



# **Bayswater Water and Other Associated Operational Works Project**

## **Appendix H – Aboriginal Cultural Heritage Assessment Report**





# **Bayswater Water and Other Associated Operational Works**

AGL Macquarie

## **Aboriginal Cultural Heritage Assessment Report**

D4 | R2

November 2019





## Bayswater Water and Other Associated Operational Works

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## Executive Summary

AGL Macquarie Pty Limited (**AGL Macquarie**) owns and operates the Bayswater Power Station, located south-east of Muswellbrook in the Local Government Areas (**LGA**) of Muswellbrook and Singleton.

Jacobs Group Australia Pty Ltd (**Jacobs**), on behalf of AGL Macquarie is currently preparing an Environmental Impact Statement (**EIS**) for the Bayswater Water and Other Associated Operational Works (**WOAOW**) project (**Project**) in accordance with Division 4.7 of the *Environmental Planning and Assessment Act 1979* (NSW) (**EP&A Act**). This assessment forms part of the EIS for the Project and responds to the Secretary's Environmental Assessment Requirements (**SEARs**) issued on 30 November 2018.

The Project is located within Bayswater on the New England Highway within the Local Government Areas of Muswellbrook and Singleton.

The features of the Project are presented in Figure 1-1 and include:

- Augmentation of the existing Bayswater ash dam to provide additional ash storage capacity;
- Improvements to water management structures and systems to ensure continued collection and reuse of process water and return waters from the Bayswater ash dam;
- Improvements to the management of water and waste materials within the coal handling plant sediment basin and associated drainage system;
- Increasing coal ash recycling activities to produce up to 1,000,000 tonnes per annum of ash derived product material and reuse of coal ash;
- Upgrades to existing fly ash harvesting infrastructure including the installation of weighbridges, construction of a new 240 tonne silo, tanker wash facility and additional truck parking;
- Construction and operation of a new coal ash pipeline to Ravensworth Void No. 3 for ash emplacement;
- Construction and operation of a salt cake landfill facility to dispose of salt cake waste;
- Construction and operation of up to four borrow pits to facilitate the improvements proposed for the Project and other works on AGL Macquarie land; and
- Ancillary infrastructure works including vegetation clearing associated with maintaining existing infrastructure, including along pipeline/transmission corridors.

This document presents the results of an assessment of Aboriginal cultural heritage within the study area. This Aboriginal cultural heritage assessment involved:

- Consultation with Aboriginal stakeholders (following the procedures outlined in DECCW 2010a) to obtain feedback on the assessment process and input on significance and cultural values associated with the study area;
- An archaeological assessment including a desktop study and an archaeological survey of the study area in full;
- A significance assessment of Aboriginal objects and places within the study area. This includes scientific and cultural significance for Aboriginal sites and places. Cultural significance has been informed by consultation with the Registered Aboriginal Parties (**RAPs**);
- Assessment of the potential impact to Aboriginal archaeological sites; and
- Recommendation of management measures to prevent or mitigate impacts to archaeological sites.

Prior to this assessment 14 Aboriginal heritage sites have previously been recorded within the study area. This assessment identified an additional Aboriginal heritage 23 sites (including isolated artefacts, artefact scatters,

potential archaeological deposits (**PAD**), and artefact scatters with associated PAD). Surface artefacts and artefact scatters ranged from low to moderate archaeological significance. The archaeological significance of the areas of PAD cannot be assessed at this stage. It is proposed to carry out test excavations to assess the nature and significance of any subsurface material present in those areas of PAD which subject to detailed design will be impacted by the Project. Test excavations will be carried out prior to determination of the Project's development application.

For the purposes of this assessment the study area has been defined to include all land within the project construction footprint (the Project area), plus a buffer area, which ranges from around 25 to 50 metres (**m**), included in the assessment to account for any potential indirect (inadvertent) impacts (see Figure 1-1 and Figure 6-3 to Figure 6-8). Following the precautionary principle, it is conservatively assumed for the purpose of this assessment that all sites, including areas of PAD, discussed in this document would be impacted by the proposed works of the Project. Impacts would range from potential indirect impact only, to direct impacts ranging from partial to total destruction. Opportunities to limit the area required for construction activities will be considered where practicable as part of detailed design to minimise impacts.

As the Project is State Significant Development (**SSD**), if development consent is granted for the Project, Section 4.41(d) of the EP&A Act operates so that an Aboriginal Heritage Impact Permit (**AHIP**) is not required for the Project. However, the following mitigation actions are recommended for the Project, to minimise impacts to cultural heritage:

- Investigate opportunities to avoid identified Aboriginal sites and areas of PAD were practicable as part of the detailed design of the Project.
- Where direct impacts are proposed to occur to areas of PAD (including those areas of PAD associated with surface artefact scatters), a program of detailed survey and test excavation will be carried out to assess the nature and significance of any subsurface archaeological material. A list of sites that this recommendation applies to is provided in Table 9-1.
- The results of test excavations on each PAD will inform decisions around subsequent management of the areas of PAD. Depending on the results of the test excavations, management options to be carried out prior to impact to sites may potentially include salvage excavation of areas currently designated as PADs. An alternative mitigation action at that point of the process might be to change the Project design to avoid impact to areas of PAD, where this is practicable.
- Collection of surface artefacts from all sites or portions of sites that would be impacted.
- Collection of surface artefacts and archaeological excavations (both test and salvage) would be undertaken by qualified archaeologist(s) and Site Officers supplied by the RAPs.

This report will be provided to the Department of Planning, Industry and Environment (**DPIE**) for review and assessment as a part of development application SSD-9697 for the Project.

## Glossary

ACHAR	Aboriginal Cultural Heritage Assessment Report
AGL Macquarie	AGL Macquarie Pty Ltd
AHIMS	Aboriginal heritage information management system
AHIP	Aboriginal Heritage Impact Permit
AHD	Australian Height Datum
DECCW	Department of Environment, Climate Change and Water NSW
DPIE	Department of Planning, Industry and Environment
Jacobs	Jacobs Group (Australia) Pty Ltd
km	Kilometres
LGA	Local Government Area
m	Metres
NSW	New South Wales
OEH	Office of Environment and Heritage
PAD	Potential Archaeological Deposit
RAP	Registered Aboriginal Party
WOAOW	Water and Other Associated Operational Works



# 1. Introduction

## 1.1 Project background

AGL Macquarie owns and operate the Bayswater Power Station (**Bayswater**). As Bayswater was commissioned in 1985, water and wastewater infrastructure and site improvements are required to ensure the continued operational and environmental performance of Bayswater until its expected retirement in 2035.

Jacobs, on behalf of AGL Macquarie is preparing an EIS for the assessment of infrastructure and water upgrade works forming part of the the Project, in accordance with Division 4.7 of the EP&A Act.

Bayswater is located approximately 20 kilometres (**km**) south of Muswellbrook, to the west of the New England Highway.

AGL Macquarie acquired the Bayswater and Liddell Power Stations, from Macquarie Generation in September 2014. AGL Macquarie is one of Australia's major electricity generators. Over recent years Bayswater has produced approximately 15,000 GWh of electricity per annum, enough power for two million average Australian homes. In conjunction with the adjoining Liddell Power Station, Bayswater produces approximately 12% of the electricity demand in eastern Australia and 30% of New South Wales' total electricity demand.

The Project will ensure the continued safe, efficient and reliable operation of Bayswater until its planned retirement. The Project also provides the opportunity for improvements to implement advances in water and wastewater management.

The study area is characterised by low hills with elevations ranging from 130 to 220m Australian Height Datum (**AHD**). In proximity to the study area are two dammed water bodies, Lake Liddell to the north east and Plashett Reservoir to the south west, both with an elevation of approximately 130m AHD. Bayswater Power Station lies on top of a small hill (approximately 210m AHD) sloping towards the water body with a 3% slope to the north towards Lake Liddell and a 2% slope south towards Plashett Reservoir. To the west, a steep hill drains towards Saltwater Creek which flows west out of the study area and then south into the reservoir. A low ridge runs along the eastern boundary of the study area.

Within the vicinity of the study area, there are a number of hydrological features, including:

- Tinkers Creek, running along the western boundary of the study area and draining to Lake Liddell
- Lake Liddell, a dammed water body located to the north east of the Bayswater Power Station
- Plashett Reservoir, a dammed water body located about 300m to the west of the proposed borrow pits (Borrow Pit 4)
- Saltwater Creek located to the west of Bayswater Power Station, which drains to Plashett Reservoir
- Wisemans Creek, which runs from east to west across Bayswater, before discharging to Plashett Reservoir
- Pikes Creek, located to the north of the proposal area, intersecting with the existing Ash Dam and running parallel to the proposed Ravensworth Ash Line
- Bayswater Creek, draining from Lake Liddell before ultimately discharging to Hunter River.

## 1.2 Project description

The key features of the Project are presented in Figure 1-1 and include:

- Augmentation of the existing Bayswater ash dam to provide additional ash storage capacity (**Ash Dam Augmentation**);

- Improvements to water management structures and systems to ensure continued collection and reuse of process water and return waters from the Bayswater ash dam (**Ash Dam water management works**);
- Improvements to the management of water and waste materials within the coal handling plant sediment basin and associated drainage system (**Coal Handling Plant upgrades**);
- Increasing coal ash recycling activities to produce up to 1,000,000 tonnes per annum of ash derived product material and reuse of coal ash (**Ash harvesting**);
- Upgrades to existing fly ash harvesting infrastructure including the installation of weighbridges, construction of a new 240 tonne silo, tanker wash facility and additional truck parking (**Ash harvesting**);
- Construction and operation of a new coal ash pipeline to Ravensworth Void No. 3 for ash emplacement (**Ravensworth ash line**);
- Construction and operation of a salt cake landfill facility to dispose of salt cake waste (**Salt cake landfill**);
- Construction and operation of up to four borrow pits to facilitate the improvements proposed for the Project and other works on AGL Macquarie land (**Borrow pits 1 to 4**); and
- Ancillary infrastructure works including vegetation clearing associated with maintaining existing infrastructure, including along two pipeline/transmission corridors (**HP pipe clearing (south)** and **HP pipe (north)** and **LSP pipe clearing**).

The impacts associated with these Project components would vary in nature and severity. Excavation of the borrow pits would constitute a severe impact to any sites and areas of PAD located within the footprint of these components. Construction of the salt cake landfill would involve earthworks and would constitute a severe impact within the Project area. Clearing of vegetation along the HP pipeline and the LSP pipeline would involve ground disturbance through the grubbing out of tree roots, and would constitute a moderate to severe impact within this project component's footprint, depending on the density of vegetation existing in different parts of these two areas. In other project components, impacts are likely to range in severity and be localised, depending upon the final detailed Project design. For the purposes of this assessment, the precautionary principle has been employed and it has been assumed that direct impacts would occur to all sites located within each project component's footprint (the Project area).

A discussion of anticipated impacts associated with each Project component is provided in Section 8.

### 1.3 Site location and study area

The Project is located within Bayswater on the New England Highway within the Local Government Areas of Muswellbrook and Singleton.

The Project is predominately located on land owned by AGL Macquarie although some Project infrastructure also crosses road reserves owned by RMS and Singleton and small areas of Crown land. The Project is located within the following land:

- Lot 610 DP 1019325
- Lot 112 DP 1059007
- Lot 2 DP 1095515
- Lot 1 DP 113655
- Lot 1 DP 1142103
- Lot 2012 DP 1151790
- Lot 1 DP 1158700

- Lot 120 DP 1174907
- Lot 1 DP 1175303
- Lot 3 DP 1193253
- Lot 10 DP 1204457
- Lots 4, 6, 9 & 11 DP 247943
- Lot 13 DP 247945
- Lot 1 DP 252530
- Lot 1 DP 369326
- Lots 1 & 2 DP 574168
- Lot 1 DP 616025
- Lot 2 DP 619383
- Lot 10 DP 700554
- Lots 19, 30, 62, 75, 86, 88, 89 & 151 DP 752468
- Lot 331 DP 752486
- Lots 1 & 2 DP 774679
- Lot 5 DP 966589
- Lot 107 DP 547864
- Lot 4 DP 1193254.

For the purposes of this assessment, the following definitions are used:

- **Project area:** which is defined as the maximum disturbance footprint that may be impacted by the Project. Works within the project area would be dependent on the activities proposed for each Project element. Further details are provided in Section 6.
- **Study area:** includes all land within the Project area, plus a buffer area, which ranges from around 25 m to 50 m, to account for possible indirect impacts. No ground disturbance would occur outside of the Project area. Note that the southwest borrow pit (borrow pit 4) has no buffer zone, so for this project component the Project area and the study area are the same.

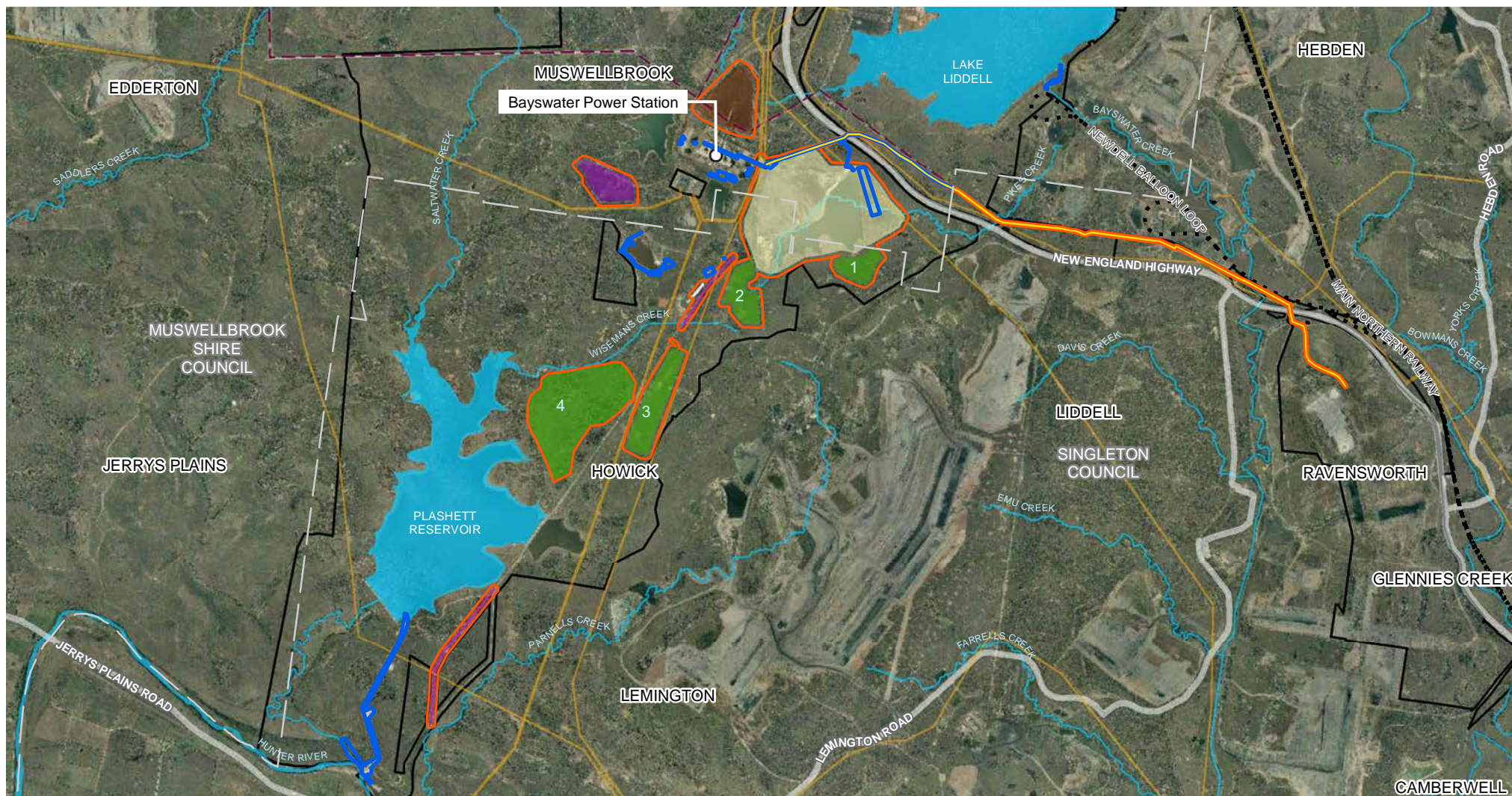
The study area boundary is shown in Figure 1-1, and the Project area boundary is presented in Figure 6-3 to Figure 6-8.

Detailed information on Aboriginal sites, objects and areas of potential archaeological deposit (**PAD**) that are located within the study area and so, subject to detailed design, will be directly or indirectly impacted by the Project, are provided in Section 6. A description of activities proposed within the Project area has been included in Section 8.

A description of the environmental context of the study area is provided in Section 4.1.

A discussion of past Aboriginal land-use of the region the study area sits within is provided in Section 4.2.





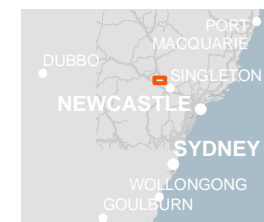
- |  |   |
|--|---|
| <span style="border: 2px solid orange; padding: 2px;"> </span> Study area                              | <b>Project elements:</b>  |
| <span style="border: 1px dashed grey; padding: 2px;"> </span> Local Government Area boundary           | <span style="background-color: yellow; border: 1px solid black; padding: 2px;"> </span> Ash Dam Augmentation, Ash Harvesting and Water Management Works |
| <span style="border: 2px solid blue; padding: 2px;"> </span> Footprints of approvals to be surrendered | <span style="background-color: yellow; border: 1px solid black; padding: 2px;"> </span> Ravensworth Ash Line  |
| <span style="border: 2px solid black; padding: 2px;"> </span> AGL owned land                           | <span style="background-color: brown; border: 1px solid black; padding: 2px;"> </span> Coal Handling Plant Water and Wastewater Infrastructure Upgrades |
| <span style="border-top: 1px dotted black; padding: 2px;"> </span> Railway                             | <span style="background-color: magenta; border: 1px solid black; padding: 2px;"> </span> HP Pipe Clearing   |
| <span style="border-bottom: 1px solid orange; padding: 2px;"> </span> Electricity transmission line    | <span style="background-color: lightgrey; border: 1px solid black; padding: 2px;"> </span> LSP Sludge Line Clearing                                     |
| <span style="border-bottom: 2px solid purple; padding: 2px;"> </span> Coal supply conveyor             | <span style="background-color: green; border: 1px solid black; padding: 2px;"> </span> Clay Borrow Pits   |
|  | <span style="background-color: purple; border: 1px solid black; padding: 2px;"> </span> Salt Cake Landfill  |



#### Data sources

Jacobs 2019  
AGL 2019  
NSW Spatial Services 2019

GDA94 MGA56



**Figure 1 - 1** AGL Site Plan and Project Elements

## 1.4 Scope and objectives

This document presents the results of an assessment of Aboriginal cultural heritage within the study area.

The Aboriginal cultural heritage assessment reported here involved:

- Consultation with Aboriginal stakeholders (following the procedures outlined in DECCW 2010a) to obtain feedback on the assessment process and input on significance and cultural values associated with the study area;
- An archaeological assessment including a desktop study and an archaeological survey of the study area in full;
- A significance assessment of Aboriginal objects and places within the study area. This includes scientific and cultural significance for Aboriginal sites and places. Cultural significance has been informed by consultation with RAPs;
- Assessment of the potential impact to Aboriginal archaeological sites; and
- Recommendation of management measures to prevent or mitigate impacts to archaeological sites.

This method of assessing Aboriginal cultural heritage was designed to meet the requirements of the following guidelines:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011);
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a); and
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b).

The objectives of this document are:

- To document the archaeological investigation undertaken to locate, identify and study Aboriginal objects, archaeological deposits and historical, oral and environmental sources to provide an assessment of the archaeological and cultural heritage significance of the study area;
- To prepare an Aboriginal and Cultural Heritage Assessment Report (**ACHAR**) that complies with legislative requirements, codes of practice and assessment procedures relevant to the proposal (refer to Section 2); and
- To respond to the SEARs issued on November 30, 2018 and inform the content of the EIS.

## 1.5 Compliance with the heritage elements of the Secretary's Environmental Assessment Requirements (SEARs)

The SEARs for the Project were issued on November 30, 2018. This ACHAR has been prepared in accordance with the SEARs. The Table below summarises the SEARs and outlines the relevant sections of this report where they have been addressed.

**Table 1-1 Compliance with the heritage components of the SEARs**

SEARs	Addressed in this report
Heritage – including an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development, including consultation with the local Aboriginal community	Throughout



SEARs	Addressed in this report
Environmental planning instruments, policies, guidelines and plans <ul style="list-style-type: none"> <li>Aboriginal cultural heritage consultation requirements for proponents</li> <li>Code of practice for archaeological investigations in NSW</li> <li>Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW</li> </ul>	Section 2

## 1.6 Report outline

The report is structured as follows:

- Chapter 2** outlines the legislative and policy framework relevant to the investigation and assessment of Aboriginal heritage in New South Wales;
- Chapter 3** presents an overview of consultation undertaken with the Aboriginal community in relation to the proposal, with supporting information provided in **Appendix A**. Consultation was carried out in accordance with the *Aboriginal Cultural Heritage Requirements for Proponents 2010* (DECCW 2010a);
- Chapter 4** presents background information relevant to the proposal, including environmental information (geology, soils, climate and vegetation) as well as a discussion of ethnographic data;
- Chapter 5** presents a summary of the identified Aboriginal cultural values associated with the study area. This information has been sourced directly from the RAPs;
- Chapter 6** describes the method and results of the Aboriginal archaeological assessment of the study area. This includes the archaeological research, fieldwork and analysis that have been conducted in support of this report;
- Chapter 7** assesses the heritage significance of the identified Aboriginal sites assessed as part of this report using the NSW heritage significance criteria;
- Chapter 8** assesses the Project's direct and indirect impact on identified Aboriginal sites and PADs and their significance; and
- Chapter 9** presents recommended management measures to mitigate the impact of the Project on Aboriginal sites and associated cultural values within the study area.

## 1.7 Authorship

The report was authored by:

- Oliver Macgregor (Senior Archaeologist, Jacobs). Oliver holds a PhD in Archaeology and Palaeoanthropology from the Australian National University and has over ten years' experience as an archaeologist.
- Clare Leever (Archaeologist and Heritage Consultant, Jacobs). Clare holds a Bachelors and Graduate Diploma degrees in Archaeology from Flinders University, SA, and has over seven years' experience as an archaeologist in Australia and the United Kingdom.
- Alexandra Siefertova (Graduate Archaeologist, Jacobs). Alexandra holds a Bachelor of Arts with Honours from the University of Sydney and has over one year of experience as an archaeologist.

The report was reviewed by:

- Rose Overberg (Principal Archaeologist and Heritage Consultant, Technical Lead, Jacobs).
- Kirsty Flynn (Project Manager, Jacobs).

Mapping was prepared by Kasia Dworniczac (Senior Spatial Consultant, Jacobs).

## 2. Legislative requirements

The project is State Significant Development (SSD) under the EP&A Act. The legislation and regulations that protect Aboriginal heritage in NSW are outlined below.

### 2.1 Commonwealth legislation

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

The *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**) provides for the protection of the environment, especially in matters of national environmental significance (**MNES**). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the MNES without approval from the Commonwealth Minister for the Environment. The definition of the environment under the EPBC Act includes both natural and cultural elements. Under the EPBC Act, heritage items can be listed on the National Heritage List (for items of National heritage significance) or the Commonwealth Heritage List (for items of heritage significance on land owned or managed by the Commonwealth).

### 2.2 State legislation

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

The EP&A Act regulates environmental planning and assessment for NSW. Land use planning requires that environmental impacts are considered as part of the assessment of development, including impacts on Aboriginal cultural heritage.

Division 4.7 of Part 4 of the EP&A Act applies to development declared to be SSD. The Project is declared to be SSD under the *State Environmental Planning Policy (State and Regional Development) 2011* (**SEPP SRD**). The consent authority for SSD development applications is the Minister for Planning and Public Spaces (Minister). The Minister has delegated the determination of SSD development applications to senior officers of the DPIE and the Independent Planning Commission (**IPC**).

An AHIP under section 90 of the *National Parks and Wildlife Act 1974* is not required for development for which a SSD development consent has been granted (Section 4.41(d) of the EP&A Act). However an EIS is required for SSD projects and the SEARs issued for the Project include provisions requiring the assessment of Aboriginal heritage, as well as consultation with Aboriginal stakeholders.

#### 2.2.2 *National Parks and Wildlife Act 1974 and National Parks and Wildlife Amendment Act 2010*

The *National Parks and Wildlife Act 1974* (NSW) (**NPW Act**) protects Aboriginal heritage within NSW. Protection of Aboriginal heritage is outlined in Section 86 of the NPW Act, as follows:

- “a person must not harm or desecrate an object that the person knows is an Aboriginal object” (Section 86(1))
- “a person must not harm an Aboriginal object” (Section 86(2)), and
- “a person must not harm or desecrate an Aboriginal place” (Section 86(4)).

Section 87(1) of the NPW Act provides that it is a defence to these provisions if the harm or desecration is authorised by an AHIP.

Harm is defined under the NPW Act as ‘any act that destroys, defaces or damages the object including moving the object from the land on which it has been situated or causes or permits the object to be harmed’.

As outlined in Section 2.2.1, an AHIP is not required for development for which a SSD development consent has been granted and the provisions of the NPW Act that prohibit an activity without such an authority do not apply (Section 4.41(d) of the EP&A Act).

### 2.2.3 Local Environment Plans

Local Environment Plans (**LEPs**) are a type of environmental planning instrument, which are legal documents that control development and set out how land is to be used. LEPs apply either to all or part of a local government area. LEPs guide planning decisions for local government areas. They do this by allocating 'zones' to different parcels of land, such as rural, residential, industrial, public recreational, environmental conservation, and business zones. Each zone has a number of objectives, which indicate the principal purpose of the land, such as agriculture, residential or industry. Each zone also lists which developments are permitted with consent, permitted without consent, or prohibited. All land, whether privately owned, leased or publicly owned, is subject to the controls set out in the LEP. LEPs determine the form and location of new development, and provide for the protection of open space and environmentally sensitive areas.

The study area is located within the Muswellbrook and Singleton local government areas (**LGA**). In accordance with the local planning instruments, being the *Muswellbrook Local Environment Plan* (NSW 2009) and *Singleton Local Environment Plan* (NSW 2013), Aboriginal heritage is protected as follows:

*In respect to places of Aboriginal heritage significance the consent authority must, before granting consent under this clause to the carrying out of development in a place of Aboriginal heritage significance:*

- a) *consider the effect of the proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place; and*
- b) *notify the local Aboriginal communities (in such way as it thinks appropriate) about the application and take into consideration any response received within 28 days after the notice is sent.*



### 3. Aboriginal stakeholder consultation

The *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a) establishes the requirements for consultation with Aboriginal stakeholders as part of the heritage assessment process to determine potential impacts of proposed activities on Aboriginal objects and places. These requirements include four stages with associated timeframes which **must** be adhered to:

**Stage 1** — Notification of project proposal and registration of interest (14 days from date letter sent to register as registered Aboriginal stakeholders).

**Stage 2** — Presentation of information about the proposed project.

**Stage 3** — Gathering information about cultural significance (28 days for registered Aboriginal stakeholders to provide a review and feedback to consultants regarding the methodology).

**Stage 4** — Review of draft cultural heritage assessment report (registered Aboriginal stakeholders have 28 days from sending of the report to make a submission).

Aboriginal stakeholder engagement and involvement is important for the identification of Aboriginal cultural values relevant to the project. This section summarises the consultation process relating to the organisation and conduct of the ACHAR. Details of consultation including meeting minutes, examples of letters sent to RAPs and knowledge holders, conversations undertaken during archaeological survey, native title search results, records of cultural heritage values interviews and a detailed consultation log are included in Appendix A.

This section summarises the consultation process throughout the archaeological assessment to date (Table 3-1) and outlines the stages of consultation.

**Table 3-1 Summary of consultation process**

Task Name	Start	Finish
Stage 1- Agency Letters	May 10, 2019	May 10, 2019
Stage 1- Newspaper advertisements	May 15, 2019	May 29, 2019
Stage 1- Project Notification and invitation to register supplied to potential Aboriginal stakeholders	June 20, 2019	July 5, 2019
Stage 1- Supply of the list of RAPs to DPIE and Wanaruah LALC	July 11, 2019	July 11, 2019
Stage 2- RAP review of project information and methodology	Aug 7, 2019	Sep 4, 2019
Stage 2- Engage Aboriginal stakeholders to undertake a site survey	Aug 7, 2019	Sep 4, 2019
Stage 3- Seek the names of Aboriginal people with cultural knowledge by letter or notify native title holders	May 10, 2019	July 5, 2019
Stage 3- Notify Aboriginal people with cultural knowledge by letter, and invite input on cultural significance	June 20, 2019	Nov 25, 2019
Stage 4- Carry out archaeological survey and prepare a draft ACHAR	Sep 9, 2019	Oct 2, 2019
Stage 4- Present the draft ACHAR to RAPs for review and comment	Oct 23, 2019	Nov 25, 2019

### 3.1 Stage 1 - Notification of project proposal and registration of interest

Stage 1 of the consultation process is to identify, notify and register any Aboriginal people or groups who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and / or places in the Study area.

Notification was initiated on 10 May 2019 to all relevant organisations listed under section 4.1.2 in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a). These organisations are listed below in Table 3-2.

**Table 3-2 List of contacted organisations (stage 1 consultation)**

Name of Organisation	Date of Notification Sent	Date of Response Received
Wanaruah Local Aboriginal Land Council	May 10, 2019	May 13, 2019
NTSCorp	May 10, 2019	None
Office of Environment and Heritage – Hunter office	May 10, 2019	May 30, 2019
Office of the Registrar, Aboriginal Land Rights Act 1983	May 10, 2019	May 27, 2019
Muswellbrook Council	May 10, 2019	May 17, 2019
Singleton Council	May 10, 2019	May 13, 2019
Singleton Local Land Services	May 10, 2019	May 13, 2019

In accordance with Section 4.1.3 (DECCW 2010a) a notice in the local newspaper circulating in the general location of the proposed project must be completed, with information explaining the project and its exact location. Notices were placed in the Koori Mail and Singleton Argus. These advertisements provided additional opportunity for Aboriginal people who are interested in the Project to register. A copy of the advertisement is included in Appendix A.

Project notifications were sent to all groups and individuals identified as a result of the above consultation process. A total of 26 groups and individuals registered their interest. These are listed in Table 3-3.

**Table 3-3 RAPs identified through Stage 1 consultation**

Organisation	Contact Person
A1 Indigenous Services	Carolyn Hickey
Aboriginal Native Title Elders Consultants	John and Margaret Matthews
AGA Services	Ashley, Gregory and Adam Sampson
Aliera French Tracing	Aliera French
Cacatua Culture Consultants	Donna and George Sampson
[REDACTED]	[REDACTED]
Crimson-Rosie	Jeffery Matthews
Didge Ngunawal Clan	Paul Boyd and Lilly Carroll
Gidawaa Walang Cultural Heritage Consultancy	Craig Horne
Hunter Traditional Owner	Paulette Ryan
Hunter Valley Cultural Surveying	Luke Hickey
Jarban and Mugrebea	Les Atkinson

Organisation	Contact Person
Kawul Pty Ltd trading as Wonn1Sites	Arthur Fletcher
Lower Hunter Wonnarua Cultural Services	Thomas Miller
Lower Wonnaruah Tribal Consultancy	Barry Anderson
Merrigarn	Shaun Carroll
Muragadi	Jesse Johnson
Murra Bidgee Mullangari	Ryan Johnson
Nunawanna Aboriginal Corporation	Colin Ahoy
Tocomwall (acts on behalf of the Plains Clan of the Wonnarua People (PCWP))	Scott Franks
Ungooroo Aboriginal Corporation	Alan Paget
Wanaruah Local Aboriginal Land Council	Noel Downs
Wattaka Wonnarua CC Service	Des Hickey
Widescope Indigenous Group	Steven Hickey
Wonnarua Nation Aboriginal Corporation	Laurie Perry
Yinarr Cultural Services	Kathleen Stewart Kinchela

Following Section 4.1.6 of Stage 1 of the Consultation Requirements (DECCW 2010a), a list of RAPs for the project and copies of the notifications from Section 4.1.3 were submitted to OEH (now part of the DPIE) and Wonnarua Local Aboriginal Land Council on July 11, 2019.

A copy of the notification is provided in Appendix A.

### 3.2 Stage 2 – Presentation of information about the proposed project

Stage 2 of the consultation process provides RAPs with information about the scope of the proposed project and the proposed cultural heritage assessment process.

The RAPs were provided with a letter outlining the Project and a copy of the document *AGL Bayswater Project Information and Methodology* (please refer to Appendix B). Comments on this document were invited from RAPs and they were invited to contact Jacobs at any time throughout the assessment process to discuss the Project.

Site Officers were selected for the archaeological survey and were issued a checklist to ensure safety and preparedness for work.

### 3.3 Stage 3 – Gathering information about cultural significance

Stage 3 of the consultation process is to facilitate a process whereby RAPs can contribute to culturally appropriate information gathering and the research methodology, provide information that will enable the cultural significance of Aboriginal objects and/or places on the study area to be determined, and have input into the development of any cultural heritage management options.

RAPs were invited to submit information relevant to the cultural significance of the study area and any areas and objects within it, at all stages of the consultation process.

