surveyor and resident of Singleton and Maitland, mentions several employers of Aboriginal boys in his journals (Le Maistre 1996: 65). Some members of the PCWP also recollect that their great grandparents were stockmen, drovers and timber-getters working on various properties across the Hunter and beyond (e.g. Stocks 2012; Charlie Franks *pers com.* 2012).

By the 1860s government reserves were becoming increasingly common throughout New South Wales as a way to control the movement of Aboriginal people. In 1893 St Clair Mission, was declared a Government Reserve (McGuigan 1983). This mission was located at Carrowbrook, a village lying between Muswellbrook and Singleton (Noble n.d). Though situated in the territory of the Wonnarua, residents of the Mission were drawn from neighbouring tribes including the Worimi, Awabakal, and Darkinjung (Gray 2010). In 1905 the St Clair Mission came under the control of the Aborigines Inland Mission (AIM), an organisation founded by Baptist missionary Retta Dixon (Blyton et al 2004). A year later she assisted in the establishment of a female orphanage for Aboriginal girls in George Street Singleton and a second mission at Redbournberry on the banks of the Hunter River (Gray 2010).

St Clair operated as a Mission until 1918 when it was taken over by the Aborigines Protection Board and was renamed Mount Olive Reserve. At his time the Aboriginal people were subjected to the absolute control of the newly appointed Station Manager and many people were removed from Mount Olive for failing to adhere to the strictly imposed rules (Blyton et al 2004). As a result the number of people living on the Reserve declined and by 1923 it was closed to Aboriginal people. For the period that St Clair Mission – Mt Olive Reserve operated, a further dissolution and dismantling of traditional Aboriginal lifeways occurred. At this time Aboriginal children were removed from their families (See Stocks 2012); others sought to avoid the strictures of the management regimes and/or missionary efforts to Christianise their children by moving away from Wonnarua country (Lester 2012). When doing so links to the Wonnarua Lands were still maintained through regular visits with extended family and clan by maintenance of oral history that was handed down from generation to generation.

For much of the first half of the twentieth century, the economic activity of the Singleton LGA was based on rural industries such as dairying, beef cattle production, vegetable and fodder farming (Robinson and Burley 1962). Members of the PCWP who retained residence in the area found work as Dingo bounty hunters, rabbit trappers, farmers, orchardists, timber getters and/or as cooks and cleaners (Franks 2012, Stocks 2012; Ward 2012). To some extent relationships developed between the PCWP and the local farming community that enabled some continuance of access to traditional lands. From the 1960s, with the advent of open cut methods for mining coal, the large deposits of steaming coal found close to the surface in the Singleton LGA became viable exploitable resources.

Hence from about the mid-seventies more than ten major open cut coalmines commenced operation. Major ancillary infrastructure developments were also completed at this time, including the Liddell and Bayswater Power Stations (HLA-Envirosciences 2007). These resulted in the destruction and removal of a significant number of Aboriginal sites throughout the Hunter.

In summary then, it is clear that the post-colonial history of the Wonnarua, as elsewhere for Aboriginal groups throughout Australia (e.g. Morris 1994; Kijas 2009), is one of significant social dislocation, marginalisation and dispossession from tribal lands. Yet Wonnarua people have maintained a long and continuing attachment to the area about the central and upper Hunter Valley. Members of the PCWP are the contemporary generation of Aboriginal people whose ancestors were Wonnarua. Based on their descent from Wonnarua ancestors, who owned and occupied the Hunter Valley area at the time of sovereignty, the PCWP identify as traditional owners. For them, they and their ancestors have been associated with the area since time immemorial. The PCWP's continuity of association is demonstrated through oral, archival and anthropological evidence from the time of contact through the generations to the present day. Current members of the PCWP collectively assert that the lands of the central and upper Hunter Valley are the lands of their parents, their grandparents and great grandparents.

### 3.2 Historical Accounts of Wonnarua People

During the very early explorations into the Hunter by Europeans, the Wonnarua kept their distance: observations made by Paterson's (1801) party investigating the Lower Hunter in 1801 indicate that Aborigines were present. On the basis of the many canoes he saw, Barralier (1802: 81) assumed there were "great numbers" of Aborigines in the area. Barralier (*ibid*) noted a young native looking for the roots of ferns; he also discovered part of a net along a creek bank, along with evidence of a fire and in the stream the remains of a weir. Allen Cunningham during his travels in the period 1823-25 remarked on seeing evidence of Aborigines, but not actually observing individuals (in Brayshaw 1987). Felton Mathew saw a group of 60 individuals camped along the banks of the Wollombi Brook in 1830: he later returned to visit the camp of Aborigines, which was located not far from Broke. Mathews (in Brayshaw 1987) also remarked that the men, women and children he saw were '...highly loathsome from dirt and starvation...' The influence of European occupation would have had a detrimental effect on the community before records were started. Some of the earliest official population figures came from the register of Aborigines taken at various stations during the annual distribution of blankets. Records of this nature were not totally reliable as some groups, or individuals, would not make an appearance to collect and others were thought to turn up at multiple stations (Brayshaw 1987).

By the 1840's some of the Wonnarua still kept to their social groups but there were individuals who will join themselves to the white men, tend or wash sheep, act as stockman, work about a house or garden or neap, or take work in many of the other occupations of civilised life (Le Maistre, N.D: 158). From the beginning of European settlement, Aborigines were initially used as interpreters and for finding resources such as food and water (Blyton 2012). Their intimate knowledge of the landscape helped in early exploration into and around the Hunter region (*ibid*). John Howe utilised the expertise of two Aboriginal guides, Myles and Mullaboy from the Sydney region. Contributions by the guides from the Hunter extended well beyond the boundaries of the region: heroic deeds by Galmara (aka

Jacky Jacky) and Harry Brown - both from the Hunter - were involved in major exploratory expeditions. Edgar Beale wrote of Galmara, who was the sole survivor of an attack on his party (Blyton 2012). Galmara was honoured for his allegiance to the group and presented with a silver breast plate in recognition of his assistance and accomplishments (*ibid*).

The Wonnarua persisted through the trials of the European invasion: they were thought to be almost extinct due to infanticide, debauchery, diseases, exposure and starvation (Miller 1886). There were still remnant tribes travelling and hunting in the Upper Hunter and at least one nearby Aboriginal held onto his old lifestyle: Cutt Muttan lived in a rock shelter in Wollombi up until his death in 1868 (Le Maistre N.D). Others that survived were absorbed into European society or survived by clinging to the fringes of settlements. There are two Aboriginal progenitors that the majority of Wonnarua claimants trace their family histories to: Sarah Madoo (or Waters) is the main progenitor who lived in Singleton and married a half-caste, Henry Waters. Her death certificate and descendant's accounts of their life establish Sarah's history, but the records and accounts have large time gaps and record her in several places at one time and married to different men. It was very common for Aboriginals in the past to use the same European name and even change it over time. Emily is the other progenitor who was said to be from Broke and was working as a domestic when she conceived a son, Henry Taggart (*ibid*).

### 3.3 Cultural Practices

Early anthropological observations described the Wonnarua as being intensely religious and constrained by strictly enforced laws (Ridley 1864; Fawcett 1898a). Likewise, tribal boundaries were well-defined and understood both by the Wonnarua and by neighbouring tribes such that:

*'So strictly were all rights and privileges understood, that for one tribe to enter into the district in pursuit of game was considered an offence of great magnitude and a good ground for a hostile meeting. They had no permanent settlements but roamed around from one place to place within their tribal district in pursuit of game and fish, which was their chief sustenance, making periodically of the same camping grounds, generation after generation, unless some special cause operated to induce them to abandon them. In choosing the site, proximity to fresh water was one essential, some food supply a second, whilst a vantage ground in case of an attack from an enemy was a third important item (Fawcett 1898a: 152).'*

One early observation of Aboriginal tribal interactions within the Hunter River area suggests that confrontation or 'hostile meetings' between them involved ritualised dress and took place according to strict codes of behaviour that enabled no one to be harmed despite spears, boomerangs and waddies being involved:

*'There was a large fight in the neighbouring mountains between the tribes of Port Stephens and Hunter's River. Remembering the old proverb, "Those who in quarrels interpose," and supposing there would be a good deal of blood spilt on the occasion I had no particular fancy to visit the scene of action. The army under king Bungaree I met proceeding to the field with all the ferocity that dabs of pipe-clay and smears of red-ochre could produce. They were armed with spears, bommarings, and waddies, and from their erect and frowning front*

*seemed sensible of the high emprise in which they were embarked, and impressed the passing stranger with ideas of blood and slaughter. On observing us, his majesty and several of his staff defiled to where we stood, and condescended to ask for a bit of tobacco! The next day, instead of hearing of long lists of killed and wounded, it turned out that nobody was hurt, but that every precaution had been taken to enable them to "fight another day." (The New Monthly Magazine 1828: 241).'*

This same observer also described how for the Wonnarua mourning and remembrance of the dead was also governed by strict protocols:

*'One old black was plastered nearly all over with pipe-clay, and cut a grotesque figure, not unlike "Moon" in the masquerade. He had lost his wife—and this is their deep mourning. I asked what his jin's name was, when he very plaintively replied, "What for, massa, you make me cry?" It appears that a black's name is never mentioned after death; and any of the family or tribe bearing the name of the deceased, are forthwith christened afresh, in order that no fond remembrance may be cherished of their loss (The New Monthly Magazine 1828: 241).'*

Societal restrictions were also placed upon the Wonnarua with respect to the consumption of certain foods. Fawcett describes elements of these restrictions as follows:

*'They had laws regarding the use of food which were very imperative. The young of both sexes were prohibited from eating certain sorts of flesh, and many animals and birds were tabooed to both youths and females at different periods of life. Previous to the passing of the ceremonies of the bora by which the boys were initiated into manhood, their food was like that of the women confined to female animals, and those only of special kinds. Flying foxes were esteemed great delicacies, and the dingo was reserved for the use of the older men only. Emu and black snakes were also reserved for special individuals and seasons. (Fawcett 1898a: 152).'*

The antecedents of the PCWP also practiced complex ceremonial rites. Individuals were subject to one group of rites at about the age of sixteen when ceremonies took place that involved having a front tooth knocked out, the septum of the nose pierced and the painful operation of being scarred on the back, shoulders, stomach and occasionally the legs (Miller 1886: 353). This latter scarring provided the necessary indication of 'status' and kinship with the clan group. Also at about the same age the males were made young men with many 'secret ceremonies' (Fawcett 1898a 1898b). In his manuscript titled 'The History of Bulga near Singleton N.S.W. from 1820 to 1921' long term resident of the Bulga District, Mr A.N. Eather provides his recollection of the commencement process undertaken for a ceremony that initiates or 'Boombats' known to him some 50 years prior (i.e. about 1870s) were to attend:

*'We had some young blacks in my house, fifty years ago, and the older blacks would come to us, and ask us to allow these lads off for a time to be made "boombat". Sometimes the boys would be away for the best part of a year. Sometimes the old men would bring back the boys in short time, saying that things were not ready for the Bora, that the other blacks were slow in coming up, and so forth, and that the ceremonies could not go on then; but usually all the*



*men, the lads, and the “jins” went off together to the appointed place of meeting. At night time wherever they camped, several of the men would go off in different directions and make frightsome noises all around, scaring the “jins” almost out of their wits, and awing the boys. Thus matters would go on until they reached the big camp of assembly (Eather, c. 1921).’*

Aboriginal Law also seems to have maintained harmonious relationships between Wonnarua and Awabakal people (an Aboriginal language and/or tribal group associated with lands at the mouth of the Hunter River) that allowed for reciprocity in the use of resources. Percy Haslam, a modern ethnographer associated with the University of Newcastle believed for example, that the Wonnarua were allowed once a year to move through Awabakal territory to the sea to get marine food and salt. He also noted that:

*‘As depicted in a cave painting near Wollombi; the Awabakal always invited the Wonnarua to feasts when whales became stranded on Newcastle or Lake Macquarie beaches (Aboriginal History in the Hunter Region, Newcastle University Archives A6712(iv); Le Maistre 1996: 35).’*

### 3.4 Subsistence Strategies

Traditional life for the ancestors of the PCWP was structured around a schedule of social interaction designed to take advantage of seasonal availability of resources (Brayshaw 1966; 1986). Though subject to seasonal extremes of drought and flood, there was both an abundance and diversity of plant and animal life within Wonnarua territory. Fawcett notes for example that:

*‘For food they ate kangaroos, wallabies, bandicoots, kangaroo rats, opossums, rats, emus, snakes, lizards, fish, caterpillars, grubs, lava of wasps and other insects, etc., and other animals, birds, reptiles, etc., found in their district. They used also a variety of bush fruits and roots, one of the latter being that of the water lily (1898a: 152).’*

Robert Miller (1886), who lived in the Hunter River district for some time from at least the 1840s, also confirms that the kangaroo and emu were usual foods of the Wonnarua, as were a number of reptiles, and a variety of roots including those of the water lily. Fawcett (*ibid*: 153) remarked that animals were sometimes caught by means of nets, which were useful in wooded areas, but also by means of a fire regime where sections of the landscape were burnt to create favourable conditions attracting the game and improving the accessibility. Wild Turkeys and many other waterfowl as well as bandicoots, long-nosed potoroo, native cat, fruit bats and wonga wonga were also found to be part of their diet (Albrecht 2000). They would climb trees using an axe (Grant 1803: 158) to chop possums, other small animals and honey from logs and trees.

Honey from two varieties of native bees (Gunson 1974:67, 124) was eaten and also mixed with water to form a drink (Breton 1835: 195; Dawson 1830: 60; Scott 1929: 34-35). Several fish species, eels and freshwater shellfish were consumed and mentioned by some of the early explorers (Koettig and Hughes 1983). There is very little evidence of the types of vegetation that were exploited by the Wonnarua: roots, yams, berries and other fruits are thought to have been part of their diet. Berries

and fruits were also noted as being consumed by the Wonnarua when in season (The New Monthly Magazine 1828).

Finally, one account from Mathew on the 11<sup>th</sup> of February 1830 demonstrates the potential carrying capacity of a parcel of land in Broke:

*'There were about 60 men, women and children. I remained with them for about an hour, and saw them retire for the night, each party or family kindling its own separate fire apart from the others. The place they were encamped in was a romantic spot on the bank of the Wollombi (Mathew 1832).'*

Finally, much like colonists around Wollombi Brook who undertook terrace farming, vegetable cultivation was adopted as a form of sustainable agriculture along many tributaries found within the perimeters of the PCWP's claimant area. The farming of yams and water lily tubers was a significant staple in everyday diets. As stated by Scott '*...in the more fertile spots by the sides of brooks, there was a species of yam, the root of which was eaten by Aborigines (1929)*' and Backhouse '*These stems are roasted, and eaten by the Aborigines, the blacks also roast the roots, and make them into a sort of cake, which they eat cold...(1843: 399).*' Hunting and gathering methods can ultimately be defined as strategic.

### 3.5 Material Culture

The traditional clothing of the Wonnarua is described as being a roughly cured opossum-skin cloak, worn with a girdle of opossum hair next to the skin although on 'gala occasions' they also anointed people with a mixture of red ochre and fat (The New Monthly Magazine, 1828; Miller, 1886). Miller also points out that the Wonnarua had various other personal effects including:

*'...ordinary spears, woomera, shields, and war boomerangs, and also the boomerang which returns when thrown into a flight of duck and other birds with very good results. They also had bags made of platted swamp grass; koolaman or wooden bowls, two or three feet long, for holding water at the camp; tomohawks of hard dark coloured stone, which were first chipped and then ground to an edge; knives made of flint for cutting up meat, and also chips with which they skinned animals (Miller, 1886:353).'*

They lived in bark mia-miams, which were shelters made of bark where each individual shelter had its own fire (Miller 1886). Cunningham remarked on the use of bark in the construction of the shelters: tree bark from the *Melaleuca quinquenervia* was cut as whole sheets from the trunk and heated with fire to flatten out (Eyre 1859 in Brayshaw 1987). Bark was also used in the construction of canoes: Threlkeld wrote of their manufacture, where the ends were tied with vine cord that was also tied down the centre line so the canoe would hold its shape (in Brayshaw 1987). The shank bone of a kangaroo was ground to a point and made the holes for the vine, where the grass tree gum was melted over the stitching and holes to seal it (*ibid*). The bark of the cabbage-tree formed the thread used to repair the canoes (Threlkeld in Gunson 1974: 191), with the bark of the Kurrajong tree being used to tie the ends of the canoe. The Kurrajong tree was also used for making fishing lines, nets, bags and binding spear shafts (Scott 1929: 40; 43; Barralier 1802:82). The effects of the Aborigines

also included three types of spears, wommera, shields and two types of boomerangs (Miller 1886). Threlkeld (1826 in Gunson 1974:67) also described the manufacture of the spears:

- Fishing Spear: was made from the stem of the grass tree, with four pieces of hard wood on the end that were about two feet long that were fastened with bark thread and covered with grass tree gum. Small wedges were affixed between the hardened wood ends; the hard wood ends were charred and bone barbs attached at ends. The total length of the spears was about 8 feet long;
- Hunting spear: this was made in the same way except only one hard wood end was attached, making a total length of 14-18 feet;
- War spear: this was also similar to the hunting spear but had the addition of sharp quartz flakes stuck along the hard wood joint on one side resembling teeth on a saw.

There is evidence that spears were traded between the coastal tribes and the inland tribes (Dawson 1830 in Scott 1929). For example, Threlkeld (1826) had an Aboriginal assistant that went to the mountains to trade the spears he had manufactured in exchange for possum fur cord. Most large game were killed with spears and/or captured with nets. Spear throwers (Wommera's) were used to open seafood, disembowel possums and split a piece of rotten wood to obtain grubs (Threlkeld in Gunson 1974: 68). Threlkeld also witnessed '...waddies being thrown at bandicoots at short range and were also used in battle...(quoted in Gunson 1974: 68).' The same source also described a heavier club referred to as a "nulla nulla" which was a mushroom shaped club with a flattish circular head. Miller (1986) described two types of boomerangs: one was a war boomerang that did not return and one did return which was considered to be partly used as a toy or for hunting.

Women were described as carrying a hard wood yam stick they used for daily foraging, which was sometimes used during altercations: it was also considered a status symbol (Brayshaw 1987). Barrallier quoted Ebsworth (1826:79) describing how the women of the group make string from bark and in Ebsworth's words '...they twist and roll the bark in a curious manner with the palm of the hand upon the leg; with the string they forms nets of curious workmanship. In some the meshes are very small and neat, the whole knit without a knot, excepting at its completion...' These nets were observed along the banks in Wonnarua country.

## 4 Landscape Context

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### 4.1 Overview

Prior to European settlement, Aboriginal hunter-gatherers had achieved a balance with nature in regard to their lifeways. Whereas fire has always been present in the Australian landscape, the use of firestick farming increased the frequency and geographical impact of burning in the landscape (Dodson and Mooney, 2002; Dodson et al 1994; Prosser 1990). Although natural erosion was always present in landscapes, no matter how stable, it was a relatively isolated occurrence in different landforms. The coming of Europeans and their unsuitable land management practices created an imbalance that is still being felt in the Australian landscape. Examples such as logging, tilling of soils, construction and subsequent urbanisation caused, and continues to cause, soils and sediments to erode from upper and middle slopes and 'blanket' lower slopes and choke up creeks and rivers with these eroded deposits. In other areas, deforestation caused water to flow off slopes at increased rates and many 'chains-of-ponds', that only flooded during extreme rainfall events, subsequently became entrenched channels and/or caused creek and river channels to migrate considerable distances. Considerations of these landscape processes is fundamental in not only identifying the location of archaeological sites, but in reducing the risk of impacting upon archaeological deposits during the course of construction: for example, during bulk earth works.

This section provides a comparative overview of the landscape context of the Hunter Valley in general.

### 4.2 Geomorphology

The landscape of the Hunter Valley has previously been described as:

*'For about the last 10 000 years or so (a period known as the Holocene) the landscape of the Upper Hunter and the resources available to its Aboriginal inhabitants would have been very much like they were in the late 1700s ..... In summary, the undulating country and the flood plains were lightly timbered (predominantly with Iron Bark Gum and Box) and well grassed. In contrast, the banks of the major rivers (including the Hunter and the Goulburn) and the large creeks were thickly treed, especially with 'swamp-oaks'. The larger tributary creeks were only shallowly incised (if at all) and were described as having 'grassy or swampy meadows' and 'chains of ponds'. The larger ponds/billabongs would have provided a permanent or semi-permanent source of water and provided a range of aquatic plant and animal foods and other resources. Except during severe droughts there would have been abundant large and small game including kangaroos, wallabies, emus and wild turkeys (bustards), as well as a host of smaller animals and birds. (ERM 2004: 7-8).'*

This provides us with a starting point in how to begin looking at the landscape history of the Hunter Valley and ultimately, how it informs a cultural values assessment. From an archaeological settlement pattern perspective, the key conclusions to draw from the above paragraph are:



- Major watercourses such as rivers were incised – and as we shall see later – included terrace systems;
- The deposition of valley sediments in mid to lower catchments; and
- The larger tributary creeks were only shallowly incised and more often than not, were actually ‘grassy or swampy meadows’ and ‘chains of ponds’.

These three points are somewhat at odds with the archaeological predictive models that have been formulated by archaeologists. The following discussion will introduce more detail in relation to the geomorphology of the Hunter Valley and specifically, how it affects the archaeological visibility and subsequently influences our perceptions of Aboriginal settlement patterns of the study area.

#### **4.2.1 Historical Accounts of the Hunter Valley Landscape**

The Hunter Valley experienced a greater rate of change due to European settlement compared to Sydney and Newcastle, due to its close proximity to Sydney and it being easily accessible thanks to its rivers and tributaries. With a growing European population and the increasing demand for resources, the Hunter Valley was a desirable location admired for the lush nutrient rich alluvial soils fringing the tributaries, and luxuriant grazing pastures for livestock and tall cedar trees skirting the higher terraces of the valley. Within a short timeframe, the Wonnarua had to deal with the rapid procurement of their resources and the manipulation of the environment by the Europeans causing a loss of their flora and fauna staples.

John Howe was one of the first explorers to venture into the Hunter region, first arriving near Doyle’s Creek in 1819. He observed valleys of grassland and rich alluvial soils that he presumed were ideal for agriculture and cattle/sheep grazing. As he headed south toward Jerrys Plains, the open grasslands with sparse tree cover continued as he travelled along the river. Governor Macquarie was informed of the fine timber of the higher reaches of the valley and the fine green grass of the lower elevations. Henry Dangar was a surveyor and was appointed to the position to survey the landscape of New South Wales. He mapped out the river and creek/pond systems and the generalised geology and vegetation profiles of the Hunter Region. In 1824 his field notes describe the Lemmington area near Warkworth as having tolerable second class forest land made up of small Box Gums and Iron Bark, growing on stiff (presumably clay?) soils (Field book 221). Heading south on the left bank of Wollombi Brook, near the junction of the Hunter River, he also noted light alluvial soils along the waterways with a tributary mapped as a chain-of-ponds. The second-class forest continued on undulating terrain and was described as thinly wooded (Field book 220). Peter Cunningham (1826), upon entering the Hunter also described the large plains of grassland with few trees ‘*..not often a 12 to the acre..*’ (1827: 156). Breton (1835: 122) described the path of the tributaries higher up in the valleys, which drained down from the Sandstone escarpments, as vegetated by thick scrub and vine brushes that were difficult to penetrate.