### **3.4 Stage 4 – Review of draft ACHAR**

Stage 4 of the consultation process involves the RAPs review and feedback on the draft ACHAR. The ACHAR was drafted to document the assessment process.

The draft ACHAR was sent to all RAPs on Oct 24, 2019 (email) and Oct 25, 2019 (post), so that they could review the document and supply comments and feedback. The ACHAR has been updated to incorporate the input from all RAPs at the close of the review period, which ended on Nov 25, 2019. Copies of written submissions received from RAPs are included in Appendix A (following section 4.4 of DECCW 2010a).

One written submission was received by Jacobs. The submission was from A1 Indigenous Services. The submission stated that A1 Indigenous Services support the draft ACHAR, and wish to be included in any future fieldwork and meetings associated with the project. The submission did not recommend any changes be made to the ACHAR (see Appendix A).

### **3.5 Sensitive cultural information and management protocol**

It is possible that during the consultation process, RAPs will provide sensitive cultural information to which access needs to be restricted.

In the event that such information is supplied, the RAP supplying the information should state to Jacobs how they wish that information to be treated, and how access to the information should be restricted.

Jacobs will follow the stated wishes provided by the RAP group in question when managing and using the information provided to Jacobs. All stated restrictions of access, communication and publication of the information will be followed. These might include:

- Restrictions on reproducing the information (in whole or in part) in reports;
- Restrictions on reproducing the information in reports provided to different audiences (for example, the version provided to the client, the version provided to DPIE and the AHIMS database);
- Restrictions on communication of the information in other ways;
- Restrictions on the location/storage of the information;
- Other required processes relating to handling the information;
- Any names and contact details of persons authorised within the relevant Aboriginal group to make decisions concerning the information, and their degree of authorisation;
- Any details of any consent given in accordance with customary law; and
- Any restrictions on access to and use of the information by RAPs.

The above list should be considered when providing a statement of requirements regarding any culturally sensitive information.

### **3.6 Consultation log**

A log summarising the consultation carried out with RAPs in relation to the project to date is provided in Appendix A.

## 4. Background information

### 4.1 Environmental context

#### 4.1.1 Topography

The study area lies within the catchment area of the Upper Hunter Valley (Upper Hunter). The Upper Hunter is the largest coastal catchment in NSW, with an area of about 21,500 square kilometres (Biswas 2010). Elevations across the catchment vary from over 1,500 m above sea level (**ASL**) in the high mountain ranges north of the catchment, to less than 50 m asl on the floodplains of the lower valley. The largest tributary of the Hunter River is the Goulburn River which joins the Hunter River approximately 25 km to the west of the study area. The Hunter River flows to the west and then around the south of the study area. The Hunter River is located approximately 8 km from the study area.

#### 4.1.2 Geology and soils

The study area is underlain by the Late Permian age Whittingham Coal Measures and Wollombi Coal Measures. These are primarily sub-horizontally bedded sedimentary strata comprising interbedded coal seams, claystones, tuffs, siltstones, sandstones and conglomerates (Geoscience Australia 2019).

Soil landscape mapping suggests that shallow soils comprising residual and colluvial shallow loams and sands would be anticipated on ridgelines, with brown solodic soils on the lower slopes. Sandy earths and possible siliceous sands may be observed within drainage lines on the lower slopes (Anonymous 2019).

#### 4.1.3 Vegetation and hydrology

The study area is located within the Hunter sub-region of the Sydney Basin Bioregion as defined by Thackway and Cresswell (1995). The majority of the study area is located with the Central Hunter Foothills Mitchell Landscape as mapped by the NSW National Parks and Wildlife Service (2002).

Vegetation in the Upper Hunter is characterised by forest and open woodland of White Box, Forest Red Gum, Narrow-leaved Ironbark, Grey Box, Grey Gum, Spotted Gum, Rough-barked Apple and extensive of stands of Swamp Oak in upper reaches and foothills. River Oak and River Red Gum are characteristic of vegetation along the streams.

The Upper Hunter Valley contains a range of ecological zones within a relatively small area. Major rivers and smaller watercourses would have provided relatively easy access to fresh water across most of the region. Ecological communities would have varied considerably from low lying watered areas around rivers and streams, to open and forested areas on valley floors, hills and mountainous regions bordering the valley to the north, south and west. The area would likely have supported a large population of Aboriginal people.

#### 4.1.4 Climate

The climate of the study area is characterised as warm temperate. Summers are warm to hot and humid, while winters are cool to mild. Rainfall is summer-autumn dominated, with rainfall minimums during late winter and early spring (Muswellbrook Shire Council n.d.). Annual rainfall is lower than on the coast. The average monthly maximum temperatures are highest in January (32 degrees Celsius at Denman) and lowest in July (four degrees Celsius at Denman). Humidity is highest during summer and autumn and lowest in September. During the summer the prevailing winds are from the east and south-east, while winter winds are generally from the west.

## 4.2 Ethnohistoric background

Ethnographic information which relates to the Aboriginal occupation of the study area is derived from publications and other forms of documentation which were compiled by early non-Aboriginal explorers, settlers, missionaries and government officials who went to the region during the mid to late 19th century. Unfortunately, within the ethnographic record, early researchers sometimes referred to tribes as having as few as 10 members, to as many as 500, which makes the determination of social organisation within certain groups difficult.

**It must be noted that the information provided here does not necessarily reflect the opinions of the Aboriginal knowledge holders for the project regarding their tribal affiliations and boundaries. The following information was compiled from a number of written sources based on language research and ethno-historic observations.**

### 4.2.1 Tribal groups and boundaries

According to Tindale (1974) in relation to Australian Aboriginal people, the term 'tribe' describes a group of people that share a common language. Tindale (1974) describes Aboriginal tribal boundaries as the limits beyond which it is dangerous to move without adequate recognition, while Stanner (1965) argues that a tribe's territory is the sum of its constituent clan estates. According to the tribal boundaries as defined by Tindale, the study area traverses the traditional lands of the Wonnarua people to those of the Gamilaroi (Tindale 1974). Tindale defines the territory of the Wonnarua as the Hunter River valley from a few miles above Maitland west to the Dividing Range. The southern boundary with the Darkinjung is on the divide north of Wollombi.

David R. Moore, Curator of Anthropology of the Australian Museum in 1969, described the Aboriginal groups who lived in the Hunter Valley. He wrote that at the time of the first European arrival the Hunter Valley was divided between many Aboriginal communities, such as:

- The Geawegal in the Upper Hunter from the Mount Royal Range to Muswellbrook;
- The Wonarua from the Middle Hunter down to Maitland;
- The Gaddhng from the Hunter estuary and Port Stephens;
- The Gamilaroi to the north and the Wirandhuri to the south of the upper Goulburn;
- The Awabagal around Lake Macquarie (south of the Hunter Valley);
- The Darginung on the northern side of the Hawkesbury (Moore 1969).

Moore's description is consistent with Tindale's mapping of Aboriginal groups, the only point of difference being that Tindale depicts the Worimi group covering an area along the coast from the Hunter estuary to Wallis Lake (Horton 1996; Tindale 1940; Tindale 1974). The groups identified by Tindale, and by earlier European researchers, are generally language groups. Finer-grained groupings almost certainly existed within these language groups. It should be noted also that various alternative spellings exist for the groups listed above.

The grammar and vocabulary published by Hale (1845) ostensibly of the Gamilaroi tribe relates to the Geawegal of the lower Hunter River. Mathews (1904) broadly suggested the Gamilaroi language extended to Jerry's Plains, but this included about one half of the Geawegal territory and also some Wonarua country. Historical records from the 19th century are severely limited by disruptions prior to the first ethno historical observations (see section 4.2.5) and the lack of anthropological expertise from the observers. More recent attempts to delineate the grammar of languages in the Hunter and Lake Macquarie region have indicated that indeed there was a degree of bilingualism and shared lexicon amongst the tribes in the district (Lissarrangue 2006).

Contradictory interpretations of tribal boundaries to those of Tindale and Moore are provided by O'Rourke (2009) and Ford (2010). O'Rourke states that Gamilaraay (alternative spellings Gamilaroi, Kamilaroi) language-speaking groups lived in the Upper Hunter Valley, above Singleton, rather than their territory starting in the upper Goulburn

River valley to the west. This interpretation is based on observations of the earliest explorer, Howe in 1819, an early tourist, Breton in the 1830's, and G.W. Rusden, a resident of Maitland from 1834-41. O'Rourke concludes that Geawegal language-speaking groups occupied the middle and lower Hunter Valley, contrary to Tindale (1940), Moore (1969) and Horton (1996)'s view that this language was spoken in the Upper Hunter.

Ford (2010) states that the Darkinung's territory extended into the Hunter Valley, and that the Gamilaroi 'had penetrated over the Liverpool Range down the upper Hunter River valley and bordered the Darkinung on the mid Hunter River floodplain at the time of settlement' (Ford 2010: 10). This interpretation extends the territory of the Darkinung into the Hunter River valley, rather than being restricted to the ranges to the south of the valley, as indicated by Tindale. The boundaries between the Darkinung, Wonarua, and Gamilaroi drawn on Tindale's map are designated as 'approximate', signaling his lack of certainty on precise tribal territories in and around the Hunter Valley (Tindale 1940).

Other interpretations exist concerning the distribution and number of different languages and dialects within the Upper Hunter Valley (Downs pers. comm.).

It should be noted that the identification of names and boundaries of tribal groups in the Upper Hunter regions remains unclear and might never be resolved.

#### **4.2.2 Social organisation, subsistence, and land-use**

Aboriginal society is generally depicted as being comprised of a hierarchy of organisational levels and groups with fluid boundaries between them (e.g. Tindale 1974). The smallest group in the hierarchy is the family comprised of a man with one or more wives, their children and some of their parents. The second level of the hierarchy consisted of bands, small groups consisting of members of several nuclear families who conduct hunting and gathering tasks together for most of the year. The third level of the hierarchy consists of regional networks or clans which comprise a number of bands. Members of these regional networks usually share beliefs in a common language dialect and assemble for specific ceremonies. The tribe is the next highest unit which is recognised as a linguistic unit with flexible territorial boundaries. The highest level of the hierarchy is the 'cultural area', which consists of groups who share certain cultural characteristics, such as initiation ceremonies and closely related languages.

The main subsistence strategy employed by Aboriginal people in the Hunter region focused on a hunter-gather lifestyle. The most basic unit in Aboriginal society was a 'band' that consisted of a collection of families, who grouped together for subsistence (Habermann 2003). Land ownership resided with the larger 'clan' or descendent group, of which the bands formed a part (Habermann 2003).

Single men were said to have lived separately to married men, single women and children. A single male entering a married man's camp without invitation would be met with violence. Campsites were thought to be on the banks of rivers:

'In choosing the site [for their camps], proximity to fresh water was one essential, some food supply a second, whilst a vantage ground in case of attack from an enemy was a third.' (Fawcett 1898, cited in Habermann 2003).

Kinship was an integral part of Aboriginal society, and created complex relationships between individuals, which governed the foods people consumed, their social and environmental interactions and the land they used. The kinship network extended social links beyond the band and even the language territory, resulting in economic ties outside the core group. As such, other territories could be visited; social gatherings promoted and maintained these extended rights and ties. Inter-clan and inter-tribal participation was also known to occur for ceremonies, such as initiation rites, and trade was a physical expression of these inter-tribal and clan networks (Habermann 2003).



The Hunter River system contains many fertile and well-watered valleys. Aboriginal people were documented living in the Hunter Valley by Europeans who first visited and settled in the area (Gunson 1974). The Hunter Valley was first described in writing by Sir Thomas Mitchell in 1831 who defined it as “being park-like” with light forest and grassy glades, populated by many different animals such as marsupials, birds and rivers full of shellfish and fish (Mitchell 1839). The area contained many species of edible nuts, wild grains and berries. Today the native animal and plant communities within the study area are extensively modified as a result of European land use practices and introduced species.

The traditional use of resources for the Hunter region was perhaps best described in ethnographical terms by Threlkeld at Lake Macquarie. Whereas this is some way from the study area, in the Upper Hunter, it does comprehensively describe the variety of the diet available to people at the time. At his mission, Threlkeld (cited in Gunson 1974) noted that Aboriginal people ate a variety of different fauna and flora. Threlkeld observed that people used the resources year round, eating certain species when they were available, such as wild plums, cobra (maggots from grass trees), snakes, cockles, lizards, fish, flying-foxes, ducks, pigeons, kangaroo, possum, swans, wallaby, kangaroo rat, eels, craw-fish, geese, oysters, honey and goanna (Gunson 1974; Neal and Stock 1986). Even whale was consumed when stranded on the beaches, and was feasted on by all Aboriginal people within reasonable travelling distance (Gunson 1974; Thomas 2008).

Hunting practices, such as beating grasslands with waddies to flush out bandicoots, and the trapping of kangaroos through the use of fire, were also recorded (Gunson 1974). Trees were climbed in search of honey. In addition, women would dive for lobster among the rocks, and would fish with lines, while men used spears. Fishing was such an important role for women, that a mother would select a female child and appoint her in the same role; this was signified by amputating the little finger on her right hand (Gunson 1974). Fish was usually consumed after being cooked, with fires kept alight on canoes during angling (Thomas 2008). Threlkeld noted that:

‘Their mode of fishing is curious, sometimes angling with hook and line thrown by the hand as they are seated in the bark canoe, sometimes diving for shell fish, sometimes standing in their frail bark darting their spears into the fish as they pass, or at other times, using hand nets forming a circle in shallow waters and enclosing the fish, but the most curious method is that of planting sprigs of bushes in a zig-zag form across the streams leaving an interval at the point of every angle where the men stand with their nets to catch what others frighten towards them by splashing in water.’ (Gunson 1974: 30).

Plant resources such as ferns potentially Bracken Fern (*Pteridium esculentum*) or Swamp Fern (*Blechnum sp.*) were crushed or sometimes roasted, before being ground to produce a flour for bread-making (Gunson 1974; Habermann 2003; Thomas 2008). Bracken Ferns comprise an edible starchy rhizome, and are available from late summer to autumn (Thomas 2008). Aboriginal people also ate the root of the Gigantic Lily (*Doryanthus excelsa*), which needed to be soaked to be edible. The yam daisy (*Microseris lanceolata* and *Microseris scapigera*), abundant in grasslands and dry sclerophyll woodlands across southeast Australia, was exploited for its edible root (Gott 2008). Cultivation practices were employed by Aboriginal people to increase the plant's productivity and expand yam beds (Denham 2008). Harvesting of yams was carried out in ways that ensured the long-term survival and productivity of yam beds (Berndt and Berndt 1993). There is uncertainty on whether the yam daisy grew in the Hunter River valley, but there are certainly multiple historical accounts of Aboriginal people there exploiting tuber-bearing plants (Ford 2010). If these were not yam daisy, they were probably the marsh club-rush, *Bolboschoenus fluviatilis*, which grows on stream banks and floodplains (Ford 2010). The consumption of *Macrozamia* nuts is also documented, which due to their toxic nature had to be soaked for two to three weeks prior to being consumed (Asmussen 2008; 2009; Asmussen and McInnes 2013; Thomas 2008). The *Macrozamia* seeds or nuts were also roasted prior to consumption. It is also possible that Kangaroo Grass seeds were ground and eaten, although there is no direct ethnographic evidence to support this (Thomas 2008).

The Hunter people were great proponents of fire farming, which altered the landscape. ‘Fire-stick farming’ resulted in both long and short term gain, with cleared areas exposing the burrows and nests of prey, and in the long term, created breaks in forest cover, attracting herbivores (Gammage 2012; Vigilante and Bowman 2004).



Brayshaw (1987:21) describes the use of fire carried out one month prior to a hunt to attract game to the new grass (Dyall 1971:4.1; Kuskie 1997). Sokoloff notes fire was also used in burials, for fishing, and farming (Sokoloff 1978a:73; 1978b:125). Burning of bushy vegetation would result in clearing vegetation that competed with food resource plants such as the daisy yam, and could therefore have functioned as a strategy of cultivating and expanding yam beds (Denham 2008; Gammage 2012; Gott 2008).

#### 4.2.3 Material culture

Aboriginal people were recorded within the Hunter region as utilising a variety of bark and wood resources. Bark and wood was harvested from a variety of Stringybark species (Stringybark, White Stringybark, and Thin-leaved Stringybark), Tea-Tree (*Melaleuca quinquenervia*), Grass Trees (*Xanthorrhoea australis*), Cabbage-tree (*Livistona australis*), River Gum, Kurrajong (*Brachychiton populneus*), Iron Bark (*Eucalyptus crebra* or *E. paniculata*) and Swamp Mahogany (*Eucalyptus robusta*) (Neal and Stock 1986). The extraction of bark from the Nettle Tree (*Urticaceae*) and the Giant Fig Tree (*Ficus sp.*) was also recorded for use in shield making (Threlkeld cited in Gunson 1974). Bark and timber were used to make canoes; spears, clubs, and shelter, among many other items were crafted from bark and timber resources. They were also used in burial practices (Neal and Stock 1986).

Up to four different types of spears have been recorded for the region, and these could be thrown up to a distance of 36.6 m (Dawson 1830, cited in Thomas 2008). Spears were crafted from the stem of Grass Trees (White 1790). The fish spear – the ‘Kul-là-ra’ and ‘Mo-ting’ – was approximately 1.83 m in length, with four pieces of hardwood at the base, which added approximately an extra 0.61 m to the length. The hardwood pieces were fastened with bark-thread covered with Grass Tree gum, and held apart through small wedges, also smeared with gum. The wooden points were fire hardened and had gum-fastened bone barbs at the tips. The hunting spear, or the ‘wa-rai’, had one hardened joint of wood at the base. The battle spear was also constructed similarly, although it had pieces of quartz stuck along one side of the wooden joint and were likened to the teeth of a saw. Following European settlement, glass was substituted for quartz (Threlkeld and Browne cited in Gunson 1974; Thomas 2008) (Gunson 1974). Spears were thrown using a ‘wom-mur-rur’, which was tapered at the end where the barb was fixed and were 1.22 m in length and half an inch thick. Spears were traded for possum skin cloaks and ‘hanks of line, spun by hand from the fur of animals of the opossum tribe’ further inland (Gunson 1974).

Canoes were observed at Maitland (Gunson 1974; Heritage Alliance 2008), and described as being from four to 14 feet (1.17 m to 4.27 m) in length and three to four feet (0.91 to 1.22 m) wide (Gunson 1974; Barrallier 1802, cited in Heritage Alliance 2008). Three types of canoe have been recorded, one made from a strong strip of gum bark, which was scraped and fire hardened. The second type was made from bark that was closed and pointed at both ends, sometimes kept taut by wedges, with the third type (‘mooten’), crafted from fire. A log would be selected that was still aflame, and Aboriginals would control the fire to form a canoe.

Other implements known to have been used included – waddies (often crafted from ironbark), yamsticks (up to 2 m long and 40 mm in diameter), fire sticks, wooden bowls (crafted from tree burls), bark water carriers with twig handles, shields (oval and up to 0.91 m long, 0.46 m wide and painted white with two red bands or stripes), clubs, boomerangs, baskets (made from palm leaves), and lances (up to 5.48 m to 6.70 m in length) (Gunson 1974; Barrallier 1802, cited in Heritage Alliance 2008; Neal and Stock 1986; Thomas 2008). Plant fibres (and fur cords) were also used to make fishing nets and twined dilly bags (Gunson 1974; Thomas 2008). Women were described as making string from bark, and also being the crafters of fishing nets (Thomas 2008).

Few ethnographic references describe the stone artefacts used by Aboriginal people in the Hunter region (Thomas 2008), however, stone axes were observed and an Australian Museum collection of implements included ‘primitive flaked celts’ made from chert (Thomas 2008). Stone axes had ground edges and were often made from basalt or diorite, with the stone fastened to a handle with gum. The handle was crafted from vines or saplings, which were heat treated (Thomas 2008). Stone axes were used for cutting saplings, peeling bark, and

cutting notches into trees (Gunson 1974; Thomas 2008). Axe grinding grooves have been described as being indicative of a large scale manufacturing industry.

While not specified as being made from stone, Mathews (1894, cited in Thomas 2008) stated that the 'largest knives' were used for skinning and dressing prey. Barrallier (1802, cited in Heritage Alliance 2008) also noted the use of a fish weir at Newcastle. Near Merewether, chert (silicified tuff) was described as being abundant (Thorpe 1928, cited in Thomas 2008). The toolkit included stone artefacts that could be used as chisels, scrapers, gravers and rasps.

Shell was used to make fish hooks and tools. Fish hooks were made from oyster shell, while shell tools could be used to sharpen spears (until the arrival of glass) (Gunson 1974; Neal and Stock 1986; Thomas 2008). Kangaroo bones were made into combs or awls, the latter of which were used for sewing kangaroo and possum skin, belts and headbands (Heritage Alliance 2008; Neal and Stock 1986; Thomas 2008). Shell and glass were traded for possum skins, yarn and headbands (Dawson 1830, cited in Thomas 2008).

#### **4.2.4 Spiritual locations and culture**

Other aspects of Aboriginal culture, such as burials, initiation ceremonies, corroborrees and cosmological beings have been described in the ethnographic record (Thomas 2008). The following sites were considered to be of importance to Aboriginal people (Department of Transport Planning and Local Infrastructure 2014; Gunson 1974; Thomas 2008):

- 'Pòr-ro-bung' a bora ring.
- 'Yu-lung' a ring where tooth extraction occurred.
- 'Ko-pur-ra-ba' another volcano on the Hunter River, where red ochre ('ko-pur-ra') was sourced.
- 'Pit-to-ba' a source of pipe-clay ('pit-to').
- 'Pu-r-ri-bang-ba', the ants' nest place, and another source of yellow ochre ('Pur-ro-bàng').
- 'Nir-rit-ti-ba' island, or Moon Island, where mutton bird and their eggs are eaten.
- 'Nul-ka-nul-ka' at Reid's Mistake, a source of silicified tuff.

The Eaglehawk was an important bird to the many tribal groups, and was significant in astronomy, legend and social structure (Gunson 1974). The use of fire has also been described as an integral part of the Aboriginal way of life, as it was used in farming, hunting, cooking, warmth, communication, initiation ceremonies, burials, mourning, weapon making, canoe construction, and fishing (Thomas 2008).

Initiation ceremonies often took place within one or two cleared circles, with the circles sometimes up to 350 m apart (Habermann 2003). Carved trees often marked the area around the circle. One known initiation ceremony included the extraction of a front tooth for boys (Brayshaw 1987; Gunson 1974). Burials were often deposited in the ground, with the body placed in various positions, often covered in a bark shroud (Habermann 2003). Grave goods, such as spears and stone tools, were often buried with the deceased (Habermann 2003).

Kuskie documented significant and widespread traditional, historical and contemporary cultural values identified by registered Aboriginal parties and ethno-historical evidence. Associations and cultural values included a number of gender related sites, the association of Mount Sugarloaf with the supreme being 'Koe-in', burial locations, and pathways throughout the landscape, such as through Black Hill Spur, Hexham Swamp and along Sugarloaf Ridge (Kuskie 1997).

#### 4.2.5 European and Aboriginal interaction

Many of the initial interactions between Aboriginal people and non-Aboriginal settlers (such as timber cutters, convicts and settlers) have been described as friendly (Allom Lovell and Associates 1998; Graeme Butler & Associates 2007; Gunson 1974; Thomas 2008). In 1790, four convicts landed at Port Stephens after seizing a small vessel and sailing from Port Jackson. After landing, they lived with local Aboriginals for five years (Goold 1981; Thomas 2008). Another group of convicts, this time of 15 individuals, stole the Norfolk and wrecked it at Stockton, where six men chose to live with the local Aboriginal people. After several months, three men made their way back to Sydney, assisted by Aboriginal guides (Goold 1981).

In 1799, conflict arose on the shores of the Hunter River, where the Aboriginal people gathered in great numbers on the foreshores' and drove the non-Aboriginal people away. An armed party was sent to rescue the remaining men, who the Aboriginal people had said had returned to Sydney overland, but they were not believed. Several Aboriginal people were wounded as a consequence of the resulting attack (Goold 1981). The early 1800s saw a variety of conflicts between escaped convicts and farmers, but in 1821, when Governor Macquarie visited Maitland, he was greeted by the chief of the 'Boan Native Tribe', Bungaree, who with his family, held a corroboree in welcome (Heritage Alliance 2008).

Aboriginal people worked as guides and trackers. In 1842, the explorer FW Ludwig Leichhardt was guided by Bo-win-bah (Gorman, chief of the Pambalong) and Biraban (Johnny M'Gill) from Ash Island to Minmi cattle station, around the margins of Hexham Wetlands (Department of Transport Planning and Local Infrastructure 2014; Thomas 2008). Peaceful encounters were soon replaced with serious conflict, however, and were generated from the mistreatment of Aboriginal women, misunderstandings with pastoral settlers, and violent behaviour from the convicts towards Aboriginal people (Gunson 1974; O'Rourke 2009; Dawson 1830, cited in Thomas 2008). Timber harvesting and hunting soon became other causes of conflict, due to spiritual beliefs (trees were believed to house the souls of Aboriginal people awaiting rebirth, with some fauna being totem animals to Aboriginal people) (Allom Lovell and Associates 1998). From the 1830s, Aboriginal groups raided settlers for food and those who were captured were tried before the Supreme Court in Sydney; some were acquitted, others sentenced to death.

Aboriginal populations suffered a dramatic decline after the arrival of non-Aboriginal settlers, with disease, the loss of traditional hunting grounds, and conflict with settlers (including massacres of Aboriginal people) all contributing to the reduced number of Aboriginal people. In 1821 in the Lake Macquarie area, over 100 individuals were observed by Reverend Middleton, whereas in 1840, only 15 adult males, seven adult females and four children were recorded (Thomas 2008). Diseases such as smallpox, chicken pox, tuberculosis, typhoid, influenza, scarlet fever, measles, diphtheria, whooping cough and croup were all disastrous to the Aboriginal people (Thomas 2008). The smallpox, and possibly chickenpox, epidemics alone, in 1789, 1829 and 1831, meant that it was impossible for non-Aboriginal settlers to understand the population sizes of Aboriginal people prior to European arrival (Gunson 1974; Thomas 2008).

The overall number of different Aboriginal groups and the location of their territorial boundaries were severely affected by an epidemic beginning in or before 1789. Soon after the first European settlement in NSW, the arrival of a disease with symptoms similar to smallpox (Tench 1788) in the local Aboriginal population was recorded. Despite the coincidence of these two events, it is now hypothesised that smallpox had originally been contracted by Aboriginal people living in Arnhem Land, who caught the disease from fishermen from Southeast Asia (Butlin 1985; Campbell 2002; Macknight 1986). If this hypothesis is correct, the disease had spread across the continent to arrive in NSW. It should be noted that some researchers contend that the epidemic originated from the Sydney colonists, and that it might have been chicken pox rather than smallpox (Wright 1987). Wright's argument in support of the epidemic being smallpox rests on the fact that no cases of smallpox were recorded among the European settlers, either on the voyage out or in the months they had been in Port Jackson. The hypothesis of Macassan origin would also explain the lack of cases among the European population. An argument against a smallpox outbreak originating with the Macassans is provided by Hunter and Carmody (2015), who view the transmission of smallpox across the continent as being unlikely, due to the low

infectiousness of smallpox and the sparse populations of Aboriginal people across the centre of the continent. This argument, it should be noted, rests on the assumption that there were no 'corridors' of dense Aboriginal population existing between northern and southeastern Australia, which would seem to ignore the probably dense populations that existed around the coastline of the continent. Hunter and Carmody in fact acknowledge the probable existence of the coastal transmission corridor (Hunter and Carmody 2015: 128) and the fact that this represents a plausible pathway for smallpox to travel from north Australia to the Sydney colony. The difficulty of a hypothetical transmission of smallpox across the continent, which argues against the 1789 epidemic being smallpox travelling in from the north, coupled with the lack of smallpox infection in the European settler population, which argues against the epidemic being smallpox originating from the First Fleet settlers, leads Hunter and Carmody to the conclusion that the epidemic was probably not smallpox at all. Instead, they view chickenpox as being the more plausible disease. Whichever disease was responsible for the epidemic, its severe effects are documented in historical records.

Mortality rates from the epidemic are difficult to measure precisely, but are likely to have been around 80 percent (Butlin 1983). Mortality could plausibly have been as high as 90 percent (Wright 1987) or even 98 percent if the epidemic were smallpox, based on observations of smallpox's effects on previously unexposed populations in other continents (Hiscock 2008: 14). The epidemic resulted in movements of people across the landscape, and possibly the disappearance of some previously existing groups. Governor Arthur Phillip recorded that, in the Sydney region, many Aboriginal people migrated inland, away from the European settlement, in an attempt to escape the disease (Phillip 1789). Lieutenant-Governor David Collins recorded a group that had been reduced to three survivors negotiating to merge with another group, and also observed a group that had been reduced to a single survivor (Collins 1798). Similar migrations, and mergers of groups in response to the appearance of diseases and their associated death toll are likely to have occurred in the Hunter Valley.

The impact of the 1789 epidemic on the distribution of Aboriginal groups across the landscape is likely to have been severe. Hiscock (2008: 14) sums up the effect of the epidemic by stating it would have "altered the operation of Aboriginal life". This alteration resulted from the reduction in population and other effects flowing on from this. The possible disappearance of some groups through mortality and group mergers, the mass migration of people fleeing the disease, the depopulation of areas, and the incursion of groups into abandoned or depopulated lands, would have substantially altered the social landscape of Aboriginal groups that had existed prior to the epidemic. The tribal boundaries mapped by European researchers after contact are those of a population that had survived the epidemic (and further epidemics that followed) and had adapted their occupation of the landscape in response to it. Subsequent disease epidemics of smallpox, measles, influenza, tuberculosis, and venereal diseases followed in the years after European settlement (Hunter and Carmody 2015).

The farming of the land by European settlers displaced Aboriginal groups and populations of plants and animals they subsisted upon. Due to the loss of traditional hunting grounds, and the modification of the landscape, food resources such as kangaroo, wallaby, emu and possum became scarce (Graeme Butler & Associates 2007). Prime agricultural land, on alluvial soils adjacent to rivers, was also land where daisy yams and other tuber plants had flourished and where yam beds had been actively cultivated and expanded by Aboriginal people (Denham 2008; Ford 2010; Gammage 2012; Goodall 1996; Kohen 1993). Farming of this land deprived Aboriginal people of access to an important plant resource (Goodall 1996). Normal hunting processes were also restricted, due to the clearance of vegetation and draining of lagoons (Ford 2010; Graeme Butler & Associates 2007). The culmination of general violence, landscape alteration and diseases would have all contributed to the massive reduction in the Aboriginal population of the region. The population loss affected traditional practices, such as kinship systems, marriage, subsistence strategies and more (Thomas 2008).

By the 1840s, Aboriginal people were reliant on settlers for clothing, food and money (Thomas 2008) and were employed in a variety of functions, such as timber cutters, water drawers, farm assistants, and errand runners, among others. Near the end of the 19th century, concern over the Aboriginal peoples' plight took root, with the Aborigines Protection Association formed in 1881. In 1883, a Board for the Protection of Aborigines was

established by the government, and rural stations were developed to allow Aboriginal people to stay on traditional lands (Thomas 2008). Yet by the mid-20th century, Aboriginal people had begun to move to Newcastle and Lake Macquarie to escape the oppression of the Aborigines Protection Board and to gain employment (Thomas 2008). Between 1909 and 1967, 5,300 Aboriginal children had been removed from their families and placed in institutions (Thomas 2008). The main sources of employment during this time were Broken Hill Propriety Limited and the Department of Railways, with Aboriginal people living in shanty settlements or in tent villages near the railway lines. In the 1930s, the new policy of assimilation was created, to try and absorb Aboriginal people into the wider community, and by the 1940s, the concept of re-settlement was established. By the 1960s, Aboriginal people were once again occupying Newcastle (at the university). Those living at the university were 'removed' from the premises.

Although disease and violence had substantial effects on the demographics of Aboriginal groups, its effects on Aboriginal cultural practises are impossible to estimate. It is important to note that these processes did not extinguish Aboriginal culture. Aboriginal traditional knowledge and elements of pre-contact Aboriginal culture, both tangible and intangible, survive today.

#### **4.2.6 Summary**

The Aboriginal people of the Hunter region would have used the wide variety of natural resources present within the fertile landscape, and ethno-historical accounts list some of the methods through which Aboriginal people harvested fruits, nuts, marine resources, terrestrial fauna, birds and so forth. While there are gaps in the ethno-historical account, such as the lack of description regarding stone artefact manufacture and use, it does provide a basis that can be used to understand how Aboriginal people used the landscape prior to non-Aboriginal colonisation.

Modification of the landscape by Aboriginal people took place through the use of fire farming and reed planting/weir development, but little evidence of such activities is likely to have been preserved in the archaeological record due to the perishable nature of the materials used and the consequent alteration of the landscape through non-Aboriginal occupation. Evidence of campsites, through deposits of stone artefacts and shell, hearths or middens are, in contrast, likely to be found where the landscape has not suffered severe ground disturbance or sedimentation. While ethno-historical accounts refer to camps being located near waterways, campsites would not have been limited to river banks. These descriptions do, however, aid in developing a predictive model for the location of Aboriginal sites.

Scarred trees, which were a result of the production of items such as canoes, containers, shelters and bowls also have the potential to be present within the region. Carved trees, which were decorated with designs and could be associated with ceremonial sites, are much rarer. However, the prevalence of logging in the Hunter region would have severely reduced remaining scarred and carved tree numbers.

Other sites, such as grinding grooves, stone quarries, burials and ceremonial grounds (bora rings, stone arrangements), while rarer, are discussed in the ethno-historical records and are known to be focal points within the current cultural landscape.



## 5. Aboriginal cultural values

### 5.1 Method of obtaining information

Input and feedback can be provided by RAPs at any time throughout the assessment process. Jacobs has sought input and feedback from RAPs at several points during the process (following procedures outlined in DECCW 2010a):

- During Stage 2 – Initial presentation of information about the proposed Project.
- During Stage 3 - Providing RAPs with the draft proposed methodology. RAPs were invited to provide feedback on the proposed methodology, and to identify cultural heritage values associated with the study area.
- During fieldwork.
- During Stage 4 - Providing RAPs with the draft Aboriginal Cultural Heritage Assessment Report. RAPs are invited to provide feedback on the report, and any further information they wish to be included.

### 5.2 Identified cultural heritage values relevant to study area

The landscape of the Hunter Valley as a whole has cultural value to Aboriginal people, being a landscape that their ancestors lived on, travelled through, and utilised for subsistence. Landmarks visible in the natural landscape are known to the present-day Aboriginal community to have been important in enabling Aboriginal groups to navigate through the landscape, and to identify where the territory of their tribes and clans were. The importance and cultural significance of visible landmarks in the landscape was communicated to Jacobs by representatives from RAP groups assisting with fieldwork. Large landmarks such as individual hills and mountains in surrounding ranges were cited as being important for navigation through the landscape. In addition, smaller and less obvious local high-points in the landscape would have had importance for the same purpose: small hills and ridgelines that were higher than their immediate surrounding landscape would have been points that travelling groups would have used as vantage points to identify landmarks and orient themselves in the landscape.

Rivers, creeks and other watercourses hold cultural value for similar reasons, as river valleys were followed when travelling through the landscape and would consequently have functioned as navigational aids. The importance of watercourses as travel routes, as well as the importance of the food resources they provided, were both cited by RAPs as attaching watercourses with cultural significance.

Stone artefacts, both individually and as assemblages, were cited as having cultural significance for a number of reasons. As items produced and in some cases used by Aboriginal people, stone artefacts provide a tangible and direct link to the lifeways and thought processes of ancestral people. In the Hunter Valley, the distribution and source areas of various distinctive materials are well understood. Particular artefacts can consequently be identified as having been made from material sourced from a specific location in the landscape. For this reason, an artefact can carry information on where Aboriginal people had travelled in the landscape, or where they had obtained traded material from. The variability of materials found on sites in the region was cited by RAPs as evidence for interactions between groups whose home territories were in different areas. The ability to identify distinctive materials with specific groups, who travelled in from specific areas of the Hunter Valley and its surrounds, adds to the cultural value of stone artefacts in this region.

## 6. Summary of archaeological assessment

### 6.1 Desktop assessment

The desktop assessment included a search of the Aboriginal Heritage Information Management System (AHIMS) and a review of existing data (including any previous archaeological investigations specific to the proposal and register searches) to identify any gaps in the assessments. Information compiled as part of the background review provided the framework for the development of a predictive model for site location.

#### 6.1.1 AHIMS search results

Jacobs carried out a search of the AHIMS on 15 July 2019. The footprint of the Project and a 50 m buffer zone was used as the search area.

Fourteen previously recorded sites are present within the search area, one of which is recorded as being destroyed. One of the sites is recorded under two AHIMS numbers (37-2-0047 and 37-2-0050). Four sites were partially collected during their original recording. All sites are scatters of stone artefacts on open ground. One of the sites also contained hearths.

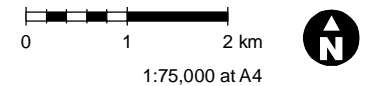
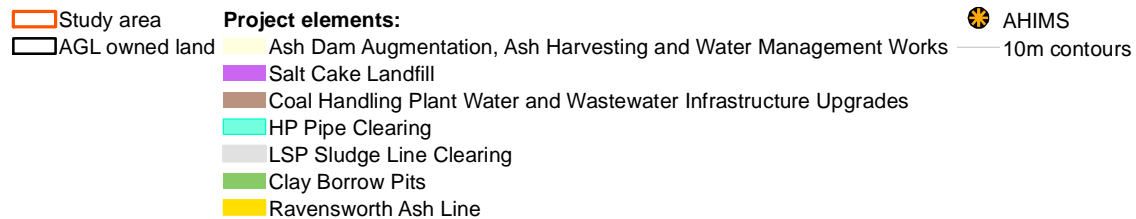
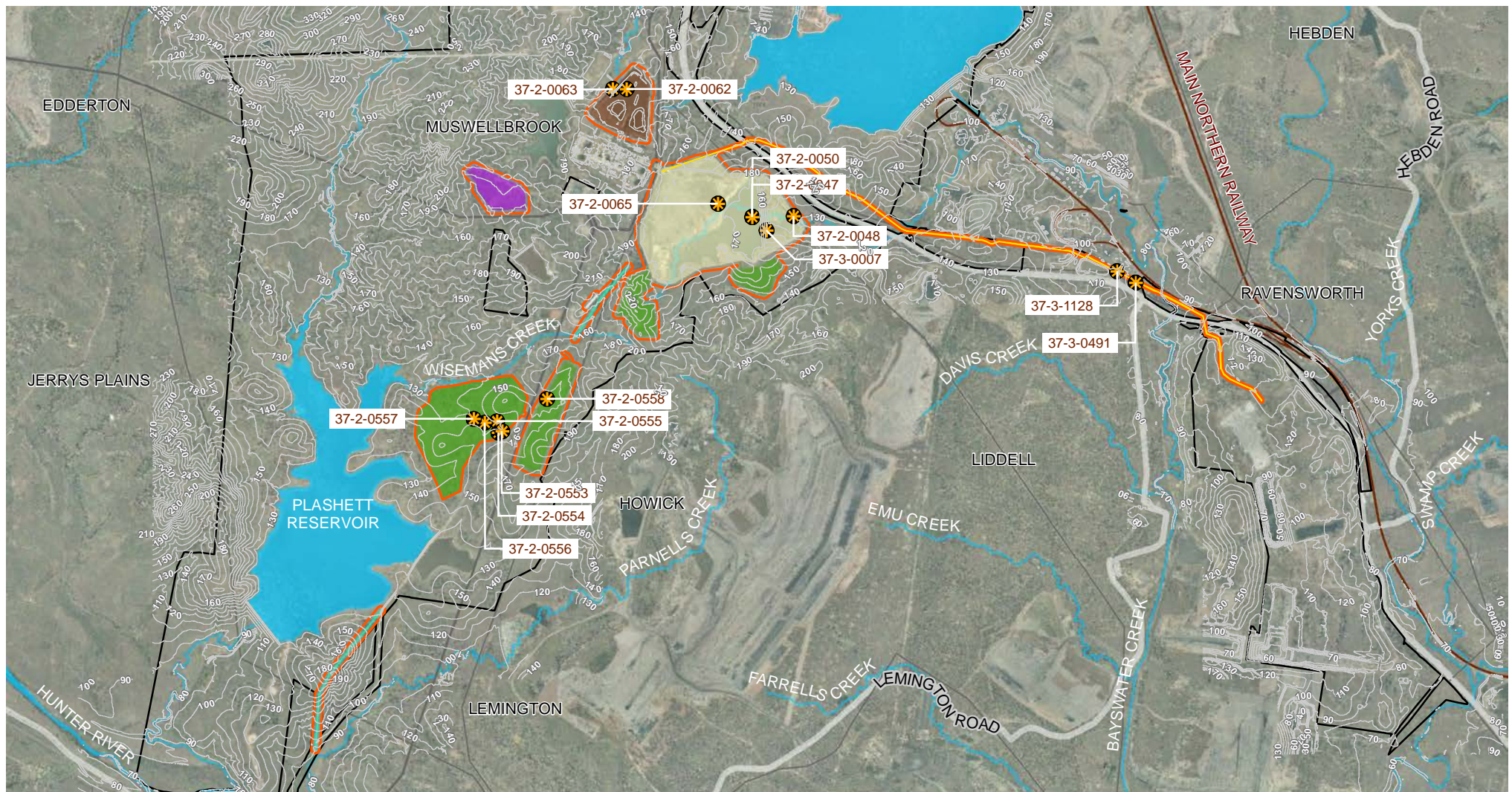
The list of AHIMS site records is provided in Appendix C. Figure 6-1 shows the location and extent of Aboriginal sites listed on the AHIMS within and near the study area.

**Table 6-1 Summary of previously recorded AHIMS sites located within the study area**

AHIMS ID	Site name	Recorded by	Date	Site context	Aboriginal objects recorded	Recommendations	Salvage carried out
37-2-0047 (this is a duplicate record of 37-2-0050)	Pikes Gully	L. K. Dyll	1978	Open site	Flakes and cores (unquantified)	None	10 cores were collected
37-2-0048	Pikes Gully	L. K. Dyll	1978	Open site	Flakes and cores (unquantified)	None	3 cores collected
37-2-0050 (this is a duplicate record of 37-2-0047)	Pikes Gully	L. K. Dyll	1978	Open site	Flakes and cores (unquantified)	None	10 cores collected
37-2-0062	Tinkers Creek/Liddell	L. K. Dyll	1978	Open site	Four separate scatters of stone artefacts, including flakes, cores and retouched flakes. Implements recorded are utilised flakes, battered cobble, cleaver, elouera, a large blade). Two of the scatters were associated with hearths. Numbers of artefacts and hearths unquantified.	None	18 cores and implements collected

37-2-0063	Tinkers Creek/Liddel I	L. K. Dyll	1978	Open site	Four separate scatters of stone artefacts. Over 240 artefacts in total. One backed blade recorded.	None	No artefacts collected
37-2-0065	No site card exists for this site						
37-2-0553	P6	M. Koettig	1991	Open site	Artefact scatter (unquantified)	None	No collection recorded.
37-2-0554	P7	M. Koettig	1991	Open site	Artefact scatter	None	No collection recorded.
37-2-0555	P8	M. Koettig	1991	Open site	Artefact scatter	Requires testing prior to impact	No collection recorded.
37-2-0556	P9	M. Koettig	1991	Open site	Artefact scatter	Requires testing prior to impact	No collection recorded.
37-2-0557	P10	M. Koettig	1991	Open site	Scatter of 20 stone artefacts	Requires salvage prior to impact	No collection recorded.
37-2-0558	P11	M. Koettig	1991	Open site	Artefact scatter and PAD	Requires testing prior to impact	No collection recorded
37-3-0007	Pike's Gully	L. K. Dyll	1978	Open site	Scatter of four artefacts, two of which are ground	None	Two ground artefacts collected
37-3-0491	Nardell-N2	R. Fife & V. Perry	2000	Open site	Scatter of at least three stone artefacts	Requires surface salvage prior to impact	No collection recorded
37-3-1128	REA256	Reynolds	2010	Open site	Isolated stone artefact	None	Collected in entirety





#### Data sources

Jacobs 2019, AGL 2019, OEH 2019  
 NSW Spatial Services 2019

**Figure 6-1** AHIMS search results for the project area

GDA94 MGA56

### **6.1.2 Previous archaeological assessments in the study area and surrounding region**

One of the first archaeological investigations of the study area was carried out between 1976-1979 as part of the Mt. Arthur Mine Project. Associate Professor L.K. Dyll from Newcastle University surveyed three mining sites with the intent of discovering Aboriginal artefacts. He found artefacts in three small areas of open ground (The Electricity Commission of New South Wales 1979).

In 1979, the Electricity Commission of New South Wales in relation to the Bayswater Power Station project concluded that the only Aboriginal sites within the area were located within the Saltwater Creek reservoir area. It recommended salvage of these Aboriginal heritage sites before the area was flooded to create Lake Liddell (The Electricity Commission of New South Wales 1979).

Dyll (1980) carried out a survey immediately south of the Bayswater Colliery, recording three sites on the banks of Saddler's Creek. The sites were scatters of flaked stone artefacts, including cores and backed artefacts. The artefacts were made from chert, rhyolite and quartz.

Dyll (1981a) carried out a survey immediately south of Mount Arthur, recording 24 open sites along Saltwater and Saddlers Creeks. The sites were stone artefact scatters, two of which contained more than 500 artefacts. Artefacts recorded included backed artefacts, ground stone axes, choppers and grindstones.

Dyll (1981b) reviewed all Aboriginal sites recorded during surveys of the Mount Arthur Coal Lease area. This report records a number of sites along the banks of Saltwater creek. One scatter of stone artefacts recorded covered more than one acre, extending up to 100m back from the creek bank. The report also records 27 axe grinding grooves on a sandstone shelf. The great majority of sites recorded are open artefact scatters and are located adjacent to the creek.

Hughes (1981) carried out a survey of a proposed extension to the Bayswater Colliery, recording nine Aboriginal sites. The sites were open artefact scatters, six of which are located on creek lines.

In 1992 Pacific Power carried out a survey of a proposed slurry pipeline and water storage pond within the Bayswater Ash Disposal Project. The area was assessed as being highly modified by European settlement and Aboriginal sites were likely to have been disturbed or destroyed (McIntyre 1992). Six sites were identified: five artefact scatters and one isolated artefact. The number of artefacts found per site varied from 2 to greater than 200. These sites were identified as outside the proposed area of impact. Avoidance and protection were recommended. Subsequent test excavation in the area of the proposed work identified an absence of artefacts in subsurface deposits.

In 1993 an Environmental Impact Assessment of Bayswater was undertaken as part of the Fly Ash Disposal in Ravensworth No.2 Mine Void and Mine Rehabilitation project. As part of the assessment an examination of Heritage registers and field examination was performed. The research showed no European heritage items along the transport corridor and two Aboriginal open artefacts scatter sites and an isolated Aboriginal artefact (Pacific Power 1993).

Umwelt Australia (1997) carried out a survey of three areas of the southern section of the Bayswater No. 3 mining lease. These areas included a coal processing plant, haul road and mine access road, overland conveyer and stockpile area. The survey recorded 36 sites comprising 28 open artefact scatters and eight isolated artefacts. The majority of sites were located adjacent to watercourses, namely Saddlers Creek and its tributaries. Sites were located on the watercourses' banks, as well as on elevated ground such as upper slopes and ridge tops adjacent to the watercourses. Artefacts included retouched flakes and cores, and one hammerstone.

In 2007 an assessment of Bayswater was undertaken as part of the Bayswater Power Station River Intake Project. During the survey an isolated mudstone flake was identified. Due to the lack of further sites in the study area, it



was inferred that extensive levels of past disturbance had impacted and destroyed sites in the area (McCardle Cultural Heritage Pty Ltd 2007).

An archaeological assessment of the Bayswater and Liddell Power Generation complex was carried out in 2009, recording 47 Aboriginal sites. All sites were open artefact scatters and isolated artefacts. The number of artefacts per scatter varied from 11 up to 250 with the majority of sites (n.36) containing fewer than 10 artefacts. It was noted that flat areas associated with Saltwater Creek and its tributaries contained surface sites and potential for associated PAD and that elevated landforms and hillslopes were landforms with low archaeological sensitivity (AECOM 2009).

In 2017 a survey was undertaken as part of the Aboriginal due diligence assessment for the Bayswater Ash Dam Overland Water Pipeline. The survey recorded ground surface visibility (GSV) within the study area between 31-50%. No surface artefacts were identified during this inspection. A search of the AHIMS, covering an area approximately 17.8 km by 13.5 km identified a total of 102 sites outside the pipeline's footprint. These 102 sites included artefact scatters (n.78), isolated artefacts (n.15), sites destroyed under the condition of an AHIP (n.8) and a single modified tree. The majority of sites consisted of artefacts identified on exposed ground surfaces. From these results it was concluded that the area did not contain areas of subsurface potential, and that this was probably due to erosion and past disturbance (AECOM 2017).

A preliminary Aboriginal heritage assessment for proposed electrical works modifications at the Bayswater Brine Concentrator Decant Basin (BCDB) was carried out in 2018 and as part of the assessment a search of the AHIMS database was completed. This search identified 113 Aboriginal archaeological sites (two sites were classified as "destroyed") (AECOM 2018).

These assessments demonstrate that the area has been subject to past disturbance, particularly during the post-contact period, which has probably impacted the Aboriginal heritage of the area and reduced the overall number of sites. Previous assessments suggest also that Aboriginal sites are most likely to occur in flat areas associated with water sources and that their number is expected to be higher in areas near permanent water sources. Elevated areas away from watercourses, and slopes are expected to contain fewer Aboriginal sites. These results feed into the predictive model outlined in the following section.

### **6.1.3 Predictive model**

The following predictive model is used to identify areas of archaeological sensitivity. The model is based on a 'land system' or 'archaeological landscape' model of site location. This type of model predicts site location based on known patterns of site distribution in similar landscape regions.

The predictive model is based on:

- A review of previous models developed for the study area;
- An assessment of the results of the previous archaeological assessments reviewed in Section 6.1.2;
- The interpretation of the distribution patterns of known sites close to the study area; and
- A study of previous impacts to the study area and the potential effects of these impacts on the archaeological record.

The following specific predictive points are noted for the landscape the proposed Project area sits within:

- Elevated landforms adjacent to watercourses have high archaeological potential. Existing archaeological data for the Hunter Valley indicate a strong trend for the presence of open sites along watercourses, specifically, on creek banks and 'flats' (i.e. flood/drainage plains), terraces and bordering slopes.
- Landforms adjacent to permanent watercourses have a higher archaeological potential than those adjacent to ephemeral watercourses.

- The most common site type will be surface and sub-surface scatters of stone artefacts.
- Other site types that may present in the landscape are quarries, grinding grooves and scarred trees.
- The most commonly occurring material will be indurated mudstone or silicified tuff followed by silcrete. Other materials such as chert and quartz are also likely to be present.
- Where present, sub-surface archaeological deposits are most likely to be within 200 m of a water source (river or creek).
- Ridgelines and hills will have a lower density of sites than basal slopes and valley floors.
- Within the areas of infrastructure associated with Bayswater power station (such as around the CHP, existing roads and access tracks, or adjacent to pipelines) surface and sub-surface deposits are likely to be heavily disturbed and may contain areas of imported fill.

A number of post-depositional processes can result in disturbance or destruction of archaeological sites. Identifying areas of high disturbance is an important factor in the predictive model. Disturbance can alter the patterns of site location expected from the points above. The following general predictive points relate to the effects of site disturbance:

- Landforms adjacent to watercourses and which have been subject to frequent or high-energy flooding events will have reduced archaeological potential.
- Steep hillslopes have reduced archaeological potential, as sites will be more likely to have been displaced by downslope movement and surface erosion.
- European land-use practises can have a range of impacts to sites. Areas that have been excavated, inundated, or buried under fill or stockpiled materials will have low archaeological potential.

Many post-depositional processes result in the movement of artefacts away from their original location and context, without resulting in damage or destruction to the artefacts themselves. Some post-depositional processes will result in the destruction of some, but not all, artefacts within a site. Only severe impacts will destroy or remove all Aboriginal objects from a landform. Factoring post-depositional disturbance into the assessment of a landform's archaeological potential should consequently take a precautionary approach. A landform should be assumed to retain archaeological potential unless there is compelling evidence for severe disturbance that can be confidently inferred to have removed all sites from the landform.

## 6.2 Archaeological survey method

The field survey systematically investigated the areas proposed to be impacted by the Project. The survey was carried out on foot by a team of archaeologists and Aboriginal Sites Officers from the RAPs.

The survey investigated the proposed impact areas in full. No sub-sampling of these areas was employed. Areas that were assessed by field teams as having no potential for archaeological material to be present, for example because of previous impacts and ground disturbance, were not surveyed. Decisions to exclude areas in this way were made in the field, through a consensus of all field team members.

The ground survey team consisted of two archaeologists as well as nine Sites Officers.

**Table 6-2 List of survey team members**

Name	Organisation
Kylie Saunders	Wanaruah Local Aboriginal Land Council
Steven Hickey	Widescope Indigenous Group
Garreth Conyard	Murra Bidgee Mullangari
Kody Mcutchen-King	Muragadi
Craig Horne	Gidawaa Walang Cultural Heritage Consultancy
Adam King	Didge Ngunawal Clan
Mike Skinner	
John Matthews	Aboriginal Native Title Elders Consultants
Margaret Matthews	Aboriginal Native Title Elders Consultants
Oliver Macgregor	Jacobs
Clare Leevors	Jacobs
Nicholas Woodard	AGL Macquarie

The field survey was aimed at locating Aboriginal sites, objects and areas of PAD .

Where archaeological sites or objects were encountered, the following attributes were recorded:

- Site location (single point for isolated artefacts, or as a boundary drawn around larger sites such as artefact scatters);
- Site type;
- Landform context;
- Vegetation type;
- Land use;
- Categories of features and artefacts present on the site;
- Orientation/aspect of the site;
- Observations on individual stone artefacts: stone material type; artefact type; platform surface; platform type; termination type; cross-section category; length, width and thickness in millimetres;

- Observations on modified trees: living status of tree; condition of tree; condition of scar; tree species; length and width of scar; height above ground; presence of regrowth; depth of scar (height of regrowth); shape of scar; orientation of scar; presence/absence of axe marks;
- Observations of other specific site types (grinding groove, art, shell scatter, closed site) following the requirements of DPIE site recording forms;
- Photographs of the site and individual site features/artefacts will be taken as judged necessary by the field team; and
- Any other comments or information as judged relevant by the field team.

Previously recorded sites within the footprint of the Project were searched for during the survey. If found, these sites were recorded following the same procedure as newly identified sites. If survey teams were unable to find previously recorded sites, this was noted in the report.

The survey also recorded land disturbance, survey coverage variables (ground exposure and archaeological visibility) and landform types across the study area.

Data were captured using iPad notebooks, handheld GPS, and compact digital camera.

### 6.2.1 In-field lithic artefact measurement

The following measurements and observations were taken on all stone artefacts identified during the survey.

**Type:** Classification of artefacts was based on technological criteria. The term “type” is sometimes used to refer to formal implement types such as backed artefacts, but in this document the term is used to classify all artefacts based on the process through which they were made. The following categories were used:

- **Core:** Cores are a piece of rock from which flakes have been detached. Cores are characterised by one or more identifiable negative flake scars, which are surfaces created when flakes have been detached. Cores do not have a positive (ventral) fracture surface.
- **Flake:** A piece of stone detached by fracture from a core, through the application of force. Flakes have a positive, or ventral, fracture surface which is characterised by a number of features which may include a bulb of percussion, a bulbar scar, ripple marks and fissures on the ventral surface and negative flake scars on the dorsal surface. A complete flake retains its platform surface and termination.
- **Retouched flake:** A flake which has had flakes removed from it after it was struck. A retouched flake has an identifiable ventral surface, and negative scars that are derived from or intrude onto this ventral surface.
- **Flaked piece:** A flaked piece is an artefact that exhibits negative flake scars, and one surface which could possibly be a ventral surface. A flaked piece does not have any other features that would enable identification as a flake, a retouched flake or core. This category is therefore an ambiguous one, and is used only for artefacts which cannot confidently be categorised more specifically.
- **Hammer:** A piece of stone, usually a pebble, which possesses pitting or furrowing indicative of hammer impacts.
- **Anvil:** A piece of stone which possesses pitting usually on a wide flat surface, indicating that it was struck repeatedly.
- **Ground artefact:** Any piece of stone showing an area or areas which have been ground or polished.
- **Eraillure:** A lens-shaped piece of stone which shatters off the bulb of a flake as the flake is struck (Faulkner 1972).

**Material:** The following raw materials were identified as present in the assemblage:



- **IMSTC:** (Indurated Mudstone, Silicified Tuff, Chert). An acronym for fine-grained siliceous rock types including chert, mudstone and other indurated fine-grained sedimentary rock, and silicified tuff (White 2018). Distinguishing between these different rock types is often impossible in the field, and confident classification requires petrological analysis (Hughes 2011). These fine-grained rock types are all isotropic and are consequently favoured materials for artefact manufacture.
- **Quartz:** The mineral quartz is crystalline silica with a hardness value of 7 (Mohs hardness scale). Given this property quartz flakes possess highly durable sharp edges (Domanski *et al.* 1994). Quartz often has internal flaws and cleavage planes, however, meaning it typically flakes in an unpredictable manner (Cotterell and Kamminga 1987; Driscoll 2011; Tallavaara *et al.* 2010).
- **Silcrete:** This rock is formed by the impregnation of a quartz-rich sediment with silica; it consists of quartz grains in a matrix of either amorphous or fine-grained silica (Rowney and White 1997; Sullivan and Simmons 1979). The fracture properties of silcrete are dependent largely of the size of the quartz grains, with finer-grained silcretes having superior fracture properties (Domanski and Webb 1992; Domanski *et al.* 1994; Webb and Domanski 2008).
- **Quartzite:** Quartzite is formed by the cementing together of siliceous grains through pressure, heat and chemical processes. Fracture properties and flaking quality are variable, depending on how cohesively the individual grains have been cemented together.
- **Igneous:** This category includes all igneous rock types. Categorising igneous rock into finer-grained categories is difficult to achieve in the field, on artefacts that are weathered or patinated, and was not attempted in this study.

**Platform type:** The platform surface is the surface from which fractures begin propagating. The following classifications of platform surfaces were used:

- **Single:** The platform is a single fracture surface.
- **Multiple:** The platform is made up of two or more fracture surfaces.
- **Cortical:** The platform is partially or fully composed of a cortical surface.
- **Shattered:** The platform has been sheared away during flake production: platform attributes cannot be identified.
- **Facetted:** The platform includes multiple small flake scars, initiated from the dorsal surface, which were removed prior to the flake being struck.
- **Focalised:** Fracture initiates close to the edge of the platform, and only a very small platform surface is present (usually no more than twice the area of the ring crack formed at the initiation point).

**Termination type:** Termination refers to the manner in which the fracture ceases to propagate by running to meet a free surface. The termination type is classified according to how the fracture surface and the free surface (i.e. the distal surface of the flake) meet (Cotterell and Kamminga 1987).

- **Feather:** Exhibits minimal thickness at the distal end and acute angle between ventral and dorsal surface.
- **Hinge:** Forms when the fracture curves sharply and meets the surface of the core at c. 90° to the longitudinal axis of the flake.
- **Step:** Forms when flake terminates abruptly in a right angle break.
- **Inflex:** A hinge termination on which the fracture surface deviates in the distal direction just before termination, leaving a "finial" or "lip" on the flake (Cotterell and Kamminga 1986; Sollberger 1986). Also known as a "languette" fracture (Bordes 1970a; 1970b; Lenoir 1975).

- **Retroflex:** Similar to an inflex, except that the deviation of the fracture surface is toward the proximal end of the flake: that is, the fracture curves back in the direction of the platform surface (Cotterell and Kamminga 1979; Cotterell and Kamminga 1986).
- **Outrepassé:** Forms when the fracture plane curves away from the face of the core and terminates on the opposite side of the core, removing the core's base. Also known as a plunging termination (Inizan *et al.* 1999; Whittaker 1994).

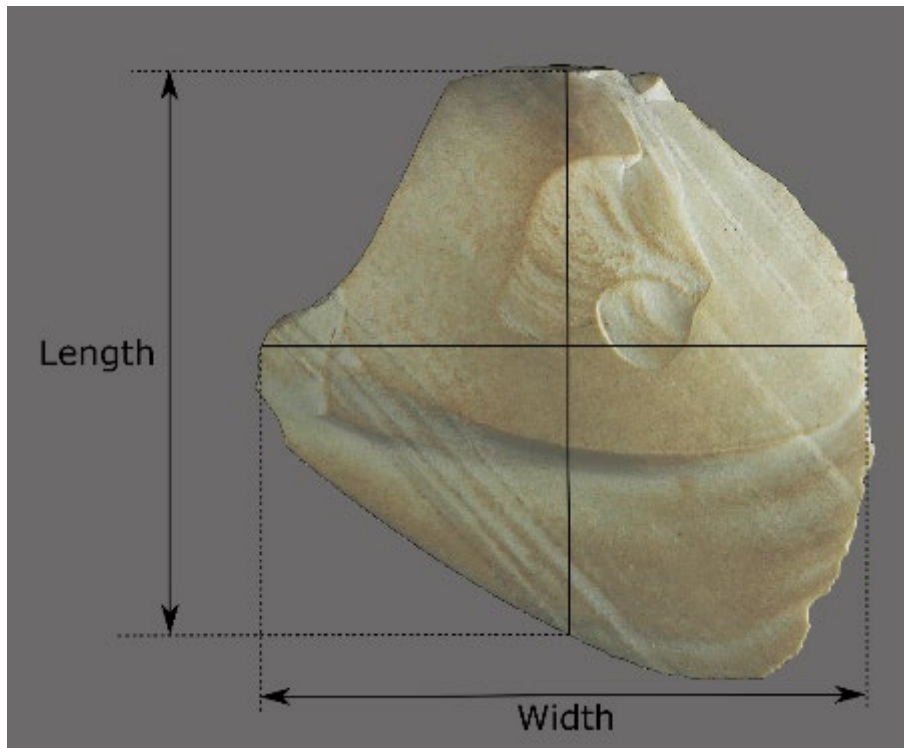
**Completeness:** This category records whether an artefact is complete or a fragment of a complete artefact. Cores were coded simply as complete or incomplete. Flakes (including retouched flakes) were coded as one of the following categories (following Hiscock 2002):

- **Complete:** A complete flake, in which the platform surface and all original flake margins are intact.
- **Distal fragment:** A broken flake which is missing its proximal end. These fragments do not possess their original platform surface.
- **Medial fragment:** A broken flake that is missing its proximal and distal ends. This fragment is the original flake's mid section, exhibiting dorsal scars and ventral surface features.
- **Proximal fragment:** A broken flake which is missing its distal margin, but retains the platform and initiation.
- **Longitudinal cone spit (LCS left and right):** A flake broken longitudinally, in which the break bifurcates the bulb of force and the ring crack (Inizan *et al.* 1999). This distinctive breakage pattern occurs during flaking event. Separate categories for left and right LCS portions were used to facilitate artefact number estimates. Note that the LCS category can only be applied if the bifurcated ring crack and bulb of force are present. Also known as a 'Siret' break, or (historically) a 'burin de Siret' (Inizan *et al.* 1999; Waechter *et al.* 1970)
- **Marginal fragment:** A flake broken transversely or longitudinally, which is lacking both its initiation and termination, and has a section of only one of the original flake's lateral margins.
- **Margin missing:** A flake which has been broken and is missing a portion, or several portions of its lateral margins, but which has retained both its platform and its distal margin.

**Length:** On flakes (including retouched flakes) this measurement was taken from the initiation point, along the percussion axis (Figure 6-2).

**Width:** On flakes (including retouched flakes) this measurement was taken perpendicular to length, and half way along length, from one margin of the flake to the other (Figure 6-2).

**Thickness:** On flakes (including retouched flakes) this measurement was taken at the intersection of length and width, and perpendicular to both length and width.



**Figure 6-2 Length, width and platform width measurements on a flake.**

**Implement type:** If artefacts had a suitable morphology to be classified into any existing formal tool types, this was recorded. Only types which are commonly in use in Australia were employed. These include backed artefacts (triangles, trapezes, crescents, trapezoids, woakwines, bondi points), juan knives, tula adzes, burren adzes, graters, horsehoof cores, scrapers, unifacial points, pirri points and bifacial points. Retouched flakes that do not fall into any established implement type were recorded as 'amorphously retouched flakes'.

## 6.3 Archaeological survey results

### 6.3.1 Survey coverage

Figure 1-1 illustrates the for location of project components within the study area, describing surface visibility and resulting surface coverage. A summary of the survey coverage and effective survey coverage is provided in Table 6-3.

Survey of each project component was restricted to areas within the study area's boundary. Note that the study area for each project component consists of the project area for that component (the area anticipated to be directly impacted) as well as a buffer zone surrounding the project area. Following the survey method, no effort was expended in surveying areas outside and adjacent to the boundaries of each project component's study area.

### 6.3.2 Ravensworth ash line

The proposed Ravensworth ash line passes through a landform of low rolling hills with low-gradient slopes, rounded tops, and flat-floored valleys free of erosion incision. Ephemeral drainage lines follow most of the valleys, as well as two semi-permanent or permanent creeklines: Pike's Creek and Bayswater Creek.

Existing above-ground pipelines run along the entire length of the ash line corridor. The ground under and adjacent to these pipelines shows remnant signs of earthworks carried out to level the ground surface when the pipelines were laid. The ground underneath and for two to four metres each side of the existing pipelines is interpreted as being highly disturbed as a result, and having negligible archaeological potential. Graded and stone-capped vehicle tracks run alongside the existing pipeline for most of the length of the ash-line corridor. These vehicle tracks and the ground immediately adjacent to them are highly disturbed by the grading, drain excavation, capping, and other earthworks required to construct the tracks. The vehicle tracks have negligible archaeological potential as a consequence. Various localised areas of disturbance occur along the ash line corridor, where it is crossed by road bridges and conveyors; and where graded and gravel-capped laydown yards have been constructed. As a result, remnant intact areas of ground that appear to be free of prior disturbance make up only a minority of the ash line corridor.

Areas of the corridor that appeared free of major prior disturbance were surveyed on foot. Areas that had obviously been subject to major ground disturbance, resulting in negligible remaining archaeological potential, were not surveyed on foot. The decision to exclude such areas from the on-foot survey was made by consensus of all fieldworkers, following the agreed survey method (see Appendix B).