The waterways above Jerrys Plains were said to contain a great number of Perch in 1819 by John Howe (in Campbell 1928:239). Erosion gullies were rarely referenced by the early settlers and explorers in the period between 1800-1840, therefore Dean-Jones and Mitchell (1993) concluded that headwater streams were stable and well grassed, or rock cut, shallow channels, which were only subject to occasional flow. This scenario changed with the rapid settlement of the valley.

Henry Dangar noted the extraordinary advances in settlement of the region between 1822 and 1825, with division of the country occupying 150 miles along the river. By 1825 more land was owned by the new settlers and the original Aboriginal inhabitants became increasingly disenfranchised from their traditional lands (Blyton 2012). The invasion by the European settlers changed the distribution of vegetation, with increasing landscape instability as a result of the logging of the forested areas around the higher elevations and the clearing of the brush around the understorey and along the tributaries for agriculture and pastoral farming. Aboriginal dependence of the Hunter River for many staples meant that the Wonnarua suffered severely when the Europeans settled: they immediately lost access to water and the raw materials in the river and on the banks. They also lost their game to the intruders who chased kangaroos in hunts to reduce competition for their introduced grazing animals; shellfish and fish populations also declined. Breton (1833) wrote that he only noted 16 kangaroos, in contrast to a previous visit to the area when they had numbered in the hundreds. The loss of fish for protein and the loss of managed plains for game hunting and seed gathering destroyed long established hunting and gathering practices of the Aboriginal community (Le Maistre 1996). This exclusion and alteration of the landscape by the Europeans brought them into conflict with the local Wonnarua People (Blyton 2012).

The necessity for inhabitants to adopt agricultural practices off fertile waterfronts through the Hunter Valley signalled the demise of the Wonnarua Peoples traditional way of hunting and gathering. Early settlers were known to take up parcels of land during the opening of the valley in 1831. This is based on three determining factors: the capacity for a tributary to carry fertile sediments that can be used for agricultural purposes; the seasonal affects such as evaporation due to intensification of summer radiation which ultimately drains watercourses leaving aggregated sedimentation left to create terraces and chains of ponds; and of course, the availability of fresh potable water for the irrigation of crops.

Initial settlement by Europeans was centred on waterways. This is demonstrated in an excerpt from Mitchell:

*'...the selection of farmland depends solely on the direction of streams, for it is only in the bed of watercourses, that any ponds can be found during dry seasons. The formation of reservoir's has not yet been resorted to, although the accidental largeness of ponds left in such channels has frequently determined settlers in their choice of a homestead, when by a little labour, a pond equally good might have been made in other parts, which would select from the want of water...' (Mitchell 1831-1832).'*

The availability of wide-open spaces, rich in fertile soils suitable for agricultural purposes were also described on the land inhabited by Blaxland:

*'Portions of the surface near Mr. Blaxland's establishment, bore that peculiar, undulating character which appears in the southern districts, where it closely resembles furrows, and is termed ploughed ground. This appearance usually indicates a good soil, which is either of a red or very dark colour, and in which small portions of trap-rock, but more frequently concretions of indurated marl, are found. Coal appears in the bed and banks of the Wollombi, near Mr. Blaxland's station, and at no great distance from his farm is a salt spring,*

*also in the bed of this brook. The waters in the lesser tributaries, on the north bank of the river Hunter, become brackish when the current ceases. In that part of the bed of this river, which is nearest to the Wollombi (or to Wambo rather) I found an augitic rock, consisting of a mixture of felspar and augite.. (Mitchell 1838).'*

Speculation regarding the fertility of the lands located between the Hunter River, Doyles Creek and Jerrys Plains meets the characteristics of land that had previously been managed by Aboriginal people via fire stick farming. This technique was adopted, amongst other reasons, to introduce specific species of brushes whilst inevitably, it was attractive to large game such as kangaroos. Instances of large burn areas utilized for hunting methods are easily identified as having fertile and rich sediments with a low count of mature timbers.

*'...the last two hours through a fine country thinly timbered, and for the last hour many acres without a tree on it. One spot, I think, exceeds 50 acres without a tree on it, and a very fine ground. The land on both sides is very fine, and a great part of it may be cultivated without felling a tree. Even the high land is well clothed with grass and lightly timbered, though most thicker than the low ground. The grass on the low ground equals a meadow in England, and will throw as a good swatch (ibid).'*

Mitchell had also made similar observations when he travelled through Broke, Warkworth and Ravensworth:

*'We found the country across which we rode very much parched from the want of rain. The grass was everywhere yellow, or burnt up, and in many parts on fire; so that the smoke which arose from it obscured the sun, and added sensibility to the heat of the atmosphere (Mitchell 1838).'*

Without doubt, early European observations reflected on the fertility of the lands of the Hunter Valley. Importantly, the hydrology of the river systems and creeks has changed considerably since European land management practices were introduced. Many creek lines, including those of the study area, were clearly a series of chains-of-ponds rather than entrenched channels. Although this is generally not the case today.

#### **4.2.2 The Hunter River Valley: Post-Contact Changes**

The late 18<sup>th</sup> and early 19<sup>th</sup> Century European settlement of Australia initiated catastrophic changes to the morphology of landforms due to inappropriate land management practices (Brooks and Brierley 1997; 2000; Erskine 1994; Haworth et al 1999; Gale and Haworth 2002; Olley and Wasson 2003; Prosser et al 2001). Clearance, tilling, intensive grazing and increasing development of infrastructure and buildings initiated widespread mobilisation and redistribution of soil and sediment mantles, river metamorphosis<sup>3</sup> (*sensu* Schumm 1969; see also Erskine 1986),

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<sup>3</sup> Processes promoting disturbance that can instigate major and incessant morphological changes over large areas within very short time frames in sensitive landscapes.

desertification and rising salinity (Brooks and Brierley 1997; 2000; Erskine 1994; Haworth et al 1999; Gale and Haworth 2002; Olley and Wasson 2003; Prosser et al 2001) in contrast to pre-Contact stability, dating back for example some 2,000 years in rivers (e.g Nanson and Doyle 1999).

Prior to colonisation by Europeans, the Upper Hunter River exhibited characteristics typical of a passively meandering gravel-bed river of moderate sinuosity and relatively uniform channel width (Hoyle et al 2008). Studies using archival records, parish maps, aerial photography and floodplain sedimentology have documented marked changes in channel morphology post-dating the settlement of the area by Europeans in the 1820's (*ibid*). At Singleton for example, the Hunter River is four times its pre-Contact width (Gardiner 1991). However, studies by Hoyle et al (2008) on the Upper reaches suggest that the first 70 years of settlement did little to change the channel morphology of the Hunter (in contrast to the Middle and Lower Hunter reaches). Based on Parish maps, channel morphology and realignment did not occur until the period between 1918 and 1938, with a second phase of stability between 1938 and 1955 until the 1:100 year flood of 1955 which again initiated channel morphology changes (*ibid*: 14-15). In other words, changes to river channel morphology and depositional regimes are not constant but require certain thresholds to be breached in order to re-activate river metamorphosis.

In summary, the post-Contact period has seen unparalleled channel changes to the Hunter River and other waterways in the Valley. Much of this change is the result of the removal of riparian vegetation, logging and the impacts of stock (Brierley et al 2005; Brooks et al 2003; Hoyle et al 2008). The entrenchment of creek systems has enhanced the geomorphic effectiveness of floods, since floods of higher magnitude are contained within enlarged channels and based on modern geomorphic studies, it will take thousands of years for these rivers to recover to pre-disturbance proportions (Brooks and Brierley 2004; Hoyle et al 2008).

#### 4.2.3 Geomorphic Expectations

Comparative studies have been included in order to provide key examples of the geomorphic processes that are likely to have impacted the current study area because a review of the available literature on previous studies of the project area provided did not contain any specific geomorphic history. The comparative studies are included to illustrate the complicated nature of depositional histories within river valleys of the Hunter Valley (and importantly, in close proximity to the study area) and the importance of understanding these in order to make sense of Aboriginal settlement patterns. The absence of detailed geomorphic studies across areas being investigated for Aboriginal settlement patterns means that there is no stratigraphic or chronological control: testing surfaces with the 'expectation' that they are contemporary is simply untenable since it is highly likely that they reflect a combination of time-transgressive sequences<sup>4</sup> with and without historical overlap. It is comparable to taking stratified deposits with artefacts from a vertically stacked sequence and mixing them up: i.e. there is **no** stratigraphic control.

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<sup>4</sup> Time-transgressive sequences with historical overlap are 'stratified' in an oblique manner and/or abut (e.g. river terraces); time-transgressive sequences without historical overlap are stacked vertically.



As illustrated in the example of following section – chosen because its geomorphology (if not geology) is comparable to the processes of the study area, the evolution of the landscape is important if we are to contextualise the various phases of Aboriginal settlement, identify a chronological sequence and thereby provide a landscape framework to use as a stepping stone to interpret the scientific, cultural, aesthetic and historic values of the study area.

#### **4.2.4 Comparative Study: Terrace Development on Widden Brook, Upper Hunter Valley, NSW**

Widden Valley is located in the Upper Hunter Valley in NSW. The upper part of the valley is nestled in the northern most part of Wollemi National Park on the western edge of the Sydney Basin and drains northwards into the Goulbourn River. The valley was the subject of a doctoral thesis on the development of river terraces and the post-LGM floodplain abandonment for each terrace sequence (Cheetham 2010: 114). The terrace sequences were located in adjacent locations that demonstrated sedimentologically and chronologically distinct formation. These indicated that processes were spatially discrete and only operated on subreaches of the valley, rather than across the entire valley system and were interpreted as *‘a series of nonsynchronous, episodic incision events beginning in the late Pleistocene (ibid: 122).’* The study discounted climate, tectonic effects and relative sea-level changes as influences on the formation of the terrace sequence in the post-LGM (*ibid: 126*). The study:

*‘clearly demonstrated that formation was controlled by localised processes resulting from the cyclic erosion and deposition of alluvial sediments brought about when a local geomorphic threshold was reached. This process was intermittently interrupted or accelerated by large-scale events that stripped sections of the floodplain down to a basal gravel lag (ibid: 126-127).’*

The study identified five phases of terrace formation dating to 13 ka BP, 6 ka BP, 2 ka BP, 1 ka BP and the Present respectively (*ibid: 114*) that reflect random incision events brought about by intrinsic threshold exceedance. This contrasts with other soil geomorphic studies that have demonstrated that fluvial terrace sequences can reflect wide-scale climatic, tectonic or base-level fluctuations, as well as landscape studies undertaken for the purposes of archaeological interpretation (Dean-Jones and Mitchell 1993; Hughes 2004; 2014). The cross section data recorded from this study illustrated a complex arrangement and relationship between and within terrace sequences (Figure 8). This complex relationship of stratigraphy is clearly demonstrated by the model of terrace sequence formation provided by Cheetham (2010: see Figure 9). In combination the cross sections and model illustrating the geomorphic history identify a complex succession of cut and fill episodes that are not necessarily correlated spatially or chronologically within a single valley system. The stratigraphic history of any given location studied in the Widden Valley was generally unique to that particular location of the valley profile. This has ramifications for the geomorphic history of creek lines in the Hunter Valley and is of particular relevance because of the lack of detailed studies for the study area.

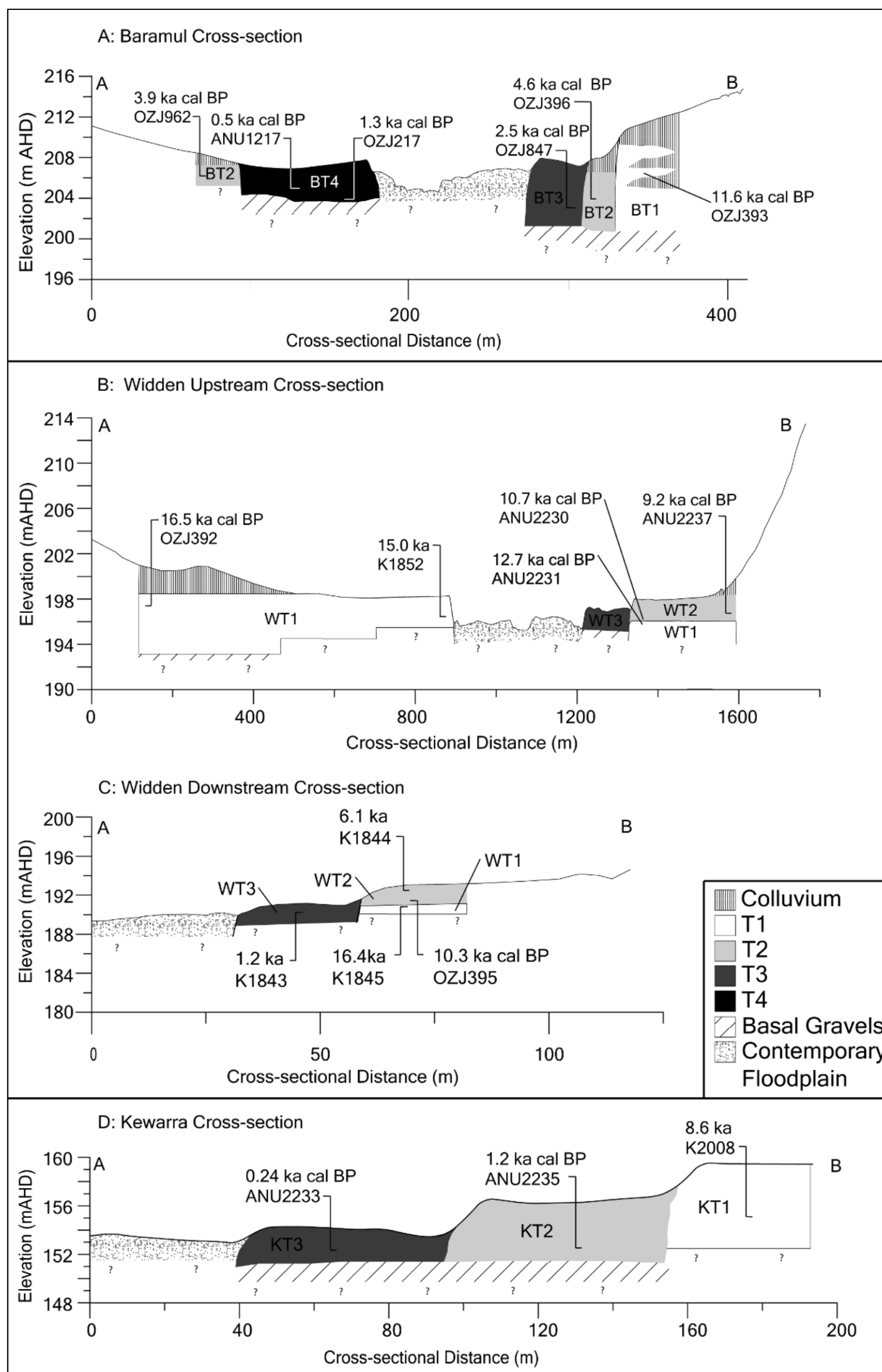


Figure 8: Representative cross-sections for each terrace sequence on Widden Brook. Cross-sections of the Widden terrace sequence include interpretational changes based on a revised chronology (source Cheetham 2010).

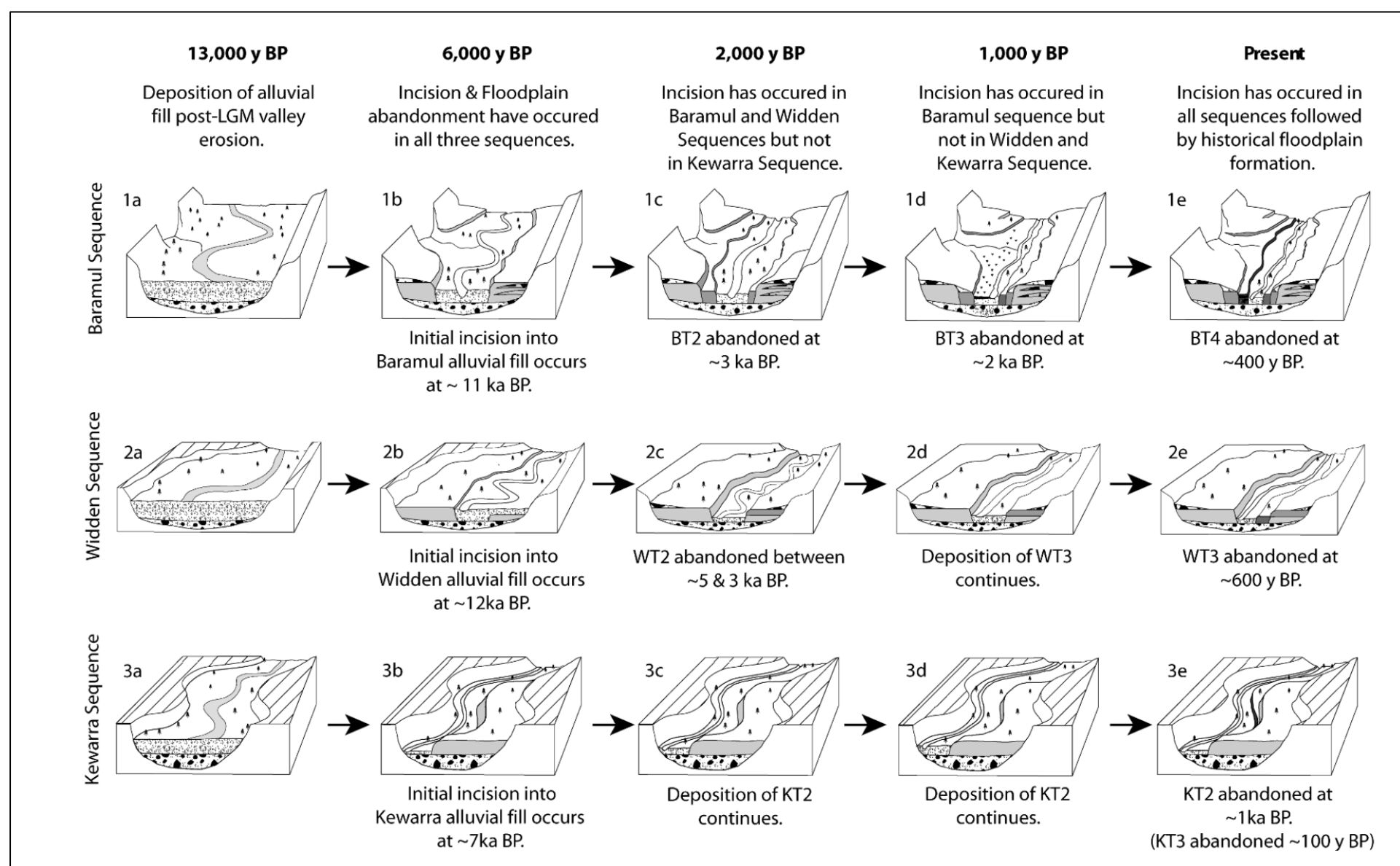


Figure 9: Illustrated phases of floodplain abandonment and terrace development for the Baramul, Widden and Kewarra sequences on Widden Brook (source Cheetham 2010: 115).

### 4.3 Geomorphology of the Hunter Valley: Discussion

Assumptions based on this wide-scale correlation of geomorphic phenomena such as floodplain formation, terrace sequences and soil formation underpin, and are implicit in, all previous studies of environmental factors in relation to archaeological patterning, including the major studies of Dean-Jones and Mitchell (1993) and Hughes (2004; 2014). Contrary to the conclusions of Dean-Jones and Mitchell (*ibid*) and Hughes (*ibid*), the geomorphic evidence clearly suggests that any conclusions about 'generic' landscape processes and chronological correlation of soil mantles, terraces and floodplains must be supported by field and laboratory studies and not simple comparative assumptions or extrapolation. From an archaeological perspective it means that simple extrapolation of generic data from studies such as Dean-Jones and Mitchell (1993) and Hughes (2004; 2014) cannot be supported. In fact, this perspective is misleading and distorts the particular and specific dynamics of any creek system that has not been studied in detail.

The Widden Valley is relevant to the study area and potentially of direct relevance to the episodic and almost certainly nonsynchronous nature of landscape evolution across this area. The rugged hills, the slope landforms and the creek lines are subject to different degrees and intensities of geomorphic processes across the Widden Valley. Any potential geomorphic changes to one of these parts has knock-on effects for adjacent landforms and in all likelihood would have happened at different times, albeit with some overlap in time. Although detailed geomorphic studies have not been undertaken for the study area, the similarity in geomorphology and the contemporary processes that can be observed on different landforms for this area suggest a similar story of landscape evolution, but with its own unique chronology. It clearly illustrates the dangers of linking terrace sequences to wide-scale allogenic<sup>5</sup> factors based on chronological correlation (Cheetham 2010: 127), or using oversimplified soil profiles to ascertain floodplain depositional histories - conclusions which are also supported by the Nowlands Creek study (Erskine 1994; see also Erskine's 2011 study of the Pages River in the Hunter Valley for further evidence).

In conclusion, it is clear that the geomorphic history of similar topographical settings across the Hunter Valley demonstrate both episodic and nonsynchronous landscape evolution. Clearly, understanding the timing and nature of landscape evolution has ramifications for the chronology and relationships of both tangible (archaeological) and intangible (cultural) values and the onset, timing and evolution of Aboriginal settlement patterns in a dynamic landscape.

#### 4.3.1 Landscape Archaeology and Cultural Significance

The preceding sections discussed and illustrated geomorphic concepts, models and interpretations in relation to the Hunter Valley and how those landscape perspectives impact the nature, visibility, preservation and ultimately, the significance of cultural heritage across the study area. It should be abundantly clear therefore that, in terms of scientific significance, an understanding of context is fundamental to any interpretation or appreciation of the relative significance of any archaeological

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<sup>5</sup> Geological material that has been transported from where it was formed and deposited as sediment by a river.



finds. Fundamentally, archaeology is a stratigraphic exercise and the development of chronology – in relation to soils (chronosequences) and stratigraphy (chronostratigraphy)– is a necessary first step to defining significance (see for example Figure 10 and Figure 11 below).

However, one of the main reasons for the exposition on landscape in this section relates to the significance that Traditional Owners ascribe to cultural landscapes and the broad continuum of fauna, flora and landforms as expressed through ancestral beings and lore, ceremonial sites and other places of cultural significance. Traditional knowledge and the cultural memory that this reflects is embodied in cultural landscapes and unlike western paradigms that ascribe significance on linear trajectories (low, moderate, high for example), Aboriginal paradigms are more 'Zen' (to borrow Sahlin's phrase in relation to subsistence and the 'original affluent society': 1968: 85) in that they reflect circular (in the sense of no beginning, no end) all-encompassing perspectives rather than linear, judgemental classifications. Obviously, ceremonial sites and particular landforms (e.g. increase sites, initiation sites, etc.) are very important in cultural terms; the difference is that they are not distinguished from the songlines that join them or the resources (e.g. plants, animals, lithic resources, etc.) that are found within them.