The areas of ground surveyed (those areas free from major prior disturbance) were vegetated with thick grass and undergrowth cover, as well as leaf litter accumulated in treed areas. Exposed areas were rare to absent along the ash line corridor.

### **6.3.3 Ash dam augmentation**

The ash dam augmentation area consists of a landform of low rolling hills, with low to medium gradient slopes and rounded tops. Pike's Creek, a 1<sup>st</sup> order stream, runs through the area from the southwest to southeast. The landscape is hillier in the south of the area, and flatter in the north of the area.

The existing ash dam sits in the centre and covers the majority of the area. The dam wall runs north-south across the eastern end of the area, and areas inundated by water and ash slurry cover the majority of the area to the west of the dam. The construction of the dam wall and inundation of the ground surface by ash and water both represent a major disturbance to the original ground surface. Archaeological potential within these areas is negligible as a result.

The areas outside the existing ash dam can be divided into four contiguous sections: a section along the eastern edge, lying to the east of the existing dam wall; a section along the southern edge, running east-west along the southern edge of the currently inundated dam area; a section along the western edge, running north-south along the western edge of the currently inundated dam area; and a section along the northern edge, running east-west along the northern edge of the currently inundated dam area.

The section to the north of the dam area has been impacted by various prior ground-disturbing works. The proposed Ravensworth ash-line (see section 6.3.2) runs along the northern edge of this area. Adjacent to the ash dam itself, existing buildings, vehicle parking and laydown yards, vehicle tracks, and a pipeline have been constructed. A high-voltage powerline runs northwest-southeast through this section. The majority of this area has been subject to ground-disturbing works during the operational life of the ash dam and the power station. Areas without any signs of prior disturbance are rare, and the majority of the section has low to negligible archaeological potential as a result. The ground surface across this section has thick grass cover with eroded exposures. Exposures are randomly distributed and variable in size.

The section to the east of the dam wall shows no visible signs of disturbance, apart from those areas underneath or immediately adjacent to the dam wall itself, where buildings and other infrastructure, and earthworks to dam and control the course of Pike's Creek, which operate as seepage controls to manage and return seepage from the ash dam (AGL Macquaire, advice received 15/10/19) have been constructed. The only other noticeable source of ground disturbance in this area is the high-voltage powerline, which runs northeast-

southwest through the section. Areas adjacent to the pylons of this powerline are assumed to be highly disturbed and have negligible archaeological potential. Pike's Creek runs west to east through this section of the ash dam augmentation area. The current creekline is moderately incised, and follows a meandering course across the flat-floored valley. Areas of remnant swampy ground are visible in the current landscape adjacent to the creek, and it is probable that prior to European land-clearing and construction of the ash dam the creek possessed swamps and ponds in this section.

The section to the south of the ash dam consists of low rolling hills, some of which have small sections that have eroded to bedrock. The hills are round-topped, with low to moderate gradient sides and rounded flat-floored valleys. No signs of major prior ground disturbance were identified during the survey, and the ground surface in this area is interpreted as being intact. The original course of Pike's Creek would have run just to the north of this section. The ground surface in this section is covered in thick grass cover. Eroded exposures are rare. Some of the eroded exposures are located on moderate slopes, and have eroded to bedrock, a process that has probably removed all archaeological material that might have existed there. These severely eroded areas are rare across the area overall, however. Across most of the area the regolith consists of soils.

The section to the west of the ash dam consists of low rolling hills, which are round-topped, with low gradient sides and rounded flat-floored valleys. There are various visible signs of prior disturbance to the ground surface in the western section. Various vehicle tracks run through the section. Artificial ponds have been constructed, and signs of water ponding against the western edge of the ash dam are identifiable. Ponding of water in this section is probably the result of rainwater runoff from the ground to the west, which ponds against the artificially raised ground along the western edge of the ash dam. High voltage powerlines also run through this section. The ground is patterned with linear plough lines and furrows, indicating that the entire area has probably been subject to the low-level disturbance of ground ploughing and perhaps contour bank formation in the recent past. The ground surface is vegetated with thick grass cover. Eroded exposures, randomly distributed and of varying size, are present across this section.

#### **6.3.4 Salt cake landfill**

The salt cake landfill area lies within a landscape of low rolling round-topped hills, which are forested with moderately dense tree cover. The area itself, however, has been artificially flattened by prior excavation. A vertical excavation face extends along the northern boundary of the salt cake landfill area, which results from the ground surface of the area having been lowered to bring it level with the natural terrain to the south of the landfill area.

The flattening of the landfill area represents a major disturbance to most if not all of the area. The earthworks involved have removed the pre-contact ground surface, and would have removed all archaeological material that might have existed on this ground surface or in sub-surface soils and sediments.

The flat area of ground created through these earthworks has been subject to further ground-disturbance works. A rectilinear array of vehicle tracks have been formed across most of the area, with the possible exception of the western and southwestern edges of the area. Most of the areas of ground between these vehicle tracks are currently being used as laydown yards for vehicles, equipment and excavated fill material. Much of the landfill area is covered with imported gravel.

It is possible that a narrow band of undisturbed ground remains along the southern and western edges of the landfill area. Similarly, areas above the vertical excavation face running along the north of the area might also be undisturbed and retain some archaeological potential.

### **6.3.5 Coal handling plant**

The coal handling plant lies within a landscape of low rolling round-topped hills, which are forested with moderately dense tree cover. The area itself is highly disturbed by prior works, and is surrounded by areas that are similarly highly disturbed.

The majority of the area is currently buried underneath a coal stockpile, which itself sits on an area of ground that has been artificially lowered several metres by prior earthwork. The coal stockpile is surrounded by a drainage trench and a vertical excavation face rising up to the surrounding ground surface. The pre-contact ground surface, along with any archaeological material that might have existed there, has been removed in the process of excavating this lowered area of ground.

Areas of ground outside the coal stockpile itself also have signs of major prior ground disturbance. An encircling chain-link fence has been placed around the coal stockpile, on the ground surface above and adjacent to the vertical excavation face. The ground surface adjacent to this fence shows signs of earthwork associated with its construction, in the form of graded or flattened ground, and incised drainage channels diverting water runoff away from the fence and the coal stockpile within it.

Sealed roads encircle the coal handling plant on three sides (west, north and east). The roads are associated with visible signs of major ground disturbance, including earthworks to level the ground surface and to cut drainage channels adjacent to the roads. It is probable that areas of ground between the encircling roads and the coal handling plant were subject to extensive disturbance during construction of the roads either through direct impact of road-creating earthworks or through the movement of roadwork vehicles.

The ground surface lying between the roads and the coal stockpile fence is covered in thick mown grass, with dense plantings of trees in some areas. In planted areas, the ground surface is covered with leaf and bark litter.

To the south, the coal handling plant area is immediately adjacent to the power station itself. A dense array of buildings, conveyors, vehicle tracks, carparks and other infrastructure cover all the ground between the coal stockpile and the power station.

The entirety of the coal handling plant area is interpreted as having been subjected to major ground disturbance during the construction and operation of the power station. Archaeological potential in this area is negligible as a result.

### **6.3.6 Borrow pit 1**

This area consists of low rolling hills, round topped, with low to medium gradient slopes, and flat-floored valleys. The ground surface rises upward to the north, toward the hilltops bordering the ash dam. To the south the ground surface slopes downward into a flat-floored valley running east-west along the area's southern border. A 1<sup>st</sup> order stream runs east through this valley, eventually joining Pike's Creek to the northeast.

Some small farm dams have been constructed along drainage lines within the area. No other signs of prior ground disturbance, aside from erosion, were identified in this area during the survey.

The ground surface is covered in thick grass, with sparse to no tree cover. Exposed areas of ground are rare. No areas of exposed bedrock were observed – instead, the ground surface consists of topsoil, the thickness of which could not be gauged.

The stream running along the southern edge of the area is slightly incised. Adjacent to the stream is a flattened benched area, probably a remnant of the banks of the stream prior to its incising down. Immediately adjacent to the current streambed, eroded exposed ground is present. The course of the stream is meandering, with areas



of swampy ground and signs of ephemeral ponds visible in the ground surface. It is probable that this creek incorporated ponds and swampy areas prior to European land clearing.

#### **6.3.7 Borrow pit 2**

This area consists of rolling hills that are round-topped with medium to steep gradient slopes. The ground is highest in the centre of the area, dropping away to the north, east and west. The slopes running eastward drain into the headwaters of Pike's Creek. The slopes in the west and south of the area drain into Wiseman's Creek, which runs past the southern boundary of the area.

Erosion has stripped away the soil from several of the steepest slopes, and in some areas has exposed the underlying bedrock. In most areas, erosion has stripped away all topsoil and exposed the underlying yellow-orange subsoil. The edges of these eroded areas indicate that topsoil across the area is less than 10 cm thick.

Some small farm dams have been constructed along drainage lines within the area. No other signs of prior ground disturbance, aside from erosion, were identified in this area during the survey.

The ground surface is covered in thick grass, with sparse to no tree cover.

#### **6.3.8 Borrow pit 3**

This area consists of rolling hills that are round-topped with low to medium gradient slopes. The ground between the hills forms flat-floored valleys. The ground slopes downward toward the west of the area. An ephemeral creek runs from east to west through the centre of the area. This creek eventually joins Wisemans Creek to the west.

The ground surface is covered in moderate to thick grass cover, with sparse to no tree cover. Eroded exposures are moderately common across the area, are randomly distributed and of varying size.

Two farm dams have been constructed on the ephemeral creek running through the area. No other signs of prior ground disturbance, aside from erosion, were identified in this area during the survey.

#### **6.3.9 Borrow pit 4**

This area consists of rolling hills, with rounded tops, low gradient slopes and flat-floored valleys. The ground slopes downward to the northwest and south of the area. The southern half (approximately) of the area drains southward into a small ephemeral creek that runs southwest into Plashett Reservoir. The northern half of the area drains to the northwest into Wisemans Creek. Wisemans Creek runs west to east along the area's northern boundary.

The ground surface is covered in moderate to thick grass cover, with sparse to no tree cover. Eroded exposures are rare across the area, are randomly distributed and of varying size.

Some farm dams have been constructed on the ephemeral creek running through the area. Contour banks have been cut into the side of the hillslope toward the northern edge of the area, to control water runoff into Wisemans Creek. No other signs of prior ground disturbance, aside from erosion, were identified in this area during the survey.

#### **6.3.10 HP pipe clearing (south)**

This area consists of low rolling hills, with rounded tops, low to medium gradient slopes, and flat-floored valleys. The ground surface generally slopes downward toward the south and the east, though the area passes through a landscape in which the topography is undulating and the orientation of slopes is variable.

Parnell's creek lies to the southeast of the area, running in a southwest direction toward the Hunter River. Parnell's creek passes immediately adjacent to the southern end of the HP pipeline, while the Hunter River lies approximately one kilometer to the southwest. Just over a kilometer to the northwest of the area, Saltwater creek flows in a southeast direction to join with the Hunter River. A number of ephemeral drainage lines run southeast from the HP pipe area to join Parnell's Creek. The presence of multiple watercourses in the surrounding landscape means that the HP pipe area would have been an area frequently travelled through or camped on by Aboriginal groups living in the region. There are currently no areas with permanent or standing water within the HP pipe area, however, so no particular point within the area has high archaeological potential.

The ground surface is covered in thick grass cover, with sparse to moderate tree cover. Ground surface visibility is close to zero, with no areas of ground exposure being observed during the survey.

A number of roads and vehicle tracks run through the area. These have created areas of localised high prior disturbance, with no remaining archaeological potential. The installation of the HP pipe has similarly created areas of localised disturbance. The ground immediately underneath the HP pipe can be assumed to be severely disturbed, as ground-disturbing works such as stripping of topsoil and excavation of platforms for the pipe's concrete footings; and levelling of terrain in areas between the footings to enable alignment of the pipe, would have been carried out along most or all of the above-ground pipeline's length (see Figure 6-20). It can be inferred from this that the ground immediately beneath the pipe has no archaeological potential.

Areas adjacent to the HP pipeline would have been disturbed by the creation of access tracks for the vehicles needed for pipeline construction. It can be assumed that a vehicle corridor on either side of the pipeline would have been disturbed through vehicle movements during construction. Other areas along the pipeline corridor might also have been disturbed through the creation of laydown areas for vehicles and equipment, and stockpile areas for excavated materials or fill (AGL Macquarie, advice received 15/10/19). If the disturbance of the ground resulting from these processes was sufficiently severe, it would remove any archaeological potential the area had. At present, however, it is not clear whether the impacts were this severe, based on observations made during the archaeological survey. The ground surface around the pipeline shows no visible signs of severe disturbance, such as downcut or flattened areas created through excavation or track grading. At this point, the precautionary conclusion is drawn that disturbance around the pipe would have functioned to reduce, but not entirely remove, the area's archaeological potential. Further investigation of the area, consisting of detailed survey and test excavations (see Section 9) would enhance our understanding of the nature and severity of prior disturbance.

In addition, sections of the HP pipeline are installed below ground and would have involved excavations approximately three metres wide and four metres deep (AGL Macquarie, advice received 15/10/19). In these areas the level of surface and subsurface disturbance would have been high, and any Aboriginal objects that might have been present on or under the original ground surface would now be destroyed, removed from the area, or scattered and distributed within the fill material around the subsurface pipe. As a consequence, the sections of pipeline in which the pipe is installed below the ground have no remaining archaeological potential.

#### **6.3.11 HP pipe (north) and LSP pipe clearing**

This area consists of the lower slopes and flat valley floor of a landscape of low rolling hills. The ground surface within the area consists of flat or very low gradient slopes.

The headwaters of Wisemans Creek cross through the southern end of the area. The southern two thirds of the area drain southwards into Wiseman's Creek. The northern third of the area drain northeast toward Pike's Creek, though the exact location of Pike's Creek in relation to the area is now difficult to reconstruct due to the existence of the ash dam and associated earthworks and dams. It is possible that ephemeral ponds and swamps existed within or close to the area, associated with these two Creeks and their feeder drainage lines.

The ground surface is covered in thick grass cover, with sparse tree cover. Ground surface visibility is close to zero, with no areas of ground exposure being observed during the survey.

A number of roads and vehicle tracks run through the area. These have created areas of localised high prior disturbance, with no remaining archaeological potential. The installation of the HP and LSP pipes have similarly created areas of localised disturbance. The ground immediately underneath the HP and LSP pipe can be assumed to be severely disturbed, as ground-disturbing works such as stripping of topsoil and excavation of platforms for the pipe's concrete footings; and levelling of terrain in areas between the footings to enable alignment of the pipe, would have been carried out along most or all of the above-ground pipeline's length. It can be inferred from this that the ground immediately beneath the pipe has no archaeological potential.

Areas adjacent to the HP and LSP pipeline would have been disturbed by the creation of access tracks for the vehicles needed for pipeline construction. It can be assumed that a vehicle corridor on either side of the pipelines would have been disturbed through vehicle movements during construction. Other areas along the pipeline corridor might also have been disturbed through the creation of laydown areas for vehicles and equipment, and stockpile areas for excavated materials or fill (AGL Macquarie, advice received 15/10/19). If the disturbance of the ground resulting from these processes was sufficiently severe, it would remove any archaeological potential the area had. At present, however, it is not clear whether the impacts were this severe, based on observations made during the archaeological survey. The ground surface around the pipeline shows no visible signs of severe disturbance, such as downcut or flattened areas created through excavation or track grading. At this point, the precautionary conclusion is drawn that disturbance around the pipe would have functioned to reduce, but not entirely remove, the area's archaeological potential. Further investigation of the area, consisting of detailed survey and test excavations (see Section 9) would enhance our understanding of the nature and severity of prior disturbance.

In addition, sections of the HP pipeline are installed below ground and would have involved excavations approximately three metres wide and four metres deep (AGL Macquarie, advice received 15/10/19). In these areas the level of surface and subsurface disturbance would have been high, and any Aboriginal objects that might have been present on or under the original ground surface would now be destroyed, removed from the area, or scattered and distributed within the fill material around the subsurface pipe. As a consequence, the sections of pipeline in which the pipe is installed below the ground have no remaining archaeological potential.

**Table 6-3 Summary of survey coverage by project component**

Survey Unit	Landform	Survey unit area (square km)	Visibility within exposures %	Exposure %	Effective coverage area (square km)	Effective coverage %
Ravensthorpe ash line	Rolling hills, low gradient slopes	0.4	90	1	0.0036	0.9
Ash dam augmentation	Rolling hills, low to medium gradient slopes	2.2	100	2.5	0.055	2.5
Salt cake landfill	Rolling hills, low gradient slopes	0.3	5	50	0.0075	2.5
Coal handling plant	Rolling hills, low gradient slopes	0.5	100	5	0.025	5
HP pipe clearing (south)	Rolling hills, low to medium gradient slopes	0.05	100	1	0.0005	1

Survey Unit	Landform	Survey unit area (square km)	Visibility within exposures %	Exposure %	Effective coverage area (square km)	Effective coverage %
HP pipe (north) and LSP pipe clearing	Rolling hills, low gradient slopes	0.05	100	1	0.0005	1
Borrow pit 1	Rolling hills, low to medium gradient slopes	0.2	100	2.5	0.005	2.5
Borrow pit 2	Rolling hills, medium to steep gradient slopes	0.2	100	5	0.01	5
Borrow pit 3	Rolling hills, low to medium gradient slopes	0.3	100	5	0.015	5
Borrow pit 4	Rolling hills, low gradient slopes	1.1	100	2.5	0.275	2.5

### 6.3.12 Aboriginal sites

Fourteen sites have previously been recorded within the study area (Table 6-4, see also Section 6.1.1).

This assessment identified an additional 23 sites (including isolated artefacts, artefact scatters, areas of PAD and artefact scatters with associated areas of PAD) ) as illustrated in Figures 6-3 to 6-8.

**Table 6-4 Summary of sites in the study area.**

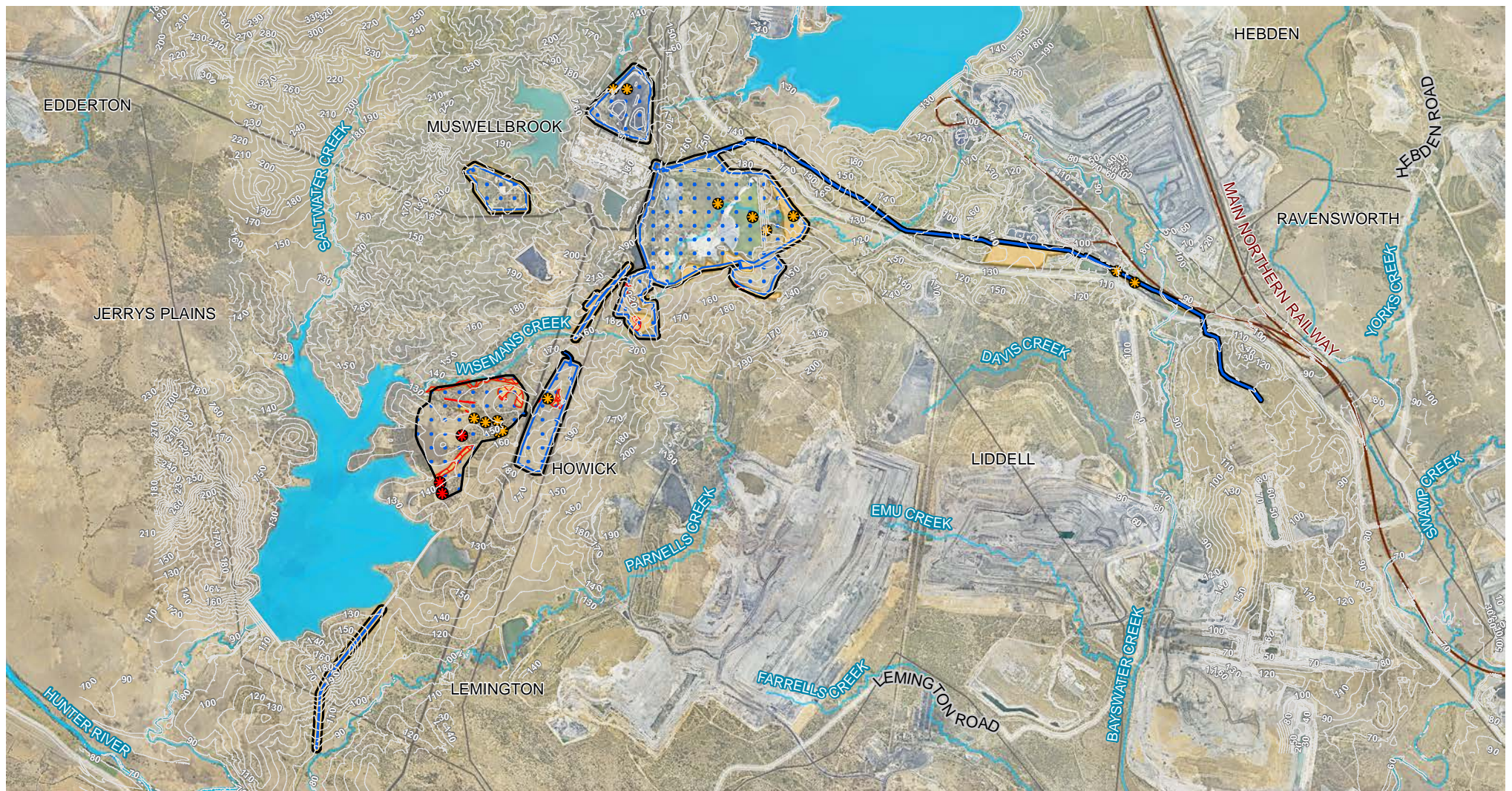
Site ID	Project component area	Recorded by	Site type	Number of stone artefacts recorded	Other site features	Current status
37-3-1128	Ravensworth ash line	Umwelt, 2010	Isolated artefact	1		Recorded as destroyed
37-3-0491	Ravensworth ash line	Umwelt, 2000	Artefact scatter	3		Intact
37-2-0063	Coal handling plant	Dyall, 1978	Artefact scatter	More than 240		Presumed destroyed <sup>1</sup>
37-2-0062	Coal handling plant	Dyall, 1978	Artefact scatter	Unquantified	Hearths	Presumed destroyed <sup>1</sup>
37-2-0065	Ash dam augmentation	Unknown (no site card exists for this site)	Unknown	Unknown	Unknown	Presumed destroyed <sup>1</sup>
37-2-0047 / 37-2-0050	Ash dam augmentation	Dyall, 1978	Artefact scatter	Unquantified		Presumed destroyed <sup>1</sup>
37-3-007	Ash dam augmentation	Dyall, 1978	Artefact scatter	6		Presumed destroyed <sup>1</sup>
37-2-0048	Ash dam augmentation	Dyall, 1978	Artefact scatter	Unquantified		Intact

Site ID	Project component area	Recorded by	Site type	Number of stone artefacts recorded	Other site features	Current status
37-2-0058	Borrow pits	Koettig 1992	Artefact scatter	4		Intact
37-2-0557	Borrow pits	Koettig, 1992	Artefact scatter	20		Intact
37-2-0556	Borrow pits	Koettig, 1992	Artefact scatter	Unquantified		Intact
37-2-0555	Borrow pits	Koettig, 1992	Artefact scatter	Unquantified		Intact
37-2-0553	Borrow pits	Koettig, 1992	Artefact scatter	Unquantified		Intact
37-2-0554	Borrow pits	Koettig, 1992	Artefact scatter	Unquantified		Intact
BAYS PAD17	Ravensworth ash line	This assessment	PAD	0		Intact
BAYS PAD18	Ravensworth ash line	This assessment	PAD	0		Intact
BAYS PAD19	Ravensworth ash line	This assessment	PAD	0		Intact
BAYS PAD13	Salt cake landfill	This assessment	PAD	0		Intact
BAYS PAD08	HP and LSP pipe clearing	This assessment	PAD	0		Intact
BAYS PAD16	Ash dam augmentation	This assessment	PAD	0		Intact
BAYS PAD14	Ash dam augmentation	This assessment	PAD	0		Intact
BAYS AS and PAD15	Borrow pits	This assessment	Artefact scatter and PAD	13		Intact
BAYS AS09	Borrow pits	This assessment	Artefact scatter	4		Intact
BAYS AS and PAD10	Borrow pits	This assessment	Artefact scatter and PAD	6		Intact
BAYS PAD12	Borrow pits	This assessment	PAD	0		Intact
BAYS AS and PAD11	Borrow pits	This assessment	Artefact scatter and PAD	27	Probable Aboriginal hearth	Intact
BAYS AS and PAD07	Borrow pits	This assessment	Artefact scatter and PAD	17		Intact
BAYS AS06	Borrow pits	This assessment	Artefact scatter	6		Intact
BAYS AS and PAD05	Borrow pits	This assessment	Artefact scatter and PAD	135		Intact
BAYS AS04	Borrow pits	This assessment	Artefact scatter	25		Intact
BAYS AS and PAD03	Borrow pits	This assessment	Artefact scatter and PAD	8		Intact
BAYS IF04	Borrow pits	This assessment	Isolated artefact	1		Intact
BAYS AS and PAD02	Borrow pits	This assessment	Artefact scatter and PAD	1		Intact
BAYS IF03	Borrow pits	This assessment	Isolated artefact	1		Intact

Site ID	Project component area	Recorded by	Site type	Number of stone artefacts recorded	Other site features	Current status
BAYS IF02	Borrow pits	This assessment	Isolated artefact	1		Intact
BAYS IF01	Borrow pits	This assessment	Isolated artefact	1		Intact
BAYS PAD01	HP and LSP line clearing	This assessment	PAD	0		Intact

<sup>1</sup> Site presumed destroyed as its recorded location is within an area severely impacted by existing operational infrastructure.





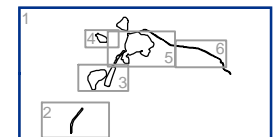
Study area Project area AHIMS Isolated find (IF) Artefact scatter (ASS) PAD (PAD) 10m contours



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GDA94 MGA56

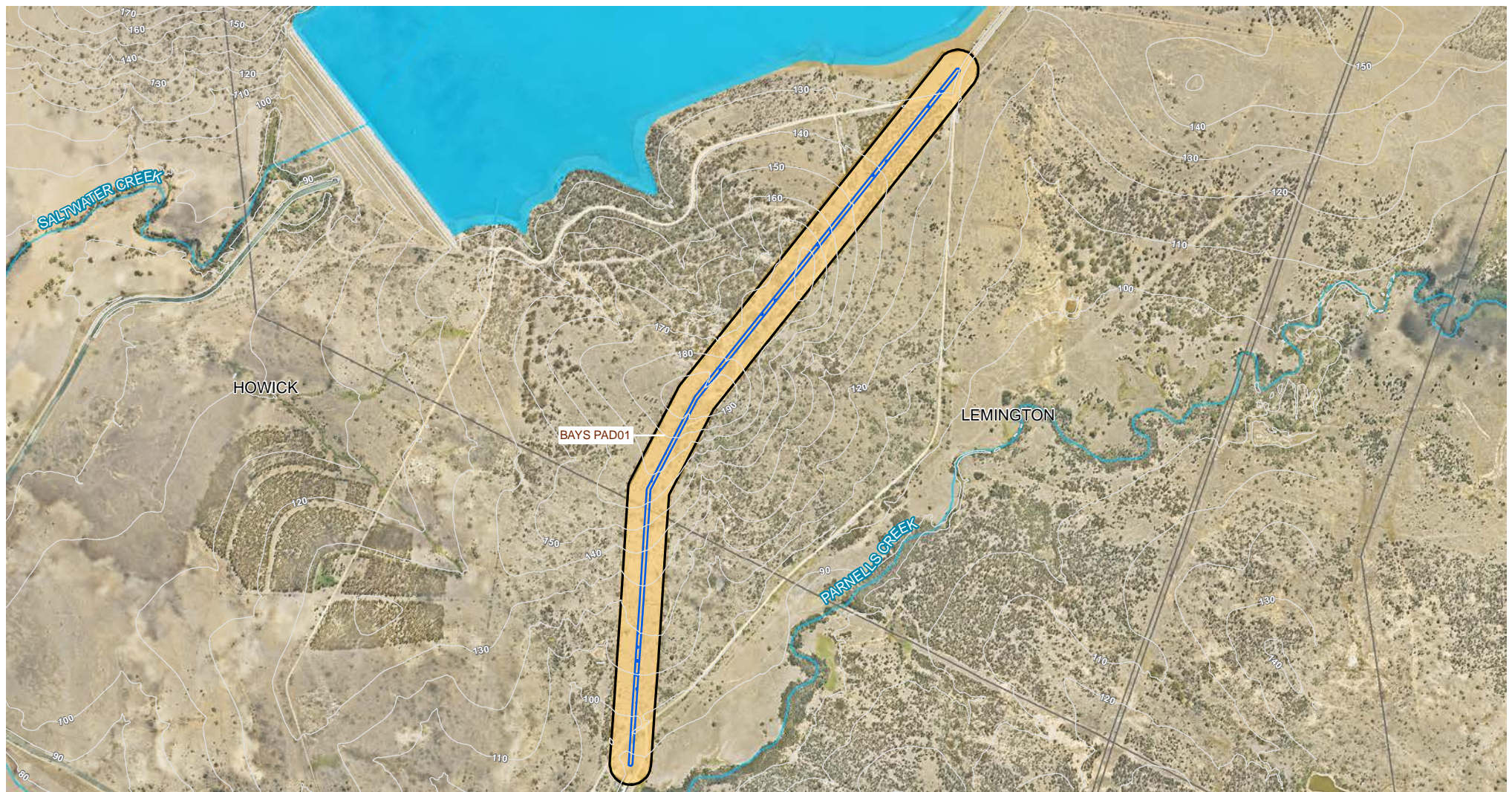
#### Data sources

Jacobs 2019, AGL 2019,  
NSW Spatial Services 2019



**Figure 6-3** Overview of project area showing all Aboriginal sites





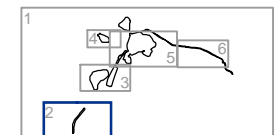
Study area Project area PAD (PAD) 10m contours

0 250 500 m

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GDA94 MGA56

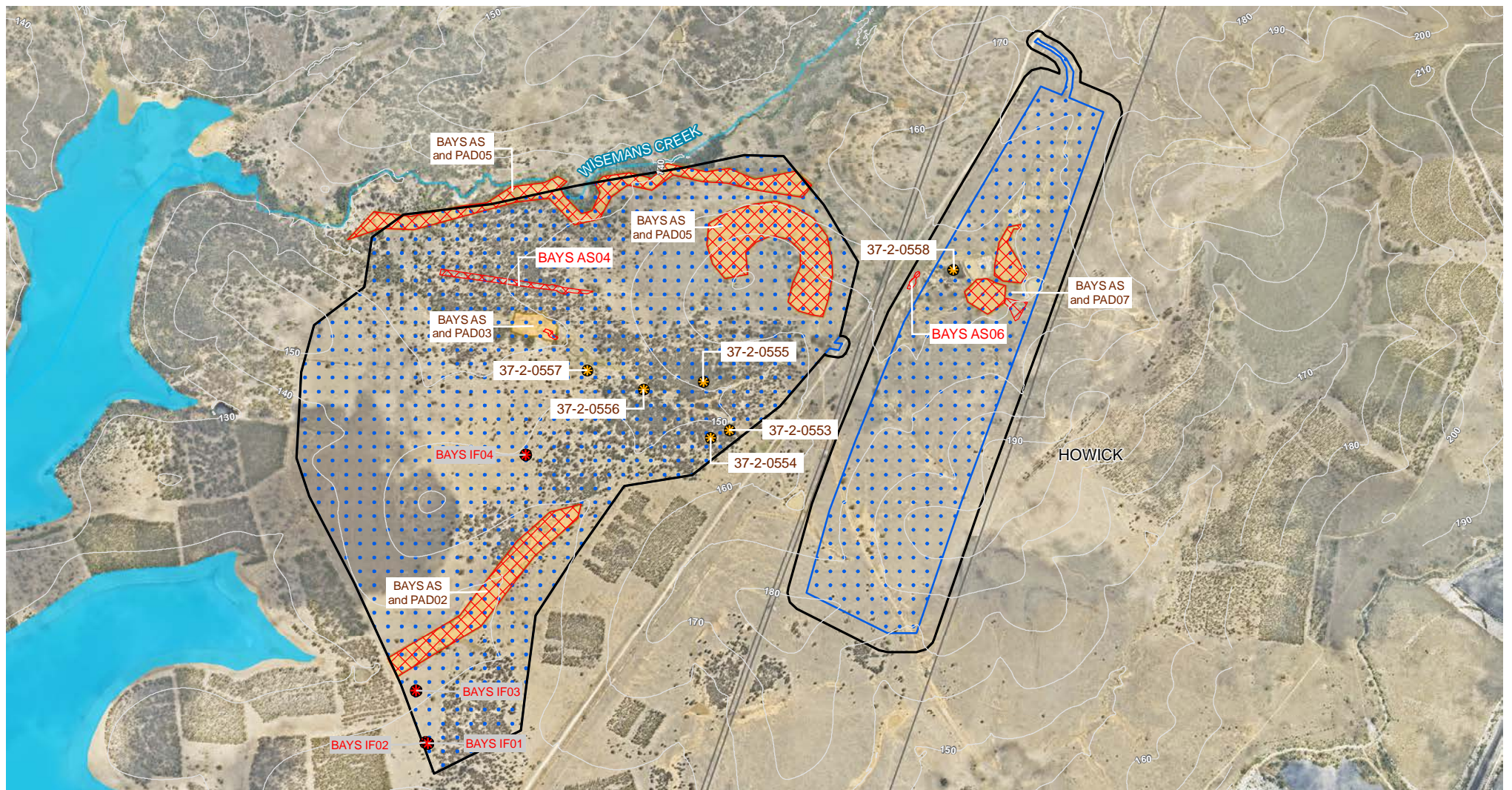
#### Data sources

Jacobs 2019, AGL 2019,  
NSW Spatial Services 2019

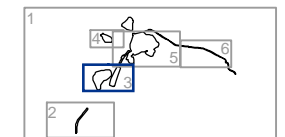
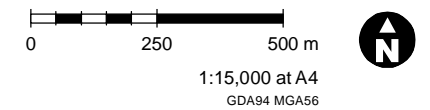