One way that archaeology and science can contribute to enhancing cultural significance is through holistic approaches integrating the natural sciences (soils, geomorphology, geology, palynology, palaeontology, etc.) and archaeology (material culture, intra- and inter-site analysis, behavioural archaeology, ethnoarchaeology, etc.). Providing an Aboriginal community, whether it is the PCWP or any other Traditional Owners, with a scientific dialogue that integrates climate, vegetation, fauna, firestick farming regimes and landscape evolution with aspects of archaeology such as material culture, subsistence and settlement patterns (for example) will allow for a more meaningful scientific dialogue *and* a better cultural integration and appreciation of this information. In a very real sense this embodies the fact that cultural significance is not static but evolves and takes on new or different or historic meaning. This appreciation in cultural as well as archaeological terms begins with and is fundamentally beholden to understanding landscape evolution.

The PCWP have a deep affiliation, understanding and appreciation of their traditional lands and ultimately respect that land and everything in it. And, whereas that land and the traditional knowledge and cultural memory that encapsulates it is considerable, the values are in many ways infinite. Importantly, the dialogues and histories that depict these are the cultural equivalents of geological and geomorphological dialogues and histories. And like the earth sciences, cultural landscapes describe and explain the evolution of *Aboriginal* landscapes in terms as significant and important as their more recent scientific counterparts.



Figure 10: A buried soil on the New England Tablelands: red arrow pointing to the dark grey deposit beneath the light brown overburden.



Figure 11: Example of a buried soil, Redbank Creek, Hunter Valley, NSW. Scale is 2m. The blue arrows demarcate the buried soil, the red arrow the overburden.



Figure 12: An example of an entrenched creek illustrating erosion, Redbank Creek, Hunter Valley, NSW. Scale is 2m.



Figure 13: An artefact scatter exposed through erosion, Hunter Valley, NSW. This reflects geomorphic processes rather than human behavior. Such locations should be considered 'lag gravels' rather than archaeological sites. Pink flags represent surface artefacts. Scale is 2m.

## 5 Hunter Gatherer Studies

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### 5.1 Aboriginal Hunter-Gatherers: an introduction

Since the beginning of the colonisation of the Australian continent by Aboriginal people a nomadic hunter-gatherer lifestyle was practiced (Cane 2013). It is in essence a mobile strategy was employed to make use of a wide range of resources across different ecosystems and is also, in part, influenced by seasonal availability. One of the key factors in hunting and gathering is maintaining sustainability. Not only were resources carefully 'harvested' in order to ensure that they could re-establish and re-grow for the following season, but populations were kept at levels that would not overtax an ecosystem. This stability and ecological familiarity were embodied in the Traditional Lore, Customs and Creation stories. This Traditional knowledge covered every facet of Aboriginal life, including aspects like marriage, the distribution of resources across the landscape, the rules regulating the use of those resources and religious practices to name but a few.

Aboriginal people colonised every part of Australia and successfully adapted to every environment. Over the thousands of years that they lived in Australia, they also had to contend with climate changes and in particular the Late Glacial Maximum (LGM), which was at its peak between 27,000 to 17,000 years ago. The LGM brought colder and drier weather and in elevated mountain areas, glaciers (Tasmania and the Snowy Mountains on the mainland). During the LGM sea-levels were some 130m lower than today due to the fact that much of the world's water was locked up in ice-sheets, particularly those across Eurasia and the American continent. As a result, both Papua New Guinea and Tasmania were part of one large landmass with today's mainland known as Sahul land.

Hunting and gathering is a very efficient life style that has been widely studied by archaeologists and anthropologists. Unfortunately, all 'academic' studies have been undertaken in post-Contact societies and it has been difficult to gauge exactly how much influence this had had on Aboriginal culture. First contact accounts of European encounters with Aboriginal people were not written as studies but as impressions, obviously biased by the impressions of the time. It is important to understand therefore that once Europeans moved into Australia and begun clearing land for agriculture, the delicate balance that had been maintained was lost. In essence, Aboriginal people began to suffer from deprivations including scarcity of food, introduced diseases and forced removals from Traditional Lands. Unfortunately, with the changes wrought by Europeans, most areas of Australia become uninhabitable using a hunting and gathering lifestyle.

### 5.2 Tangible and Intangible Aboriginal Cultural Heritage

Aboriginal cultural heritage encompasses a significant range of material remains (e.g. stone artefacts, petroglyphs, hearths [fire places]), places with physical (e.g. rock shelters, open camp sites) or without physical traces (e.g. Ceremonial grounds [Bora's], birthing or initiation sites), intangible values associated with Traditional Lore, Ancestors, and Creation figures and landscapes (e.g. song lines or dreaming tracks). It is important to understand that not all of this information will be readily divulged: in many cases it is culturally inappropriate for Aboriginal stakeholders to talk about cultural knowledge with 'outsiders' or uninitiated people, or it may simply be due to gender



specific issues. In certain cases, Traditional knowledge holders will only demarcate an area or landscape as ‘culturally significant’. The detailed or specific ‘knowledge’ of such areas is often restricted information. Whilst we can separate certain aspects of this cultural heritage from a ‘Western’ paradigm, for example, demarcate the extent of a surface stone artefact scatter, it should be understood that this is often inappropriate for Aboriginal people who believe (to quote Aristotle ironically) that ‘the sum is greater than the parts’. In other words, the tangible and intangible cultural heritage values form part of a ‘cultural landscape’.

### 5.3 Cultural Landscapes and Intangible Sites

From an anthropogenic perspective there are few examples of landscapes on Earth that have not – in some way or another – been impacted by human actions in some form or another. From an Aboriginal cultural perspective, a cultural landscape is:

*‘a place or area valued by an Aboriginal group (or groups) because of their long and complex relationship with that land. It expresses their unity with the natural and spiritual environment. It embodies their traditional knowledge of spirits, places, land uses, and ecology. Material remains of the association may be prominent, but will often be minimal or absent’* (Buggey 1999; quoted in OEH 2010c).

The way perceptions, beliefs, stories, experiences and practices give shape, form and meaning to the landscape is termed a cultural landscape (ACH 1998; *ibid*). The concept of ‘fire-stick farming’ (burning practices) by Aboriginal people in Australia is at least 10,000 years old and potentially goes back 30-40,000 years ago. This practice has irrevocably changed the ecosystems of Australia but in a way that has (or rather had) achieved a balance in the ecosystems. This is therefore an anthropogenic landscape, an ecosystem ‘mosaic’ created to suit Aboriginal hunter-gatherer lifestyles.

Cultural landscapes symbolize a relationship between all parts of the natural ecosystem and cultural objects and places via past human behavior patterns (as in the fire-stick farming example above). This acknowledges the fact that the present-day landscapes are the long-term consequence of complex interaction between people and the natural environment. The approach encapsulates a ‘landscape-scale of history and the connectivity between people, places and heritage items (*ibid*).’

The various forms that Aboriginal cultural landscapes can be identified include (*ibid*):

- *‘Significant biodiversity and a diverse range of ecological systems and associations, all of which contributed to the continuing existence of Aboriginal peoples in the region over many thousands of years, and which are valued in different ways by Aboriginal communities today.*
- *Material remains of this continuing occupation in the form of a diverse array of Aboriginal sites and places known to the Aboriginal communities, some of which will be recorded on the Department of Environment, Climate Change and Water’s Aboriginal Heritage Information Management System.*
- *Extensive historical records from 1788 through to today which record observations of Aboriginal people and lifestyles, wars, massacres, social and cultural events, population*

*census, social interactions, language etc, and which influence Aboriginal community values today.*

- *An Aboriginal population made up of people who have traditional association and knowledge of the region, as well as others who live, work and play within the region, all of whom may attribute various values with the area, derived from the distant and recent past, through to the present day.*
- *For Aboriginal people, the significance of individual landscape features is derived from their inter- relatedness within the cultural landscape. This means features cannot be assessed in isolation and any assessment must consider the feature and its associations in a holistic manner. This may require a range of assessment methods and will always require the close involvement and participation of Aboriginal people. By consulting with Aboriginal people and using the concept of cultural landscapes, the story behind the features can be told which demonstrates the associations that may exist between Aboriginal objects and other features within the landscape.'*

## 6 Documenting the PCWP Cultural Values for the Study Area

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### 6.1 Introduction

Cultural values are, of necessity, historically contingent, dynamic and situation specific (cf. Murdoch and Pratt 1997). Hence an understanding of the historical and social context of the individual and/or group's relationship with a particular place is pivotal to the assessment of the cultural values that may obtain at each place. Moreover, the fluid and multi-dimensional character of the place within which a 'culture' is represented, and from within which it acquires value, cannot be ignored.

Ultimately, the meanings attributed to material and intangible cultural items or places mirror the processes of the cultural construction of those items or places. The contexts of the creation and expression of cultural values must be understood in order to fully characterise the places in which such values are being ascribed (Cotter and Boyd 2001). Hence the primary focus of this section is to provide the context(s) for the creation and expression of cultural values in the study area by the PCWP.

It is not possible to document every circumstance and define the appropriate investigative method to use for each and every investigation and assessment of Aboriginal cultural heritage (OEH 2011c). Nor is it sensible to restrict the methods by which data regarding the cultural heritage value(s) of an area is gathered and/or analysed. There are a multiplicity of meanings that may be ascribed to heritage items and places, and each individual or group may have a cognitive ownership (sensu Boyd et al 2005; Cotter 2009) of one or more of these items or places that needs to be explored and explained. In addition, for either the individual or group holder of a 'cognitive ownership' the significance each ascribes to the heritage item or place it 'owns' is likely to have a multivalent character (CQCHM 2011). Thus a site that has significance as a camping or occupation site may also be of significance because of the presences of an important creator being or its representation at the same location. Ultimately it is important to recognise that in both traditional and contemporary Aboriginal society there was (and is) no static list of places that were (are) deemed culturally important (Godwin and Weiner 2006). In this sense, and as has been articulated elsewhere in the assessment of Aboriginal cultural heritage items and places within the Environmental Impact Assessment framework (CQCHM 2011:60):

*'..the entire landscape was [is] a cultural entity in which some locations required a greater level of response but in which people had to be continually aware that the 'old people' or other entities could manifest themselves. People regularly had experiences in the course of the daily round, or dreamed about places and things, that were then submitted to older, knowledgeable people for their consideration. Dependent on the outcome of that adjudication, areas and events were then added to a corpus of localities that were seen as important, demanding special attention and response from people: that is those places had to be managed.'*

The centrality of landscape to Aboriginal Australians cannot be understated. For Aboriginal Australians, landscape is the locus of social memory such that stories, songs, dance and paintings are all means of retrieving meanings from 'Country' and, paradoxically, help to combine extreme and long-term continuity with considerable negotiability (Rumsey 1994 cited in Cotter 2009). One

contemporary consequence of this juxtaposition of notions of continuity and negotiability is that Aboriginal Australians continue to *'take extremely seriously the responsibilities they have to their ancestors, spiritual entities and hero figures, and to the management and protection of the cultural heritage areas and objects they have inherited from them (CQCHM 2011:60).'*

A further consequence is that Aboriginal cultural heritage management regimes have increasingly been shown to need to accommodate landscape as heritage (Ross 1996; Ross et al 2010) and to more fully explore local Aboriginal interests in heritage (e.g. Clarke 2002; Smith et al 2003; Greer et al 2002; Greer 2010). Rose (1996) has demonstrated the appropriateness of doing so in her book, *Nourishing Terrains* where she explained the complex and multivalent nature of Aboriginal relationships to 'Country' in the following terms:

*'Country in Aboriginal English is not only a common noun but also a proper noun. People talk about country in the same way they would talk about a person: they speak to country, sing to country, visit country, worry about country, feel sorry for country, and long for country. Country is not a generalised or undifferentiated type of place... Rather country is a living entity with a yesterday, today and tomorrow, with a consciousness, and will toward life (Rose 1996:7).'*

With this recognition there has been a move away from notions of 'sites' to incorporate 'place value' and the notion of 'cultural landscapes' (Brown 2010). In general the term 'cultural landscapes' has been used to facilitate the analysis and management of cultural heritage beyond a rigid "sites" based approach - which tends to narrowly define and preserve heritage as 'relics' - to consider the spatial, temporal, physical and social contexts in which these 'relics' occur (Cotter and Boyd 2001; Cotter 2009). Further, a cultural landscape perspective enables recognition of the history of a place and its cultural traditions as well as and/or including its ecological value and its continuity between past and present (Mitchell and Buggy 2002 cited in Brown 2010). As outlined below this is most effectively done using a 'holistic approach' to the identification and assessment of landscape elements and the cultural heritage values that can be ascribed them.

## 6.2 A Holistic Approach

As it is the intersection of the biophysical and sociocultural elements of landscape that manifest as places (see Figure 14), then it follows that an integrated examination of these landscape elements is critical to determining the nature and extent of the cultural values that may exist at any such place. Cotter (2009) has demonstrated that there is ongoing merit in the use of a holistic approach in such an examination, particularly where identification of the cultural values of a multivalent Indigenous landscape is the focus of study. In the context of wanting to, as best as possible, articulate the PCWP values in the study area, Tocomwall has similarly adopted a holistic approach.



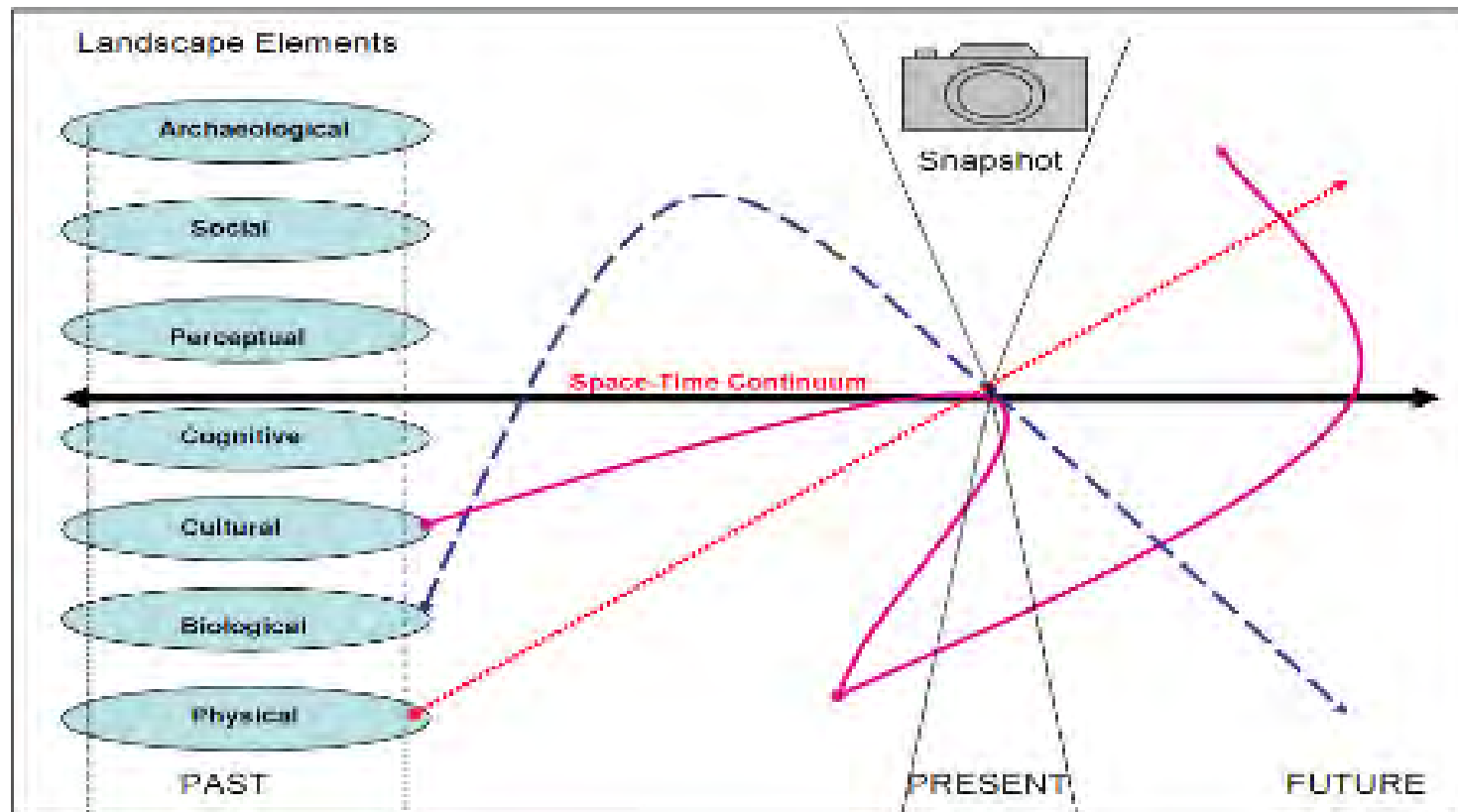


Figure 14: A schematic diagram of the structural elements of landscape and the variable trajectories in space-time that manifest as places(s) in the present (from Cotter 2009: xxiv).

At the most fundamental level, a holistic approach crosses both the boundaries between academic disciplines and the boundaries between academic investigation and 'real-world' practice and does so in the concerted attempt to derive information from data that lies at the interface of human and natural systems (Hollaender et al 2008; Pohl and Hirsch Hordan 2008; Russell et al 2008). In doing so it provides for an investigative framework that allows for collaborative knowledge generation between researchers and stakeholders. The distinguishing feature of this approach is not simply collaboration between researchers or 'experts' from different disciplines but also collaboration with the community of interest. The ability of an individual researcher or Project Officer to fuse (or integrate) knowledge from a number of different disciplines and engage with community stakeholders in the process of generating knowledge(s) thus becomes the key to such collaboration (Wickson et al 2006; Kueffer et al 2007; Russell et al 2008; Pohl et al 2008). Consequently, no single method is prescribed in a holistic approach rather, flexible and adaptable project frameworks are required to allow methods to evolve if and when the nature and context of the investigation changes (Wickson et al 2006; Russell et al 2008).

In using a holistic approach to identify and investigate the cultural values of the PCWP in the study area, Tocomwall has sought:

- To integrate scientific expertise and cultural knowledge in all elements of the research project but especially by developing a collaborative partnership between the PCWP knowledge holders and the technical experts retained by Tocomwall; and
- To use multiple research and investigative methods including (but not limited to):
  - Desktop archival research and literature review of disparate source materials of environmental, archaeological, ethnographic and historical information of relevance to the PCWP and its links to the study area;
  - Development and application of a rapid-infield assessment of the study area to identify the traditional, historical and/or contemporary natural resource values in the MCCO Project; and
  - Consultation and informal interviews with members of the PCWP, in accordance with the agreed protocols of the PCWP as to who can and does speak for each family on these matters.

An important consideration in the use of multiple research and investigative methods for this cultural values assessment is the range of literacy and numeracy skills held by members of the PCWP; and the consequent individual variation in the use of and access to public information sources by them. The use of and access to source materials is important in the context of understanding the derivation of the cultural value information provided about the study area by the PCWP. Ultimately, knowledge of the information sources used to ascribe meaning and value to an item or place enables some temporal classification of these values. For example, it has previously been identified that Aboriginal natural resource use knowledge within parts of NSW derives from three separate but interlinked and overlapping sources (Cotter et al 2004). The first of these is knowledge that, in principal, can only be described as having been derived from traditional custom and practice and that generally requires the intergenerational communication of such knowledge by oral story and/or by physical example. This knowledge might, for example, pertain to the creation of

nets for trapping fish from native plant species in the form and pattern documented in the ethnographic record. This type of knowledge may also be shown to have been subject to adaptation in the historical period. Thus fish traps of traditional form may be recollected as having been made by grandparents using non-native species such as willow; and or more recently to have been made using 'chicken wire'.

The second type of Aboriginal natural resource use knowledge often derives from the involvement of Aboriginal people in the pastoral industry and their consequent adaptation of traditional methods to non-historical practices. For example, Charlie Franks recollected how his father would use paperbark (i.e. the bark from *Melaleuca* species) as a wound and poultice cover for his injured stock horses and cattle.

The final type of knowledge about Aboriginal natural resource use comes from current and accessible literature and other media such as television and the internet. The PCWP are members of contemporary Australian society as well as being traditional Aboriginal owners of Wonnarua country. To this end the ecological values identified by the PCWP in the study area may also be those that have been referenced in a number of contemporary sources including: Appetiti 2005; Bryce 1992, Cribb and Cribb 1981; Daw et al 1997; Gaikwad et al 2008; Green 2003; Harris et al 2000; Hiddins 2003; Julwarlu Aboriginal Corporation 2003; Lassak and McCarthy 2001; Latz 1995; Lindsay et al 2001; Maslin et al 1998; McKerney and White 2011; Miller et al 1997; Puruntatatermeri et al 2001; Stewart and Percival 1997; Turner-Neale 1996; and Wightman and Brown 1994.

The information sources from which the cultural values of the study area (and its surrounds) are derived are necessarily identified; as the subsequent classification of this information into temporal classes such as traditional, historic and contemporary knowledge(s), provides form to the mixed-mode analysis of cultural value. However, it should not be misconstrued that this privileges one temporal class of values knowledge over another. Each values class is equally important as a component of the sum cultural values that the PCWP have and retain in the study area as a traditional owner group with ongoing connection to it.

### 6.3 Cultural values

The cultural heritage values that are explored and explained in this report are those encompassed by the broad umbrella of terms used in the Burra Charter (Australia ICOMOS 1999) to explain cultural significance. This Australian Charter provides a primary and 'best-practice' framework within which decisions about the management of cultural heritage in Australia should be made. The Burra Charter defines cultural significance as being derived from the following four values (Walker and Marquis-Kyle, 2004):

- Aesthetic value: This value derives from aspects of human sensory perception for which criteria can and should be stated. These criteria may result from consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the item or place and its use.
- Historic value: This value encompasses the history of aesthetics, science and society, and therefore, to a large extent, underlies all other heritage values. A place may have historic

value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

- Scientific value: The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information. In the context of cultural landscape analysis, it is the view of Tocomwall, that this value must necessarily be broadened from the typical focus on the scientific analysis of material culture remains (i.e. archaeological science) to consider the application of natural science techniques, particularly those associated with ecological analyses (particularly flora, fauna and biodiversity studies) in the evaluation of Aboriginal cultural values.
- Social value: This value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group. Thus in this study the primary (and only) focus are the social values of the study area to the PCWP.

#### 6.4 PCWP Consultation and Participation

The authority of the PCWP to speak for Wonnarua country and to be involved in decision-making regarding the protection, and management of Wonnarua lands and waters is asserted on the basis of identification and recognition of individuals as Wonnarua people by cognate descent. Under Aboriginal law, membership of the traditional owner PCWP group is a matter that is determined by Wonnarua people according to their traditional laws and customs. For the PCWP kinship is the idiom through which customary law is expressed:

*'The reckoning of land tenure interests...on the basis of genealogical relationships is itself an implicit instance of customary law. That is, the laws of descent and of other kinds of relatedness practiced by a particular group are themselves part of customary Aboriginal land tenure law (Sutton 1995: 11).'*

In so far as consultation with the PCWP has occurred about the MCCO Project, Tocomwall has at all times informed the PCWP Heads of Family as to its purpose, progress and outcomes. All four formal Heads of the PCWP families were contacted and interviewed in relation to this cultural values assessment. Ongoing email, phone and meeting contact with Heads of Family has occurred about the study area, and it is in these terms that the Heads of Family have currently endorsed the limited release of the current report.



## 7 Recognising the PCWP Values in the Study Area: Results

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### 7.1 Introduction

This section reports the results of the exploration and documentation by Tocomwall of the historical, social, aesthetic and scientific values held by the PCWP in the study area. What follows is a complex record of the multiple and interconnected values held by the PCWP in the study area and its surroundings. To achieve this record, Tocomwall has relied upon the integration of western and Aboriginal knowledge traditions. Information has been documented with reference to regional and local family histories and archives; formal and informal contemporary oral history and storytelling activities undertaken by and/or with PCWP members; active field participant observations; scientific evaluation of potential and likely archaeological values based on an archaeological survey and comparative analysis with data of similar values elsewhere obtained from the PCWP (Tocomwall 2012; 2013; 2016; 2017). Further, to facilitate the identification, elicitation and elaboration (including a necessary exploration of connection and overlap) of values and their contexts a 'historical narrative' or 'storytelling' approach has been adopted as the primary presentation mode for all the values held by the PCWP in the study area (cf. Masson 2002; Satterfield 2002). What is demonstrated by this narrative approach is that the project area is a multivalent Aboriginal cultural landscape of immense importance to the PCWP. It is an integral part of Wonnarua Country with ancestral, historic and contemporary values that are fundamental to the identity of the PCWP.

### 7.2 Historical values

The capacity of an object, place or landscape to convey, embody or stimulate a relation or reaction to the past is part of the fundamental nature and meaning of heritage; and consequently, historical values are recognised to be the root source of all other cultural heritage values (Mason 2002; Marquis - Kyle and Walker 2004). Historical values can accrue to an item, place or landscape on the basis of

- Its antiquity;
- Its ability to represent and/or evoke an historical period or theme;
- Its association with people or events of importance in the course of local, state or national histories; and/or
- Its rarity and/or uniqueness in its historical and/or environmental contexts.

This section of the report focuses on the documentation and assessment of historical values recognised in the study area by the PCWP. In particular it outlines those cultural values of the project that result from the association of the PCWP with people, events and/or places of importance in the course of the local history, especially where these historically important people places and/or events have physical markers or referents within the study area.

### **7.2.1 Social values**

In its broadest terms, the Burra Charter describes social value as embracing the “qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group” (Marquis-Kyle and Walker, 2004). What follows is a documentary record of some of the social and spiritual values that the PCWP ascribe to the lands and creek systems of which the study area forms an integral part. It is not an exhaustive telling of the values that the PCWP retains in this landscape, but reflects those values the PCWP has agreed are to be conveyed in order to best express the cultural importance of the study area to the proponent.

### **7.2.2 Spiritual values**

As elsewhere in Aboriginal Australia, the spiritual beliefs of the PCWP describe the creation of Wonnarua land and link this landscape with their ancestors. The activities of creative beings and ancestors of long ago transformed the world and laid down the pattern of life and the laws of the PCWP. Today the spiritual presence of the beings and the tangible evidence of their activities during the creation era are embodied in physical features of the landscape. Stories of the events and the associated sites are the cultural property of the PCWP and this knowledge has been passed down through the generations.

As will be outlined below with examples exclusive to the PCWP, the study area is part of a physical and mythological landscape of enduring importance. However, what must also be stated is that the PCWP are only too well aware of the isolation, fragmentation and loss of connectivity with and between elements of this spiritual landscape. This deterioration in the spiritual landscape of the Wonnarua is not an entirely new phenomenon. It in fact commenced with the uptake of the first grants of land by European settlers in the Central Hunter in the early 1820s. However, it is the degree, scale and permanence of current and future mine induced landscape modification that has had and/or is likely to have the most profound effect on the spiritual landscape of the PCWP. In addition, the cognitive ownership of the related mythologies, whilst strongly vested with the PCWP has been long subject to challenge as early ethnological recordings of physical elements of this landscape and its associated stories have been provided to the wider public for more than 100 years (e.g. Mathews 1897; Singleton Argus 1893). It is therefore not simply the generic recounting of these creation myths that provides proof of their authenticity or of their enduring spiritual importance. The PCWP establish the authenticity of their spiritual beliefs by their immediate association with the story telling of fond Aunts, Uncles and Grandparents and in their detailed recollections of these personalised stories. The following are some of the stories told:

### **7.2.3 Biامي<sup>6</sup> and the creation of Wonnarua Country**

In a statement to the Native Title Tribunal, Mr Scott Franks outlined the following story, as told to him by his Uncle Clyde (Franks 2012, para. 17). It is a creation story that clearly affirms for Scott the

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<sup>6</sup> It is recognised that there are variant spellings of the name of the creator and protector of Wonnarua Country, the spelling adopted herein is as per Mr Franks’ statement to the Native Title Tribunal.

interconnectedness of the biophysical environment of Wonnarua Country and the spiritual realm from which it was created, and through which it continues to be protected and sustained.

*'Before our people were allowed to enter the lands known today as the Hunter valley our creator Biامي looked down from the skies. He then stepped down onto Big Yango with his son, Little Biامي. As both then stepped onto Little Yango, Big Biامي looked across the area and started to move the lands to make the valleys. As both then moved across the area Biامي opened up the lands and made the hills and streams and gave life to the area, as both moved from Yango up into the Hunter valley, Biامي and his son placed the animals in the lands and the birds in the skies.*

*Biامي then looked at the waters and brought the fish. He first placed the mud gudgeon to settle the muddy water that was created from the new water as it flowed through the new streams. After the mud was settled he then put the catfish in the water and ordered him to make his nest of rocks on the bottom of the streams to slow the water. Once the stream has settled Biامي set the other fish loose in the creek. The perch to hide and watch under logs and holes in the bank and yabbies to build up the banks and to eat all the grasses that were left in the lower streams. He then placed the sprat that all swam together travelling up and down the streams making sure everything was working (I recall too that Uncle Clyde used to call sprats sugar fish because they were so sweet. He would smoke them and eat them whole and he always took a special "sugar bag" with him in the bush just in case he came across some in the creek during our travels).*

*Once the water was in place Biامي then started in the land so our people could live. He put the trees in the ground, and then blew his breath to make the wind. This wind pushed out and made the plains. Once the land settled our people were let go into the lands. Biامي told all not to cross certain areas as others would come, the lands that was here was for our people and to look after it. As Biامي move across the lands the trees started to grow. To watch over the trees Biامي brought Yarra (Koala). Yarra was told to watch over our people in the campsites and the scrub as Biامي would not be able to see them from the sky once the trees had grown. (Our mob was never allowed to harm any Yarra).*

*He then placed the Kangaroo (kaNawang) on the land to help make the tracks and flatten out the lands. The Kangaroo was told that he could be hunted by our people so he asked Biامي for help to prosper so Biامي gave him long legs to help him stand high, and be fast and ears that moved all around. He told the Kangaroo to always look for our people. As Biامي watched our people he helped them with fire from the sky and showed them where to go for shelter when it was cold and where to camp when it was hot.*

*He told them to camp near the water when hot and when it was cold to move to the caves he had made. He told our people that he would make the springs near the caves so we could get water. In the springs he ordered the Yabby to live. He then gave the turtle legs so he could walk on the lands and so he could grow in the ponds formed by the spring. He also told the Eels that they could move on the lands only at night and in the early morning so he also could grow in the springs and ponds.*

*Now that our people had shelter and food Biami looked at the sky and made night and day, sunlight and rain. Our people were lost with the darkness of night and Biami saw this and so he placed the Moon and the stars in the sky and made the fire-fly. The fire-fly allowed our people to see that trees with fruit were nearby so they could eat and wait for the day to come. He also set the flying fox to watch over our people at night.*

*Biami then grew the ranges and the mountain around the Valley and told our people not to cross them as other people would be in those areas and it was their home not ours. As he was building up the Liverpool Ranges some of our people crossed into that area including six (6) men from the one family. Biami saw this and the men were taken. One of the wives started wailing and cried to Biami asking why he would take her man and Biami told her that all were warned. The wife told Biami that she would sit and wait till her man returned. As she sat on a high rock waiting and crying Biami looked down and turned her into stone forever as a warning to all our people. As she was turning to rock one of her tear drops fell from her crying face and set a light a cave and Biami to this day has kept that fire burning. (This is Burning Mountain). This area is known to be the border of our lands in the North. Biami told our people what he had done to the woman and ordered them to use that fire, carry fire sticks and to make fire at all our campsites. He warned all not to cross the ranges or risk what would happen.*

*Biami then turned his attention onto the lands in our country and to help our people move around the lands he gave them ceremonial tracks and taught them how to walk through the land and tell the stories of our people. He said ceremonial tracks will be used to teach what is needed to live in your lands.*

*Many of these ceremonial tracks are still in place today. One ceremonial track runs from the apex of the Barrington Tops right back to Yango. This track moves down out of Barrington Tops, following Glennies Creek, it passes through Carrowbrook, down to Falbrook and then it continues all the way to Jerrys Plains, Warkworth, Bulga and to Yango. When walking along this track our people would tell this story of how the land was made and of what was expected of you to live in our lands to ensure that the story was told to all in the lands.'*

For Scott, the study area forms one part or segment of the ancestral lands created by Biami for the Wonnarua to enjoy. Likewise, all traditional ecological resources to be found today within the study area are as those provided by Biami in ancestral times to ensure that he and his ancestors could survive off the land. Consequently for Scott, the study area is part of a cultural landscape of immense and enduring spiritual value. Within this landscape ancestral ceremonial tracks are pathways and guides to the lores and customs required to ensure the health, prosperity and sustainability of the Wonnarua people.

Maria Stocks (Stocks 2012, para. 15-17) outlines the importance of storytelling in the development of her understanding of the interconnection between the physical and mythological elements of Wonnarua Country.

*'Stories relayed to me by my grandparents of the times they had spent in Wonnarua Country - and of the things they were told by their parents - were often shared during picnics held at*



*a lovely spot along Glennies Creek up on Old Carrowbrook Road... During these picnics we would listen to stories about the creation of Wonnarua country and about those special places and/or beings such as Biami, Tidilick the Frog and Burning Mountain that were of and from the beginning of time. I was told that a cave at Milbrodale was painted with an image of Biami. He was painted there to welcome people to the territory of the Plains Clan and, with his arms outstretched facing east northeast, he was there as a guardian and protector of our people and our clan country. I was also told of the ceremonial tracks that linked sites such as Biami Cave (Figure 15), the corroboree sites at Bulga and the old home spaces of my people up near Mt Olive and Glennies Creek. I was also told that there were many of the sites that women (females) should never go near. Burning Mountain which is up near Wingen, at the northern end of the territory of the Plains Clan of the Wonnarua, was one such place that my mum would never go near or pass by for fear that she would anger Biami. She would avoid driving up that way to Tamworth so that she was never in sight of this mountain.*

*...I especially remember that Pop told me that when up Milbrodale way I should never visit Biami's cave. In fact I had not done so until two weeks ago when given the impromptu opportunity I visited this site with Scott Franks, Robert Lester and a friend of ours. Frankly after all these years I was curious about a place I had been told I should not go near. I felt uneasy when I was there but nothing untoward happened immediately. However less than an hour after my visit, the two cars that had transported our visiting party to the site - one with Scott and Rob travelling south home together and the other with my friend travelling north home alone - were involved in two separate car accidents. No one was injured but both cars could no longer be driven. I believe these incidents occurred to show me how wrong I had been to go to that place. I simply was not meant to go there. My old people have spoken to me and told me again of the importance of keeping all our lores.'*



Figure 15: Biامي the Creator, Milbrodale, Hunter Valley, NSW.

#### 7.2.4 Lizard Mountain

In another variant of the creation story, little Biامي features prominently as a protector and guardian of the Wonnarua people, especially in and around the Broke area. As described by Scott Franks this form of the creation story is as follows:

*'As he stood at the bottom of Wollombi looking out toward our peoples lands Biامي told his son to stay behind and protect his people. This was Wonnarua land and all in it. Little Biامي then filled the creeks with life such as Becan (Platypus) Kutamong (turtle), perch, yabbies and the like. He also made the Kawal, (The Hawk) — To our mob the Wedgetail Eagle is our totem, and he is the eyes of little Biامي left here to watch over our people and to protect us. — Little Biامي then laid a giant lizard to sleep on the mountain range behind Broke (between Broke and Cessnock) to warn all others to stay away. This area is called, wirramin kooaran Lizard Mountain (Figure 16).'*



Figure 16: Sacred Lizard Mountain: Little Biامي, a creation being, placed a giant Lizard (Wirramin Kooaran) to sleep on the mountain between Broke and Cessnock to warn all others to stay out of Wonnarua lands.

#### 7.2.5 Biامي and Sentinel Mountain

Another topographic feature within the Broke-Milbrodale–Bulga area that is associated with Biامي is Sentinel Mountain. As the PCWP members understand it, before Biامي left all the lands he had made and returned to the heavens, he turned four Wonnarua warriors into trees. Three of the trees were left to guard the front of the cave where the image of Biامي had been painted. The three warrior trees were placed at the cave to protect it from other mobs coming to that area. The trees were told

to bring the breeze and send a howling noise to warn others to stay away. However as explained in this paraphrased remark of Scott Franks:

*“In recent years some uninformed people have agreed to let the Warrior trees be removed so as to improve the access to the cave for tourists. It’s a joke.”*

The PCWP remain concerned that these sorts of decisions have impacted directly on Biami and made ‘their Country’ more vulnerable to interference from other mobs.

As for the fourth warrior he was sent up into the mountain to the highest peak and there he was also turned into a tree so he could forever watch the paths into Wonnarua Country and forewarn the other three warrior trees that people were coming. If this high warrior and guardian saw other mobs coming in he would send the wind howling down the Valley with a noise like when Biami opened up the lands. This was to warn them that if they were to trespass on Wonnarua country without permission from Wonnarua people, Biami would come back with all his force and energy to deal with them.

#### **7.2.6 Tiddilick the Frog**

Although recognised by some PCWP members to be a generic and much retold Aboriginal myth (and see OEH, 2011d) the story of ‘Tiddilick the Frog’ does have geographical referents within the Broke-Bulga areas. Maria Stocks (Stocks 2012, para. 18) describes the way in which this story is being told and retold within her family:

*‘Today, having been taught by my grandparents my brother David tells my youngest children and grandchildren some of these ancestral stories too. A favourite of my grandson Oliver is “Tidilick the Frog”. There is a giant mossy green frog to be found in the natural sandstone outcrop out near Wollombi (Figure 17). This is said to represent the frozen body of Tidilick the Frog. As my brother tells the story Tidilick was a gigantic frog that got greedy and swallowed up all the water from the creeks and rivers. This made all the plants and animals suffer. Luckily a platypus out near Wollombi way made him laugh so that he spat the water out and the water run to fill all the rivers and creeks of the area including Cockfighter’s Creek, the Goulburn and Hunter Rivers, Loders Creek, Nine Mile Creek and Wollombi Brook. This made these creeks beautiful and abundant places for our people and it is why in good times this area was like a modern day supermarket for our mob.’*





Figure 17: Mary Franks. c. 1980s photographed near the giant form of Tiddilick the Frog, Wollombi.  
Photograph courtesy Alma Franks.

### 7.2.7 The 'Hairy Men and Other Leery People

In addition to creation beings the mythological realm of the PCWP is populated by other spirits, many of which are not benign protectors but rather scary and malevolent beings. Scott Franks (2012; para. 8) recounts the following story of the malevolent Hairy Man:

*'Not long after this Dad and Uncle Clyde sat me and my brothers down and told us of the Half Moon Brush. This area was across the creek and up to the north about 1 km from where we lived, you could see it from our home. Dad and Uncle Clyde told us of the Hairy Man that lived there. As boys my dad and his brother were out in that area Dingo hunting when they shot some Wonga Pigeons. They left them behind on the roo track to collect them on their return. On their way back as they come out of the Half Moon Brush a "Hairy Man" had found the Wonga Pigeons and was eating them. Dad and his brother heard the Hairy Man yell out and this scared them and they ran home. Dad's mum had told them that the Hairy Man lived in that brush and that he could stop time. This is how he could both scare and run away from people. She told my Dad and Uncles not to ever go back to the Half-Moon Brush as it was the Hairy Man's place. She said that "if he gets you you'll be trapped in time and vanish". Dad always told us boys that we were not allowed to go to that Brush as he and his brothers had seen the Hairy Man and they were lucky to have got away.'*

Below, Maria Stocks (2012; para.9) similarly describes the story of the Hairy Men as told to her by her Grandmother:

*'When David and I were young Gran told us stories about the "Hairy Men" that lived in the mountains and how these spirit creatures could make time stand still so as to get away from and/or avoid people. Gran told us that these Hairy Men came down at night looking for*



*food...she said they stunk really bad...and that they looked in the windows when they heard a baby cry.'*

Interestingly in conversation with Charlie Franks (pers. comm. May, 2012), he speculated that as much as these beings were described by his parents as being real, in the light of his adult eye they were also effective stories through which his Dad had "scared the shit out of him" and stopped him and his brothers running about after dark. In this adult expression of the role of story and the spiritual realm in the lives of PCWP members, Charlie indicates that the spirit beings described and invoked by his parents had a very practical role in the discipline and socialisation of him and his brothers. This social role, which through the telling and retelling of stories had continued into the present, was clearly traditional in its origin and reflects the ongoing interconnectedness of the spiritual realm and the secular realm for the PCWP.

Scott Franks (2012, para. 8, 9 and 12) also describes other malevolent spirits that he was told about by his parents and uncles. These beings may warn of imminent trespass or encounter with a ceremonial place for which you must have permission to enter or they may simply be protectors of the spirits of dead ancestors. Either way, it is clear that the stories provided to him by his Dad and uncles were designed to equip him with the skills and knowledge to negotiate safely through this spiritual realm:

*'One night me and my brothers were walking in the scrub on our way to go eel bashing when we heard a loud noise like footsteps going "crunch, crunch" through the scrub in front of us. As we stopped to listen and tried to work out what it was we heard a loud crash in the nearby waterhole. We then saw a bright light coming up from the water. At this stage I took off running home with my brother's behind me. When we got home Dad was waiting for us and he told us off as if he knew where we had been and what we had been up to. We told Dad what had happened. He told us that we had gone too close to the "Blacks Camp" and that one of the spirits had come to warn us not to go any closer. My brother told me that before they could run the light in the water had come to the surface and it was glowing with a man inside it. The next day Dad got us all together and told us to stay away from there at night as at night time the protector of the valley was there watching over the body's that were left to rest.'*

Up the road from where we lived there is a hill with a cliff on Razorback Mountain that we called "Baybuck". This was a bad place. It was told to me by Uncle Clyde and Ashley Hedges that in the early days the soldiers that drunk all the Rum [the Rum Corps?] took some of the Black Fella's and threw them off the cliff and shot all the Aboriginal women too. One of the woman's head was cut off and thrown in to a gully up from our home. At night Dad and my Uncle told me that she could be heard shaking a chain and not to go up there after dark.

*'... I was taught that the fire that we made needed to be very smokey as smoke would clear the path for us to go ahead. Uncle Clyde and Ashley told me that this was a protected area and we needed to do this to let the "Leery People" know that we were from that area and to let us pass through. Leery People, as my Uncle explained it, were small spirit people that would torment you and that smelt really bad. The Leery People would guard certain areas*

*and stop other Mobs going that way as we were getting close to the back of the property known as Sunnyside on Bridgeman Road. This property was adjacent to Sydenham and the ceremonial site where my great grandfather had been born.'*

### 7.2.8 Totems and Taboos

The use of natural species as totems or 'skin names' to define classificatory kinship relationships is recognised as being common within traditional Aboriginal societies across Eastern Australia (Radcliffe-Brown 1929). At its most elemental, this use of classificatory skin names provided a means of social regulation whereby each individual within a language and/or clan group understood their relationships, roles and responsibilities to all other individuals within their group (*ibid*). Equally though the use of natural species, predominately animals, as totems and skin names brought both secular and ritual responsibilities to bear on individuals with regard to the animals to whom they were of the same 'skin'. In particular, responsibilities to protect animals of the same 'skin' often resulted in hunting and eating restrictions on certain species (Rose et al 2003). The PCWP recognise a number of animal species to which traditional (and ongoing) totemic responsibilities apply. Of these, the primary totemic species recognised by all members of the PCWP is the wedge tailed eagle. This bird of prey is recognised as an important living embodiment of the 'eyes of Biarni' and as such commands (and receives) the utmost respect and protection from the PCWP. Other species recognised to be totemic animals similarly protected by the PCWP were the Curlew, the Koala and the Black Snake. Of these, Scott Franks recalled how his father showed particular affection for the Koala:

*'Dad has a real love of Koalas. He always protected them and taught us kids not to harm or touch them. When I was a kid he rescued a baby Koala. The mother was a road kill. He brought it home and with the help of mum who cared for it - and she was always caring for some sort of wildlife - it survived. We called it 'Blinky Bill' and it lived with us for about ten years, 'til the National Parks people found out and came and took it off us. Not long after that Dad went to go see it and found out it had died. He reckoned it was 'cause the poor thing had fretted from being removed from us (Scott Franks, pers.comm, October 2012).'*

In contrast, other animals were strictly taboo species because they were associated with 'bad' or malevolent entities. Of these the Wonga Pigeon was considered taboo and dangerous to be eaten because of its being a food of the Leery People. It was therefore best avoided. Eels are also described as a taboo species not to be eaten as they did not have scales. However, rather than avoid them the practice of 'eel bashing' was used to manage their numbers and ensure that they did not out compete other scaly fish species within the creeks and rivers of Wonnarua Country.