**Figure 6-4** Aboriginal sites within the HP pipe clearing area (south)





Study area Project area AHIMS Isolated find (IF) Artefact scatter (ASS) PAD (PAD) 10m contours

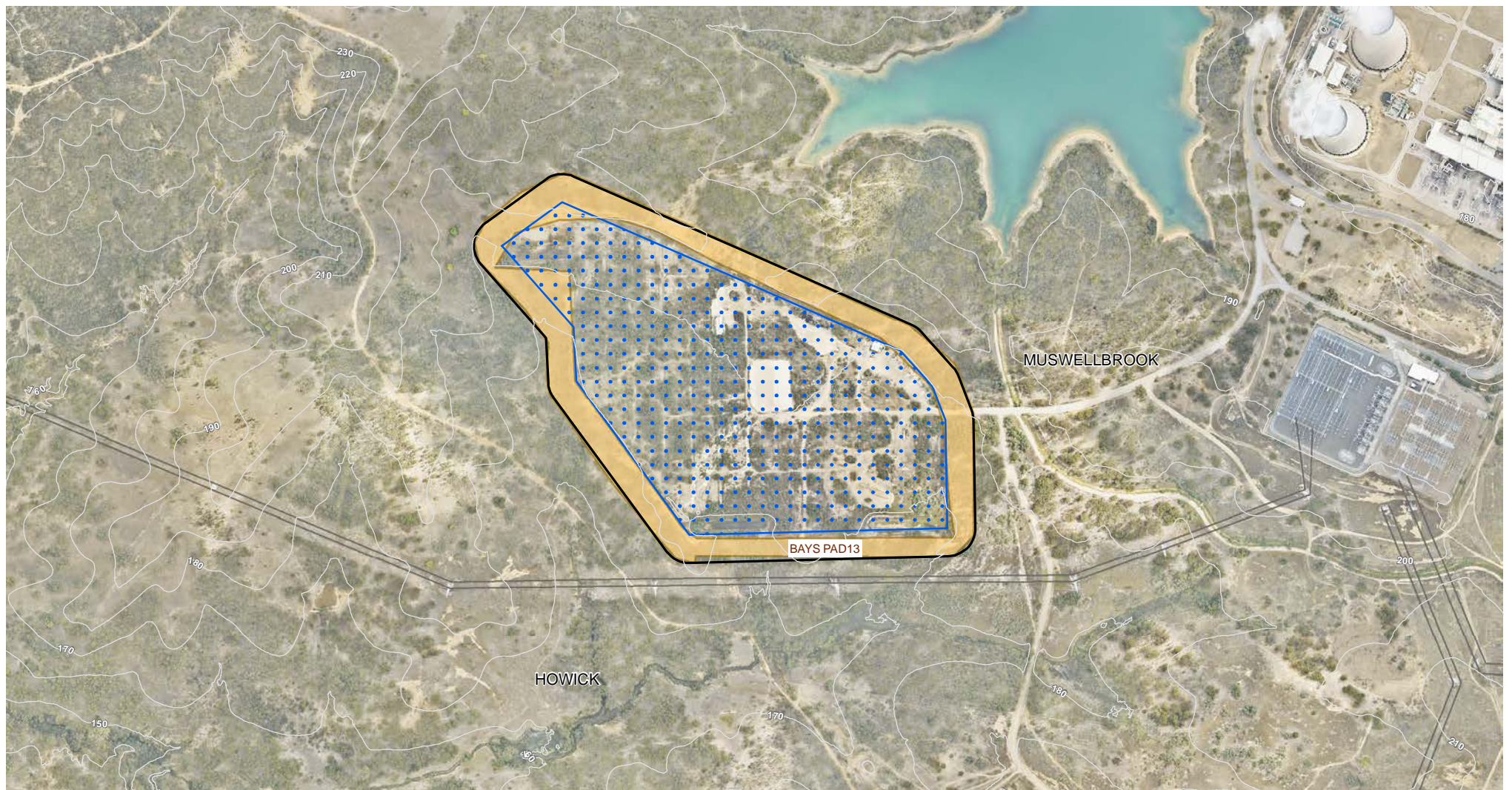


#### Data sources

Jacobs 2019, AGL 2019,  
NSW Spatial Services 2019

**Figure 6-5** Aboriginal sites within borrow pit 3 and borrow pit 4





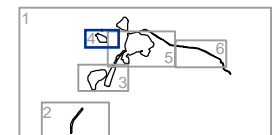
Study area Project area PAD (PAD) 10m contours



1:10,000 at A4  
GDA94 MGA56

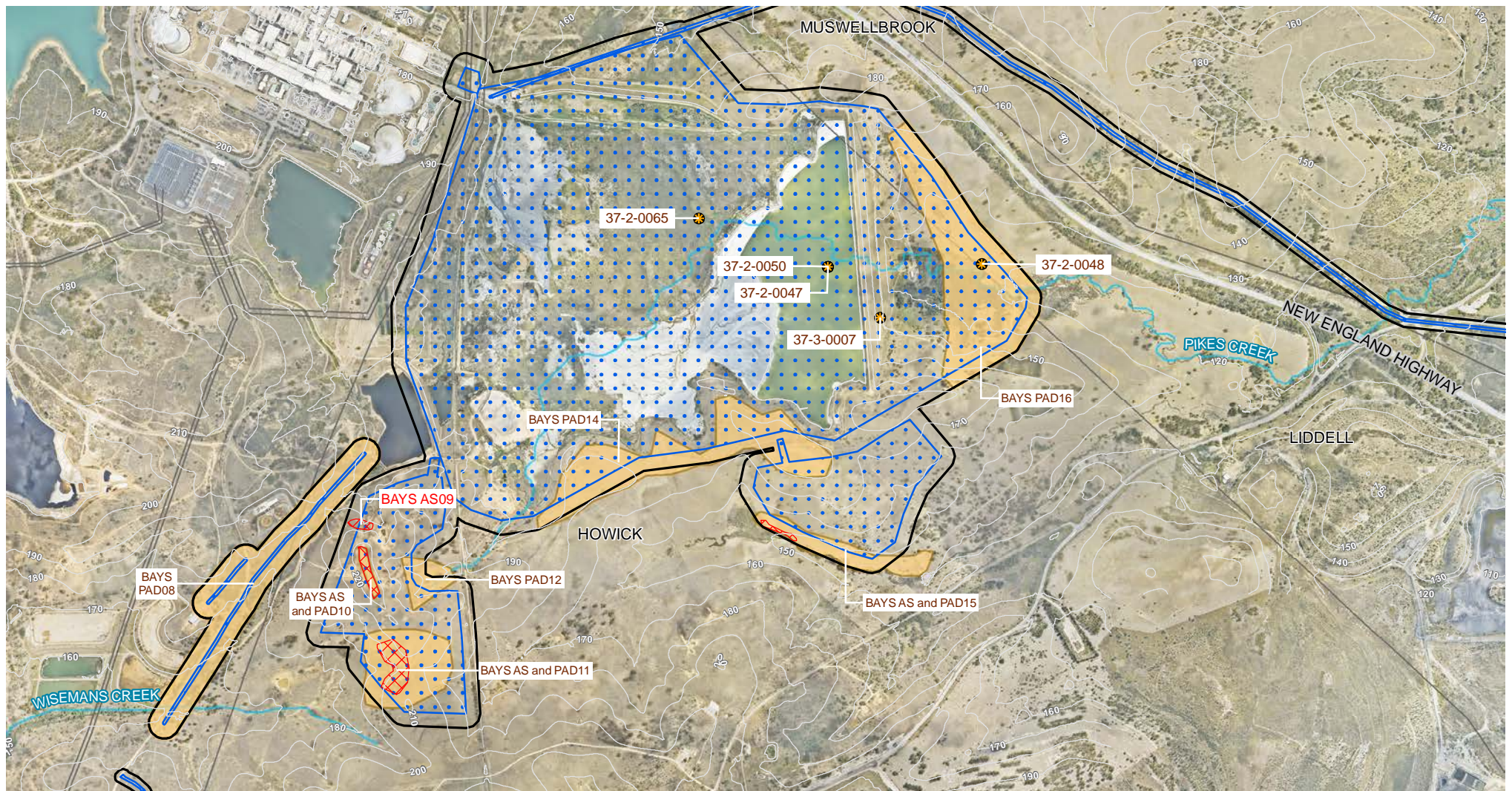
#### Data sources

Jacobs 2019, AGL 2019,  
NSW Spatial Services 2019

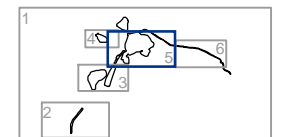
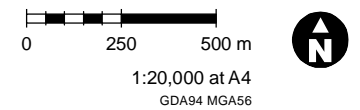


**Figure 6-6** Aboriginal sites within the salt cake landfill





Study area Project area ABHMS Artefact scatter (ASS) PAD (PAD) 10m contours



#### Data sources

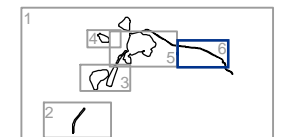
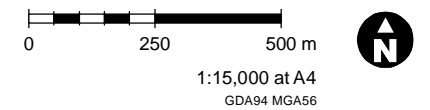
Jacobs 2019, AGL 2019,  
 NSW Spatial Services 2019

**Figure 6-7** Aboriginal sites within the HP (north) and LSP pipe clearing area; borrow pit 1; borrow pit 2; and ash dam augmentation area





Study area Project area AHIMS PAD (PAD) 10m contours



#### Data sources

Jacobs 2019, AGL 2019,  
NSW Spatial Services 2019

**Figure 6-8** Aboriginal sites within the Ravensworth ash line area



#### 6.3.12.1.1 BAYS AS and PAD05

Project component: Borrow pit 4 (Figure 6-5)

This site is a scatter of surface artefacts and an overlapping area of PAD. Artefacts occur on the upper, mid and lower slopes of a round-topped hill (Figure 6-9), and extend downward to the banks of Wisemans Creek to the northwest. An area of PAD extends along the southern bank of Wisemans Creek (Figure 6-10) (the northern bank lies outside the area of Borrow pit 4 and so was not assessed).



**Figure 6-9 Exposed area on a midslope looking east, part of BAYS AS and PAD05**



**Figure 6-10 Area of PAD along the southern bank of Wisemans Creek looking west, part of BAYS AS and PAD05**

Wisemans Creek is a semi-permanent or permanent creek, and lies immediately adjacent to the site. The creek flows along a slightly incised meandering course, with areas of swampy ground and visible signs of ephemeral ponds associated with the current watercourse. It is probable that this creek consisted of a chain of ponds and swamps prior to European land clearing.

One hundred and thirty five surface artefacts were recorded (Table 6-5). Most of these were unretouched flakes, with retouched flakes, flaked pieces, cores and hammers also present. IMSTC was the most common material, followed by silcrete, quartz, and quartzite.

**Table 6-5 Artefacts found at BAYS AS and PAD05 by type and material**

Type	IMSTC	Silcrete	Quartz	Quartzite	Sum
Unretouched flake	65	35	6	1	107
Retouched flake	8	3	0	0	11
Flaked piece	7	1	0	0	8
Core	5	2	0	0	7
Hammer	0	0	0	2	2
Sum	85	41	6	3	135

The middle and upper slopes of the hill, on which most surface artefacts were found, is assessed as having low potential for artefacts to be present in subsurface deposits. This part of the site appears to have been heavily eroded following European contact, with thin or no topsoils present. Patches of remnant pre-European topsoil might survive in isolated areas across the hill, but identifying these would be difficult without an exhaustive program of archaeological excavation. It is likely that soils now present on the upper and mid slopes are reworked deposits of material washed from further upslope. These soils are likely to be very thin. They could contain some artefactual material, but subsurface material is likely to be sparser than the surface assemblage, and consequently would be difficult to detect through a typical program of test excavation.

The lower slopes of the hill, and the adjacent banks of Wisemans Creek, by contrast, have a high potential to contain artefactual material. In these areas, the regolith is likely to be a complex layering or mixture of the pre-contact creek bank alluvium, pre-contact soil formation on this alluvium or on the lower slope subsoil, and more recent alluvial material from creek flood events, and recent colluvial material from downslope erosion of the slopes above.

Artefacts that were deposited in the pre-contact creek bank sediments or the pre-contact lower slope soils are likely to be present in the present subsurface sediments and soils as a result, having been buried under recent alluvial and colluvial deposit.

This possibility is strengthened by the finding, during this survey, of a number of artefacts on the surface in erosional surfaces immediately adjacent to the current creek line. These artefacts have probably eroded out of the current creek bank at times when the water level is higher and the creek banks are scoured back by flooding. Intact areas of creek bank are therefore likely to contain artefacts as well.

The potential for subsurface artefacts to be present in sufficiently high density to be detectable by test excavation is assessed as being moderate to high. The archaeological and cultural significance of this artefactual material is currently unknown.

#### **6.3.12.1.2 BAYS AS04**

Project component: Borrow pit 4 (Figure 6-5)

This site is a sparse scatter of stone artefacts on the ground surface, found in the exposed ground created by a vehicle track and its associated erosional exposures. The vehicle track is uncapped and shows no signs of having been graded (Figure 6-11).





**Figure 6-11 Exposure along vehicle track (foreground) looking southwest, BAYS AS04**

Wisemans Creek lies approximately 200 m to the north. An ephemeral creek lies approximately 100 m to the south.

Twenty-five artefacts were recorded (Table 6-6). Most artefacts were unretouched flakes, with flaked pieces, a retouched flake, a core and a hammer also present. IMSTC was the most common material, followed by silcrete, igneous rock, and quartzite.

**Table 6-6 Artefacts found at BAYS AS04 by Type and Material**

Type	IMSTC	Silcrete	Igneous	Quartzite	Sum
Unretouched flake	13	5	0	1	19
Flaked piece	3	0	0	0	3
Core	0	1	0	0	1
Hammer	0	0	1	0	1

Type	IMSTC	Silcrete	Igneous	Quartzite	Sum
Retouched flake	0	1	0	0	1
Sum	16	7	1	1	25

The potential for artefacts to be present in subsurface deposits in the immediately surrounding landscape is assessed as being low. The surface assemblage along the vehicle track is sparse. It is likely that the ground surrounding the site contains subsurface artefacts, but these are likely to be similarly sparse and consequently would be difficult to detect through a typical program of test excavation.

#### 6.3.12.1.3 BAYS AS and PAD03

Project component: Borrow pit 4 (Figure 6-5)

This site is a scatter of surface artefacts clustered around an incised ephemeral creek. The artefacts are lying on flat areas of ground immediately adjacent to the creek, which has been downcut by 0.5 – 1 m. Artefacts were found in eroded exposures within this flat area of ground, most of which is thickly grassed and retains topsoil (Figure 6-12).



Figure 6-12 BAYS AS and PAD03 looking east

The creek follows a slightly meandering course through a flat-floored valley, and retains some visible signs of ephemeral ponds. It is probable that prior to European land-clearing, this creek consisted of a chain of ponds and swampy areas.

Eight artefacts were recorded, seven of which are unretouched flakes and one of which is a retouched flake (Table 6-7). Silcrete is the most common material, with one artefact made from IMSTC. The pieces of silcrete are similar in grain size and general appearance, and it is possible these artefacts could be part of a knapping floor.

**Table 6-7 Artefacts found at BAYS AS and PAD03 by type and material**

Type	Silcrete	IMSTC	Sum
Unretouched flake	6	1	7
Retouched flake	1	0	1
Sum	7	1	8

The ground adjacent to the artefact scatter has the potential to contain subsurface artefacts in densities high enough to be detected through a program of test excavation. The regolith of the flat floor of the valley is likely to consist of old alluvial deposit and remnant pre-contact topsoil, although this topsoil might have been depleted through erosion in the post-contact period, and might have been substantially reworked and mixed with newer alluvium. The presence of a moderately dense surface scatter of artefacts in area of eroded ground within this landform makes it likely that a subsurface assemblage of similar density extends through the adjacent ground.

The potential for artefacts to be present in subsurface deposits within the area of PAD, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.4 BAYS IF04**

Project component: Borrow pit 4 (Figure 6-5)

This site is an isolated artefact, found in a small eroded exposure on a saddle between two low round-topped hills. The artefact is an unretouched flake made from IMSTC (Table 6-8).

An ephemeral creek lies around 200 m to the southeast of the artefact.

**Table 6-8 Artefacts found at BAYS IF04 by type and material**

Type	IMSTC	Sum
Unretouched flake	1	1
Sum	1	1

The potential for additional artefacts to be present in subsurface deposits in this area is assessed as being low. The isolated surface artefact is not associated with any larger scatter. If artefacts are present in subsurface deposits in the immediately surrounding area, they are unlikely to be in sufficiently high density to be detectable through a typical program of test excavation.

#### **6.3.12.1.5 BAYS AS and PAD02**

Project component: Borrow pit 4 (Figure 6-5)

This site is a sparse scatter of artefacts associated with an ephemeral drainage line in the south of the Borrow pit 4 area. This ephemeral creek drains southwest into Plashett Reservoir. The valley the creek flows through is



flat-floored, with low gradient slopes rising to the northwest and southeast. A farm dam has been constructed on the creek. The creekline is incised to a depth of 0.5-1m below the surrounding ground surface.

One stone artefact was found on this site (Table 6-9). The artefact was on an erosional surface at the edge of the incised course of the ephemeral creek.

**Table 6-9 Artefacts found at BAYS AS and PAD02 by type and material (needs updating)**

Type	IMSTC	Sum
Unretouched flake	1	1
Sum	1	1

The ground adjacent to the creekline has the potential to contain subsurface artefacts in densities high enough to be detected through a program of test excavation. The regolith of the flat floor of the valley is likely to consist of old alluvial deposit and remnant pre-contact topsoil, although this topsoil might have been depleted through erosion in the post-contact period, and might have been substantially reworked and mixed with newer alluvium. The presence of the creek, and consequent availability of water and associated resources, and the presence of visible artefacts on the current ground surface, means there is a plausible possibility of subsurface artefacts being present in detectable numbers.

The potential for artefacts to be present in subsurface deposits within the area of PAD, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.6 BAYS IF01**

Project component: Borrow pit 4 (Figure 6-5)

This site is an isolated surface artefact, on the mid-slope of a low gradient slope of a round-topped hill. The slope faces north, with the ground dropping down to the ephemeral creek on which BAYS AS and PAD02 is situated. The artefact is an unretouched flake made from IMSTC (Table 6-10).

The ephemeral creek lies approximately 200 m to the north.

**Table 6-10 Artefact found at BAYS IF01 by type and material**

Type	IMSTC	Sum
Unretouched flake	1	1
Sum	1	1

The potential for additional artefacts to be present in subsurface deposits in this area is assessed as being low. The isolated surface artefact is not associated with any larger scatter. If artefacts are present in subsurface deposits in the immediately surrounding area, they are unlikely to be in sufficiently high density to be detectable through a typical program of test excavation.

#### **6.3.12.1.7 BAYS IF02**

Project component: Borrow pit 4 (Figure 6-5)

This site is an isolated surface artefact, on the mid-slope of a low gradient slope of a round-topped hill. The slope faces north, with the ground dropping down to the ephemeral drainage line on which BAYS AS and PAD02 is situated. The artefact is an unretouched flake made from IMSTC (Table 6-11).

The ephemeral creek lies approximately 200 m to the north.

**Table 6-11 Artefact found at BAYS IF02 by type and material**

Type	IMSTC	Sum
Unretouched flake	1	1
Sum	1	1

The potential for additional artefacts to be present in subsurface deposits in this area is assessed as being low. The isolated surface artefact is not associated with any larger scatter. If artefacts are present in subsurface deposits in the immediately surrounding area, they are unlikely to be in sufficiently high density to be detectable through a typical program of test excavation.

#### **6.3.12.1.8 BAYS IF03**

Project component: Borrow pit 4 (Figure 6-5)

This site is an isolated surface artefact, on the mid-slope of a low gradient slope of a round-topped hill. The slope faces north, with the ground dropping down to the ephemeral drainage line on which BAYS AS and PAD02 is situated. The ephemeral creek lies approximately 75 metres to the north.

The artefact is a core made from IMSTC (Table 6-12).

**Table 6-12 Artefact found at BAYS IF03 by type and material**

Type	IMSTC	Sum
Core	1	1
Sum	1	1

The potential for additional artefacts to be present in subsurface deposits in this area is assessed as being low. The isolated surface artefact is not associated with any larger scatter. If artefacts are present in subsurface deposits in the immediately surrounding area, they are unlikely to be in sufficiently high density to be detectable through a typical program of test excavation.

#### **6.3.12.1.9 BAYS AS and PAD07**

Project component: Borrow pit 3 (Figure 6-5)

This site is an artefact scatter and associated PAD areas, located on the confluence of two ephemeral drainage lines. The surrounding landscape is rolling hills with rounded tops, which rise up to the north and east of the site (Figure 6-13). An ephemeral creek runs from east to west across the Borrow pit 3 area, on which two farm dams have been constructed. A second, smaller ephemeral drainage line runs from north to south, joining the first drainage line at the location of the larger and westernmost of the two dams.



**Figure 6-13 BAYS AS and PAD07 looking south**

The ground surface is generally covered in thick grass cover, with very sparse to no tree cover. In the two drainage lines, eroded exposures are common, some of which are downcut by 10 – 30 cm below the current ground surface. The ground surface lying between the two ephemeral creeklines, and to the south of the east-west creekline, is raised above the level of the drainage lines themselves, and is generally free of eroded areas.

Seventeen artefacts were recorded, all of which were found in erosional exposures adjacent to one or the other ephemeral creekline. The majority of these are unretouched flakes, with one core and one flaked piece also present. Silcrete is the most common material, with IMSTC also present (Table 6-13).

**Table 6-13 Artefacts found at BAYS AS and PAD07 by type and material**

Type	Silcrete	IMSTC	Sum
Unretouched flake	10	5	15
Core	1	0	1
Flaked piece	1	0	1
Sum	12	5	17

The ground adjacent to the two ephemeral creeks has the potential to contain subsurface artefacts in densities high enough to be detected through a program of test excavation. The regolith of the flat floor of the valley is likely to consist of old alluvial deposit and remnant pre-contact topsoil, although this topsoil might have been depleted through erosion in the post-contact period, and might have been substantially reworked and mixed with newer alluvium. The raised areas of ground adjacent to the two creeklines could have retained remnant pre-contact soils and sediments, within which artefacts could be buried in their original context or a reworked context. The surface artefacts found during survey are lying in eroded areas, making it likely that a buried assemblage of artefacts is present in the raised areas of ground immediately adjacent, which have not been eroded and scoured by the flow of water down the two drainage lines. The presence of the creeks, and consequent availability of water and associated resources, and the presence of visible artefacts on the current ground surface, means there is a plausible possibility of subsurface artefacts being present in detectable numbers.

The potential for artefacts to be present in subsurface deposits within the area of PAD, at densities sufficiently high to enable detection through test excavation, is assessed as being high. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.10 BAYS AS06**

Project component: Borrow pit 3 (Figure 6-5)

This site is a scatter of artefacts located on the edges of an ephemeral drainage line that flows from east to west across the area of Borrow pit 3. The surrounding landscape is rolling hills with rounded tops, which rise up to the north and east of the site. An ephemeral creek runs from east to west across the Borrow pit 3 area, on which two farm dams have been constructed. A larger artefact scatter and associated area of PAD (BAYS AS and PAD06) lies approximately 200m to the east, on the same creekline.

The ground surface is vegetated by thick grass cover, with sparse to no tree cover (Figure 6-14). On the banks of the ephemeral creek, erosional exposures are common, many of which have been downcut to depths of 5-20 cm below the surrounding ground surface. The ground adjacent to the creek bank rises to the north and the south, with no flattened areas of old creek bank identifiable in the immediately surrounding area.





**Figure 6-14 BAYS AS 06 looking east**

The immediate surrounds of this site have been substantially disturbed by the construction of a road, which runs along a raised embankment immediately to the west of the site, and by a farm dam to the east that has caused erosion of the creekline immediately adjacent to the site to the east.

Six artefacts were recorded, all of which are in eroded exposures immediately adjacent to the ephemeral creek. The majority are unretouched flakes, with one core and one flaked piece also present. Silcrete is the most common material, followed by IMSTC and quartzite (Table 6-14).

**Table 6-14 Artefacts found at BAYS AS06 by type and material**

Type	Silcrete	IMSTC	Quartzite	Sum
Unretouched flake	2	2	0	4
Core	0	0	1	1
Flaked piece	1	0	0	1
Sum	3	2	1	6

The potential for artefacts to be present in the subsurface deposits adjacent to the artefact scatter is assessed as being low. The surrounding ground shows signs of substantial erosion in the recent past, associated with the construction of the farm dam to the east, which has probably functioned to scour away much of the topsoil in this area. Unlike BAYS AS and PAD06 (lying to the east of this site), the creek here does not possess any flat raised areas of ground that could plausibly be surviving remnants of the pre-contact creek banks. Any creek bank areas that were present have presumably been scoured away by erosion during periods when the creek was flowing or in flood. The potential for subsurface artefacts to be buried in the soils and sediments surrounding the site is judged to be low as a consequence.

#### **6.3.12.1.11 BAYS AS09**

Project component: Borrow pit 2 (Figure 6-7)

This site is a small sparse scatter of artefacts lying on exposed bedrock and saphrolitic bedrock on a steep mid slope. The slope, which runs downward toward the north, has been heavily eroded, with no topsoil or subsoil remaining in this eroded area (Figure 6-15).

The surrounding landscape consists of rolling hills with moderate to high gradient slopes. Vegetation consists of thick grass cover, with frequent patches of exposed erosional ground.





**Figure 6-15 BAYS AS09 looking east**

Four artefacts were recorded on this site. Two are unretouched flakes, with one core and one retouched flake also present. Three of the artefacts are made from IMSTC, and one from silcrete (Table 6-15).

**Table 6-15 Artefacts found at BAYS AS09 by type and material**

Type	IMSTC	Silcrete	Sum
Unretouched flake	1	1	2
Core	1	0	1
Retouched flake	1	0	1
Sum	3	1	4

There is negligible potential for subsurface artefacts to be present within or surrounding this surface scatter of artefacts. Severe erosion in this area of Borrow pit 2 has stripped away all topsoil and subsoil from the entire mid slope of the hill, exposing the underlying bedrock. No patches of remnant sediment or soil are present, and as a consequence there is no potential for subsurface artefacts to be present.

#### **6.3.12.1.12 BAYS AS and PAD10**

Project component: Borrow pit 2 (Figure 6-7)

This site is a small scatter of artefacts in an eroded exposure on a high rounded hill top. The ground slopes away steeply to the north, and moderately steeply to the east and west. To the south the ground slopes gently to form an isolated ridgeline.

The ground surface in this area is vegetated with thick grass cover, with occasional areas of erosional exposure being randomly distributed. No tree cover is present (Figure 6-16).



**Figure 6-16 BAYS AS and PAD10 looking west**

Six artefacts were recorded, all of which are unretouched flakes made from IMSTC (Table 6-16). The material from which all the artefacts are made is of similar colour and texture, and it is probable that this scatter is a knapping floor – an artefact scatter produced by flaking activities carried out on this location.



**Table 6-16 Artefacts found at BAYS AS and PAD10 by type and material**

Type	IMSTC	Sum
Unretouched flake	6	6
Sum	6	6

The potential for artefacts to be present in the subsurface deposits adjacent to the scatter is assessed as being moderate. The ground surrounding the eroded exposure that the artefacts are in retains topsoil and grass cover. The density of this scatter, and the fact that it is likely to be part of a knapping floor, makes it probable that additional artefacts from this scatter of knapping debris are present in the subsurface deposits in the surrounding ground.

The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.13 BAYS AS and PAD11**

Project component: Borrow pit 2 (Figure 6-7)

This site is a scatter of surface artefacts in an eroded exposure adjacent to a saddle on a north-south ridgeline. The ground rises up toward round topped hills to the north and south, and drop away to the east and west. Slopes to the east and west are moderate gradient, while slopes to the north and south are low gradient.

The ground surface is vegetated with thick grass cover, with no tree cover present (Figure 6-17). The regolith in the area is topsoil, which could be remnant pre-contact soil or a secondary post-contact soil. Exposed sections in downcut erosional areas indicate that the topsoil is around 5 cm thick.



**Figure 6-17 BAYS AS and PAD11 looking north**

Twenty-seven artefacts were recorded, all of which are located in a heavily eroded area on the upper slope at the western edge of the saddle. This eroded area has eroded down to a depth of around 20 cm lower than the ground surface upslope. The eroded area is sheet wash erosion that is gradually working its way upslope, incising and downcutting the ground surface as it progresses uphill. The majority of artefacts are unretouched flakes, with cores, a flaked piece and a retouched flake also present. IMSTC is the most common material, followed by silcrete and quartz (Table 6-17).

**Table 6-17 Artefacts found at BAYS AS and PAD11 by material and type**

Type	IMSTC	Silcrete	Quartz	Sum
Unretouched flake	18	4	1	23
Core	1	1	0	2
Flaked piece	1	0	0	1
Retouched flake	0	1	0	1
Sum	20	6	1	27

Also present in the erosional area is a semi-circular formation of angular cobbles, each around 10-20 cm in diameter. The semi-circular formation seems to extend into the currently uneroded area of ground at the upper edge of the erosional exposure. Within the semicircle, the clay-rich sediments are reddened and have probably been heated. This feature is a probable Aboriginal hearth (Figure 6-18).



**Figure 6-18 Probable Aboriginal hearth at BAYS AS and PAD11, looking west**

There is a potential for artefacts to be present in subsurface deposits in the areas surrounding the erosional exposure, and to be present in densities high enough to be detected through test excavations. The scatter of artefacts present in the erosional exposure have probably eroded out of the soil as it has been washed downslope, and remain on the erosional surface as a lag deposit. This being the case, there is a likelihood that an assemblage of subsurface artefacts is present in the adjacent ground, which has not experienced the same severe level of erosion. The density of artefacts present in the eroded area makes it likely that a similarly dense scatter of artefacts are present in adjacent subsurface deposits.

The potential for artefacts to be present in subsurface deposits within the area of PAD, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.14 BAYS PAD12**

Project component: Borrow pit 2 (Figure 6-7)

This area of PAD is composed of the lower slopes and valley floor at the headwater of Pike's Creek. A moderate gradient slope rises up at the west, southwest, and southeast of the area of PAD, rising to a round-topped ridgeline on which three sites (BAYS AS09, BAYS AS and PAD10, and BAYS AS and PAD11) have been identified. Rainfall on the eastern slopes of this ridge drains into the PAD, where Pike's Creek initiates. The creek flows out of the PAD in a northeasterly direction.

The ground surface within the PAD is vegetated with thick grass cover and sparse tree cover. Surface visibility is close to zero within the PAD. The ground surface across the PAD is flat or has a low gradient. No surface artefacts were identified.

Pike's Creek follows an incised course, downcut to a depth of around 0.5 – 1 m below the surrounding ground surface.

The presence of Pike's Creek, and consequent availability of water and associated resources, gives this area a heightened archaeological potential. The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.15 BAYS PAD14**

Project component: Ash dam augmentation and Borrow pit 1 (Figure 6-7)

This area of PAD is composed of the rounded tops, upper slopes, and mid slopes of a series of low hills that border the southern edge of the area currently inundated by the ash dam. The PAD consists of low rolling hills, some of which have small sections that have eroded to bedrock. The hills are round-topped, with low to moderate gradient sides and rounded flat-floored valleys. No signs of major prior ground disturbance were identified during the survey, and the ground surface in this area is interpreted as being intact. The original course of Pike's Creek would have run just to the north of the PAD.

The ground surface in this section is covered in thick grass cover (Figure 6-19). Eroded exposures are rare. Some of the eroded exposures are located on moderate slopes, and have eroded to bedrock, a process that has probably removed all archaeological material that might have existed there. These severely eroded areas are rare across the PAD, however. Across most of the PAD the regolith consists of soils.





**Figure 6-19 BAYS PAD14 looking northeast**

This area of ground would have been elevated above the height of Pike's Creek, in its original course prior to establishment of the ash dam. The elevation and presence of water nearby, along with associated resources along the creek, gives this area a heightened archaeological potential. The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.16 BAYS PAD01**

Project component: HP Pipe clearing (south) (Figure 6-4)

This area of PAD encompasses the area of the southern proposed HP pipe clearing works. This PAD consists of low rolling hills, with rounded tops, low gradient slopes, and flat-floored valleys. The ground surface generally slopes downward toward the south and the east, though the area passes through a landscape in which the topography is undulating and the orientation of slopes is variable.