### 7.2.9 Ceremonial places and pathways

The repeated use of pathways as a means of traversing the Australian landscape is a common reported feature of traditional Aboriginal society (e.g. Belshaw 1978; Campbell 1978; Steele 1984; Godwin 1990; 1997; Morris 1994; Sahukar et al 2003; Donovan and Wall 2004, Harris 2004; McBryde 2004; Beck 2006). So too, the ethnographic record is replete with first-hand accounts of the aid provided by Aboriginal guides to explorers, surveyors and early settlers during their excursions into

the 'colonial frontier' (e.g. Wallis 1821; Brown c. 1825; Cunningham 1827; Breton 1834; and see Lee 1925). Breton (1834: 186) for example, notes the following:

*'The natives on the Hunter resemble their neighbours in every respect. In common with all those tribes with which we are acquainted, they make excellent guides, when well treated; but when hard pressed, which is sometimes the fact, when accompanying persons on horseback, who forget that a horse at a good walk goes faster than is convenient for a man on foot, they turn sulky, and avail themselves of the first opportunity to give their employers the slip.'*

Today the PCWP recognise pathways as having both secular and/or sacred roles. In a secular vein they mark traditional routes through Wonnarua country traversed by their ancestors either in the daily search for and procurement of food and shelter, or, in the seasonal cycles of return to known resource rich camping areas. Within the sacred realm the PCWP identify that pathways map the movement of creation beings across Wonnarua Country and link sites where physical manifestation of these beings occur. In addition, they are the physical routes taken through 'Country' during important ceremonies such as initiation and often these pathways intersect sites where creation beings are manifest. Hence, Maria Stocks (2012: para.16) noted that she:

*'was also told of the ceremonial tracks that linked sites such as Biarni Cave the corroboree sites at Bulga and the old home spaces of my people up near Mt Olive and Glennies Creek.'*

In the following extract Scott Franks (2012 para. 9,10,11,13,16, 17i and 19) indicates his knowledge of important ceremonial tracks and places. In the extract Scott describes the way in which he was physically brought to knowledge of these places in his childhood, whilst being in the bush in the company of his Uncle Clyde and Cousin Ashley. In this description we see that for Scott the physical, socio-cultural and spiritual domains of this landscape are not separate but rather are fused, as an interconnected network of nodes and pathways with multiple cultural values and meanings. These nodes and pathways have a clear physical dimension in the creek systems that exist today but also as demonstrated in Scott's recount, these pathways have been "burnt into his head" as he listened, learnt and walked in the bush with fond Elders. This is both a clear affirmation of Scott's cognitive ownership of this landscape and a demonstration of the way in which, for him at least, traditional and contemporary, sacred and secular meanings coalesce in the 'walking' and 'talking' in and about Country.

*'On the days that Uncle Clyde, Ashley Hedges and me would go out to the bush we would travel most of the times along the creeks from Mt Olive through to Bulga and the Putty. We would not take any food or water as Uncle Clyde and Ashley would teach me what food and resources were around for me to use. For most of this time I walked barefoot and only commenced wearing shoes when I had to wear them to attend High School. It was just one more reason not to enjoy School. My Dad used to joke about how tough the soles of my feet were saying that he reckoned he could light a match on my feet as they were so hard.'*

*I was told that the creek formed the only route which I should use to travel through the country of my people. It was the track which my family would use to travel to ceremonies and to move across country to get food. As we walked along my Uncle and Cousin would talk and I would listen and learn. About a kilometre downstream from the Mission we would*

*normally stop at the same place along the creek. This was a place where the channel of the creek became wider and deeper. At this place there were some big old she-oaks along the creek bank that had rings cut into them forming bands around the trunk. Uncle Clyde told me that when he was a boy he and his brothers had climbed the trees, cut the rings around them then jumped into the creek. This had been a normal game for Uncle Clyde and his brothers...*

*Once we left this area we would continue downstream and come to an area called 'Yankees Drop'. In this area we would stop and uncle Clyde and Ashley would make a small fire. Ashley would collect some bark from the paperbark tree and grind it up. Uncle Clyde would then mix the ground paperbark with the insides from the "Black boy" (grass trees) that grew at this place he would then use a long short stick and some cord with a small block of wood that he kept in his dilly bag. The block had a carved gate in it with a small indent. Uncle Clyde would put the grass tree and the paperbark in it, push the stick in then use another stick with the cord and pull it back and forth. This would spin the stick and heat up the material. Then he would drop that in. Then he would get me to blow on it softly and as I did this he and Uncle Ashley would ask the flame to come. (When this happened I did feel pretty special)...*

*At about this point in our travels me, Uncle Clyde and Ashley would leave the creek and walk up the hill towards this ceremonial site. It was made of stones that were arranged in a circle that had two openings one facing north and the other facing south. A path lined on either side with rocks extended out from each of the openings acting like corridors which we used to enter into the circle. My Uncles reminded me that you couldn't go into the "guts" of the circle but had to keep to the edge of the circle. I would also be reminded that this was because you could only go into the centre of the circle to speak and you could only speak if you had authority to do so. My uncles and I would walk silently through it but would never go around the outside of it as it was also not allowed. Uncle Clyde and Ashley would always tell me about the boys coming here to become men. Ashley would tell me about how they would be in this area for over a week being shown how to catch fish and hunt. I was also told that somewhere nearby was a women's site also arranged with stones...*

*After being in the area for about three days I was told that these boys would then move off upstream towards the stone ceremonial site at Sydenham to continue their lessons. The boys would then make their way to Bowman's creek and continue downstream towards the Hunter River where they would then follow along the sandy creek banks of the Hunter eventually to arrive at a big bora ground near the present village of Warkworth where large ceremonies would take place.*

*Many of these ceremonial tracks are still in place today. One ceremonial track runs from the apex of the Barrington Tops right back to Yango. This track moves down out of Barrington Tops, following Glennies Creek, it passes through Carrowbrook, down to Falbrook and then it continues all the way to Jerrys Plains, Warkworth, Bulga and to Yango. When walking along this track our people would tell this story of how the land was made and of what was expected of you to live in our lands to ensure that the story was told to all in the lands...*



*An extension of this ceremonial track allowed people to move across from the Falbrook-Ravensworth Area down both Glennies and Bowmans creeks into the Warkworth area and then back up the Wollombi Brook, through Jerry's Plains past Plaschett and across to Apple Tree Flats. This route was burnt into my head as a child by my Uncles, Aunties and Father as the only way our people (my family) could travel to get to the bora. I was also taught that my family would return to Falbrook after the ceremonies had finished by way of Nine Mile Creek, Loders Creek then across to the Hunter River and back to Mt Olive and St Clair.'*

This recount also alerts us to Scott's awareness of the need for reinforcement of the values of each known pathway and place via ongoing physical engagement with them (the "walking") and by ongoing oral transmission (the "talking") of their stories to other members of the PCWP. As he succinctly states "When walking along this track our people would tell this story of how the land was made and of what was expected of you to live in our lands to ensure that the story was told in all the lands" (Franks 2012: para 17i). In these terms, the maintenance of the knowledge of these places and pathways and their spiritual importance is an ongoing obligation of the PCWP. Further for this obligation to be fully met individuals ultimately must "be" and "do" in this landscape. Critically for this to occur the pathways and places of importance must remain accessible and have a degree of physical connectivity that allows physical traverse across the landscape and/or appropriate reference points for the oral transmission of the linkage points between and about them.

#### **7.2.10 The Bulga Bora Ground**

In 1852 the people of Bulga witnessed the last recorded Bora held in the Hunter Valley. The Bora was an aboriginal ceremony which amongst other rites included the initiation of young males into manhood. According to the local white settlers as many as six hundred warriors attended the Bora. The Bora Ground which was located in the Wallaby Scrub close to the road to Warkworth, was encircled with an earth mound and symbolically carved trees- sadly nothing remains of that ceremonial ground today (Mitchell 2004:41-42).

Aboriginal heritage practitioners, local historians and Aboriginal community members make common reference to the presence of a former Aboriginal ceremonial ground within the vicinity of the central Hunter Valley village of Bulga (e.g. Eather 1921; Bulga School Centenary Committee, 1968; Brayshaw 2003; Mitchell 2004). It is apparently agreed that no physical evidence of this former ceremonial ground currently exists. It is generally understood that it was located somewhere in the vicinity of the 'Wallaby scrub' and Warkworth (Mitchell 2004). In a recent submission to the Land and Environment Court Scott Franks stated:

*'The area is known to have been an important gathering area for the Wonnarua and neighbouring Aboriginal groups. It was an area where initiation and marriage ceremonies occurred and where tribal disputes, trade and social gatherings were conducted. The unique ecological diversity of the area now known as the "Warkworth sands" meant that in season there was an abundance of plant and animal resources including fish within the nearby Wollombi Brook that could be used to support large gatherings of people. As a boy I was taught the importance of this area by my Uncle Clyde and his Cousin Ashley Hedges as he included it in his description of the physical route and spiritual journey/songline that my*



*family would take from Falbrook near Ravensworth to Warkworth to attend gatherings and initiation ceremonies, especially at the 'Bulga Bora Ground' (Franks 2012b: 1).'*



Figure 18: Image of carved tree associated with the 'Bulga Bora ground' Image courtesy of Mr Stewart Mitchell.



In 2011 the PCWP was advised that on the basis of evidence provided by Brayshaw (2003) Coal and Allied believed the nominal location of the Bora Ground was partly within the Wollombi Brook Aboriginal Cultural Heritage Conservation Zone and partly within the Wambo Mine Lease area. However a physical inspection of this location by Tocomwall staff, in the company of Wambo mine employees - coupled with further documentary and oral history research, undertaken by Tocomwall on behalf of the Plains Clans of the Wonnarua People - indicates that the more probable location of the Bulga Bora Ground is in fact solely within the Warkworth Mine Extension Project area (Franks et al in prep).

#### **7.2.11 The Gold Ochre Site**

The gold ochre site is a site with spiritual values that derive both from its important association with traditional ceremonial practice and its contemporary rediscovery as a result of the intervention of ancestral spirits. The site is known to many members of the PCWP because of their participation in a smoking ceremony that occurred at its location upon its rediscovery in the early 1990s. This location is in the vicinity of the Mt Thorley Rail Loop and Loading Pad, to the north of the BCC, and adjacent to Loders Creek. The smoking ceremony was attended by multiple generations of the PCWP; and the video record of it confirms the physical and oral transmission of important cultural and ceremonial information relating to the use of the gold ochre identified at the site. Mr Brian Grant, a Wiradjuri Elder who lived in the Singleton area for some time and was instrumental in the 1990s development of the Singleton – St Clair Aboriginal Corporation and the Ungaroo Aboriginal Corporation, was a key person in the rediscovery of the gold ochre site. In an informal phone conversation with Mr Grant in October 2012 he described how the rediscovery had occurred with words to the following effect:

*'I had been troubled by reoccurring visions of a man who kept asking me to fix it. I did not know who the man was in my visions, nor did I know what I had to fix or how I was to do it. I told a Wonnarua Elder – she has since passed on - about my visions and described the man to her. She said that man you describe is my father and you better listen to him.*

*After several weeks of the vision I understood that it was occurring in the same place, although I didn't recognise the place. One day though I had to go to the local Dr because I had some trouble with my blood pressure. When I went to the Drs surgery there was some material about the coal loader rail loop and pad development at Mt Thorley. I looked at it and was immediately overcome as I recognised that a photograph of the area proposed for the rail loop depicted the same place as what I saw in my vision. I still didn't know what I had to fix but I knew I had to look at that area.*

*When I went out to the mine area to have a look, and despite the archaeologists having already done a survey and apparently found nothing, we come across the gold ochre site. It had been there since the beginning and the ancestors had led me to it.*

*I have wondered why me, as I'm not Wonnarua. However like the Wonnarua, my personal totem is the Wedge-tailed eagle, and you know when we went out to the site two wedge-tailed eagles were circling about.'*

The PCWP recognise the important ancestral connections with this site, and also recognise it to be an important source of ochre for both the painting and repainting of the images of Baimi in the nearby rockshelters; and for the body painting that would occur during initiation ceremonies.

### 7.3 Cultural Mapping of the Cultural Landscape

The PCWP, through Tocomwall, are undertaking a long-term project that involves the mapping of their intangible cultural values. The project is already beginning to show promising results (see Figure 19). Importantly, the mapping has begun to illustrate that not only are the intangible sites part of an interconnected cultural landscape, but that the distribution of known archaeological sites is showing some interesting correlations with the cultural values (work currently in progress). This highlights the need to include a combination of detailed study and analysis of all values, including cultural, scientific, aesthetic and historical.

The travelling lines illustrated in Figure 19 were used by Wonnarua People to traverse their traditional lands, with different parts of the landscape being occupied by various clans (NTDA 2013: Attachment F, 0026 and 0031). Although each clan occupied a different part of the landscape or 'range', they were intimately linked via their cultural landscape through trade, subsistence, ceremony and social ties. If we traverse the cultural landscape from Mt Yengo in a northerly direction we find that the culturally significant sites are linked both by song lines and travel routes of the Wonnarua People, namely:

- Mt Yengo – Tiddilick the Frog - Yellow Rock – Lizard Mountain - Sentinel Mountain – Baiame Cave – Bora Ground at Bulga – Bora Ground at Warkworth – Dural region – continuing north towards Burning Mountain;
- East of the Bora ground at Bulga we also have the Gold Ochre Quarry, which coincides with the initiation song line that flows through PCWP Country between Lake St Clair and Jerry's Plain; and
- Additionally there is the fire song line that connects with the initiation song line and ceremony at Dural, which has been described as an important ceremonial area – and is also associated with the Hunter River – and flows northward to the sacred site of Burning Mountain and westwards towards Putty where it eventually joins up with sites associated with the Sydney Aboriginal clans.

Importantly the fire ceremony and song lines are frequently associated with high levels of male initiation and cannot be told to those who are not likewise initiated. Therefore, the information provided is, due to cultural constraints, necessarily limited in detail.

The distribution of archaeological sites illustrated in the 2004 ERM archaeological baseline study (in particular Figures 3.3 to 3.5: 62-64) and covering the areas (in a north to south direction) of the Mt Royal Range, Barrington Tops and North Eastern Mountains, Southern Mountains and down into the Central Lowlands, demonstrates very high densities of sites associated with these song lines and travel routes. Despite the potential for bias in the archaeological site locations (since archaeological surveys are driven by development rather than research frameworks), there is a very clear association and correlation between the very high archaeological site densities and culturally



significant locations, song lines and pathways. It suggests settlement patterns that traverse the various functions mentioned earlier, namely trade, subsistence, ceremony and social ties and indicate an incredibly diverse use of the landscape through the very varied functions expected and required of the Wonnarua Clans. Furthermore, the distribution of Aboriginal sites illustrated in the ERM (2004: figures (3.3 – 3.5) provides physical evidence of the pathways and song lines that the PCWP have identified.



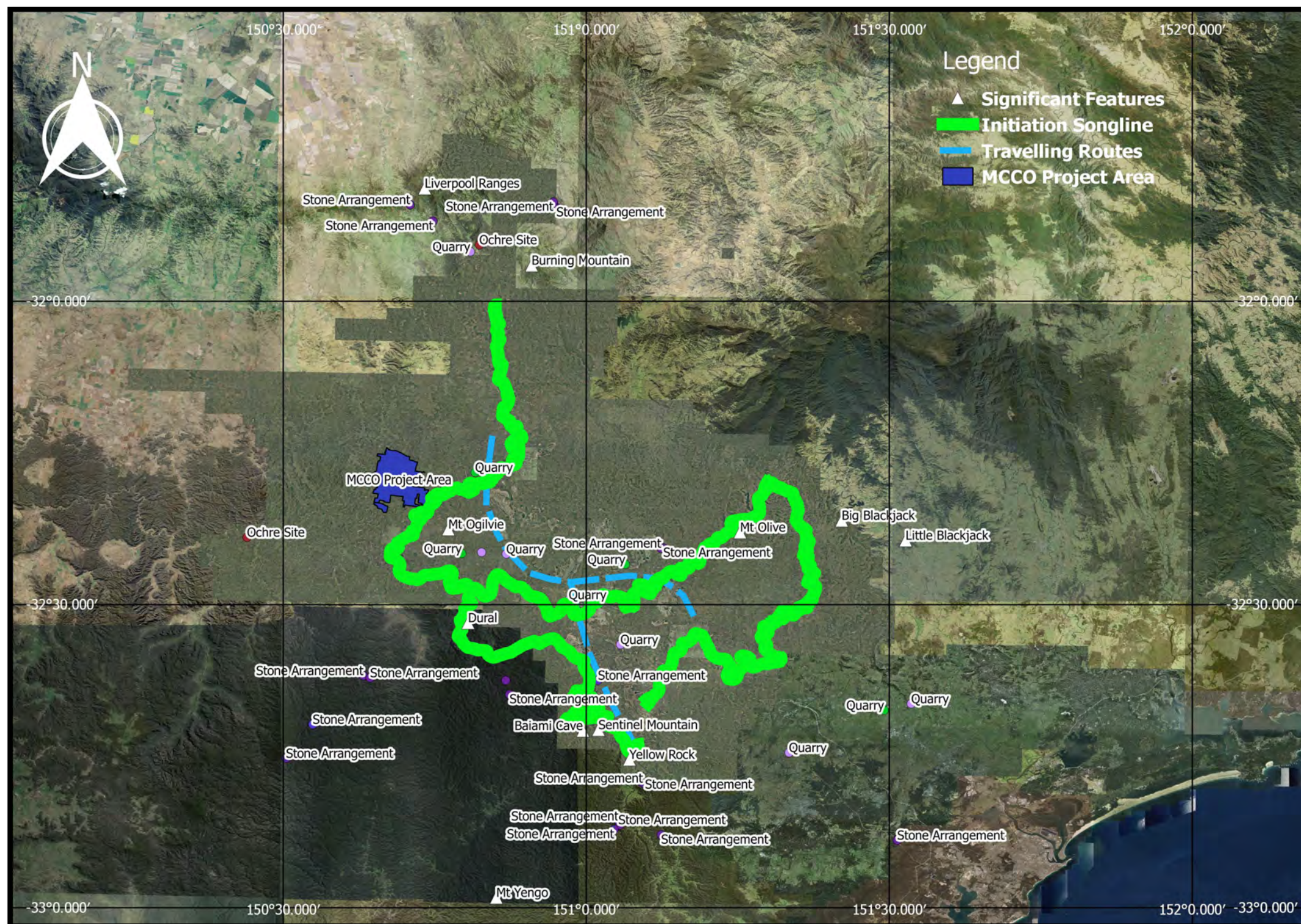


Figure 19: Ceremonial and song lines, as reported by Mr Franks 2015, and recorded in Tocomwall 2013. Also showing some key regional Aboriginal aspects, places and sites. Source: Scott Franks 2015, Tocomwall 2013, with GML 2015, and AHIMS additions. (Aerial image ©Department Finance, Services & Innovation. Date of extraction 19/09/2018.).



## 7.4 Landscape and Environmental Context

### 7.4.1 Background

This section discusses landscape studies and how they contribute to a greater understanding of the soil geomorphology of the study area, particularly in respect to Aboriginal settlement patterns, site formation processes and visibility/preservation of the archaeology. Both geology and soil geomorphology play a pivotal role in the nature, visibility, distribution, and significance of site types that are likely to be encountered during the course of either archaeological surveys or excavation programs. Broadly defined as landscape studies, or in archaeological terms ‘geoarchaeology’ (the application of the earth sciences to archaeology), they are fundamental to understanding where and what type of archaeology is likely to be present within any given landscape type such as a floodplain, benched bedrock slope or dried up lakebed. The ‘geoarchaeology’ of Aboriginal settlement patterns is as important as finding the sites themselves. Put another way, understanding whether a landscape is stable, aggrading or eroding will have ramifications as to whether: archaeological sites are undisturbed (stable); buried under modern sediments (aggrading); or exposed on the surface (eroding). One of the factors that define the scientific significance of an Aboriginal archaeological site is a product of one, or a combination of these geomorphic processes. This has consequences for developing archaeological predictive models and plays a key role in understanding whether surface surveys, as one example, will be effective. This will be explained in more detail below.

### 7.4.2 Geology and Topography

The geology of the study area reflects the geological eras of the Palaeozoic, Mesozoic and Cainozoic. It includes Newcastle Coal measures from the geological period of the Permian, which consists of sandstone, shale, mudstone, conglomerate and coal measures. The Narrabeen group from the Triassic are also represented and consists of sandstone, conglomerate, red and grey claystone and shale. The area adjacent to and including the main watercourses consists of gravel, sand, silts and clays from the Quaternary period (Geological Survey of NSW 1969). The distinct geology of the study area influences the overall topography. The study area comprises low undulating hills broken by the presence of steep outcrops (Mangoola Open Cut, Glencore 2017:16).

### 7.4.3 The Hunter Valley Region

Most of the evidence for Aboriginal occupation in the Hunter Valley comes from stone artefacts and the recording of these Aboriginal archaeological sites. Unfortunately, there is little ethnography concerning the production and use of stone artefacts. Typically stone resources are mentioned only with reference to the use of: quartz as a barb on spears; the use and curation through grinding of stone hatchets; and the use of ‘chips’ for skinning animal foods (Brayshaw 1986).

Formal examination of the Aboriginal archaeological heritage of the Hunter Valley region commenced at or about the 1930s with the research of Frederick McCarthy of the Australian Museum (Thorpe and McCarthy 1933; Moore 1970). An earlier excursion by Thorpe to the Hunter had confirmed the presence of a *‘significant bora ground with carved trees, clearing and mounds still intact’ at Bulga as reported by A.N. Eather; and provide some tangible evidence of the Aboriginal ceremonial use of the area* (Etheridge, 1918; McCarthy, 1940).’ Indeed the later papers prepared by

McCarthy (1944a; 1944b; 1944c; 1944d) provide descriptions and images of unusual Aboriginal objects collected by Mr Eather, at or near the site of this bora ground and its neighbouring camp sites.

Prior to the interest of the Australian Museum, only a few local individuals had taken an interest in the prehistory of the region (HLA-Envirosciences 2007). R.H Mathews, a surveyor, is one such person and he left accounts and drawings of some of the Aboriginal 'relics' he found (Moore 1970). He appears to have been the first to report publicly on the cave paintings near Bulga (Singleton Argus 1893; Mathews 1893). Drawings of the images seen by Mathews in the caves at Bulga accompanied the descriptions of them that he published in the Journal of the Royal Society of New South Wales in 1893 (Figure 20). In the 1940's McCarthy and Davidson began locating Aboriginal sites in Wonnarua County in the terraces and slopes along the Hunter River near Singleton (McCarthy and Davidson 1943).

In the mid-1960s the Australian Museum sponsored a more systematic survey of the locations identified by McCarthy and Davidson (1943) that found several types of sites including painted rock shelters, rock engravings, axe-grinding grooves, stone artefact scatters, manufacturing areas and habitation sites within the upper Hunter Valley (Moore 1969). As a result of these reconnaissance surveys, Moore (1969; 1970) undertook a series of subsurface investigations of both open sites and rock shelters within the Milbrodale and Sandy Hollow areas of the upper Hunter with the aim of reconstructing the prehistory of the Hunter Valley's occupation by Aboriginal people. At Sandy Hollow, a rockshelter about 300m north of the Goulbourn River revealed a stone artefact assemblage of more than 4,280 artefacts (ERM 2004), as well as bone implements, shell and bone fragments and hearths (ERM 2004). Subsequent to the excavation program, a probable post-Contact Aboriginal burial was identified by some schoolboys who visited the site in the 1960s (Moore 1969; 1970).

Since this time, numerous surveys have been conducted as part of the consent process for a number of mining and large infrastructure projects within the Hunter Valley. The following is an indicative rather than an exhaustive list of some of the areas investigated and the projects undertaken: Antiene (ERM 2007; Perry 2010); Bayswater (Umwelt 1997); Black Hill (Brayshaw 1982); Drayton (Ozark 2013); Glennies Creek (Brayshaw 1986; Koettig 1986a; 1986b; Dowling 1991; Stuart 1999; Witter 2002); Hunter River (Haglund 1982); Liddell (Brayshaw 1982; 1983; Umwelt 2006); Liddell to Mount Arthur (Koettig and Hughes 1985; McDonald 1997; Kuskie 2000; Kuskie and Clarke 2004); Muswellbrook (Byrne 1987); Rixs Creek (Effenberger 1993); Bowman's Creek (Witter 2002); Loders Creek (Dyall 1981a; 1981b; Koettig 1994; Brayshaw 1988); Nine Mile Creek (Stern 1981); and Wollombi Brook (HLA-Envirosciences 1991; Wambo Coal Pty Ltd 2003). In concert these studies cover an extensive portion of the central Hunter Valley.

Site types other than artefact scatters that have been found in the region include scarred and carved trees, burials, stone and ochre quarries, grinding grooves and contact sites containing glass artefacts (ERM 2004). Brayshaw (1986) noted the presence of hearths sites along Glennies Creek, as did Koettig (1986; 1987). Radiocarbon dates obtained by Koettig (1986; 1987) from excavations undertaken of hearth sites along Glennies Creek yielded Pleistocene ages and indicate that the Wonnarua had made use of this landscape and the adjoining creek systems for over 20,000 years.



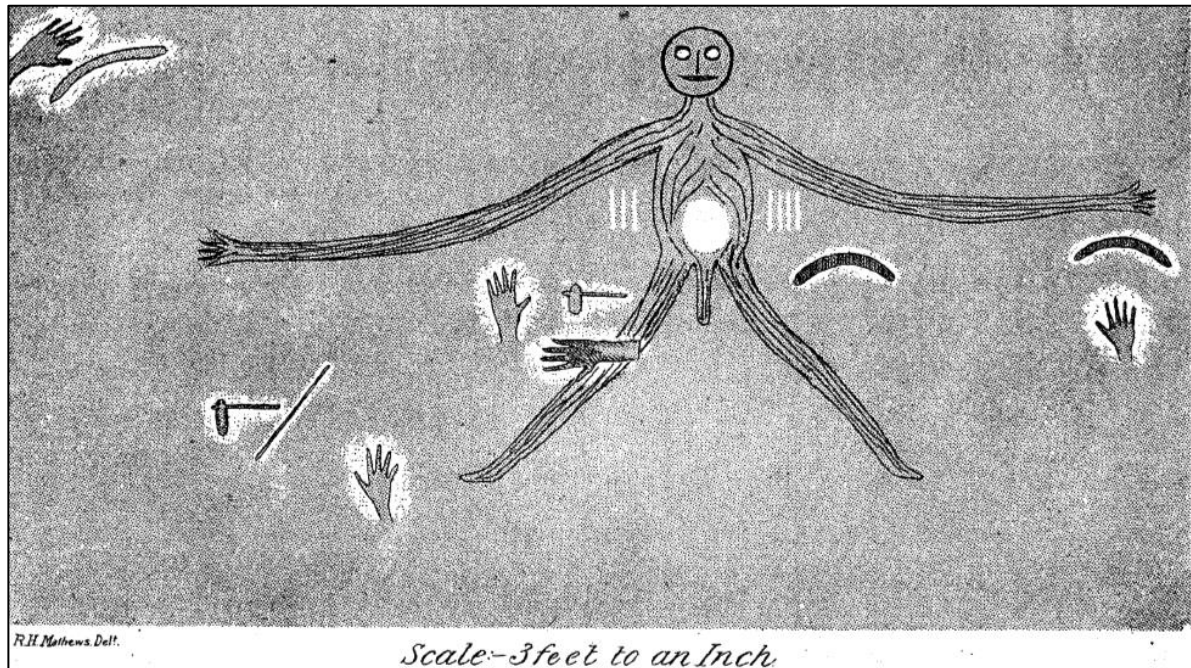


Figure 20: A copy of the drawing Mathews (1893: 356) produced of a figure he describes as 'The figure of Baiamai, or Devil Devil or whatever the image represents' as published in the Journal of the Royal Society of NSW.

## 7.5 Predictive Modelling for the Hunter Valley Based on Previous Archaeological Studies

Predictive modelling in archaeology is used as an interpretive framework to understand the distribution of archaeological sites in order to inform models relating to the nature, significance, patterns and distribution of human activities across the landscape. The expectation is that as the information base grows, the predictive modelling will evolve in relation to that expanding knowledge base. Unfortunately, the predictive modelling utilised in the Hunter Valley is very simplistic and has contributed very little to expanding some of the original patterns identified in the early days of exploration.

There is a paucity of ethnographic literature to draw upon in relation to Aboriginal lifestyles at the time of Contact in the Hunter Valley. Although early accounts exist in relation to cultural practices such as corroborees (e.g. Breton 1833) and land management practices such as systematic burning of the grasslands and undergrowth for hunting (Fawcett 1898), there are no records describing everyday activities such as foraging, hunting or the use of stone tools.

The current understanding of archaeological settlement patterns in the Hunter Valley is predominantly based on development driven archaeological studies. The predictive modelling is a result therefore of a selection of random study areas rather than ones selected systematically to build upon the knowledge of archaeological settlement patterns. As it stands, the underlying variables for the current predictive models are:

- The largest and most complex artefact scatters occur along watercourses

- Artefacts are generally located within 50 metres of tributaries as water is considered the most valuable resource
- Mudstone is the most dominant raw material in the region
- The landforms preferred tended to be lower slopes and waning slopes more than flood plains

However, the predictive models are biased in that testing programs have, since the late 1990s been selective in the landforms that they have targeted. The expectation that archaeology will be concentrated around modern watercourses has led to a disproportionate amount of 'testing' around current alignments of creeks and rivers, with the consequence that other landforms have been ignored. It also means that the archaeological activities that are being tested are those ones located in and around home-base camps rather than those associated with subsistence, trade, cultural activities (e.g. ceremonial) or mobility (e.g. moving between seasonal ranges). Early studies identified the types of sites that were present in particular landforms; subsequent studies have built on these locational factors to begin making predictive statements and expectations for Aboriginal settlement patterns.

The Hunter Valley has experienced considerable impacts primarily related to historical agricultural practices and land use along with impacts arising from the mining industry and its related infrastructure. As studies have accumulated and progressed, the regional database of archaeological sites has provided the background knowledge to create predictive models for future research and a better understanding of the Aboriginal culture. However, archaeological investigations have favoured settings along the lower elevations of the Central Lowlands and very few projects have explored the higher elevations of the mountains, ridges and national parks.

The available research has been reviewed by several archaeological organisations including ERM (2004), GHD (2005), HLA Enviroscience (2005) and Umwelt (2007), and provides the following regional summary of expectations:

- The majority of known Aboriginal objects are stone artefacts and they are recorded as archaeological sites in the Central Lowlands of the Hunter Valley in the form of artefact scatters, open camp sites and isolated finds. Less common site types include scarred trees, art sites, quarries and grinding grooves.
- Archaeological sites, even where surface evidence is not present, occur on most landforms as confirmed by a HLA-Enviroscience's (2005) excavation programme, in which Aboriginal sites were encountered on alluvial terraces, flats, slopes, bench areas, spurs and ridgelines. The majority of sites have been recorded along the Hunter River and its major tributaries. Previous archaeological investigations have established that the majority of archaeological sites occur within 50 metres of a creek line or creek confluence, although more recent investigations extend this to within 200 metres of permanent water.
- Sites along major creek lines typically have the highest potential for subsurface archaeological deposits, a result of aggrading trends for alluvial settings, as well as the potential for buried sites. However, these deposits can be subjected to erosional and depositional processes that may have reworked the archaeological deposits and therefore an understanding of geomorphology is critical to the understanding of subsurface archaeological potential.

- Site frequency and density are dependent on their position in the landscape, the ideal scenario including in situ deposits: these tend to be rare due to the extensive landscape modifications post-dating European settlement.
- The dominant raw material recorded is mudstone. The Hunter River is a key source of mudstone, along with silcrete which is thought to dominate later periods. Quartz, petrified wood, chalcedony, porcellanite and other igneous rocks are less frequent. The most common artefact types are flakes, broken flakes and cores, with smaller frequencies of other types such as backed artefacts, ground edge axes, hammerstones and grindstones.
- Despite the general lack of stratified sites with datable material in the Hunter Valley, a number of Pleistocene sites (archaeological deposits over 10,000 years old) have been identified by previous investigations. It is thought that Aboriginal people have occupied the Hunter Valley for around 40,000 years but further research needs to be conducted to validate this.

## 8 Significance Assessment

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### 8.1 Introduction

*‘...people’s sense of place, and their engagement with the world around them, are invariably dependent on their own social, cultural and historical situations (Ashmore and Knapp 1999: 20-21).’*

The current study relates to the MCCA Project and surrounding area. The assessment of the significance of this area is, at the time of the preparation of this report considered as progressing. Projects are presently being implemented that are determining, recording, and assessing these values. The values defined in this report are presented in a way that is sympathetic with cultural values since traditional values do not separate the ‘natural’ world from the cultural and archaeological values. Under traditional ‘lore’ the cultural landscape embodies what western paradigms separate into natural, anthropological and archaeological values.

### 8.2 Aesthetic values

There is not one ‘aesthetic’ that can be assigned to the study area. The scale and dimension of the area, the geomorphological diversity of its landforms; the diversity of flora and fauna within it; and the scale and complexity of past and present land use practices and their allied infrastructure, inclusive of their singular and cumulative effects on the form and fabric of the landscape, variously intersect to achieve a mixed and often competing aesthetic. Moreover, as the aesthetic quality of objects or places result from the engagement of the individual or group with them via one or more of the five senses (i.e. touch, taste, smell, sight, and hearing) they are highly subjective and frequently changeable. Hence the aesthetic values described below are only those recognised for the area by the PCWP during the fieldwork and consultation component of the MCCO Project. Specifically, they are those values recognised for the MCCO Project via the participant observation of the Tocomwall team in the archaeological and cultural values; and those determined via formal and informal enquiry of other PCWP members regarding their knowledge of the study area. Note too that the aesthetic values described here for the PCWP are not exhaustive but rather are illustrative of the range of such values that can be ascribed to the project. Where applicable the aesthetic values described are examined with reference to specific elements of the study area where one or more other Aboriginal cultural values have also been identified.

#### 8.2.1 Positive Aesthetic Values

Those aesthetic aspects of the project identified to have positive qualities by the PCWP are described below. Wherever possible the qualities described are illustrated with examples obtained from the study area. The scale at which the value can be/is ascribed to the project and/or its component parts and/or the cultural items and places within it are also outlined.

One of the positive aesthetic values of the study area is the diverse landforms and associated diversity in plants and animals. The cultural landscape of the study area embodies a ‘tessera’ in the larger ‘mosaic’ of the PCWP traditional lands. The study area reflects aesthetic values within a



relatively small area that are representative of those found across larger areas of the PCWP traditional lands.

### 8.2.2 Negative Aesthetic Values

The onset of large scale mining operations in the Hunter Valley including those in the region of the Mangoola Open Cut, has clearly impacted the capacity for the PCWP to both describe and observe the song lines and pathways towards the PCWP cultural sites. This clearly impacts the ability for the PCWP to read, teach and understand the cultural landscape and highlights the issues that are faced in relation to intergenerational equity.

The qualification is made here that in general, and as is frequently described by the PCWP, mining is considered to be wholly intrusive and negative in its aesthetic consequences. For example in the recent statement to the Native Title Tribunal, Maria Stocks recounted the following with respect to mining and its impacts on Wonnarua Country:

*...my family has always identified as Wonnarua. We have always valued, and respected our land, our heritage and our identity. For me and my family the land is not ours but a gift given to us to use because everything comes from the land. We have been brought up and taught to believe that we were fashioned out of the earth and to the earth we will return. When Anastasia and Jeremiah (my two youngest children) were about eight I took them for a drive to show them about Glennies Creek where I grew up, rode horses and motorbikes and went fishing. When I got there I just gasped and went "Aargh" because there was nothing there. It was all gone. There was big hole from mining. I sat there and tears rolled down my cheeks. I couldn't show my children anything. It was like a part of me had been deleted.*  
(Stocks, 2012, para 7).

### 8.2.3 Individual Artefacts

At the scale of individual artefacts the PCWP express the view that those that have an identifiable form have a positive aesthetic. Many of the Aboriginal objects encountered in the study area clearly had aesthetic values that were visual in character and related to the colour, lustre and homogeneity (or otherwise) of the raw material from which they were made; as well as to the shape and size of the manufactured artefact; and including evidence of the repeated attention to detail given to the object by its maker (e.g. level of retouch, number of flakes removed etc.). Many of the aesthetic values of individual artefacts are demonstrably tactile such that tools and cores were picked up by members of the PCWP, held in the hand to feel their weight and to grasp them as/and consider they might be held if they were to be used as a tool.

### 8.2.4 Artefact Scatters

All artefact scatters have a positive aesthetic for the PCWP particularly as visual markers of the prior use of the landscape by their ancestors. In general, the size, distribution and content of each artefact scatter variously contribute to the overall aesthetic value it retains. Furthermore, as discussed in Section 7.3 above, there is a clear correlation between the significant cultural sites, song lines and pathways of the PCWP and the distribution of archaeological sites – the majority of which are

artefact scatters. The distribution of archaeological sites reinforces the cultural knowledge and values of the PCWP.

### 8.3 Archaeological Values

Central to the deliberations of Aboriginal people today with regard to the cultural significance of an item or place, is consideration of the duty of care they owe to the material culture, as a manifestation of their ancestors, spiritual entities resident in particular areas or mythical hero figures, and to the area as a whole, recognising they are being watched by their ancestors, spiritual entities and hero figures. Indeed, as Aboriginal field researchers often note in the course of fieldwork, they are aware they often are being observed by the 'old people' when they are in the field (CQCHM, 2011).

Archaeological values are typically considered to be scientific values and therefore achieved only by the archaeologist using scientific method to observe, record and explain the material cultural remains of a society as manifest in the 'archaeological record'. As the scientific method is derived from western modes of thought and practice there is a frequently assumed (and often manifest) tension between the traditional cultural values of the Aboriginal community whose material culture it is and the archaeologists(s) who are to investigate it. In response to this tension in the last fifteen years or so there has been an increasing focus on Aboriginal community participation and collaboration in archaeological research (e.g. Clarke 2002; Smith and Beck 2003; Greer 2010; Ross et al 2010). Frequently these collaborations have emphasised the importance of changing the focus of the archaeological research from articulation of the 'universal' human truths that might be yielded up by the 'archaeological endeavour' to consider the questions that the local Aboriginal community want to see answered from the material cultural remains of their ancestors (Greer 2010).

At a most fundamental level the study area is of cultural importance to the PCWP because it contains items of material culture manufactured, used and left within the landscape by 'the ancestors' during the course of their everyday lives. These material culture or archaeological remains are therefore of inherent cultural value to the PCWP. The inherent value of these items to the PCWP exists irrespective of the application of any general or specific scientific (archaeological) method to further explicate meaning from them. Moreover, it is not the mere application of scientific method that gives further meaning or value to such cultural remains. Rather, for the PCWP it is the focused attention on the cultural relevance and suitability of the scientific method to be applied, and its ability to answer specific questions about the ancestral past that best values such Aboriginal material cultural remains. One critical aspect of the archaeological record infrequently addressed by archaeologists in any project context, but of immediate importance to the PCWP is the influence and representation of gender in the material cultural remains of their ancestors. The PCWP recognise the area to be an engendered landscape. Hence, both ritual practice and everyday resource use and exploitation are expected (and also presumed) to exhibit patterns in the material culture record that reflect men and/or women's business. The explication or otherwise of this patterning in the archaeological record of the study area is a yet unrealised research potential; and hence, archaeological value of the area.

For this project, the PCWP have participated in all aspects of the archaeological fieldwork (survey) and been provided with summary details of the archaeological assessment and its results. It is possible to move beyond some of the inherent values of the archaeological resource to the PCWP, and consider some of the values held by the PCWP in the 'doing' of archaeological work.

The practical involvement in archaeological fieldwork is of fundamental physical, social and psychological value to members of the PCWP. Rhonda Ward has previously expressed this in the following terms:

*'I like doing site work and I do like the bush. I get excited going out on the mine sites. We look for artefacts. Most of them are just on the surface and you just go: "Oh...there's one," and you put a flag where the artefacts are. You might walk another step and there is another one and you just flag them like that and the archaeologists come behind and record them. We just keep going and we leave them there and we might later down the track like to collect them, so we go and collect them.*

*Most of the archaeologists we work alongside are very good. There is a few I'm a bit 'iffy' about but most of them are really great. Really good to get on with and they show you the maps where you've got to go and how much you have got to do. I feel most excited when I find 'cores'. 'Cores' is where they break the flakes off. It's just a core and they've got a stone and they just hit it off. They break the flakes or the black [sic] blades for their weapons. Just to find an artefact tickles me pink. It really does (Rhonda Ward 2003 cited in Adlem 2008: 102-103).'*

Some of this 'doing' value arises from the fact that with significant change in land tenure, especially in the past 20 to 30 years as a result of active mining within the coalfields that lie between Singleton and Muswellbrook (i.e. flanking either side of the New England Highway), access to land of cultural value to the PCWP has been increasingly restricted. Again this challenge of access to land of cultural value for the PCWP has been previously articulated by Rhonda Ward:

*'We went on an excursion with the TAFE out to Baiame [sic]. Baiame looks over the Valley and I know he is here to guard us and look after us. I hadn't seen him when I was little because he is actually on private property. I don't think that should be. He is ours and I think we should be able to go there any time we want to go and look at him. I don't think it should be on private property and I don't think they should be charging us to go there either (Rhonda Ward 2003 cited in Adlem 2008: 108).'*

Likewise Maria Stocks has expressed her dismay at finding that an open cut mine had 'deleted' the landscape of her childhood.

Importantly, for the significant cultural site of Baime the restrictions on access noted by Rhonda in 2003 does not currently apply. However, many of the sites within the project area (and its surrounds) of value are without easy access. In this context, it is only through the active doing of the archaeology that these cultural items and places have been able to be visited by contemporary members of the PCWP.

Previously, Danny Franks has eloquently expressed two aspects of value to the PCWP in the doing of archaeology that are worthy of reiteration (Tocomwall 2012). Firstly, he noted that his very intersection with artefacts and archaeological sites makes it ‘living archaeology’ not an abstract. Secondly, Danny commented on the value of the natural elements retained within a mine site that he is able to experience when doing archaeology; as these provide connection to memories and people of value to him:

*‘Regardless of the negatives, I have to endure and the constant questioning I have within myself and the disrespect and devastation environmentally I have to witness every single time I am out in the field. I do some times have moments where I enjoy being out in the field but these moments are only flash backs of my childhood and most of the time I’m with my friends fishing or hunting. These are bitter sweet memories because the only things that trigger those thoughts are the specific wildlife I see; ones I am familiar with and have used as bait, have caught, or have even learnt how to track.’*

It is also in the context of the prior development of conservation strategies and/or mechanisms for Aboriginal community participation in the rehabilitation and protection of archaeological and ethno-ecological resource values within the wider project area that the ‘doing of archaeology’ has contributed to some members of the PCWP.

#### 8.4 The Cultural Values of the PCWP in the Study Area: A Synthesis

The cultural landscape is greater than the sum of its parts, and the inter-relationships between the parts can be significant. For this reason, the details matter, significant loss of integrity and meaning can occur through the attrition of many small elements (Context et al 2002 cited in Brown 2010).

From the outset, the PCWP have been concerned to ensure that no single Aboriginal item or place within the project be subject to an evaluation based on the systematic ranking of its Aboriginal cultural values relative to the other items or places within the project area. This type of ranking is counter to the expression and belief of the PCWP that it is not one item, artefact, grinding groove, plant or animal species that is of value to them in the project but rather it is the sum total of all such component parts of the landscape, and its surrounds, that provide cultural meaning to them. This has been clearly articulated by the late Aunty Barbara Foot. The following is an amended extract of notes made by Ms Sarah Paddington of OEH when in conversation with Aunty Barbara Foot and her son David in February 2011:

*‘As a girl I would travel along Bowmans [Creek]. We’d go from the mission, to school to town ... My Dad had a lot of cultural knowledge. He passed it on to me. He’d tell me places I could and couldn’t go. He showed me important places. Places our ancestors still come through. I know how to read the signs of the land, the seasons. The signs are our lore, they show the way – like people used street signs to have order. Some of the signs, the trees, have been cleared but we know where they were from our ancestors, and we know what they tell us. People not from here don’t have that knowledge....’*



*The area is all important to us. We can't break it up for each mine – that is how they are getting away with destroying so much of our culture. They don't understand how it all links together, so it doesn't seem as important when you look at this little bit or that little bit. That's how they are breaking up our community too – the mine mention money and that starts fights. The mines want the fights as they get to keep what they want if the community is distracted (Aunty Barb Foot, February 2011 cited in attachment to email forwarded by Ms Sarah Paddington of OEH to Mr Scott Franks and Mr Robert Lester, 17 April 2011).'*

In line with Aunty Barb's assessment, it remains the broad view of the PCWP that the steady attrition of elements of the Aboriginal cultural landscape within their Wonnarua Country - especially those items of Aboriginal material culture subject to archaeological assessment - has occurred as a direct result of the application of a process of systematic ranking of items or places.

The purpose of this section then is to provide a synthesis of the cultural values that the PCWP ascribes to the project area; and to provide a summary of these values in the context of standard Burra Charter significance criteria. The statement of cultural significance that results from this summary and synthesis is by necessity at the 'whole of landscape' rather than the individual item or place. Tocomwall acknowledges that this 'whole of landscape' approach is not the evaluation mode adopted in the broader context of cultural heritage studies in NSW, both of which attribute some form of ranking of significance to component parts of the Aboriginal cultural landscape within the project area. Whilst this may make some elements of the integration of this report within the broader cultural values assessment challenging, Tocomwall believes that to include such rankings would be counter to the PCWPs world view; and consequently, would not be an effective synthesis of their cultural knowledge in and of the project area and its surrounds.

#### **8.4.1 An Overview Statement of Cultural Value**

The Heads of Family of the PCWP collectively support the following overview statement in relation to the cultural significance of the study area to them:

*'We need to look at the landscape from a position of duty, responsibility, and focus on the achievement of inter-generational equity. We do not own the land, in terms of European concepts of ownership. Our ownership is in the context of the use of the land and its various animals and plants to sustain our bodies and we gave/give homage to them by creating ceremonial dances for them. The importance of this process should not be underestimated, for it is how our people worked with the environment, the landscape, our neighbours and how we all from different Aboriginal language groups, worked as one with Mother Nature. We were practising land management thousands of years before Europeans invaded our country.'*

The study area is in an area with close proximity to places that have been used by our people since the time of creation. The location of ceremonial sites in the general area, as well as pathways between them, known today as song lines, indicates that the cultural landscape of the study area and its environs holds significant values to the PCWP. The path was placed there by our creator Baiami, which in the beginning would have been sheltered from prying eyes and onlookers who

were not supposed to know or see what was going on, unless invited. This pathway contains sites for initiations and religious practises (Dream Time).