The ground surface is covered in thick grass cover, with sparse to moderate tree cover (Figure 6-20). Ground surface visibility is close to zero, with no areas of ground exposure being observed during the survey.



**Figure 6-20 BAYS PAD01 looking northwest**

Most of the area of the PAD lies in the buffer zone and outside the area anticipated to be impacted during works on the HP pipe. Areas adjacent to the HP and LSP pipeline would have been disturbed by the creation of access tracks for the vehicles needed for pipeline construction. It can be assumed that a vehicle corridor on either side of the pipelines would have been disturbed through vehicle movements during construction. The ground immediately adjacent to the HP pipe was heavily disturbed during the installation of the pipe and is likely to have low archaeological potential. Other areas along the pipeline corridor might also have been disturbed through the creation of laydown areas for vehicles and equipment, and stockpile areas for excavated materials or fill (AGL Macquarie, advice received 15/10/19). Disturbance around the pipe would have functioned to reduce, but not entirely remove, the area's archaeological potential. The ground immediately adjacent to the HP pipe is likely to have low archaeological potential. In addition, sections of the HP pipeline are installed below ground and would have involved excavations. As a consequence, the sections of pipeline in which the pipe is installed below the ground have no remaining archaeological potential.

Parnell's Creek lies to the southeast of the area, running in a southwest direction toward the Hunter River. Parnell's Creek passes immediately adjacent to the southern end of the HP pipeline, while the Hunter River lies approximately one kilometre to the southwest. Just over a kilometre to the northwest of the area, Saltwater Creek flows in a southeast direction to join with the Hunter River. A number of ephemeral drainage lines run southeast from the HP pipe area to join Parnell's Creek. The presence of multiple watercourses in the surrounding landscape means that the HP pipe area would have been an area frequently travelled through or camped on by Aboriginal groups living in the region. There are currently no areas with permanent or standing water within the HP pipe area, however, so no particular point within the area has high archaeological potential.

The presence of watercourses on both sides of the PAD gives this area a level of archaeological sensitivity. Although there is no sign of permanent or semi-permanent water being present within the PAD, it is likely that this area of the landscape was one through which Aboriginal groups would have frequently travelled. The low undulating terrain would have been easy to travel through and to forage and hunt for resources within. It is likely that this area was frequently visited by groups travelling between the Parnell's Creek and Saltwater Creek valleys. These visits might have involved short-term camps within the PAD, and there is consequently a possibility that archaeological material will be present within the PAD. The lack of surface artefacts within the area is potentially the result of the extremely low surface visibility.



The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being low to moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.17 BAYS PAD08**

Project component: HP pipe (north) and LSP pipe clearing (Figure 6-7)

This area of PAD encompasses the area of the northern proposed HP pipe and LSP pipe clearing works. This PAD consists of the lower slopes and flat valley floor of a landscape of low rolling hills. The ground surface within the area consists of flat or very low gradient slopes.

The ground surface is covered in thick grass cover, with sparse tree cover (Figure 6-21). Ground surface visibility is close to zero, with no areas of ground exposure being observed during the survey.



**Figure 6-21 BAYS PAD08 looking northeast**

The headwaters of Wisemans Creek cross through the southern end of the area. The southern two thirds of the area drain southwards into Wiseman's Creek. The northern third of the area drain northeast toward Pike's Creek, though the exact location of Pike's Creek in relation to the area is now difficult to reconstruct due to the existence of the ash dam and associated earthworks and dams. It is possible that ephemeral ponds and swamps existed within or close to the area, associated with these two Creeks and their feeder drainage lines.

Most of the area of the PAD lies in the buffer zone and outside the area anticipated to be impacted during works on the HP and LSP pipes. Areas adjacent to the HP and LSP pipeline would have been disturbed by the creation of access tracks for the vehicles needed for pipeline construction. It can be assumed that a vehicle corridor on either side of the pipelines would have been disturbed through vehicle movements during construction. Other areas along the pipeline corridor might also have been disturbed through the creation of laydown areas for vehicles and equipment, and stockpile areas for excavated materials or fill (AGL Macquarie, advice received 15/10/19). Disturbance around the pipe would have functioned to reduce, but not entirely

remove, the area's archaeological potential. The ground immediately adjacent to the LSP and HP pipe are likely to have low archaeological potential. In addition, sections of the HP pipeline are installed below ground and would have involved excavations. As a consequence, the sections of pipeline in which the pipe is installed below the ground have no remaining archaeological potential. The presence of Wisemans Creek at the southern end of the PAD, and the possibility of ephemeral ponds and swamps existing on the drainage line running north-south through the PAD, give this area heightened archaeological potential. The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being low to moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.18 BAYS PAD13**

Project component: Salt cake landfill (Figure 6-6)

This PAD encompasses a narrow band of possibly undisturbed or minimally disturbed land around the edge of the salt cake landfill area.

The salt cake landfill area lies within a landscape of low rolling round-topped hills, which are forested with moderately dense tree cover. The area itself, however, has been artificially flattened by prior excavation (Figure 6-22). A vertical excavation face extends along the northern boundary of the salt cake landfill area, which results from the ground surface of the area having been lowered to bring it level with the natural terrain to the south of the landfill area.



**Figure 6-22 A section of BAYS PAD13 (top left of frame) looking west with disturbed ground in foreground**

The flattening of the landfill area represents a major disturbance to most if not all of the area. The earthworks involved have removed the pre-contact ground surface, and would have removed all archaeological material that might have existed on this ground surface or in sub-surface soils and sediments.

The flat area of ground created through these earthworks has been subject to further ground-disturbance works. A rectilinear array of vehicle tracks have been formed across most of the area, with the possible exception of the western and southwestern edges of the area. Most of the areas of ground between these vehicle tracks are currently being used as laydown yards for vehicles, equipment and excavated fill material. Much of the landfill area is covered with imported gravel.

It is possible that a narrow band of undisturbed ground remains along the southern and western edges of the landfill area. Similarly, areas above the vertical excavation face running along the north of the area might also be undisturbed and retain some archaeological potential. It is this area that has been designated as BAYS PAD13.

The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being low to moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.19 BAYS PAD16**

Project component: Ash dam augmentation (Figure 6-7)

This PAD consists of flat or very low-gradient terrain within a wide flat-floored valley through which Pike's Creek runs. It lies to the east of the dam wall of the current ash dam. The area of ground within the PAD shows no visible signs of disturbance, other than some vehicle tracks that run through the PAD and some contour banks. The only other noticeable source of ground disturbance in this area is the high-voltage powerline, which runs northeast-southwest through the section. Areas adjacent to the pylons of this powerline are assumed to be highly disturbed and have negligible archaeological potential.

Pike's Creek runs west to east through this section of the ash dam augmentation area. The current creekline is moderately incised, and follows a meandering course across the flat-floored valley. The current course of the creek might have been altered slightly from its course prior to construction of the ash dam, due to reduced flow and construction of dams and seepage collection systems to the west of the PAD, adjacent to the dam wall.. Areas of remnant swampy ground are visible in the current landscape adjacent to the creek, and it is probable that prior to European land-clearing and construction of the ash dam the creek possessed swamps and ponds in this section.

The ground surface within the PAD is vegetated with moderate to thick grass cover. Ground surface visibility is very low.

The presence of Pike's Creek, and the consequent availability of water and associated resources, give this area heightened archaeological potential. The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. Areas of localised disturbance within the PAD, for example vehicle tracks and contour banks, would have low archaeological potential. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.20 BAYS PAD17**

Project component: Ravensworth ash line (Figure 6-8)

This area of PAD consists of a low gradient slope within a landscape of rolling round topped hills and flat-floored valleys. The ground surface within the PAD shows no sign of prior disturbance. The current ash-line and adjacent vehicle track run along the northern edge of the PAD (Figure 6-23). The majority of the PAD lies outside the study area. The portion of the PAD within the study area is largely located in the buffer zone around the area anticipated to be impacted during upgrading of the ash line.





**Figure 6-23 BAYS PAD17 (top of frame) looking west, showing existing pipeline**

This area was cited by RAPs involved in the fieldwork as having a heightened archaeological potential, due to other sites having been discovered in the immediately surrounding landscape, and the undisturbed condition of this specific area of ground (Hickey pers. comm.).

The ground within the PAD is vegetated with thick grass cover and sparse tree cover. Ground surface visibility within the PAD is close to zero.

The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.21 BAYS PAD18**

Project component: Ravensworth ash line (Figure 6-8)

This PAD consists of a low gradient slope within a landscape of rolling round topped hills and flat-floored valleys. The ground surface within the PAD shows no sign of prior disturbance. The current ash-line and adjacent vehicle track run along the northeast edge of the PAD. Bayswater creek lies approximately 200 m north of the PAD.

The ground within the PAD is covered with moderately thick tree cover, which has carpeted the ground surface in thick leaf litter. Ground surface visibility is close to zero (Figure 6-24).



**Figure 6-24 BAYS PAD18 looking southwest**

A previously recorded surface scatter of stone artefacts ( AHIMS # 37-3-0491), lies within the area of PAD. This site is currently still intact and protected by a fence, although leaf litter made it impossible to identify whether the originally recorded artefacts are still present.

The presence of Bayswater Creek nearby, and the consequent availability of water and associated resources, along with the identification of surface artefacts in this area by previous archaeological investigations, give this area a heightened archaeological potential. The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.22 BAYS PAD19**

Project component: Ravensworth ash line (Figure 6-8)

This area of PAD consists of a low gradient slope within a landscape of rolling round topped hills and flat-floored valleys. The ground surface within the PAD shows no sign of prior disturbance. The current ash-line and adjacent vehicle track run along the northeast edge of the PAD (Figure 6-25).

The ground within the PAD is covered with moderately thick tree cover, which has carpeted the ground surface in thick leaf litter. Ground surface visibility is close to zero.





**Figure 6-25 BAYS PAD19 (top right of frame) showing existing pipeline**

Bayswater Creek crosses through the PAD in a northwest to southeast direction. The creek currently flows along an undulating and incised course, which is downcut to a depth of around 1 – 2 metres below the surrounding ground surface. It is probable that this incision has happened following European land clearing, and the pre-contact course of the creek lay closer to the current ground surface. If this were the case, most of the PAD would still have been elevated above the level of the creek.

The presence of Bayswater Creek, and the consequent availability of water and associated resources, gives this area a heightened archaeological potential. The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being moderate. The archaeological and cultural significance of subsurface material is unknown.

#### **6.3.12.1.23 BAYS AS and PAD15**

Project component: Borrow pit 1 (Figure 6-7)

This site is an artefact scatter and associated PAD on the bank of a creekline running from west to east along the southern boundary of the Borrow Pit 1 area. The artefact scatter is within eroded exposures immediately adjacent to the current course of the creek, and the PAD extends from the creek up onto a flattened raised area of ground above the current creekline and extending onto the lower slopes of a ridge rising toward the north. The ground surface slopes up to the north towards a round-topped series of hills along the southern edge of the current ash dam.

The creek currently follows a slightly meandering course through a flat-floored valley. The creek has areas of swampy ground, and signs of ephemeral ponds are visible in the current ground surface. It is likely that this creek consisted of a chain of swampy areas and ponds prior to European land clearing. It flows eastward, eventually meeting Pike's Creek to the northeast. The creekline is slightly incised, to a depth of around half a metre below its current banks. Behind the current bank is a slightly raised and flat area of ground, which appears to be a remnant of an older creek bank. This is possibly part of the bank of the creek during the pre-contact period, before it began to incise following European land clearing.

Thirteen artefacts were recorded, all of which were found in eroded areas immediately adjacent to the current creekline. The majority of the artefacts are unretouched flakes, with one core and one retouched flake also present. IMSTC is the most common material, followed by silcrete (Table 6-18).

**Table 6-18 Artefacts found at BAYS AS and PAD15 by type and material**

Type	IMSTC	Silcrete	Sum
Unretouched flake	8	3	11
Core	1	0	1
Retouched flake	0	1	1
Sum	9	4	13

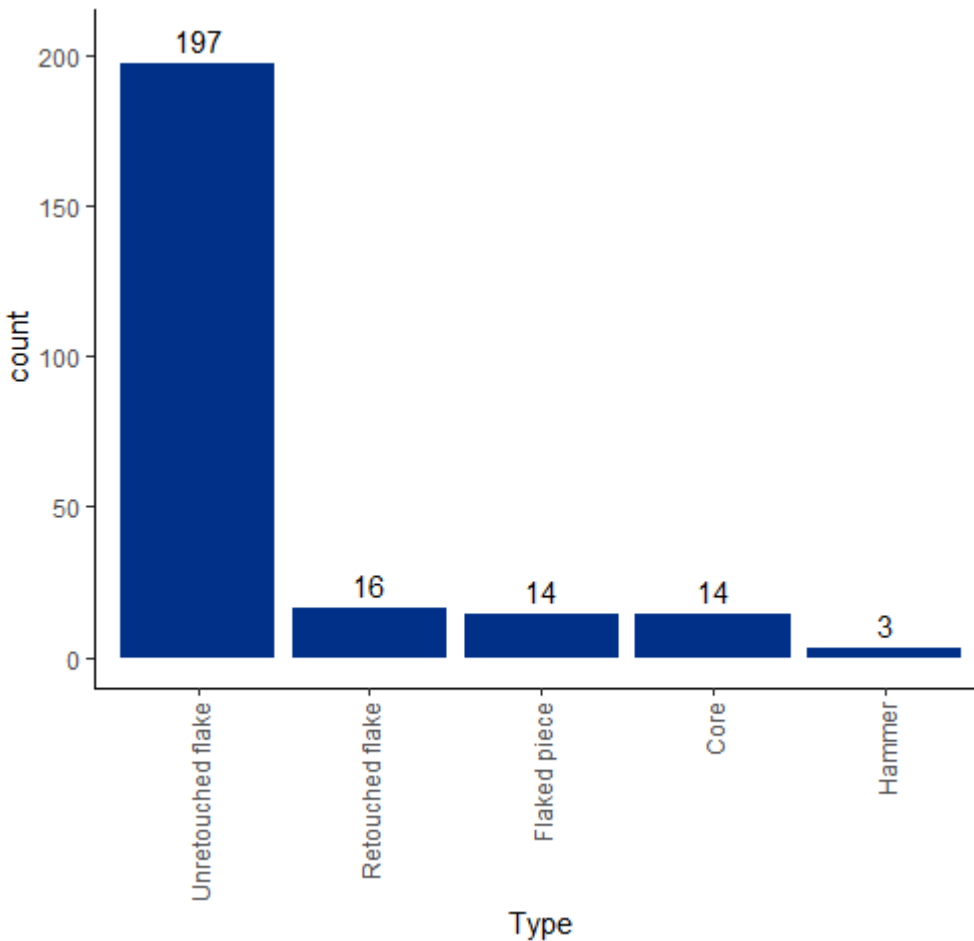
There is a potential for artefacts to be present in subsurface deposits in the areas of ground between the current course of the creek and the lower slopes of the ridge to the north. There is the potential for these artefacts to be present in densities high enough to be detected through test excavations. The artefacts present in the erosional exposures along the creek have probably eroded out of the soil as it has been scoured back during creek flood events, and remain on the erosional surface as a lag deposit. This being the case, there is a likelihood that an assemblage of subsurface artefacts is present in the adjacent ground, which has not experienced the same severe level of erosion. The density of artefacts present in the eroded area makes it likely that a similarly dense scatter of artefacts are present in adjacent subsurface deposits. The presence of the creek, and the consequent availability of water and associated resources, also raise the potential for archaeological sites to be present within the PAD area.

The potential for artefacts to be present in subsurface deposits within the PAD area, at densities sufficiently high to enable detection through test excavation, is assessed as being high. The archaeological and cultural significance of subsurface material is unknown.

### **6.3.13 Artefact types and materials**

In this section, and in Section 6.3.14, the artefacts found across all sites have been pooled into a single dataset, to provide information about the stone artefacts found within the study area as a whole. This analysis does not attempt to discuss variability between individual sites, as the number of artefacts found and recorded on most sites is too small to enable a robust analysis of inter-site variation.

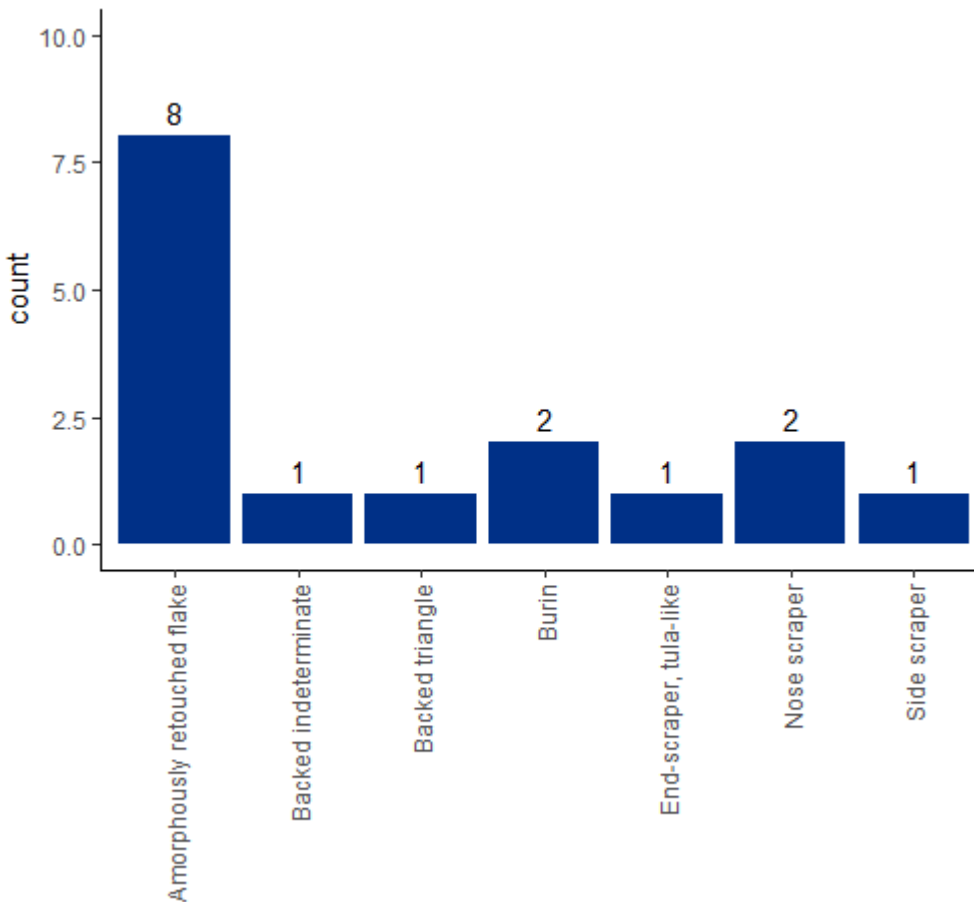
Most of the stone artefacts identified during the survey are flaked artefacts, with three hammers being the only non-flaked stone artefacts (Figure 6-26). Unretouched flakes are the most common artefact type, followed by retouched flakes and cores. Flaked pieces (ambiguous broken or damaged artefacts which could either be cores or flakes) are also present. The high proportion of unretouched flakes in relation to other artefact types is typical for stone artefact assemblages.



**Figure 6-26 Barplot of all artefacts recorded, by type**

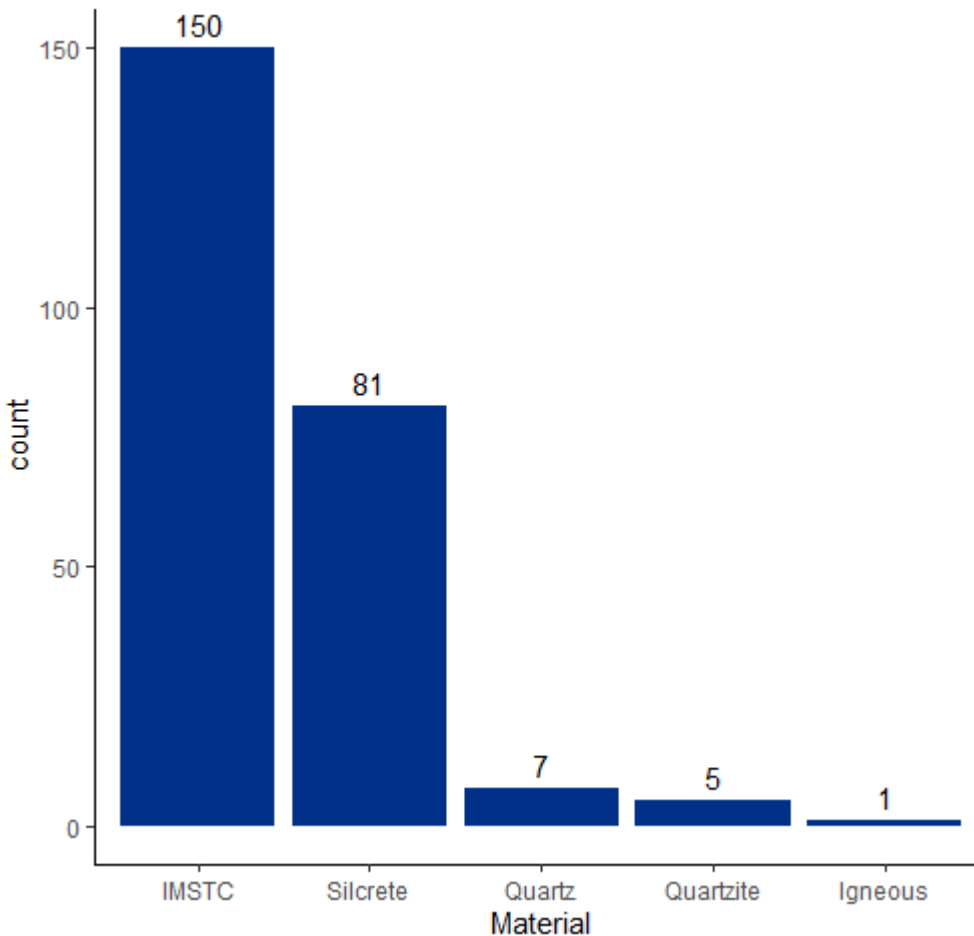
A diverse variety of implement types were recorded during the survey (Figure 6-27). Two backed artefacts (one triangle and one of indeterminate shape); two burins; two nose scrapers; one side scraper; and one end-scraper (similar to a tula in size, shape, and location of retouch - but not thick and robust enough, and lacking the prominently convex bulbar ventral surface). Eight amorously retouched flakes, which do not fall into any established implement type, were also recorded. These preliminary results indicate that a diverse range of technological strategies were being employed across the study area, in terms of the ways in which flakes were retouched. The production of retouched flakes does not seem to be geared toward the production of any single implement type.





**Figure 6-27 Barplot of all retouched flakes, by implement type**

The artefacts recorded during the survey are made from five material categories (Figure 6-28). IMSTC (Indurated mudstone, silicified tuff, chert) is the most common material type. Silcrete is the next most common type for artefacts to be made from, with quartz, quartzite and igneous artefacts present in lower numbers.



**Figure 6-28 Barplot of all artefacts recorded, by material**

IMSTC is a material category that is highly variable in colour and texture. Artefacts made from this material ranged in colour from white to grey, brown, red, and yellow. Fracture surfaces ranged from fresh in appearance to patinated and slightly chalky and friable. Fracture surfaces ranged from smooth and glassy to moderately rough and grainy. Much of this variability probably results from the different geological origin of the materials from which the artefacts are made. Some of the artefacts might well be true cherts, with a microcrystalline structure and composed entirely of silica. Other artefacts might be indurated mudstone, and retain the colour and grain-structure of the sediments they are derived from. Others again might be silicified tuff, retaining the colour and texture of the tuff deposits they are derived from. In some cases, materials might be indurated sediments that were mixtures of sedimentary material and reworked tuffaceous deposits, in which case individual nodules of material could retain complex variability in mineral composition and texture. The variability could indicate that materials have been procured from different source areas. Specific geographical locations have been identified for several distinctive types of mudstone in this part of the Hunter Valley (Hickey pers. comm.).

Silcrete also showed a range of variability in appearance across artefacts. Colours ranged across red, yellow, grey, brown, and cream. Grain size ranged from under a tenth of a millimeter to over two millimetres in diameter. Fracture surfaces ranged from smooth surfaces that cut through individual grains, to rough surfaces where fractures travelled preferentially around grains. The variability of material appearance across artefacts could indicate that the silcrete being utilised in this area has been procured from a number of different source areas.

This interpretation is supported by previous observations of sites in this part of the Hunter Valley, which have identified sources for some distinctive silcrete types (Hickey pers. comm.).

Detailed recording of material colour, texture and appearance for individual artefacts was beyond the scope of this survey. A large sample of artefacts were photographed in the field, however, to provide a record of the variability in material appearance.

The quartz artefacts identified in this survey are relatively consistent in appearance. The quartz utilised is universally high-quality white vein quartz, with few internal flaws. Fracture surfaces were relatively smooth, with little evidence that the crystal structure of the quartz was dictating fracture paths or causing fractures to be diverted or perturbed as they travelled through the material. The total number of quartz artefacts found in the survey is small, but these preliminary results indicate that Aboriginal people in this area were able to preferentially target high quality quartz for artefact manufacture.

Quartzite artefacts were made from fine-grained quartzites. Fracture surfaces were relatively smooth, preferentially travelling around the small and uniformly-sized grains in the material. The total number of quartzite artefacts found in the survey is small, but these results indicate that Aboriginal people were able to preferentially target high quality quartzite for artefact manufacture.

The data from the artefacts identified during the survey indicate that Aboriginal people in this area preferentially utilised particular materials for the production of different types of artefact. None of the quartz or quartzite flakes have been retouched (Table 6-19). All retouched flakes are made from IMSTC or from silcrete. Although the small number of quartz and quartzite artefacts mean that this pattern could plausibly be due to sampling error, the data we have indicate that retouching of flakes was preferentially carried out on IMSTC and silcrete.

The three hammers found during the survey are made from igneous rock and quartzite, with no hammers made from IMSTC, quartz or silcrete. This indicates that Aboriginal people preferentially utilised these materials for use as hammers, which is consistent with the fact that igneous rock and quartzite are typically tougher and more fracture resistant than quartz, chert, and indurated sedimentary rocks such as silcrete and mudstone (Domanski *et al.* 1994).

**Table 6-19 All artefacts by type and material**

Type	IMSTC	Silcrete	Quartz	Quartzite	Igneous	Sum
Unretouched flake	122	66	7	2	0	197
Retouched flake	9	7	0	0	0	16
Core	8	5	0	1	0	14
Flaked piece	11	3	0	0	0	14
Hammer	0	0	0	2	1	3
Sum	150	81	7	5	1	244

### 6.3.14 Artefact morphology and technological systems

The majority of flakes, both retouched and unretouched, discovered during the survey are broken. Of the 197 unretouched flakes, 87 are complete. Of 16 retouched flakes, 7 are complete. The majority of cores (13 of 14) are complete, while one out of the three hammers is complete.

The high rate of flake breakage observed is not unusual for surface artefacts in a landscape that has been farmed, probably ploughed, and used to graze livestock. Heat-fracturing of artefacts during bushfires and controlled burning, trampling by stock and vehicles, and movement across the surface during erosion and floods

are all possible causes of flake breakage. Prior to deposition in the archaeological record, flakes can be broken during use, or can break during manufacture.

**Table 6-20 All artefacts by type and completeness**

Type	Complete	Proximal fragment	Medial fragment	Distal fragment	LCS	Margin missing	Broken
Unretouched flake	87	11	36	51	9	3	0
Retouched flake	7	2	0	7	0	0	0
Core	13	-	-	-	-	-	1
Flaked piece	14	-	-	-	-	-	-
Hammer	1	-	-	-	-	-	2

The length of unretouched flakes varies between 5mm and 75mm (Figure 6-29). The distribution of flake length is right-skewed, meaning that the majority of flakes fall toward the lower end of the range of flake lengths. A small number of flakes lie at the upper end of the range, forming an extended 'tail' at the upper end of the distribution. A right-skewed distribution of flake size is typical for most stone artefact assemblages, as knapping typically produces a large number of small flakes relative to the number of large flakes produced (Andrefsky 2007; Bertran *et al.* 2012; Morrow 1997). The distributions of flake width and thickness are also right-skewed, with the mean and median of both variables falling toward the lower end of the range (Table 6-21).

Median flake length is 20mm, median width is 20mm and median thickness is 5mm. The largest values recorded are 75mm for flake length, 50mm for flake width and 30mm for flake thickness. These data indicate that flakes in the study area are generally small in size. These data are consistent with a technological system in which small nodules of material are being reduced, or nodules are being transported away from their source areas and have been reduced in size before being transported onto the study area.



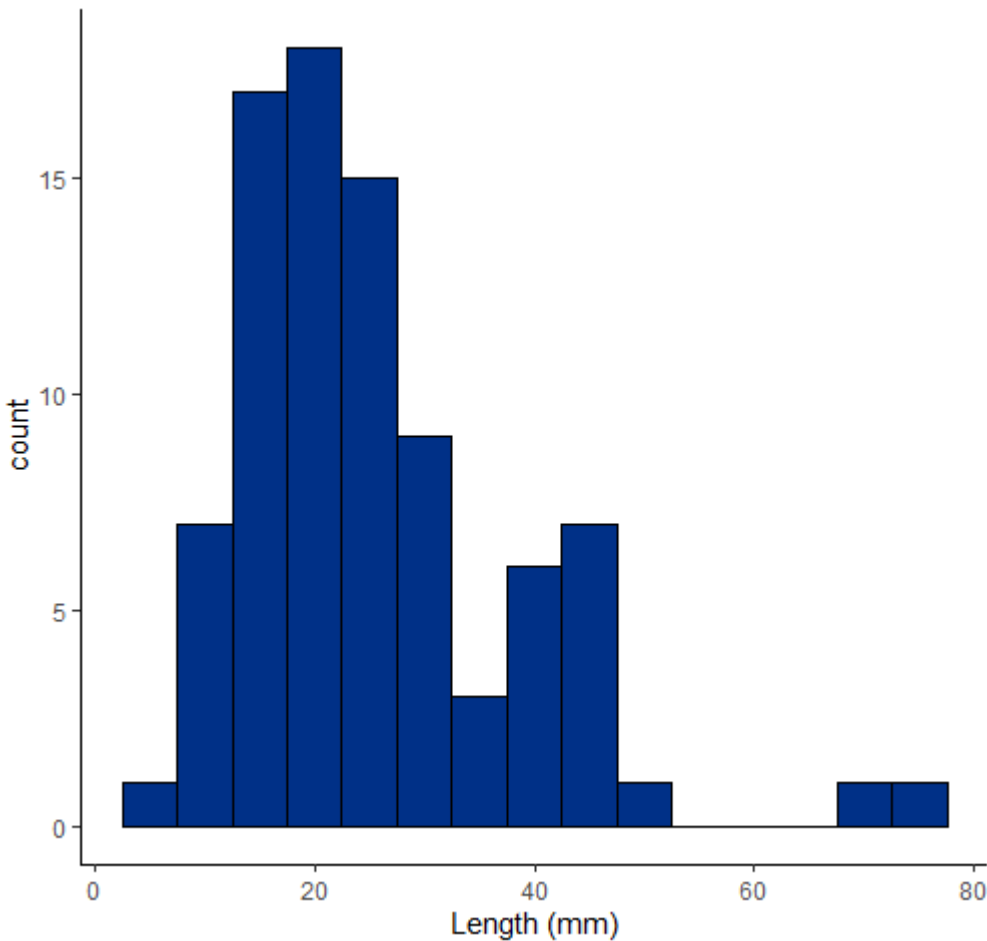


Figure 6-29 Histogram of the length of all complete unretouched flakes

Table 6-21 Summary statistics of the dimensions of all complete unretouched flakes

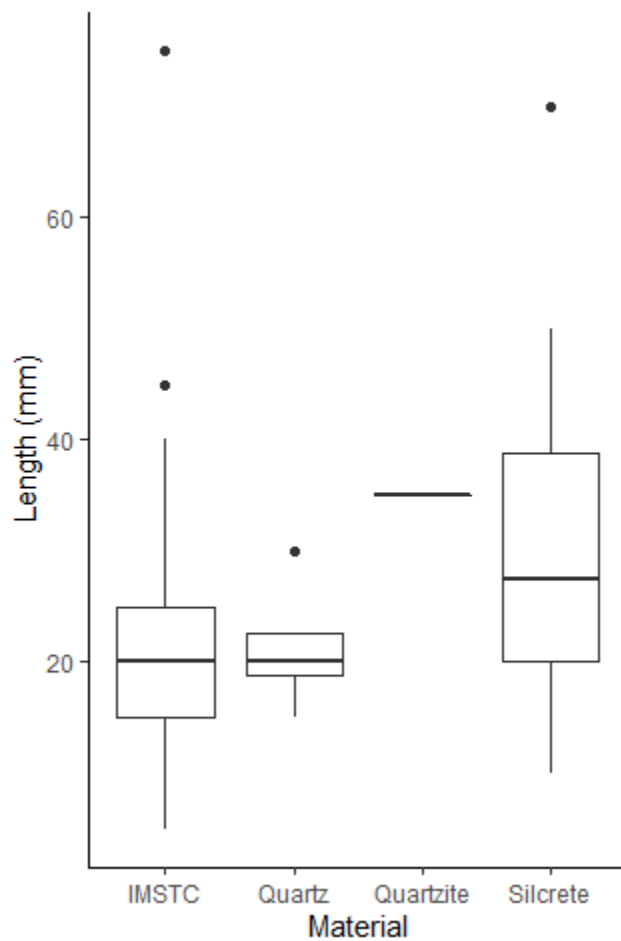
Measuremnt	Minimum	1 <sup>st</sup> quartile	Median	3 <sup>rd</sup> quartile	Maximum	Mean
Length (mm)	5	15	20	30	75	25.4
Width (mm)	5	15	20	25	50	20.63
Thickness (mm)	2.5	5	5	10	30	7.529

Flake length and thickness are significantly different between materials (at  $p=0.05$  level), while flake thickness shows no significant difference between flakes made of different materials (Table 6-22).