*'These same lands that may have interaction with this mine are places that represent what our people are about. The landscape (and its environs: my addition) has present ceremonial places (bora grounds), scarred trees, fishing holes, teaching and birthplaces and places to camp and prosper. In today's terms this is our home and our community. Even today you can talk to any member of our claim group and all will have some type of association with this area.*

*Having Glencore work with our people to understand its importance is a great step forward but at this stage it is a very small one as almost all reports that have been undertaken in the Hunter Valley and elsewhere, in the past regarding Aboriginal Cultural Heritage Values, are centred solely on the identification of stone objects within a given location. The normal stakeholder incentive for involvement in this process is for paid fieldwork participation and often their expertise is in stone materials and identification only.*

*Consideration in the past, by those in the archaeological industry, is that Aboriginal people had more to say about the landscape than just stones and bones. This has never been fully canvassed which has been a fundamental flaw in almost all previous reports. There has not been an inclusion of the values that Aboriginal people place on the fauna and flora within a given study area. This is a major issue, not only for Aboriginal people but for the wider community. The history of this country is for all to protect. As the human race, we learn from our past and our history to better understand the future.*

*The Hunter Valley has been heavily impacted on for decades from both coal mining and the agricultural industries. The Plains Clans of the Wonnarua People's (PCWP's) country only has approximately 7.5% of our lands left untouched. Our own traditional lores and customs need to be able to protect this remaining pristine country for our people to live in harmony and for all future generations to learn from. We need to continue teaching our people and all future generations about who we are and where we are from.*

*Most surveys focus tend on the artefacts that are found on the day and invariably no real effort is taken to understand why they are there, what is happening or where the artefacts are located. Most are recorded as isolated finds when in fact it is a series of sites that make up a complex camping ground being a recognised Aboriginal site. We were taught from these lands as we grew up. It is a place where our families lived, hunted and learnt to interpret the lands. To a non-Aboriginal person in this area is your house, school, hospital, church, shopping centre, doctors, police station, your whole community or society. That is why most reports do not reflect this; it is very complex for a non-Aboriginal to understand and interpret the lands and put into words.*

*The land around the project is extremely important to our people. Today, the lands, as in most other areas, are one of many pages in a book and allow us look back in time. It gives our people a better understanding of the stories we were told, when we were young, what*

*they were about and about why. The land still has the footprints of our people from the beginning of time and allows our people to have direct contact with our lands and our elders.*

*As we looked around the landscape, and participated in surveys or test excavations we found many artefacts. Each time we encountered these objects we felt the presence of our people and the excitement that we were now standing in one of our people's houses. It is a firsthand experience and shows where our people lived, hunted, fought to defend their lands, thrived and were happy and cried.*

*This part of the Hunter Valley makes us feel like we are coming home. The reality is though that this is a place that will not be here in the future. Just as what has happened to the other homes of our people it will be lost. To try and put in words exactly what this place is worth is beyond comprehension (Heads of Family of the PCWP, September 2015).'*

## **8.5 Summary Statements of Value Relative to Burra Charter Criteria**

### **8.5.1 Summary Statement of Historical Value**

The information in this report firmly indicates, the Heads of Family of the PCWP have a strong Aboriginal identity with specific knowledge and connection to the physical and spiritual landscape of Wonnarua country; and respect for the traditional lores and customs of their Plains Clans society. Equally, they are modern Australians within an ever-globalised world with use and access of mobile phones, internet, and digital TV technologies; and fundamental use and respect of the law and practices of Australia today. Yet, it is an historical narrative that consistently emphasises a continuity of association of members of the PCWP with land and landscape in and around the project area. It is not simply a story of dispossession and alienation from tribal lands. Nor is it one of regeneration of Aboriginal identity within the socio-centre of the Aboriginal reserve or mission, as is elsewhere typified for the Hunter Valley (Blyton and Ramsland 2012). It is a narrative of persistence, adaptation and cohabitation with various settler families. It is a story of negotiated spaces and shared landscape in the 'Country' to which the PCWP recognise that they now and forever have belonged.

### **8.5.2 Summary Statement of Social Value**

The study area and surrounds are of immense and enduring social significance to the PCWP. This significance primarily derives from the complex mix of that which is understood to be 'sacred' and derived from the realm of the creator and that, which is 'secular' and arising out of their everyday experiences of both their ancestors and themselves within this landscape. Today, a unifying element in this sacred and secular world is the Hunter River. This watercourse's value to the PCWP as a dreaming track, as a loci of family histories, as an ecological resource zone, and as a site of recreation and story-telling is immeasurable. Furthermore, the PCWP maintains that the creek systems across the Hunter Valley were used as (a) manufacturing sites for materials that would be used in the initiation ceremonies to be conducted at the nearby Bora ground, (b) as sites for teaching, hunting and stone knapping skills to initiates, (c) places where large groups gathered and prepared meals in support of the bora ceremonies; and (d) places where people dressed and painted their bodies using available ochre sources in preparation for the ceremonies.

The Aboriginal cultural landscape is also of historic and contemporary social importance as a place where either, via participation in various historic and contemporary rural activities and/or recent mine related activities (including archaeological surveys as part of cultural heritage studies), the PCWP have been able to achieve freehold lease and/or ownership and/or access to part of their cultural landscape that is for them unprecedented within in the Hunter Valley.

### ***8.5.3 Summary Statement of Aesthetic Value***

The aesthetic values of the MCCO Project to the PCWP are mixed. This is predominately the result of the scale and form at which the aesthetic values of the area are considered. At the scale of individual Aboriginal objects, artefact scatters, camp sites, water-bodies and native fauna and flora species the MCCO Project can be identified as a landscape that holds positive aesthetic values for the PCWP. Areas of the surrounding country, including the nearby crown lands have relatively low levels of impact. The area has high biodiversity values with diverse ecological communities. The study area includes threatened ecological communities including threatened plant and animal species (Mangoola Open Cut, Glencore 2017:21-26). These communities all contribute to the aesthetic value and importance of the place.

Overwhelmingly however, the immense scale at which development activity has and continues to alter the biophysical landscape of the surrounding areas, and negatively affect the visual and aural perception of the items and places of cultural value within it, means that the immediate project area is considered to have little aesthetic values for the PCWP. The PCWP commonly state that mining destroys the landscape, there is nothing left and that the landscape that remains has no integrity. Or else it is stated that “When open cut mining is planned there are no aesthetic values for consideration the landscape is, or will be gone”.

### ***8.5.4 Summary Statement of Scientific Value***

For the PCWP the archaeological and ethno-ecological values of the Project are both substantial and yet to be fully realised. For the PCWP the scientific value of the archaeological and ethno-ecological resources of projects in the Hunter Valley has often been diminished by a program of archaeological assessment that has been tied to the development process and compliance; and for which no due consideration of the Wonnarua perspective has been afforded, or broader consideration given to the overall scientific value of a study area. The numerous archaeological sites, significant number of plants and animals known for the study area should be considered in their context as contributory elements of a unique, highly ritualised and bountiful cultural landscape to which the PCWP has direct ancestral, historic and contemporary links.

### ***8.5.5 Statement of Cultural Heritage Significance***

The landscape of the project area has a fundamental significance because of its historical, social, and scientific value to the PCWP. For the PCWP the study area and surrounds is a complex, multi-layered cultural landscape where in combination (a) the biophysical attributes of the landscape including the drainage systems, fauna and flora, geology and soils; (b) the material traces of traditional Wonnarua people; (c) the historical associations and experiential reference points of its members, and in particular those of the Franks family (and all associated descendant families); and (d) the various



spiritual, lived experiences and economic attachments of contemporary PCWP members contribute to a high level of cultural significance for which words are considered inadequate to describe.

This immensely important cultural landscape is however perceived by the PCWP to be highly fragmented and subject to catastrophic change and despoilment by the physical action and aesthetic impact of past, current and future mining activities. Mining has been a progressive and substantial intrusion on this cultural landscape for which the PCWP feel a profound and enduring sense of loss. This loss is compounded by their feelings of guilt and distress at not being able to protect the land for which they have custodial responsibility.

## 8.6 Possible Mitigation Measures: The PCWP Viewpoint

*'You can't just borrow something, use it to the point of no sustainability then hand it back for future generations. It's not just land. By then it's lost its values both culturally and spiritually (Danny Franks, 2012).'*

The PCWP has previously outlined to Glencore that Aboriginal cultural heritage assessments are 'front- end' requirements to mine development, and although the resultant Aboriginal Cultural Heritage Management Plans (ACHMPs) are frequently constituted as "Life of Mine" documents, the opportunities for engagement in mine-related activities by Aboriginal groups such as the PCWP is usually limited (Tocomwall 2012).

The PCWP notes that it has previously expressed a wish to partner with Glencore in longer-term mine-related activities that bring economic and cultural benefit to the PCWP; and which enhance (rather than destroy) the natural and cultural capital of Wonnarua Country more generally (Tocomwall 2012; 2013; 2016).

It is important to recognise that:

- (i) There is a continuing existence of Aboriginal archaeological sites in the surface and sub-surface of the study area and these are coupled with physical attributions across this landscape of European pastoralism and settlement in which the members of the PCWP have had a historical association and/or continue to participate in (e.g. as fencing contractors, boundary riders, dingo bounty hunters, rabbit trappers etc.).
- (ii) For the PCWP, the physical landscape continues to reflect their cultural narrative and has within it loci of social memory and cultural and spiritual meaning to which they can and do continue to refer.

The PCWP maintains that the measures outlined if provided for in the short-, mid- and long-term will enable them to be instrumental in managing the consequences of their decisions for all elements of their heritage within the study area.

## 8.7 Discussion and Recommendations

An ongoing concern of the PCWP has been that to date decisions about Aboriginal cultural heritage on Wonnarua lands have been made by people who do not have - and will never have - the cultural



knowledge of, values in, nor connections to Wonnarua Country as do the PCWP. This is absolutely so for that part of Wonnarua Country bounded by the current project area that is in that part of the cultural landscape of the PCWP from which they derive their unique identity and cultural connections: it is the epicentre of their beginning and belonging.

## 9 Bibliography

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Adlem, K.J. 2008. *Relating to Country: Listening, Reflecting and Relating to Contemporary Aboriginal stories from Wonarua Country in the Hunter Valley*. Unpublished, PhD Thesis (Fine Arts), University of Newcastle, NSW.

Albrecht, G. 2000. *Rediscovering the Coquun: Towards and Environmental History of the Hunter River*. River Forum 2000, Wyndum Estate, Hunter Valley.

Appetiti, E. 2005. Remedies from the Bush: Traditional Medicine among the Australian Aborigines.

Atwell, F. 1988. *Upon a State Unknown*. Terrigal, NSW.

Australian Heritage Commission, 2000a. *Protecting Heritage Places: Information and Resource Kit*. Australian Heritage Commission, Canberra, ACT.

Australian Heritage Commission, 2000b. *Protecting Local Heritage Places: A Guide for Communities*. Australian Heritage Commission, Canberra, ACT.

Australia ICOMOS 1999 *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999: (with Associated Guidelines and Code on the Ethics of Co-existence)*. Australia ICOMOS Canberra.

Backhouse, J. 1843. *A Visit to the Australian Colonies*. London.

Beck, W. 2006. Chapter 8. Aboriginal Archaeology. In Atkinson, A, J.S Ryan, I. Davidson, and A. Piper, (eds.) *High Lean Country: Land People and Memory in New England*, pp.88-97. Allen and Unwin, Crows Nest.

Belshaw, J. 1978. Population distribution and the pattern of seasonal movement in northern New South Wales. In McBryde, I. (ed.), *Records of Times Past: Ethnohistorical Essays on the Culture and Ecology of the New England Tribes*. Australian Institute of Aboriginal Studies, Canberra, pp.65-81.

Binford, L. R. 1979. Organisation and formation processes: looking at curated technologies. In *Journal of Anthropological Research* 35: 255-73.

Binford, L. R. 1980. Willow smoke and dogs' tails: hunter-gatherer settlement systems and archaeological site formation. In *American Antiquity* 45: 4-20.

Blyton G. M., Heitmeyer D. G. and Maynard J. M. 2004. *Wannin Thanbarran: a History of Aboriginal and European Contact in Muswellbrook and the Upper Hunter Valley*. Muswellbrook Shire Aboriginal Reconciliation Committee, Newcastle.

Boodle, R.G. 1874. Recollections of ministerial work in the Diocese of Newcastle, New South Wales. In Halcombe, J.J. Rev. 1874. (ed.) *The emigrant and the heathen, or sketches of Missionary Life*. Society for Promoting Christian Knowledge, London.

Boyd, W.E., Cotter, M.M., Gardiner, J. and Taylor, G. 2005. Rigidity and a changing order...disorder, degeneracy and daemonic repetition: Fluidity of cultural values and cultural heritage management,

In Mathers, C., T. Darvill, and B.J. Little. (eds.), *Heritage of Value, Archaeology of Renown: Reshaping Archaeological Assessment and Significance*, pp. 89-113. University of Florida Press, Gainesville, Florida.

Brayshaw, H. 1966. *Some Aspects of the Material culture of the Aborigines of the Hunter Valley at the Time of First White settlement in the Area*. Unpublished, B.A. Honours Thesis, University of New England, Armidale.

Brayshaw, H 1982a *Archaeological Survey of Extended Open Cut Coal Mine near Liddell*. Report prepared for Croft and Associates Pty Ltd.

Brayshaw, H 1982b *Archaeological Survey of the Proposed Black Hill Coal Mine, near Muswellbrook in the upper Hunter Valley*. Report submitted to Sinclair Knight and Partners.

Brayshaw, H 1983 *Archaeological Investigation at Hunter Valley Extended near Liddell, New South Wales*. Report prepared for Croft and Associates Pty Ltd.

Brayshaw, H. 1986. *Aborigines of the Hunter Valley: A Study of Colonial Records: Bicentennial Publication No 4*: Scone, Scone and Upper Hunter Historical Society.

Brayshaw, H. 1986. *Archaeological Survey at the CSR Lemington Mine, Hunter Valley, NSW*. Report held by NPSW.

Brayshaw, H. 2003. *Looking for the Bora Ground in the Wallaby Scrub near Bulga NSW*. Unpublished report by Helen Brayshaw heritage Consultants, Drummoyne.

Breasted, J.H. 1916. *Ancient Times: A History of the Early World*. Boston Ginn.

Breton, R.N. (1834). *Excursions in New South Wales, Western Australia and Van Dieman's Land, During the Years 1830, 1831, 1832 and 1833*. 2nd Revised Edition, Richard Bentley, London.

Brooks A and Brierley G. 1997. Geomorphic responses of lower Bega River to catchment disturbance, 1851-1926. In *Geomorphology 18*: 291-304.

Brooks A and Brierley G. 2000. The role of European disturbance in the metamorphosis of lower Bega River. In *River Management: The Australasian Experience*, Brizga SO, Finlayson BL (eds). John Wiley and Sons: London; 221-246.

Brown, J. C. 1825. *Anonymous Diary by a Servant of the Scott family, 8 August 1821 –March 1824 (Written after 1825) with Notes*. [Transcribed and researched by Jan Thomas, State Library of NSW]. State Library of NSW MLMSS 7808(Safe 1/403). Located online at [acms.sl.nsw.gov.au/\\_transcript/2011/D03307/a2852.htm#2a2852009](http://acms.sl.nsw.gov.au/_transcript/2011/D03307/a2852.htm#2a2852009).

Brown, S. 2008. *Cultural Landscapes*. Department of Environment, Climate Change and Water, Goulburn.

Butlin, Noel G. 1983. *Our original aggression: Aboriginal populations of south eastern Australia 1788 – 1850*. Allen and Unwin, Sydney.



Bryce, S., 1992. *Women's Gathering and Hunting in the Pitjantjatjara Homelands*. IAD Press, Alice Springs.

Byrne, D 1987 *Survey for Aboriginal Archaeological Sites along the Route of the Proposed 330KV Liddell to Muswellbrook Transmission Line in the upper Hunter Valley, New South Wales*. Report to the Electricity Commission of New South Wales.

Bryne, D., Brayshaw, H. and Ireland, T. 2003. *Social Significance: a Discussion Paper*. NSW National Parks and Wildlife Service. Hurstville, NSW.

Byrne, D. and Nugent, M. 2004. *Mapping Attachment: A Spatial Approach to Aboriginal Post-Contact Heritage*. Department of Environment and Conservation, Bridge Street Hurstville, NSW.

Campbell, J.F. 1928: John Howe's Exploratory Journey from Windsor to the Hunter River in 1819. In *Royal Australian Historical Society, Journal* 4:232-241.

Campbell, V. 1978. Ethnohistorical evidence on the diet and economy of the Aborigines of the Macleay River Valley. In McBryde, I. 1978, *Records of Times Past: Ethnohistorical essays on the Culture and Ecology of the New England Tribes*. Australian Institute of Aboriginal Studies, Canberra, pp. 83-100.

Cane, S., 2013. *First footprints: the epic story of the first Australians*. Sydney, Australia: Allen and Unwin.

Close, A. E. 2000. Reconstructing Movement in Prehistory. In *Journal of Archaeological Method and Theory*, Vol. 7, No. 1.

Cotter, M.M. 2009. *Landscapes of Deception: A Multi-modal Exploration of the Indigenous Cultural Heritage Values of Deception Bay, Southeast Queensland. (Vols. 1 and 2)*. Unpublished PhD Thesis, School of Environmental Science and Management, Southern Cross University, Lismore NSW.

Cotter, M.M. and Boyd, W.E. 2001. The value of cultural heritage in 'marginal' landscapes: a southeast Queensland case study. In Cotter, M.M., W.E. Boyd and J.E. Gardiner (eds), *Heritage Landscapes: Understanding Place and Communities*. Lismore: Southern Cross University Press.

Cotter, M. Boyd, B. and Gardiner, J. 2001. *Heritage Landscapes: Understanding Place and Communities*. Southern Cross University Press, Lismore, NSW.

Cotter, M., Davidson, I., Duncan, B., Porter, S. and Wilson, J. 2005. The Gamilaraay Resource Use Project: documenting Indigenous natural resource use in northern New South Wales. In *Recording Indigenous Knowledge on Electronic Databases Workshop*, Desert Knowledge Cooperative Research Centre, Alice Springs, February

Cotter, M., Davidson, I., Ross, H. Brown, D. Duncan, B and Waters, C. 2006. Win-win Aboriginal Community participation in cotton. In *product, Production profit: progressing our Natural Advantage*, Proceedings of the 13th Australian Cotton conference, Gold Coast, August 2006. Australian Cotton Growers Research Association, pp 173-179.

Cotter, M. and Gamilaraay Resource Use Project Team, 2004. Documenting aboriginal ecological knowledge in northern New South Wales: time to expand the cultural heritage management paradigm? In Cotter, M., W. Beck, C. Clarke, I. Davidson, K. Grant, R. James, C. Mitchell, M. Ridges, J. Ross, A. Piper, D. Vale, P. Watson and R. Webb (eds) *Networks and Narratives: Program and Abstracts*, Australian Archaeological Association Annual Conference 12-15 December 2004. Armidale: School of Human and Environmental Studies, University of New England, pp. 76.

Cotter, M.M., Ulm, S., Lilley, I., Reid, J. and Cotter, S.J. 2001. The Application of LA-ICP-MS in Stone Artefact Provenance Determination: A Raw Material Resources Study, Southern Curtis Coast, Central Queensland, Australia. Paper presented at Archaeometry 2001, (February 2001) Auckland, New Zealand.

Cunningham, P. 1827. *Two Years in New South Wales*. 2nd Edition. 2 Vols. Henry Colburn, London.

Dean Jones, P. 1995. Salvage of Archaeological Sites in the Northwest Corner of Lemington Colliery Lease, Hunter Valley, NSW. Unpublished Lemington Mine Report.

Dean Jones, P. and Mitchell, P.B. 1993. *Hunter Valley Aboriginal Sites Assessment Project: Environmental Modelling for Archaeological Site Potential in the Central Lowlands of the Hunter Valley*. Report to National Parks and Wildlife Services (NPWS)

DECCW, 2007. Data Audit and Summary of Aboriginal Cultural Heritage. Draft Report to the Lachlan CMA Regional Aboriginal Reference Group. Department of Environment Climate Change and Water, North West Branch, Dubbo NSW.

DECCW 2010a. Aboriginal cultural heritage consultation requirements for proponents 2010. Part 6 National parks and Wildlife Act, 1974. April, 2010. Department of Environment, Climate Change and Water, Goulburn St, Sydney.

DECCW 2010b. *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW*. Department of Environment, Climate Change and Water, Goulburn St, Sydney.

DECCW 2010c. *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*. Department of Environment, Climate Change and Water, Goulburn St, Sydney.

Dodson, JR. and Mooney, SD. 2002. An Assessment of Historic Human Impact on South-Eastern Australia Environmental Systems, Using Late Holocene Rates of Environmental Change. In *Australian Journal of Botany* 2002, v50: 455-464.

Dodson, J.R., Roberts, F.K. and de Salis, T. 1994b. Palaeoenvironments and human impact at Burruga Swamp in Montane rainforest, Barrington tops National Park, New South Wales, Australia. In *Australian Geographer* 25:161-169.

Dyall, L.K. 1981a. Saxonvale Coalmining Authorisation Report on Aboriginal Relics. Unpublished Report to BHP Co Ltd.

Dyall, L.K. 1981b. Aboriginal axe sharpening Grooves Located outside BHP's Saxonvale Coal Mine Property. Unpublished report to BHP Central Engineering, North Sydney. Effenberger, S. 1994.

Archaeological Assessment — Rixs Creek. Unpublished Envirosiences Pty Limited Report for Bloomfield Collieries Pty Limited.

Environmental Resources Management Australia (ERM). 2004. *Upper Hunter Valley Aboriginal Heritage Baseline Study*. Report for the Upper Hunter Aboriginal Heritage Trust.

Envirosiences, 1991. Environmental impacts statement: expansion of Wambo Coal Mine at Warkworth. Unpublished report prepared for Wambo Mining Corporation Pty Ltd.

Erskine, W.D. 1994. Late Quaternary Alluvial History of Nowlands Creek, Hunter Valley, NSW. *In Australian Geographer, Volume 25, Issue 1: 50-60.*

Erskine, W.D. 2011. Geomorphic Controls on Historical Channel Planform Changes on the Lower Pages River, Hunter Valley, Australia. *In Australian Geographer, 42:3, 289-307.*

ERM, 2004. Upper Hunter Aboriginal Heritage Baseline Study. Unpublished Report for the Upper Hunter Aboriginal Heritage Trust.