The significant difference in flake length between materials is due to silcrete flakes being significantly longer (at the  $p = 0.01$  level) than flakes made from IMSTC (Dunn Test,  $z = -2.72488796$ ,  $p = 0.01$ ). All other between-groups tests (Dunn tests) yielded non-significant results, meaning that no compelling differences in flake length exist between materials. The fact that silcrete flakes are typically longer than IMSTC flakes can be seen in the boxplot provided in Figure 6-30, which shows that the median length of silcrete flakes is higher than that of IMSTC flakes, and that the inter-quartile range (the range in which the middle 50% of flakes fall) occurs across a higher range of values for silcrete flakes than it does for IMSTC flakes.

**Table 6-22** Kruskal-wallis test comparison of complete unretouched flake dimensions by material

Attribute	Chi-squared	d.f.	p
Length	8.7635	3	<b>0.033</b>
Width	4.2564	3	0.235
Thickness	10.134	3	<b>0.017</b>



**Figure 6-30** Boxplot of length of complete unretouched flakes separated by material

The significant difference in flake thickness is due to quartz flakes being significantly thicker (at the  $p = 0.01$  level) than flakes made from IMSTC (Dunn test,  $z = -2.5581338$ ,  $p = 0.01$ ), and to silcrete flakes being significantly thicker (at the  $p = 0.05$  level) than IMSTC flakes (Dunn test,  $z = -2.0501958$ ,  $p = 0.04$ ). All other between-groups tests (Dunn tests) yielded non-significant results, meaning that no compelling differences exist in the thickness of flakes across other materials. The between-groups tests show that IMSTC flakes are thinner than flakes made from quartz and silcrete, a result that can be seen clearly in the boxplot of flake thickness provided in Figure 6-31. The boxplot shows that flakes made from IMSTC have the lowest median thickness, with an inter-quartile range lower than quartz flakes and the same as silcrete flakes.

The data on flake dimensions indicate that IMSTC was knapped in ways that produced shorter and thinner flakes than is the case for other materials. The smaller size of IMSTC flakes could be the result of smaller nodules of this material being available in the landscape – if this were the case, then the production of smaller flakes would be dictated by the nature of pieces of stone that could be procured. Another possible explanation is that pieces of IMSTC were flaked more intensively than pieces of other materials. If pieces of IMSTC were reduced to a greater degree than other materials, the result would be that IMSTC cores would be smaller at the end of their use-lives than cores of other materials, and consequently the flakes struck toward the end of the reduction process would be smaller. More intensive reduction could occur if IMSTC was more highly prized than other materials, or if it involved a higher cost in terms of time or energy to procure. If sources of IMSTC were located further away from the study area, for example, obtaining replacement material would require a greater investment of time and energy from Aboriginal groups, creating an impetus to extend the reduction process on IMSTC cores relative to other materials.

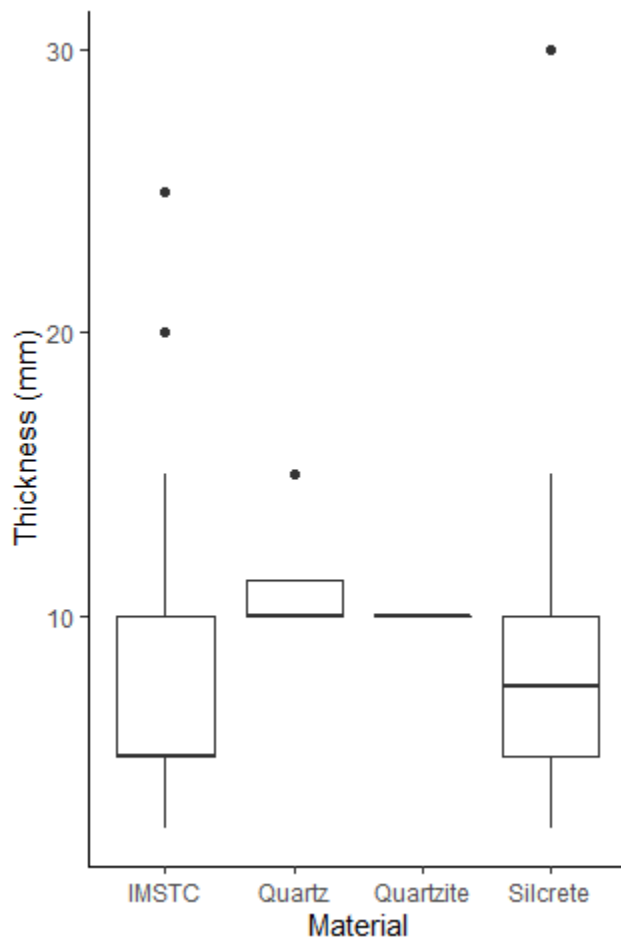


Figure 6-31 Boxplot of thickness of complete unretouched flakes separated by material

It should be noted that the flakes recorded during the survey are quite small, regardless of material. The longest flake recorded is 75 mm long, and only two flakes are longer than 50 mm. Seventy-five percent of flakes are 30 mm or shorter. This is consistent with a technological system in which materials were procured from some distance away, and reduced prior to being transported onto the study area. An alternative possible explanation is that the nodules of material were already small when they were procured, and that the small size of is consequently not evidence for prior reduction of stone outside the study area. If this were the case, then the

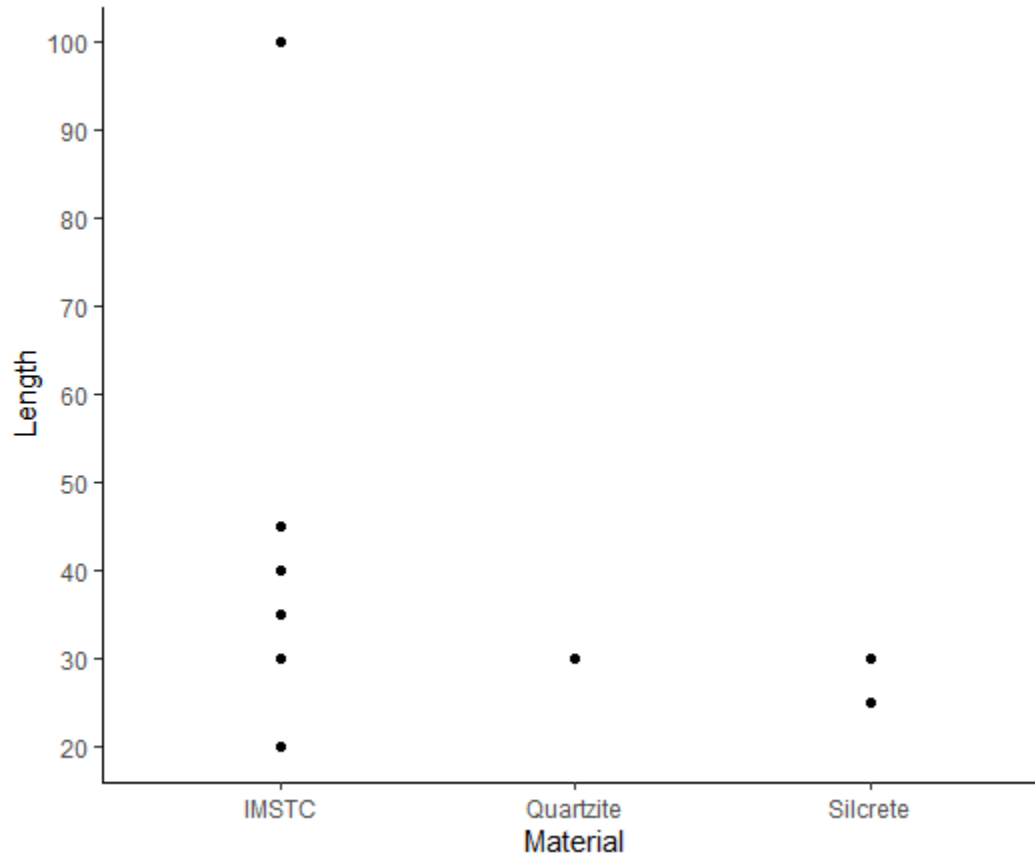
assemblage of flakes in the study area should include primary flakes, or flakes whose dorsal surfaces are entirely covered in cortex.

Cores recorded during the survey are also generally small in size. Median core length is 30 mm, with the smallest core being 20 mm in length, and the largest being 100 mm in length (Table 6-24). Half of the cores are between 30 mm and 40 mm long. As core length is measured along the plane of the largest flaking surface, it is indicative of the size of flakes that could have been struck from the core just prior to it being discarded. The small size of cores is consistent with the small size of flakes recorded during the survey. No statistically detectable difference exists in the length of cores made from different materials (Kruskal-Wallis chi-squared = 1.4912, d.f. = 2,  $p = 0.47$ ), though the small number of cores found during the survey would hamper the identification of any difference in core size that might exist between materials in the larger population of artefacts within the study area. Plotting the length of cores by material illustrates the fact that almost all cores are below 50 mm in length, with one core with a length of 100 mm being an outlier (Figure 6-32).

**Table 6-23 Summary statistics of the length of all complete cores**

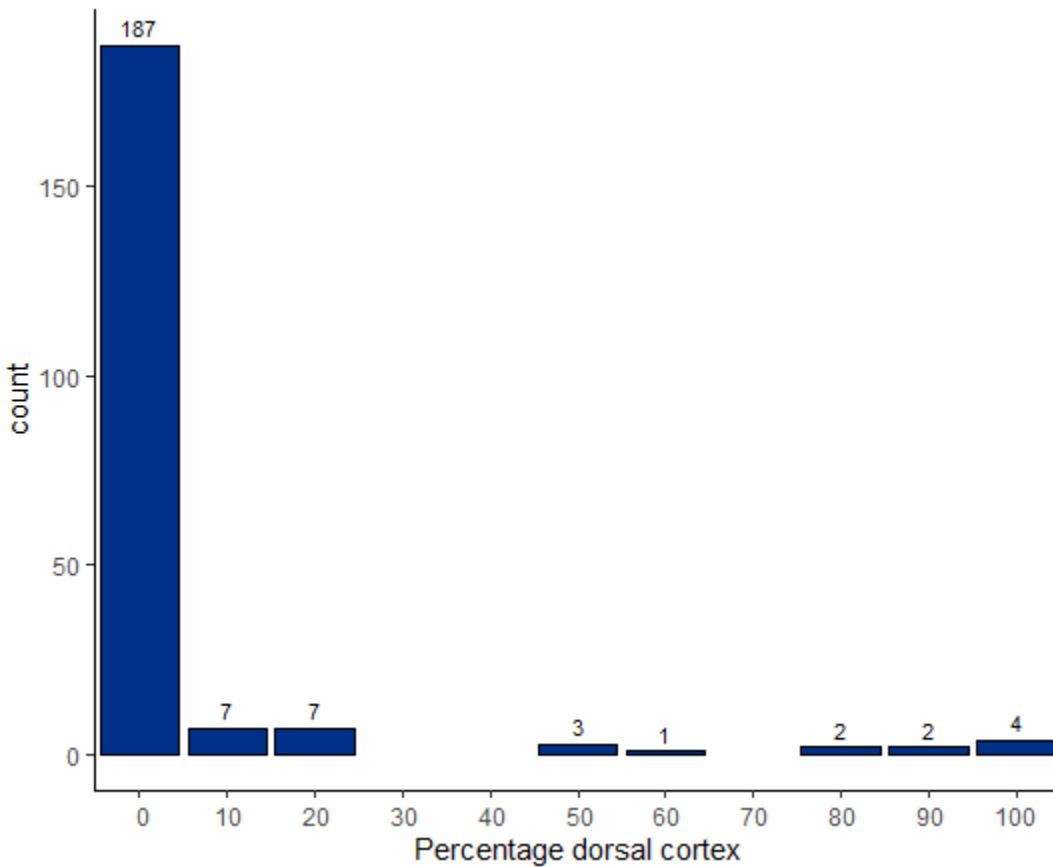
Attribute	Minimum	1 <sup>st</sup> quartile	Median	3 <sup>rd</sup> quartile	Maximum	Mean
Length	20.00	30.00	30.00	40.00	100.00	36.54





**Figure 6-32 Scatterplot of the length of all complete cores, separated by material**

Flakes with dorsal cortex are rare, with the great majority of flakes having no cortex on their dorsal surfaces (Figure 6-33). Of the 213 flakes recorded, 187 are tertiary flakes – flakes that retain no cortex on their dorsal surface. The low proportion of cortical flakes is consistent with an assemblage created from nodules which had undergone preliminary flaking elsewhere prior to being transported onto the study area. This is consistent with a technological system that procured materials from outside the study area, and processed materials on other sites prior to transporting stone into the study area.



**Figure 6-33 Barplot of all flakes, by percentage dorsal cortex**

There are no differences in the frequency of dorsal cortex on flakes made from different materials, as far as can be identified from the flakes recorded during the survey (Figure 6-34). Silcrete and IMSTC, the two most common materials, both have a small proportion of flakes with cortex, and a great majority of flakes without any cortex. Only one quartz flake, and no quartzite flakes, have any dorsal cortex. The extreme rarity of dorsal cortex on flakes of these two materials could well be the result of the small size of the sample of flakes recorded, however. The data available do not indicate any substantial difference in the frequency of cortex across materials, and are consistent with a technological system that procured all materials from source areas outside the study area, and carried out preliminary flaking of all materials on other sites prior to transport into the study area.

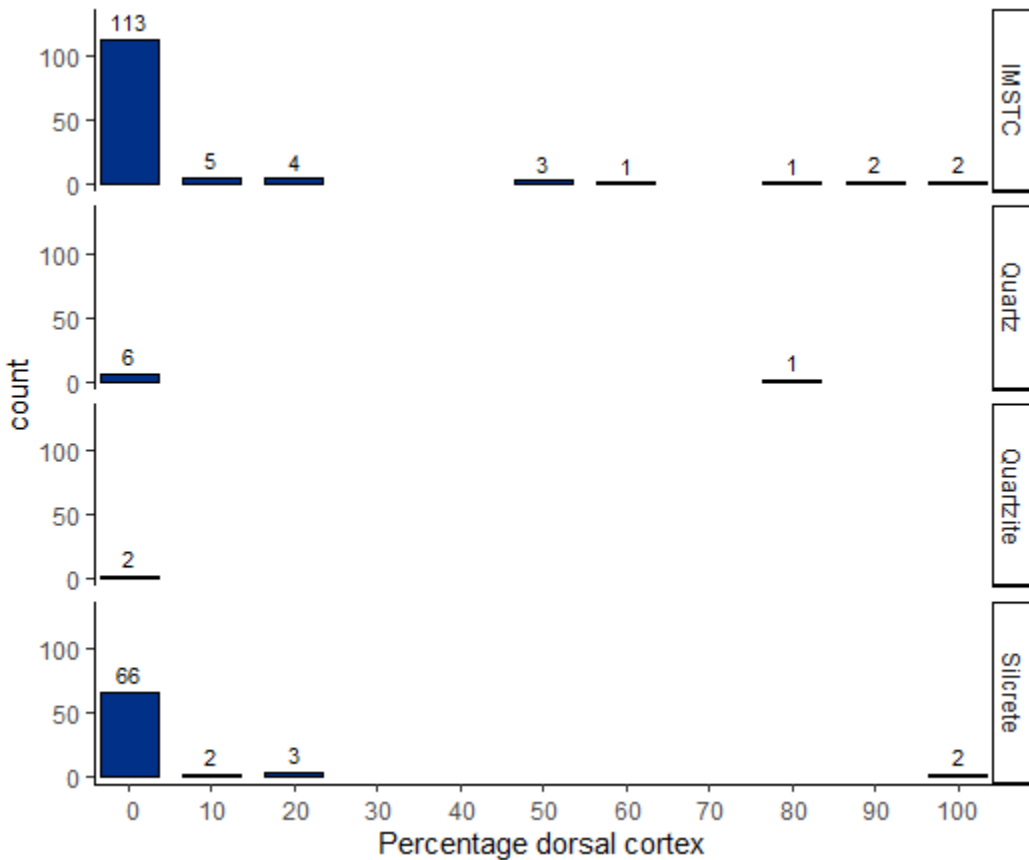


Figure 6-34 Barplot of all flakes, by percentage dorsal cortex, separated by material

The relationship between flake length and width provides an impression of the general flake shapes that a technological system produced, and can signal when systems are geared toward the production of specific flake shapes. Plotting flake length against flake width, for all complete unretouched flakes recorded during the survey, shows that there is considerable variability in the relationship between these two dimensions (Figure 6-35). Length and width are positively correlated with one another (Spearman's  $\rho = 0.6411569$ ,  $p < 0.001$ ), which is an unsurprising result – large flakes are both wider and longer than small flakes. A linear trend-line, with 95% confidence interval, is included in the scatterplot to show the nature of this positive relationship. There is a large spread of datapoints around this trendline, however, showing that individual flakes have widely varying ratios of length to width. The dotted red line on the plot shows where flake length is twice flake width. Having a length that is more than twice its width is a criterion on which 'blades' are identified. Other characteristics are also cited as necessary characteristics of blades, such as parallel margins and a triangular or trapezoidal cross-section.

The small number of flakes lying above the threshold ratio of length to width do not support the possibility that flake production in the study area was specifically geared toward the production of blades. The flakes which do lie above the threshold seem to be the upper end of a more or less continuous range of variability of length to width ratios, rather than being an isolated and separate cluster on the scatterplot. It is the case, however, that the small number of complete flakes recorded during the survey could well be insufficient to identify instances where knapping was geared toward the production of elongated flakes. The dataset of flakes being analysed here is pooled from all sites identified across the study area. If knapping on particular sites was targeted toward the production of flakes with a particular shape, this patterning could well be invisible in the pooled dataset. Based on the available data, however, there is no reason to conclude that flake production within the study area was geared toward the production of any specific flake shape.

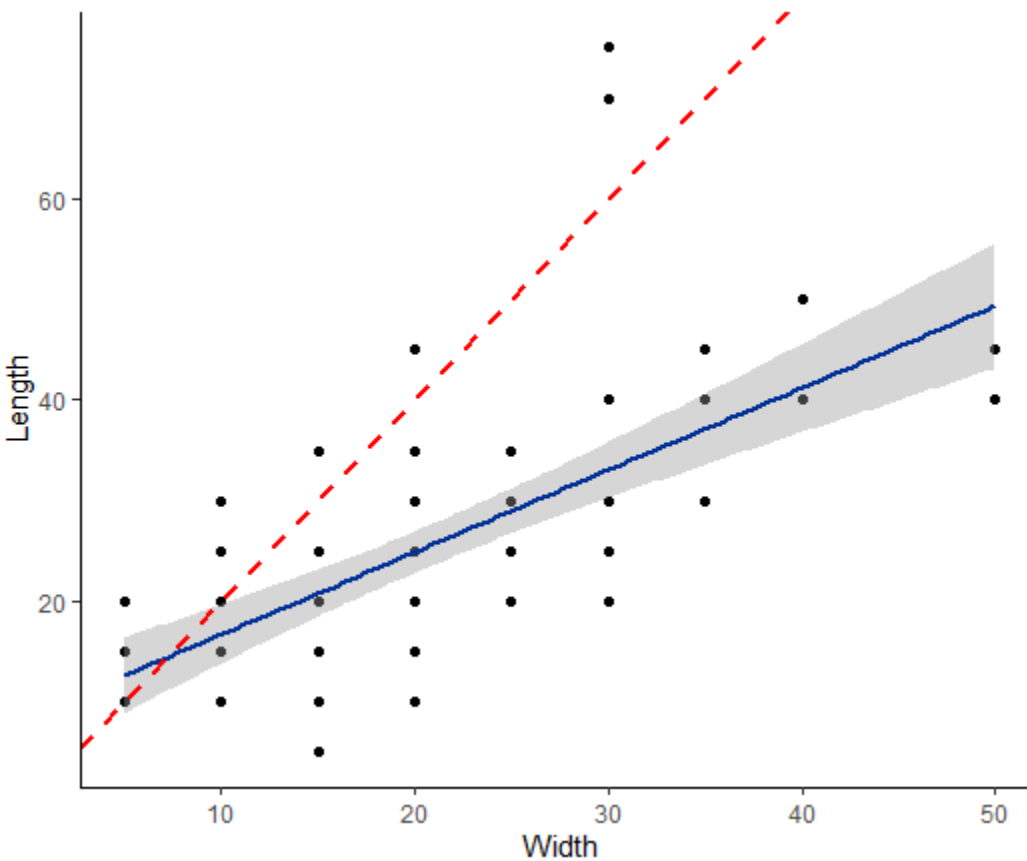


Figure 6-35 Scatterplot of length vs width of all complete unretouched flakes, with linear trendline and 95% confidence interval, and dashed line showing length = 2 x width

The ratio of flake length to flake width can be expressed as a flake's 'elongation'. Elongation is calculated by dividing flake length by flake width: consequently, a flake twice as long as it is wide would have an elongation of two. Elongation of flakes varies between a minimum of 0.33 and a maximum of 4 (Table 6-24). Half of the flakes (the inter-quartile range) have an elongation between 1.00 and 1.58. In other words, half of the flakes fall within a relatively narrow range in terms of elongation, varying between being as long as they are wide, and one and a half times longer than they are wide. Above and below this interquartile range, however, there is a substantial upper and lower 'tail' of artefacts that vary between being around one third as long as they are wide, and being four times as long as they are wide. As discussed above, these data do not indicate that knapping was specifically geared toward the production of any specific flake shape. Instead, it appears that knapping was flexible and variable in nature, resulting in a variety of flake shapes.

Table 6-24 Summary statistics of the elongation of all complete unretouched flakes

	Minimum	1 <sup>st</sup> Quartile	Median	3 <sup>rd</sup> Quartile	Maximum	Mean
Elongation	0.3333	1.0000	1.2500	1.5833	4.0000	1.3623

The distribution of flake elongation is not significantly different between materials (Kruskal-wallis chi-squared = 2.6495, d.f. = 3,  $p = 0.4489$ ). This means that there is no reason to think, based on the available data, that Aboriginal knappers were flaking different materials in ways that would result in differently shaped flakes. These results are consistent with a technological system in which different materials were knapped in equivalent ways, and that knapping resulted in assemblages of similarly shaped flakes regardless of the material being worked.



## 6.4 Summary

Fourteen sites have previously been recorded within the study area (Table 6-4, see also Section 6.1.1).

This assessment identified an additional 23 sites (including isolated artefacts, artefact scatters, areas of PADs, and artefact scatters with associated areas of PAD) within the study area. Of these 23 sites, nine were areas of PAD only, on which no surface artefacts were found during this assessment. The remaining 14 sites had a surface artefact or multiple surface artefacts.

Two hundred and forty-four stone artefacts were recorded during the survey. Of these, 197 were unretouched flakes, 16 were retouched flakes, 14 were cores, 14 were flaked pieces, and 3 were hammers. The retouched flakes included burins, scrapers, and backed artefacts. Four material types were recognized. One hundred and fifty artefacts were made from IMSTC (Indurated Mudstone, Silicified Tuff or Chert), 81 from silcrete, seven from quartz, five from quartzite, and one from igneous rock.

Slightly more than half of the artefacts are broken fragments. The complete flakes and cores found during the survey are generally small in size, and flakes with dorsal cortex are rare relative to flakes with no cortex on their dorsal surfaces. The data indicate that nodules of stone were procured from source areas outside the study area, and that nodules were flaked at sites elsewhere prior to being brought into the study area. This data is consistent with information provided by representatives from the RAPs on site, indicating that stone was sourced from various locations elsewhere in the Hunter Valley, and that Aboriginal groups travelled into the study area from other parts of the Hunter Valley and surrounding regions. These groups would frequently carry stone into this part of the Hunter Valley as they travelled in from neighbouring areas.

The different material types identified in this analysis show considerable internal diversity in colour, texture, grain size and other qualities. Analysis of this intra-type variability is beyond the scope of the current analysis, but should be explored further if future archaeological work examines a larger sample of stone artefacts from the study area. Variability in material is likely to be relevant to discussions of material quality as well as reconstructing the mobility, procurement strategies, and material optimisation strategies of Aboriginal groups in the region.

The analyses of stone artefact assemblage composition carried out here have pooled the artefacts found from all sites to provide an overview of the stone artefacts found within the study area. Pooling all artefacts was necessary to provide a large enough body of data to enable analyses to be carried out. It does, however, create some limitations in the interpretations that can be drawn from the analyses. Most importantly, it would function to mask any fine-grained variability that might exist between the artefacts found on different sites across the study area. If differences exist between sites, the pooled data set is not able to reveal the existence of these differences.

The artefacts examined in this study are all surface artefacts found during the survey. Discovery of artefacts during a surface survey would tend to favour large artefacts, and artefacts made from obtrusive or unusual materials. For these reasons, it is possible that the sample of artefacts made from materials such as chert, mudstone, tuff and silcrete, which are fine-grained and consequently exhibit smooth fracture surfaces, and which are different from the background geology of the region, could be over-represented in the dataset. Artefacts made from quartz and quartzite, which tend to exhibit rougher and less recognizable fracture surfaces, and which are more frequently found in the background geology and are less visually obtrusive as a result, might be under-represented in the dataset.

## 7. Significance assessment

### 7.1 Method of significance assessment

#### 7.1.1 Basis for assessment

A significance assessment is made up of several significance criteria that attempt to define why a site is important. Such assessment recognises that sites may be important for different reasons to different people, and even at different times. The assessment of Aboriginal cultural heritage in this assessment is based upon the four values of the Australia ICOMOS Burra Charter (Australia ICOMOS 2000).

- Social values
- Historical values
- Scientific values
- Aesthetic values.

Each of these values is assessed below for Aboriginal sites in or adjacent to the study area, and an overall significance is assigned based on an average across the values. This is inherently a reductive process, and oversimplifies what is important for different reasons to a range of different stakeholders, but is a necessary process in being able to create comparative values between sites. The significance of each site ultimately informs the management of sites and places.

It should be noted that only existing Aboriginal sites within the study area or adjacent (within 50 m) to the study area are assessed for significance here. Aboriginal sites within or adjacent to the project corridor that could not be relocated during the archaeological survey are not assessed in this chapter.

#### 7.1.2 Social significance

The significance of a heritage item does not relate only to its scientific or research value. Aboriginal people's views on the significance of archaeological sites are usually related to traditional, cultural and educational values, although some Aboriginal people also value any scientific information a site may be able to provide.

Aboriginal cultural significance was assessed from consultation with the nominated Site Officers for the relevant RAPs during and following field assessments. It should be noted that Aboriginal significance assessed in this manner may not reflect the views of all members of the community.

#### 7.1.3 Historic significance

The historic value of a site is determined through its association with historically important people, events or activities.

A 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 particular period.

#### **7.1.4 Scientific significance**

A concept, place or object can have cultural significance if it is significant in exhibiting particular 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 virtue of 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.

Research potential or scientific significance of an Aboriginal archaeological site can be assessed by using the criteria set out below. Each criterion is rated as low, moderate or high.

- **Site integrity** – The integrity of a site refers to its state of preservation, or condition. A site can be disturbed through a number of factors including natural erosion processes, destructive land use practices or repeated use of a site in the past by both humans and animals
- **Site structure** – Structure refers to a site's physical dimensions, that is, size and stratigraphy. A large site or a site with stratified deposits has more research potential than small sites and/or surface scatters. Sometimes however, specific research questions may be aimed at smaller sites in which case they would be rated at a higher significance than normal. Site structure cannot be assessed for scarred trees or isolated artefacts
- **Site contents** – This category refers to the range and type of occupation debris found in a site. Generally, complex art sites, extensive quarries with associated debris and surface sites that contain a large and varied amount of organic and non-organic materials are considered to have greater research potential than those sites with small, uniform artefacts, single motif art sites and small quarries with little or no debris. For scarred trees, contents may refer to the size and type of scar and/or how many scars there are on the one tree
- **Representativeness and rarity** – Representativeness refers to how much variability exists between the subject site and others inside or outside the subject area. It also considers the types of sites already conserved in the area and how much connectivity between sites exists. Rarity considers how often a particular site type occurs in an area. Assessment of representativeness and rarity requires some knowledge of the background archaeology of the area or region in which a study is being carried out. Rarity also relates to whether the subject site or area is important in demonstrating a distinctive way of life, custom, process, land use, function or design which is no longer practiced (OEH 2011).

#### **7.1.5 Aesthetic significance**

This refers to the sensory value of a place, and can include aspects such as form, texture, and colour, and can also include the smell and sound elements associated with use or experience of a site (Australia ICOMOS 2000). Aesthetic significance can be closely linked to the social value of a site.

A 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.

## 7.2 Statements of significance

The significance of all sites in the study area is set out in Table 7-1. The significance assessment here is limited by the nature of the data available from the archaeological work carried out to date. Surface survey provides an understanding of the nature, and consequently the significance, of Aboriginal objects currently visible on the ground surface only. The significance of areas of PAD cannot be assessed on the basis of the data gathered during the archaeological survey. It is proposed to carry out test excavations to assess the nature and significance of any subsurface material present in areas of PAD which detailed design confirms will be impacted by the Project. Test excavations would be carried out prior to the determination of the Project's development application.

It should be noted that the assessed significance of individual sites provided here does not incorporate, at the time of writing, any input from RAPs on the cultural significance of individual sites.

**Table 7-1 Assessment of site significance**

Site ID	Project component	Significance assessment of site	Significance assessment of PAD	Relevant notes
BAYS PAD13	Salt cake landfill	NA	Cannot be assessed	Further work required
37-2-0063	Coal handling plant	None	NA	Site presumed destroyed <sup>1</sup>
37-2-0062	Coal handling plant	None	NA	Site presumed destroyed <sup>1</sup>
BAYS PAD16	Ash dam augmentation	NA	Cannot be assessed	Further work required
BAYS PAD12	Ash dam augmentation	NA	Cannot be assessed	Further work required
37-2-0065	Ash dam augmentation	None	NA	Site presumed destroyed <sup>1</sup>
37-2-0047 / 37-2-0050	Ash dam augmentation	None	NA	Site presumed destroyed <sup>1</sup>
37-3-0007	Ash dam augmentation	None	NA	Site presumed destroyed <sup>1</sup>
37-2-0048	Ash dam augmentation	Low-Moderate	NA	Artefact scatter of unspecified size, some artefacts have been removed by previous archaeological surface collection
BAYS PAD08	HP and LSP pipe clearing	NA	Cannot be assessed	Further work required
BAYS PAD01	HP pipe clearing	NA	Cannot be assessed	Further work required
BAYS PAD17	Ravensworth ash line	NA	Cannot be assessed	Further work required
BAYS PAD18	Ravensworth ash line	NA	Cannot be assessed	Further work required
BAYS PAD19	Ravensworth ash line	NA	Cannot be assessed	Further work required
37-3-1128	Ravensworth ash line	None	NA	Site destroyed
37-3-0491	Ravensworth ash line	Low - Moderate	See BAYS PAD09	Small artefact scatter on stable landform, within BAYS PAD09



Site ID	Project component	Significance assessment of site	Significance assessment of PAD	Relevant notes
BAYS AS and PAD15	Borrow pits	Low - Moderate	Cannot be assessed	Artefact scatter on unstable landform (eroding creek bank)
BAYS AS09	Borrow pits	Low	NA	Highly disturbed small artefact scatter on severely eroded steep hillslope
BAYS AS and PAD 10	Borrow pits	Moderate	Cannot be assessed	Minimally disturbed knapping floor on stable landform (hilltop)
BAYS PAD12	Borrow pits	NA	Cannot be assessed	Further work required
BAYS AS and PAD11	Borrow pits	Moderate	Cannot be assessed	Disturbed artefact scatter on unstable landform (sheet eroding slope). Undisturbed probable Aboriginal hearth partially buried in stable ground.
BAYS AS06	Borrow pits	Low	NA	Small artefact scatter on unstable landform (eroding creekline)
BAYS AS and PAD07	Borrow pits	Low-Moderate	Cannot be assessed	Artefact scatter on somewhat unstable landform (erosion exposures associated with adjacent creeklines)
37-2-0558	Borrow pits	Low-Moderate	Cannot be assessed	Artefact scatter on somewhat unstable landform (erosion exposures associated with adjacent creeklines)
BAYS AS and PAD05	Borrow pits	Moderate	Cannot be assessed	Large artefact scatter on stable and unstable landforms (hilltop, low gradient slope, and erosion exposures associated with adjacent creekline)
BAYS AS04	Borrow pits	Low	NA	Artefact scatter on previously impacted landform (vehicle track)
BAYS AS and PAD03	Borrow pits	Low	Cannot be assessed	Small artefact scatter on unstable landform (erosion exposures adjacent to creekline)
BAYS IF04	Borrow pits	Low	NA	Isolated surface artefact
BAYS AS and PAD02	Borrow pits	Low	Cannot be assessed	Small artefact scatter on unstable landform (erosion exposures adjacent to creekline)
BAYS IF03	Borrow pits	Low	NA	Isolated surface artefact
BAYS IF02	Borrow pits	Low	NA	Isolated surface artefact
BAYS IF01	Borrow pits	Low	NA	Isolated surface artefact
37-3-0557	Borrow pits	Low	NA	Small artefact scatter on erosional surface
37-2-0556	Borrow pits	Low-Moderate	Cannot be assessed	Small artefact scatter, recorded as having subsurface potential

Site ID	Project component	Significance assessment of site	Significance assessment of PAD	Relevant notes
37-2-0555	Borrow pits	Low-Moderate	Cannot be assessed	Small artefact scatter, recorded as having subsurface potential
37-3-0554	Borrow pits	Low	NA	Small artefact scatter on erosional surface
37-2-0553	Borrow pits	Low	NA	Small artefact scatter on erosional surface

<sup>1</sup> Site presumed destroyed as its recorded location is within an area severely impacted by existing operational infrastructure.