Etheridge, R. 1918. The denroglyphs or carved trees of New South Wales. *Memoirs of the Geological Survey of New South Wales, Ethnological Series No.3.*

Fawcett, J.W. 1898a. Notes on the Customs and dialect of the Wonnah-ruah tribe. *In Science: of Man, 7:152:154.*

Fawcett, J.W. 1898b. Customs of the Wannah-ruah tribe and their dialect of vocabulary. *Science of Man, 8:180:181.*

Flood, J. 1995. *Archaeology of the Dreamtime: The Story of Prehistoric Australia and its People.* Sydney: Angus and Robertson.

Foley R. 1981a. A model of regional archaeological structure. *Proceedings of the Prehistoric Society 47:1-17.*

Foley R. 1981b. Off-site archaeology and human adaptation in eastern Africa: an analysis of regional artefact density in the Amboseli, southern Kenya. Oxford: *British Archaeological Reports International series 97. Cambridge Monographs in African Archaeology 3.*

Franks, S.2012a. Further Statement of Mr Scott McCain Franks 24 August 2012, in support of the Plains Clans of the Wonnarua People Native Title Application #2 (NNTT# NC12/4), Federal Court #NSD 1093/12, pp.12. Unpublished Statement to the National Native Title Tribunal, August 2012.

Franks, S. 2012b. Summary of Evidence of Mr Scott McCain Franks, Registered Native Title Claimant for the Plains Clan of the Wonnarua People. RE: Land and Environment Court Case # 10224/2012, Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Anor. To be given at Singleton Local Court, Elizabeth St Singleton, Wednesday 22 August 2012.

Gaikwad, J., Khanna, V., Vemulpad, S., Jamie, J., Kohen, J. and Ranganathan, S. 2008. CMKb: a web-based prototype for integrating Australian Aboriginal customary medicinal plant knowledge. *BMC Bioinformatics, 9. Supplement 12:S25.*

Gale, S.J. and R.J. Haworth. 2002. Beyond the Limits of Location: human environmental disturbance prior to official European contact in early colonial Australia. In *Archaeology in Oceania* 37: 123–136.

Gardiner J. N. 1991. *Hunter Region Environment Strategic Plan*. NSW Department of Water Resources: Muswellbrook.

GHD 2005 GHD (International) Pty Limited. *Proposed Coal Stockpile at Newpac No. 1 Colliery, Ravensworth. Environmental Impact Statement, Volume 1*. Report to Resource Pacific Ltd.

Godwin, L. 1990. Inside information: Settlement and Alliance in the late Holocene of Northeastern New South Wales, Unpublished PhD Thesis, University of New England.

Godwin, L. 2011. The Application of Assessment of Cumulative Impacts in Cultural Heritage Management: A Critique. *Australian Archaeology*, 73: 88-91.

Godwin, L. and Weiner, J.F. 2006. Footprints of the Ancestors: the Convergence of Anthropological and Archaeological Perspectives in Contemporary Aboriginal Heritage Studies. In David, B., Barker, B and McNiven, I.J. (eds), *Social Archaeology of Australian Indigenous Societies*. Aboriginal Studies Press, Canberra.

Gollan, V. 1993. The Military Suppression of the Wanaruah Resistance in the Upper Hunter 1826. Mount Arthur and Surrounding Area. Unpublished Report to Wanaruah Lands Council.

Grant, C., 2012. Analogies and links between cultural and biological diversity. *Journal of Cultural Heritage Management and Sustainable Development*, 2(2), pp. 153-163.

Gray, A. 2010. St Clair Mission. Accessed online April 2012 at [www.australianmuseum.net.au/St-Clair-Mission/](http://www.australianmuseum.net.au/St-Clair-Mission/).

Green, J. 2003. Anmatyerr Plant Stories: By the women from Laramba (Napperby) Community. IAD Press, Alice Springs, NT.

Greer, S., Harrison, R. and McIntyre-Tamwoy, S., 2002. Community-based archaeology in Australia. *World Archaeology*, 34(2), 265-287.

Greer, S. 2010. Heritage and Empowerment: community based Indigenous cultural heritage in northern Australia. *International Journal of Heritage Studies*, 16:1-2, 45-58.

Haglund, L 1982 *Archaeological Survey of Proposed Routes for Conveyor Belt and Haul Road Linking Hunter Valley No.2 Mine Authorisation Area with Hunter Valley No.1 Mine*. Report for Croft and Associates Pty Ltd.

Harris, B., James, D., Ohlsen, E., Griffiths, P. and Barker, C. 2000. Pilaarrkiyalu of the Cobar Peneplain: Ngiyampaa Traditional Uses of Plants and Animals. NSW national Parks and Wildlife Service, Sydney.

Haworth R.J, S.J. Gale , S.A. Short and H. Heijnis. 1999. Land Use and Lake Sedimentation on the New England Tablelands of New South Wales, Australia. In *Australian Geographer*, 30:1, 51-73.

Hiddins, L. 2003. Bush Tucker Field Guide. Explore Australia Publishing Pty Ltd, Prahran, Victoria.



Hirsch Hadorn, G., Hoffmann-Reim, H., Biber-Klem, S., Grossenbacher-Mansuy, W., Joye, D., Pohl, C., Weismann, U. and Zemp, E. 2008. (eds) *Handbook of Transdisciplinary Research*, Springer, pp.448.

Hiscock, P. 2008. *Archaeology of Ancient Australia*. Routledge, London.

HLA-Envirosciences, 2002. *Archaeological Assessment of Drayton Coal Lease Renewal/ Extension*. EIS 02 Vol.3(I-M)

HLA-Envirosciences 2005 HLA Envirosciences (J. Czastka). *Preliminary Research Permit #1982: Excavations and Findings at Newdell Junction, Ravensworth*. Report to Macquarie Generation.

HLA-Envirosciences Pty Limited, 2007. *Aboriginal Heritage Assessment of Proposed Longwalls 10 and 11, United Collieries, Warkworth, NSW*. Unpublished report prepared for United Collieries.

Hoyle, J, A. Brooks, G. Brierley, K. Fryirs and J. Lander. 2008. Spatial variability in the timing, nature and extent of channel response to typical human disturbance along the Upper Hunter River, New South Wales, Australia. In *Earth Surface Processes and Landforms Vol. 33(6): 868-889*.

Karskens, G. 1985. *The grandest improvement in the country: An historical and archaeological study of the Great North Road, N.S.W., 1825-1836*. Unpublished M.A. Thesis, University of Sydney.

Kijas, J. 2009. *There Were Always People Here: a History of Yuraygir National Park*. Department of Environment, Climate Change and Water, Goulburn Street, Sydney.

Koettig, M. and P.J. Hughes. 1983. *Archaeological Investigation on the United Collieries Coal Lease, Warkworth, Hunter Valley, NSW*. Report to United Collieries PTY Ltd, Singleton NSW.

Koettig, M. 1986. *Test excavation at six locations along the proposed pipeline route between Glennies Creek Dam, Hunter Valley region, NSW*. A report to the Public Works Department, NSW.

Koettig, M. 1987. *Monitoring excavations at three locations along the Singleton to Glennies Creek pipeline route, Hunter Valley, NSW*. A report to the Public Works Department, NSW.

Koettig, M. 1994. *Bulga Authorisation Lease 219: Salvage Excavations*. Report by Margrit Koettig Archaeological Services to Saxonvale Coal.

Kovac, M. and J.W. Lawrie. 1991. *Soil Landscapes of the Singleton 1: 250 000 Sheet*. Soil Conservation Service of NSW, Sydney.

Lassak, E.V. and McCarthy, 2001. *Australian Medicinal Plants* Reed New Holland, Sydney Australia.

Latz, P. 1995. *Bushfires and Bushtucker: Aboriginal Plant Use in Central Australia*. IAD Press, Alice Springs.

Lee, I. 1925. *Early Explorers in Australia*. (From the Log-Books and Journals with maps and Illustrations). Methuen and Co Ltd, London.

Le Maistre, B. 1996. *The Wonorua Tribe, its Land and European Penetration of the Hunter*. Unpublished Report prepared for New South Wales Native Title Services.

Lester, R. 2012. Statement of Robert Lester 12 September 2012, in support of the Plains Clans of the Wonnarua People Native Title Application #2 (NNTT# NC12/4), Federal Court #NSD 1093/12, Unpublished statement to the Federal Native Title Tribunal, September 2012.

Lindsay, B.Y., Waliwararra, K., Miljat, F., Kuwarda, H., Pirak, R., Muyung, A., Pambany, E., Marruridji, J. Marrfurra, P. and Wightman, G. 2001. Malamalak and Matngala Plants and Animals: Aboriginal flora and fauna knowledge from the Daly River area, northern Australia. Northern Territory Botanical Bulletin No. 26. Parks and Wildlife Commission of the Northern Territory, Darwin.

Mangoola Open Cut, Glencore 2017 Biodiversity Offset Management Plan and Strategy.

Marquis-Kyle, P. and Walker, M. 2004. The illustrated Burra Charter: good practices for heritage places. Australia ICOMOS, Inc. Canberra, ACT.

Maslin, B.R., Thomson, L.A.J., McDonald, M.W. and Hamilton-Brown, S. 1998. Edible Wattle Seeds of Southern Australia: A review of species for use in Semi-arid Australia. CSIRO Publishing, Collingwood, Victoria.

Mathew, F. 1829-1832. *Diary and Journal*.

Mathews, R.H. 1893. Rock Paintings by the Aborigines in Caves on Bulgar Creek near Singleton. In *Journal Royal Society of New South Wales*, 27: 353-358.

Mathews, R.H. 1918. Description of two Bora grounds of the Kamilaroi Tribe. In *Journal of Proceedings of the Royal Society of New South Wales*, 51: 423: 430.

McBryde, I. 1978. *Records of Times Past: Ethnohistorical essays on the culture and ecology of the New England tribes*. Australian Institute of Aboriginal Studies, Canberra.

McCarthy, F. 1940. The Carved Trees of New South Wales. In *Australian Museum Magazine*, 7(5): 161-166.

McCarthy, F. 1944a. Some unusual cylindro-conical stones from New South Wales and Java. In *Records of the Australian Museum*, 21 (5): 257-260.

McCarthy, F. 1944b. The Windang, or edge-ground uniface pebble axe in Eastern Australia. In *Records of the Australian Museum*, 21 (5): 261-263.

McCarthy, F. 1944d. Adzes and adze-like implements from eastern Australia. In *Records of the Australian Museum*, 21 (5): 267-271.

McCarthy, F.D. and Davidson, F.A. 1943. The Elouera Industry of Singleton, Hunter River, New South Wales. In *Records of the Australian Museum* 21: 210-230.

McGuigan, A. 1983. Aboriginal Reserves in N.S.W: A land Rights Research Aid: A listing from archival material of former Aboriginal Reserves together with information required to access them. *New South Wales Ministry of Aboriginal Affairs, Occasional Paper No. 4*, pp52.

Mckerney, M. and H. White. 2011. *Bush Tucker, Boomerangs and Bandages: Traditional Aboriginal Plant Use in the Border Rivers and Gwydir Catchments*. Border Rivers-Gwydir Catchment management Authority, Inverell, NSW.

Miller, J.B., James, K.W. and Maggiore, M.A. 1997. *Table of Composition of Australian Aboriginal Foods*. Aboriginal Studies Press, AIATSIS, Canberra, ACT.

Miller, R. 1886. *The Hunter River: The Wonnarua Tribe and Language. Australian Race: its origin, languages, customs, place of landing in Australia, and the roots by which it spread itself over the continent*. 3 Vols, Melbourne, Government Printer, 1886/7.

Millis, R. 1994. *Waterloo Creek: The Australia Day Massacre of 1838. George Gipps and the British Conquest of New South Wales*. University of New South Wales Press, Sydney.

Mitchell, T.L. 1838. *Three Expeditions into the Interior of Eastern Australia*. London. Volume 1.

Moore, D.R. 1969. The prehistory of the Hunter River Valley. In *Australian Natural History, March 1969: pp.166-171*.

Moore, D.R. 1970. Results of an archaeological survey of the Hunter River Valley, New South Wales, Australia. Part 1. The Bondaian Industry of the Upper Hunter and Goulburn River Valleys. In *Records of the Australian Museum* 28(2): 25-64.

Morris, B. 1994. Part 2: Anthropological Study: The Gumbaingirr Peoples of Corindi Beach. In *Dallas, M and Morris, B. Archaeological and Anthropological Study of an Option of the Corindi Beach*.

Mulvaney, J and J Kamminga. 1999. *Prehistory of Australia*. Allen and Unwin Press.

Murdoch, J. and Pratt, A.C. 1997. From the power of topography to the topography of power: A discourse on strange ruralities, pp. 51-69. In Cloke, P. and Little, J. (eds.). *Contested Countryside Cultures: Otherness Marginalisation and Rurality*. Routledge, London.

Nanson G.C, and C. Doyle. 1999. Landscape stability, Quaternary climate change and European degradation of coastal rivers in southeastern Australia. In *Proceedings of the Second Australian Stream Management Conference, Rutherford, I. and R. Bartley (eds). Adelaide, February 8-11; 473 - 479*.

OEH. 2010. *What is an Aboriginal Cultural Landscape?* Fact Sheet 2.

<http://www.environment.nsw.gov.au/resources/cultureheritage/commconsultation/09783factsheet2.pdf>

OEH, 2011a. *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*. Office of Environment and Heritage, Department of Premier and Cabinet, Sydney.

OEH, 2011b. *Operational Policy: Protecting Aboriginal Cultural heritage, Version 2*. Office of Environment and heritage, NSW, 59 Goulburn Street, Sydney.

OEH, 2011c. *Guide to Aboriginal Heritage Impact Permit Processes and Decision Making, Version 2*. Office of Environment and Heritage, 59 Goulburn Street, Sydney.

OEH, 2011d. "Pathways across the Hunter: a cultural journey..." Office of Environment and Heritage, Bridge Street, Hurstville, NSW.

Olley J. M and R.J. Wasson. 2003. Changes in the flux of sediment in the Upper Murrumbidgee catchment, Southeastern Australia, since European settlement. In *Hydrological Processes* 17(16): 3307-3320.

OzArk Environmental and Heritage Management Pty Ltd. 2013 *Aboriginal Archaeological Assessment Proposed Relief Road, Drayton*. Report for URS Australia on behalf of Australian Rail Track Corporation.

OzArk Environmental and Heritage Management, 2013. *Due Diligence Archaeological Assessment: Proposed track Maintenance Hillcrest Offset Area, upper Hunter Valley*. Unpublished report to Ravensworth Operation Pty Ltd.

Peake, T. 2006. The Vegetation of the Central Hunter Valley, New South Wales, Vols. 1 and 2 (Version 2.2). Hunter-Central Rivers Catchment Management Authority, Paterson, NSW.

Perry, V 2010 *Aboriginal Cultural Heritage Assessment for HCR10\_176 Sneddon and Passfield, Antiene Row, Muswellbrook*. Report for Hunter Central Rivers Catchment Management Authority.

Pohl, C. 2008. From science to policy through transdisciplinary research. *Environmental Science and Policy*, 11:46-53.

Pohl C. and Hirsch Hadorn, G. 2008. Core Terms in Transdisciplinary Research. Chapter 28, In Hirsch Hadorn G. et al., (eds) *Handbook of Transdisciplinary Research*, Springer, pp.427-432.

Prosser I.P. 1990. Fire, Humans and Denudation at Wangrah Creek, Southern Tablelands. In *Australian Geographical Studies* 28: 77-95.

Prosser I. P, I.D. Rutherford, J.M. Olley, W.J. Young, P.J. Walbrink and C.J. Moran CJ. 2001. Large-scale patterns of erosion and sediment transport in rivers networks, with examples from Australia. In *Freshwater and Marine Research* 52: 1-99.

Radcliffe-Brown, A.R. 1929. Notes on Totemism in Eastern Australia. *The Journal of the Royal Anthropological Institute of Great Britain and Ireland*, 59 :399-415.

Ridley, W. 1864. The Aborigines of Australia: A Lecture. Delivered before the Young Men's Presbyterian Institute in the Free Church, Macquarie Street, Sydney, September 1864.

Robinson, K.W. and Burley, T.M. 1962. Flood-plain farming on the Maitland flats, Hunter Valley, N.S.W. *Economic Geography*, 38(3): 234-250.

Rose, D.B. 1996. *Nourishing Terrains: Australian Aboriginal Views on Landscape and Wilderness*. Australian Heritage Commission, Canberra, ACT.

Rose, D., James, D. and Watson, C. 2003. *Indigenous kinship with the Natural World in New South Wales*. NSW National Parks and Wildlife Service, Hurstville, NSW.



Ross, A., Prangell, J. and Coghill, B. 2010. Archaeology cultural landscapes and indigenous knowledge in Australian cultural heritage management legislation and practice. *Heritage Management*, 3(1): 73-96.

Rumsey, A. 1994. The Dreaming, human agency and inscriptive practice. In *Oceania*, 65: 116-130.

Russel, A.W., Wickson, F. and Carew, A.L. 2008. Transdisciplinarity: Context, contradictions and capacity. In *Futures*, 40: 460-472.

Russell, M and V Hardy 2002 *Archaeological Assessment of the Proposed Drayton Mine Extension*. HLA Envirosiences Pty Ltd report for Drayton Coal Pty Ltd.

Schumm S. A. 1969. River metamorphosis. In *Journal of Hydraulics Division - Proceedings of the American Society of Civil Engineers* 95: 255-273.

Scott, W. 1929. *The Port Stephens Blacks*. Chronicle Office, Dungog.

Singleton Argus, 1893. Rock Paintings by Aborigines, Some curiosities in the Caves at Bulga. Published Wednesday, 11 October, 1893, p.4. (Accessed online, 2012 at: <http://nla.gov.au/nla.news-article78701492>).

Smith, A. and Beck, W. 2003. The archaeology of No man's land: indigenous camps at Corindi Beach, mid-north coast New South Wales. In *Archaeology in Oceania*, 38(2): 66-72.

Smith, L. 2005. Archaeological significance and the governance of identity in cultural heritage management. In *Mathers, C, T. Darvill, and B.J. Little (eds.), Heritage of Value, Archaeology of Renown: Reshaping Archaeological Assessment and Significance*. pp. 77-88. University of Florida Press, Gainesville, Florida.

Smith, L. and A. van der Meer. 2001. Landscape and the negotiation of identity: A case study from Riversleigh, north-west Queensland. In *Cotter, M.M., Boyd, W.E. and Gardiner, J.E. 2001 (eds.), Heritage Landscapes: Understanding Place and Communities*. Southern Cross University Press, Lismore NSW, pp. 51-63.

Smith, L, A. Morgan and A. van der Meer. 2003. Community-driven research in cultural heritage management: the Waanyi women's history project. In *International Journal of Heritage Studies* 9(1), 65-80.

Smith, L. R. 1980. *The Aboriginal Population of Australia*. Australian National University Press, Canberra.

Steele, J.E. 1984. *Aboriginal pathways of Southeast Queensland*. University of Queensland Press, St Lucia Brisbane, Qld.

Stewart, K. and P. Percival. 1997. *Bush Foods of New South Wales: A botanical record and Aboriginal Oral History*. Royal Botanical Gardens, Sydney.

Stocks, M. 2012. *Statement of Mrs Maria Stocks September 10 2012, in support of the Plains Clans of the Wonnarua People Native Title Application #2 (NNTT# NC12/4), Federal Court #NSD 1093/12*, pp.14. Unpublished statement to the National Native Title Tribunal, September 2012.

Story, R, R.W. Galloway, R.H.M van de Graaff and A.D Tweedie. 1963. *General Report on the Lands of the Hunter Valley*. Land Research Series No. 8. CSIRO.

Sutton, P. 1995. *Country: Aboriginal boundaries and land ownership in Australia*. Aboriginal History Monograph 3, ANU, Canberra.

The New Monthly Magazine, 1828. Rambles in New South Wales, Letters I-V. Vol. 22., pp. 236-247.

Threlkeld, L.E. c. 1828-1846. *Unpublished Journal of Lancelot Edward Thelkeld, c. Dec 1828 c. Feb. 1846*.

Thorpe, W.W., and McCarthy, F.D. 1933. Ethnological notes. In No.5. *Records of the Australian Museum*, 19(1): 23-27.

Tindale, N.B. 1974. *Aboriginal Tribes of Australia: their terrain, environmental controls, distribution, limits and proper names*. University Of California Press, Berkley.

Tocomwall Pty Ltd. 2012. *Our Country. Our Culture. Our Values. The traditional, historical and contemporary cultural landscape of the Bulga Coal Optimisation Project Area: A Plains Clans of the Wonnarua Peoples Perspective*. Unpublished Confidential Report prepared for Xstrata Coal.

Tocomwall Pty Ltd. 2013. *Beginning and Belonging: The Traditional, Historical and Contemporary Cultural Landscape of the Mount Owen Continued Operations Project Area: A Plains Clans of the Wonnarua Peoples Perspective*. Unpublished Confidential Report prepared for Glencore Coal Assets Australia.

Tocomwall Pty Ltd. 2017. *Hillcrest Aboriginal Cultural Values Assessment Report*. Unpublished Report prepared for Glencore Coal Assets Australia.

Turner-Neale, M-M. (with John Henderson) 1996. *Bush Foods: Arrernte foods from Central Australia, Nhenhe-areye anwerne-arle arlkwene*. IAD Press, Alice Springs.

Umwelt Pty Ltd 1997 *Archaeological Assessment – Proposed Modifications to Coal Preparation and Transportation System – Bayswater Coal Mine Project*. Report for Bayswater Colliery Company Pty Ltd and Ravensworth Coal Company Pty Ltd.

Umwelt Pty Ltd. 2006. *Salvage of Artefacts from LID 1 under section 90 Consent #1443 Liddell Mine, Hunter Valley, NSW*. Report for the Department of Environment and Conservation on the collection of LID1.

Umwelt Pty Ltd. 2006. *Archaeological Survey and Assessment of a Proposed 132kV feeder at Antiene, near Lake Liddell, NSW*. Archaeological assessment and survey report for Energy Australia.

Umwelt Pty Ltd. 2007. *Statement of Environmental Effects for the Bulga Underground Southern Mining Area Modification – Section 96(2) Application to Modify Consent DA 376-8-2003*. Report for Bulga Coal Management Pty Limited.

Ward, R. 2012. Statement of Rhonda Ward 12 September 2012, in support of the Plains Clans of the Wonnarua People Native Title Application #2 (NNTT# NC12/4), Federal Court #NSD 1093/12, pp.14. Unpublished statement to the Federal Native Title Tribunal, September 2012.



Wambo Coal Pty Ltd, 2003; Wambo Development Project: Environmental Impact statement, Vol 1 Main Report + Appendices.

Wickson, F., Carew, A.L. and Russell, A.W. 2006. Transdisciplinary research: characteristics, quandaries and quality. *Futures*, 38: 1046-1059.

Wightman, G. and Brown, J. 1994. Jawoyn, Plant Identikit. Common Useful Plants in the Katherine Area of Northern Australia. Conservation Commission of the Northern Territory, (Darwin) and Jawoyn Association, (Katherine, NT).

Wood W. A.1972. Dawn in the Valley, Wentworth Books, Sydney.