## 8. Impact assessment

### 8.1 Impact avoidance

Where practicable, the detailed design of the project will avoid impacts to Aboriginal sites and areas of PAD (see recommendations in Section 9).

Sites and areas of PAD located outside the Project area, will be protected from indirect impact during construction of the Project. In this way, the potential risk of inadvertent impact to sites located near to the Project area will be avoided.

For this assessment, the precautionary principle has been followed and consequently it is assumed that all sites and areas of PAD within the project footprint will be subject to direct impact resulting from the Project. Similarly it is assumed for the purposes of this assessment that all sites and areas of PAD within the buffer zones (that is, outside the project area but within the study area) are vulnerable to inadvertent impact resulting from the Project.

### 8.2 Potential impacts

The nature of proposed impacts varies between the separate project components, these are discussed here separately by project component.

#### 8.2.1 Ravensworth ash line

##### Proposed works

The installation of the Ravensworth Ash Pipelines would generally consist of the following activities:

- vegetation clearance along the pipeline alignments. It has been assumed that all vegetation would be cleared, however opportunities to minimise clearance would be considered where feasible;
- laying above ground pipelines, held on plinths which would rest on the ground;
- trenching or underboring below ground sections of the pipelines. Depending on the trench depths, shoring or benching the trench may be required;
- removal of any disused pipelines as required and rehabilitation of relevant areas; and
- the pipeline would be installed adjacent to the existing ash pipeline in previously disturbed areas where practicable.

##### Potential impacts to Aboriginal sites

Proposed works in the Ravensworth ash line area have the potential to impact the following Aboriginal sites (Table 8-1):

**Table 8-1 Potential impact to Aboriginal sites in the Ravensworth ash line area**

Name	Site type	Type of harm	Degree of potential harm	Consequence of harm	Notes
BAYS PAD17	PAD	Direct and indirect	Partial destruction	Partial loss of value	Most of PAD is outside the study area. A portion of the PAD is within the buffer zone. A portion of the PAD is within the Project area (footprint)

Name	Site type	Type of harm	Degree of potential harm	Consequence of harm	Notes
BAYS PAD18	PAD	Direct and indirect	Partial destruction	Partial loss of value	Most of PAD is outside the study area. A portion of the PAD is within the buffer zone. A portion of the PAD is within the Project area (footprint)
BAYS PAD19	PAD	Direct	Partial destruction	Partial loss of value	Most of PAD is outside the study area. A portion of the PAD is within the buffer zone. A portion of the PAD is within the Project area (footprint)
37-3-1128	Artefact scatter	NA	None (site already destroyed)	None	Site is recorded on AHIMS as destroyed
37-3-0419	Artefact scatter	Indirect	Total destruction	Total loss of value	Site is within the buffer zone, and outside the Project area (footprint)

### 8.2.2 Coal handling plant water and wastewater infrastructure upgrades

#### Proposed works

Infrastructure works would generally include:

- Construction of clean water diversions to reduce stormwater inflows to the coal handling plant sediment basin;
- Reuse of water within the coal plant water system where possible for operational purposes which could include water treatment; and
- Changes to the water management structures, including the enlargement/reconfiguration of the coal handling plant sediment basin to allow for a larger volume of water to be stored with increased detention time and improved settlement of coal fines to better enable the treatment of water.

#### Potential impacts to Aboriginal sites

No impacts to any Aboriginal sites would result from proposed works in the coal handling plant project component (Table 8-2).

**Table 8-2 Potential impact to sites in the coal handling plant area**

Name	Site type	Type of harm	Degree of potential harm	Consequence of harm	Notes
37-2-0063	Artefact scatter	Direct	None (site presumed destroyed)	None	Site presumed destroyed, as it is within a previously impacted area
37-2-0062	Artefact scatter	Direct	None (site presumed destroyed)	None	Site presumed destroyed, as it is within a previously impacted area

### 8.2.3 Salt cake landfill

#### Proposed works

The following activities would be undertaken to construct the salt cake landfill:



- Site clearing, including the removal of contractor facilities and materials. It is assumed that these materials would be relocated to other areas of AGL Macquarie land, as required;
- Establishment of clean water diversions;
- Establishment of erosion and sediment controls in accordance with *Managing Urban Stormwater: Soils and construction - Volume 1* (the Blue Book)
- Excavation and minor earthworks to create landfill cells, including installation of appropriate lining, and surface water diversion structures, where required; and
- Clay materials for construction of cells, and capping, would be sourced from the proposed borrow pits.

### Potential impacts to Aboriginal sites

While no Aboriginal objects were identified during the survey, proposed works involved in construction and operation of the salt cake landfill have the potential to harm the following PAD (Table 8-3).

**Table 8-3 Potential impact to PAD in the salt cake landfill area**

Name	Site type	Type of harm	Degree of potential harm	Consequence of harm	Notes
BAYS PAD13	PAD	Direct and indirect	Total destruction	Total loss of value	Most of the PAD is within the buffer zone. A portion of the PAD is within the Project area (footprint)

### 8.2.4 Ash dam augmentation, ash harvesting and water management works

#### Proposed works

The augmentation of the ash dam would generally consist of the following works:

- A levee embankment on the western perimeter to a rendered level (RL) of 184.5 metres (11.5 metre high embankment);
- Increasing the existing levee embankment on the eastern perimeter by about 3.5 metres to RL 176;
- Construction of a concrete parapet wall along the main embankment crest to increase flood attenuation within the dam;
- Construction of two new southern saddle dams to prevent ash from spilling out of a low point along the southern ridgeline;
- Extensions to the ash dispersion and water supply and management systems;
- Installation of ash dam divider walls allowing ash discharge to be undertaken in alternating cells and deployment of dust suppression (water sprays or polymers) during dust events where necessary in accordance with existing dust management processes;
- Works may include relocation/replacement of existing pipelines to current standards;
- Upgrade to ancillary infrastructure associated with ash disposal such as pumps, pipelines and power infrastructure; and
- Water management improvement works associated with the main and saddle dam walls including diversion of clean runoff around the site, installation of new seepage capture and return infrastructure and upgrading existing seepage capture and return infrastructure.

### Potential impacts to Aboriginal sites

Augmentation of the ash dam has the potential to directly impact the following Aboriginal sites (Table 8-4):

**Table 8-4 Potential impact to Aboriginal sites in the ash dam area**

Name	Site type	Type of harm	Degree of potential harm	Consequence of harm	Notes
BAYS PAD14	PAD	Direct and indirect	Total or Partial destruction	Total or Partial loss of value	A portion of the PAD is within the buffer zone. Most of the PAD is within the Project area (footprint)
BAYS PAD16	PAD	Direct and indirect	Total or partial destruction	Total or partial loss of value	A portion of the PAD is within the buffer zone. Most of the PAD is within the Project area (footprint)
37-2-0065	Artefact scatter	Direct	None (site presumed destroyed)	None	Site presumed destroyed, as it is within the ash dam inundation area
37-2-0047 / 37-2-0050	Artefact scatter	Direct	None (site presumed destroyed)	None	Site presumed destroyed, as it is within the ash dam inundation area
37-3-0007	Artefact scatter	Direct	None (site presumed destroyed)	Non	Site presumed destroyed, as it is within the ash dam inundation area
37-2-0048	Artefact scatter	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)

### 8.2.5 HP pipeline clearing corridor and LSP sludge pipeline clearing corridor

#### Proposed works

Clearing the HP pipe areas and the LSP pipe area would generally involve the following:

- Clearing of vegetation. This ACHAR assumes, following the precautionary principle, that clearing vegetation would involve ground disturbance resulting from grubbing out of roots and the movement of vehicles across the area. Vegetation clearing is consequently assumed to represent an impact to any subsurface archaeological material that might exist within the HP pipe clearing and LSP pipe clearing areas; and
- Establishment of vehicle tracks enabling ongoing access to the pipes for routine maintenance clearing.

#### Potential impact to Aboriginal sites

While no Aboriginal objects were identified during the survey, proposed works in the HP pipe and LSP pipe areas has the potential to impact the following PADs (Table 8-5):

**Table 8-5 Potential impact to Aboriginal sites in the HP and LSP pipe areas**

Name	Site type	Type of harm	Degree of potential harm	Consequence of harm	Notes
BAYS PAD01	PAD	Direct and indirect	Total destruction	Total loss of value	Most of the PAD is within the buffer zone. A portion of the PAD is within the Project area (footprint)
BAYS PAD08	PAD	Direct and indirect	Total destruction	Total loss of value	Most of the PAD is within the buffer zone. A portion of the PAD is within the Project area (footprint)

### 8.2.6 Borrow pits

#### Proposed works

Construction of the borrow pits would consist of the following works:

- Site clearance, including vegetation removal where necessary.
- Establishment of clean water diversions;
- Establishment of erosion and sediment controls;
- Clearing vegetation and either mulching for onsite reuse or used to create habitat piles; and
- Stripping of topsoil for later use in rehabilitation.

The borrow pits operational stage would comprise:

- Excavation of clay material using benching techniques;
- Transport of material to point of use using existing internal access tracks; and
- Progressive rehabilitation, or soil binding, of exposed areas to manage dust and sediment runoff.

#### Potential impacts to Aboriginal sites

Construction of the borrow pits has the potential to directly impact the following Aboriginal sites (Table 8-6). Note that in the case of borrow pit 4, it is anticipated that the entire area will be disturbed as part of the Project. This borrow pit does not have a buffer zone not subject to direct impacts (see Figure 6-5). Consequently all sites and areas of PAD within the borrow pit 4 area are anticipated to be directly impacted.

**Table 8-6 Potential impact to Aboriginal sites in the borrow pit areas**

Name	Site type	Type of harm	Degree of potential harm	Consequence of harm	Notes
BAYS PAD14	PAD	Direct and indirect	Total destruction	Total loss of value	A portion of the PAD is within the buffer zone. Most of the PAD is within the Project area (footprint)
BAYS AS and PAD15	Artefact scatter and PAD	Direct and indirect	Complete destruction of artefact scatter, partial destruction of PAD	Partial loss of value	Most of the site is within the buffer zone. A portion of the site is within the Project area (footprint)

Name	Site type	Type of harm	Degree of potential harm	Consequence of harm	Notes
BAYS AS 09	Artefact scatter	Direct	Total destruction	Total loss of value	Site is entirely within the Project area (footprint)
BAYS AS and PAD 10	Artefact scatter and PAD	Direct	Total destruction	Total loss of value	Site is entirely within the Project area (footprint)
BAYS AS and PAD11	Artefact scatter and PAD	Direct and indirect	Total destruction	Total loss of value	A portion of the site is within the buffer zone. A portion of the site is within the Project area (PAD)
BAYS PAD12	PAD	Direct and indirect	Total destruction	Total loss of value	A portion of the PAD is within the buffer zone. A portion of the PAD is within the Project area (footprint)
BAYS AS and PAD07	Artefact scatter and PAD	Direct	Total destruction	Total loss of value	Site is entirely within the Project area (footprint)
BAYS AS06	Artefact scatter	Indirect	Total destruction	Total loss of value	Site is entirely within the buffer zone, and outside the Project area (footprint)
BAYS AS and PAD05	Artefact scatter and PAD	Direct and indirect	Partial destruction	Partial loss of value	Most of the site is within the Project area (footprint). A portion of the site lies extends outside the Project area.
BAYS AS04	Artefact scatter	Direct	Total destruction	Total loss of value	Site is entirely within the Project area (footprint)
BAYS AS and PAD03	Artefact scatter and PAD	Direct	Total destruction	Total loss of value	Site is entirely within the Project area (footprint)
BAYS IF04	Isolated artefact	Direct	Total destruction	Total loss of value	Site is entirely within the Project area (footprint)
BAYS AS and PAD02	Artefact scatter and PAD	Direct	Total destruction	Total loss of value	Site is entirely within the Project area (footprint)
BAYS IF03	Isolated artefact	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)
BAYS IF02	Isolated artefact	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)
BAYS IF01	Isolated artefact	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)



Name	Site type	Type of harm	Degree of potential harm	Consequence of harm	Notes
37-2-0557	Artefact scatter	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)
37-2-0556	Artefact scatter	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)
37-2-0555	Artefact scatter	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)
37-2-0553	Artefact scatter	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)
37-2-0554	Artefact scatter	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)
37-2-0558	Artefact scatter	Direct	Total destruction	Total loss of value	Site is within the Project area (footprint)

### 8.3 Significance of impact

The significance of the sites identified in this assessment is discussed in Section 7.

Potential impact to each site is detailed in Section 8.2.

In summary, the proposed works would directly impact isolated surface artefacts and surface artefact scatters that range from low to moderate archaeological significance. Proposed works would also directly impact areas of PAD (some of which are associated with surface artefacts).

There are sites and areas of PAD that lie wholly or partially within the buffer zone that was included in the study area. Sites and areas of PAD in the buffer zone are not anticipated to be subject to direct impacts, but would be vulnerable to indirect impact. In other words, these areas could plausibly be inadvertently impacted as a result of Project works. Sites and areas of PAD subject to inadvertent impact are recommended to be protected during the Project's construction phase.

The significance of areas of PAD cannot be assessed based on the archaeological survey detailed in this report. Assessing the significance of PADs would require further archaeological work including subsurface testing to be carried out. It is proposed to carry out test subsurface excavations to assess the nature and significance of any subsurface material present in areas of PAD which detailed design confirms will be impacted by the Project. Test excavations will be carried out prior to the determination of the Project's development application (see Section 9)

Pending these further investigations, the overall significance of the proposed impacts represented by the Project cannot comprehensively be evaluated at this point, due to a lack of data on subsurface archaeological material.

### 8.4 Cumulative impacts

#### 8.4.1 Introduction

Assessing cumulative impacts involves the consideration of the proposed impact in the context of existing developments and past destruction of heritage sites, as well as the population of heritage sites that still exist in the region of interest (Godwin 2011). The concept of assessing cumulative impacts aims to avoid discussing the

impact of a development in isolation, and aims to assess the impact in terms of the overall past and future degradation of a region's heritage resource.

### **8.4.2 Assessment**

The cumulative impact to the archaeological resource of the region cannot be gauged at present, due to the significance of PAD areas requiring further work to be assessed (see Section 8.3). The cumulative impact represented by the project will be assessed following test excavations, as these will establish the nature and significance of any subsurface archaeological material present within each of the areas of PAD.

It is noted that impacts to AGL land has been cited by RAPs as a concern due to it being a pocket of relatively undisturbed land in an area that has been subject to extensive impact from mining operations. Prior impact to large areas of land in the immediate surrounding region, and across the Hunter Valley overall, have increased the concern that the Aboriginal community has with impacts proposed by future projects. This concern with the cumulative impact of successive development projects is consistent with feedback on other projects in the region (for a review, see Sutton *et al.* 2013).

## 9. Management and mitigation recommendations

The management recommendations presented here are based on the assessment of impacts in Section 8.2.

For this assessment, the precautionary principle has been followed and consequently it is assumed that all sites and areas of PAD within the project footprint will be subject to direct impact resulting from the Project. Similarly it is assumed for the purposes of this assessment that all sites and areas of PAD within the buffer zones (that is, outside the project area but within the study area) are vulnerable to inadvertent impact resulting from the Project.

The significance of sites has been assessed based on the surface artefacts identified during the archaeological survey (see Section 7.2). The significance of any subsurface Aboriginal objects that might be present within areas of PAD cannot be assessed at this stage, as no archaeological excavations have taken place.

Table 9-1 outlines the areas of PAD where a program of test excavations is recommended to be carried out prior to construction occurring. These test excavations would establish the nature and significance of any subsurface assemblages of Aboriginal objects present in each of the PADs.

Test excavations would be carried out only within portions of PAD that were anticipated to be subject to direct impact. The final detailed design of the project would be used to identify the areas of PAD that would be directly impacted and so would require test excavation to establish the nature and significance of subsurface archaeological material.

The results of test excavations on each PAD would inform decisions around subsequent management of the areas of PAD. Depending on the significance of subsurface archaeological materials, subsequent mitigation actions carried out on a PAD might involve amending the Project's design so as to avoid impacting the PAD to the extent practicable. Mitigations might involve carrying out salvage excavations to recover a sample of material from the PAD prior to impact; or might involve carrying out the proposed construction works without any further excavations taking place. Decisions of management and mitigation actions to be carried out on areas of PAD would be dependent upon the practicality of amending the Project's design, and on the significance of the archaeological material found within the PAD.

It is recommended that Aboriginal artefacts that have been identified on the ground surface be collected and removed from all sites (or portions of sites) that are proposed to be impacted. Collection of these artefacts would represent a mitigation action for destruction of the site, in that it would protect the surface artefacts from harm during the proposed works. All Aboriginal artefacts hold cultural significance for present-day Aboriginal people (see Section 5.2), as well as having archaeological (scientific) significance resulting from their potential to provide information about pre-contact Aboriginal society.

Collected artefacts would be held in secure temporary storage during construction, and could be returned to country on an area of ground outside the impact zone. Any artefacts recovered from archaeological excavations would similarly be returned to country in a safe location. The final location of collected artefacts would be decided through discussion with the RAPs.

As outlined in Section 2.2.1, an AHIP will not be required for impacts to cultural heritage authorised by any SSD consent granted for the project. However, the following mitigation actions are recommended following development consent of the project, to minimize the risk of impacts to cultural heritage:

- Investigate opportunities to avoid identified Aboriginal sites and areas of PAD where practicable.
- Sites and areas of PAD (or portions thereof) that have been assessed as subject to potential indirect (inadvertent) impact will be protected from these impacts during Project works through fencing or other appropriate measures.

- Where direct impacts are proposed to occur to areas of PAD (including those areas of PAD associated with surface artefact scatters), a program of detailed survey and test excavation would be carried out to assess the nature and significance of any subsurface archaeological material. A list of sites that this recommendation applies to is provided in Table 9-1.
- The results of test excavations on each PAD would inform decisions around subsequent management of the areas of PAD. Future work to be carried out prior to impact to sites might include salvage excavation of areas currently designated as PADs. The decision to recommend salvage excavation on a site would be contingent upon the results of test excavation.
- Collection of surface artefacts from all sites or portions of sites that would be impacted.
- Collection of surface artefacts and archaeological excavations (both test and salvage) would be undertaken by a qualified archaeologist and Site Officers supplied by the RAPs.

**Table 9-1 Sites and areas of PAD where test excavation is recommended**

Site	Potential for subsurface artefacts to be present
BAYS AS and PAD05	Moderate to high
BAYS AS and PAD03	Moderate
BAYS AS and PAD02	Moderate
BAYS AS and PAD07	High
BAYS AS and PAD10	Moderate
BAYS AS and PAD11	Moderate
BAYS PAD12	Moderate
BAYS PAD14	Moderate
BAYS PAD01	Low to moderate
BAYS PAD08	Low to moderate
BAYS PAD13	Low to moderate
BAYS PAD16	Moderate
BAYS PAD17	Moderate
BAYS PAD18	Moderate
BAYS PAD19	Moderate
BAYS AS and PAD15	High
37-2-0555	Potential for subsurface artefacts, and recommendation for test excavation, identified in original site recording
37-2-0556	Potential for subsurface artefacts, and recommendation for test excavation, identified in original site recording
37-2-0558	Potential for subsurface artefacts, and recommendation for test excavation, identified in original site recording



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## **Appendix A. Consultation documents**

13 May 2019

**Subject: Seeking Aboriginal knowledge holders to assist AGL Macquarie to prepare a cultural heritage assessment report for the Bayswater Water and Other Associated Operational Works Project**

To Whom It May Concern,

AGL Macquarie Pty Limited (AGL Macquarie) own and operate the Bayswater Power Station, located approximately 16 km south-east of Muswellbrook. Commissioned in 1985, water and wastewater infrastructure and site improvements are required to ensure the continued operational and environmental performance of Bayswater until its expected retirement in 2035.

The Bayswater Water and Other Associated Operational Works Project (the Project) would ensure the continued efficient operation of Bayswater until its retirement, replace and/or upgrade ageing infrastructure, and provide the opportunity for improvements based on post-installation advances in water and wastewater management.

The key features of the project may include:

- Augmentation of the existing Bayswater ash dam to provide additional ash storage capacity, involving minimal additional ground disturbance.
- Improvements to water management structures and systems to ensure continued collection and reuse of process water and return waters from the Bayswater ash dam.
- Improvements to the management of water and waste materials within the coal handling plant sediment basin and associated drainage system.
- Increasing coal ash recycling activities to produce up to 1,000,000 tonnes per annum of ash derived product material and reuse of coal ash.
- Upgrades to existing fly ash harvesting infrastructure including the installation of weighbridges, construction of a new 240 tonne silo, tanker wash facility and additional truck parking.
- Construction and operation of a new coal ash pipeline to Ravensworth Void No. 3 for ash emplacement.
- Construction and operation of a salt cake landfill facility to dispose of salt cake waste from the approved salt caking plant to be constructed at the Bayswater water treatment plant.

Subject: Seeking Aboriginal knowledge holders to assist AGL Macquarie to prepare a cultural heritage assessment report for the Bayswater Water and Other Associated Operational Works Project

- Construction and operation of a borrow pit(s) on AGL Macquarie land to facilitate the improvements proposed for the Project and other works on AGL Macquarie land.
- Seepage water return system improvement works at Lake Liddell.
- Ancillary infrastructure works including repositioning of underground pipelines to above ground, replacement or upgrading of ageing pipelines, vegetation clearing associated with maintaining existing infrastructure, including along pipeline/transmission corridors and drainage canals as well as necessary for the construction of feedlines as required.

The Project area is shown in **Figure 1** and will be refined to a disturbance footprint and provided to Registered Aboriginal Parties upon their identification.

Jacobs, on behalf of AGL Macquarie is currently drafting an Environmental Impact Statement in accordance with Division 5.7 of the *Environmental Planning and Assessment Act 1979 (NSW)*. Jacobs, on behalf of AGL Macquarie, is therefore seeking Aboriginal knowledge holders to assist in the assessment of the Project and provide input into the preparation of a cultural heritage assessment report (CHAR).

In accordance with section 4.1.2 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010), it would be appreciated if your organisation could please provide a list of the names of, or pass this request along to, Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects or Aboriginal places for the proposal within the concept proposal area.

Thank you for your assistance and advice in this matter. If you have any questions or would like to discuss this further, please contact me as per the contact details below:

[Redacted contact details]

Yours sincerely,

[Redacted signature]

**Clare Leever**  
Project Archaeologist

[Redacted contact details]

**From:** [REDACTED]  
**Sent:** Monday, 13 May 2019 1:34 PM  
**To:** Leever, Clare  
**Subject:** [EXTERNAL] Fwd: Seeking Aboriginal knowledge holders for the Bayswater Water and Other Associated Operational Works Project  
**Attachments:** image006.jpg

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Clare,

Please see below correspondence and contact details for [REDACTED] CEO of WLALC

Wanaruah Local Aboriginal Land Council  
PO Box 127  
MUSWELLBROOK NSW 2333  
19 Maitland St, Muswellbrook NSW 2333

[REDACTED]

[REDACTED] | SLSO Aboriginal Communities Officer  
Natural Resources Management  
Hunter Local Land Services | Healthy Landscapes  
816 Tocal Road | PATERSON | NSW 2421  
M: [REDACTED]  
E: [REDACTED]  
W: [www.hunter.lis.nsw.gov.au](http://www.hunter.lis.nsw.gov.au) : [www.facebook.com/HunterLLS](https://www.facebook.com/HunterLLS)

I pay my respects to all First Nations people of the lands in which i work and acknowledge their long connections to the land we are on and extend that respect to all custodians today.

[REDACTED]

----- Forwarded message -----  
From: [REDACTED]  
Date: Mon, May 13, 2019 at 1:28 PM  
Subject: RE: Seeking Aboriginal knowledge holders for the Bayswater Water and Other Associated Operational Works Project  
To: [REDACTED]

Yes please

From: [REDACTED]  
Sent: Monday, 13 May 2019 10:59 AM  
[REDACTED]  
Subject: Fwd: Seeking Aboriginal knowledge holders for the Bayswater Water and Other Associated Operational Works Project

Good Morning

Please see below email send from Jacobs seeking Registered Aboriginal Parties nomination, let me know if you are happy to pass on your details and if you would like further RAP's details passed on

regards

[REDACTED] | SLSO Aboriginal Communities Officer  
Natural Resources Management  
Hunter Local Land Services | Healthy Landscapes  
816 Tocal Road | PATERSON | NSW 2421  
M: [REDACTED]  
[REDACTED]  
W: [www.hunter.lis.nsw.gov.au](http://www.hunter.lis.nsw.gov.au) : [www.facebook.com/HunterLLS](https://www.facebook.com/HunterLLS)

I pay my respects to all First Nations people of the lands in which i work and acknowledge their long connections to the land we are on and extend that respect to all custodians today.

----- Forwarded message -----  
From: [REDACTED]  
Date: Mon, May 13, 2019 at 10:40 AM  
Subject: Seeking Aboriginal knowledge holders for the Bayswater Water and Other Associated Operational Works Project  
To: [REDACTED]

13 May 2019

Attention: [REDACTED]

Singleton Local Land Services  
816 Tocal Road, Paterson, NSW 2421

Via Email: [REDACTED]

Subject: Seeking Aboriginal knowledge holders to assist AGL Macquarie to prepare a cultural heritage assessment report for the Bayswater Water and Other Associated Operational Works Project

Dear Jess Wegener,

AGL Macquarie Pty Limited (AGL Macquarie) own and operate the Bayswater Power Station, located approximately 16 km south-east of Muswellbrook. Commissioned in 1985, water and wastewater infrastructure and site improvements are required to ensure the continued operational and environmental performance of Bayswater until its expected retirement in 2035.

The Bayswater Water and Other Associated Operational Works Project (the Project) would ensure the continued efficient operation of Bayswater until its retirement, replace and/or upgrade ageing infrastructure, and provide the opportunity for improvements based on post-installation advances in water and wastewater management. The Project area shown in the attached document will be refined to a disturbance footprint and provided to Registered Aboriginal Parties upon their identification.

Jacobs, on behalf of AGL Macquarie is currently drafting an Environmental Impact Statement in accordance with Division 5.7 of the *Environmental Planning and Assessment Act 1979 (NSW)*. Jacobs, on



behalf of AGL Macquarie, is therefore seeking Aboriginal knowledge holders to assist in the assessment of the Project and provide input into the preparation of a cultural heritage assessment report (CHAR).

In accordance with section 4.1.2 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010), it would be appreciated if your organisation could please provide a list of the names of, or pass this request along to, Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects or Aboriginal places for the proposal within the concept proposal area.

Thank you for your assistance and advice in this matter. If you have any questions or would like to discuss this further, please don't hesitate to contact me.

[REDACTED]

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Jacobs' Energy, Chemicals and Resources business is now part of Worley



This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of their organisation.



This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of their organisation.

<b>Follow Up Flag:</b>	Follow up
<b>Flag Status:</b>	Flagged

[REDACTED]

Doc19/398931-3  
Bayswater Water and Other Works

Ms [REDACTED]  
Jacobs  
[REDACTED]

Dear Clare

**Bayswater Water and Other Works – Aboriginal Stakeholder List – Singleton Council and Muswellbrook Council**

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 Singleton Council and Muswellbrook Council Local Government Areas (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.

**Aboriginal stakeholder lists may cover multiple Local Aboriginal Land Council boundaries**

Please note that the attached list may contain two or more Local Aboriginal Land Councils (LALCs) that occur in the LGA. Please review the boundary of your specific project area and ensure you consult with all LALC(s) that overlap with your project area. OEH does not require you to contact any LALCs on the attached list that you determine are wholly located outside your 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 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: [REDACTED]

Should you require any further information, please do not hesitate to contact us.

Yours sincerely

A black rectangular redaction box covering a signature.

30 May 2019

[REDACTED]  
**Senior Team Leader Planning**  
**Hunter Central Coast Branch**  
**Conservation and Regional Delivery Division**



27 May 2019

By email: [REDACTED]

[REDACTED]  
Project Archaeologist  
Jacobs Group Australia Pty Ltd  
[REDACTED]  
NORTH SYDNEY NSW 2059

Dear Ms Leever,

**Request - Search for Registered Aboriginal Owners**

We refer to your letter dated 10 May 2019 ("Letter") regarding an Aboriginal Cultural Heritage Assessment for the proposed developments within the study area indicated on the map attached to the Letter, located approximately 16 kms south-east of Muswellbrook, NSW.

Under Section 170 of the *Aboriginal Land Rights Act 1983* the Office of the Registrar is required to maintain the Register of Aboriginal Owners (RAO). A search of the RAO has shown that there are not currently any Registered Aboriginal Owners in the project area.

We suggest you contact Wanaruah Local Aboriginal Land Council on 02 6543 1288 as they may be able to assist you in identifying Aboriginal stakeholders who wish to participate.

Yours sincerely

[REDACTED]

[REDACTED]  
**Project Officer, Aboriginal Owners**  
Office of the Registrar, ALRA

**From:** [REDACTED]  
**Sent:** Monday, 13 May 2019 2:08 PM  
**To:** [REDACTED]  
**Subject:** [EXTERNAL] FW: Seeking Aboriginal knowledge holders for the Bayswater Water and Other Associated Operational Works Project

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Clare,

Council can advise that the primary contact for all consultation relating to Aboriginal Heritage is the Wanaruah Land Council.

**Address:** [REDACTED] Singleton NSW 2330  
**Phone:** [REDACTED]  
**Email:** [REDACTED]

Please feel free to give me a call for any further information.

Regards,



**SINGLETON  
COUNCIL**

[REDACTED]  
Acting Coordinator Planning & Development

[REDACTED]  
W [singleton.nsw.gov.au](http://singleton.nsw.gov.au)

Uncontrolled when printed - verify current version, if printed. Please consider the environment before printing this document.

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**From** [REDACTED]  
**Sent:** Monday, 13 May 2019 10:41 AM  
**To:** recordsmbx <[council@singleton.nsw.gov.au](mailto:council@singleton.nsw.gov.au)>  
**Subject:** Seeking Aboriginal knowledge holders for the Bayswater Water and Other Associated Operational Works Project

13 May 2019

Attention:  
Singleton Council  
PO Box 314, Singleton, NSW 2330

Via Email: [council@singleton.nsw.gov.au](mailto:council@singleton.nsw.gov.au)

**Subject: Seeking Aboriginal knowledge holders to assist AGL Macquarie to prepare a cultural heritage assessment report for the Bayswater Water and Other Associated Operational Works Project**

To Whom It May Concern,

AGL Macquarie Pty Limited (AGL Macquarie) own and operate the Bayswater Power Station, located approximately 16 km south-east of Muswellbrook. Commissioned in 1985, water and wastewater infrastructure and site improvements are required to ensure the continued operational and environmental performance of Bayswater until its expected retirement in 2035.

The Bayswater Water and Other Associated Operational Works Project (the Project) would ensure the continued efficient operation of Bayswater until its retirement, replace and/or upgrade ageing infrastructure, and provide the opportunity for improvements based on post-installation advances in water and wastewater management. The Project area shown in the attached document will be refined to a disturbance footprint and provided to Registered Aboriginal Parties upon their identification.

Jacobs, on behalf of AGL Macquarie is currently drafting an Environmental Impact Statement in accordance with Division 5.7 of the *Environmental Planning and Assessment Act 1979 (NSW)*. Jacobs, on behalf of AGL Macquarie, is therefore seeking Aboriginal knowledge holders to assist in the assessment of the Project and provide input into the preparation of a cultural heritage assessment report (CHAR).

In accordance with section 4.1.2 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010), it would be appreciated if your organisation could please provide a list of the names of, or pass this request along to, Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects or Aboriginal places for the proposal within the concept proposal area.

Thank you for your assistance and advice in this matter. If you have any questions or would like to discuss this further, please don't hesitate to contact me.

Yours sincerely,

[REDACTED]

[REDACTED]  
Project Archaeologist  
[REDACTED]  
[clare.leivers@jacobs.com](mailto:clare.leivers@jacobs.com)

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20th June 2019

**Subject: Seeking Aboriginal knowledge holders to assist Jacobs, on behalf of AGL Macquarie to prepare a cultural heritage assessment report for the Bayswater Water and Other Associated Operational Works Project**

Dear <Name>

AGL Macquarie Pty Limited (AGL Macquarie) own and operate the Bayswater Power Station, located approximately 16 km south-east of Muswellbrook. Commissioned in 1985, water and wastewater infrastructure and site improvements are required to ensure the continued operational and environmental performance of Bayswater until its expected retirement in 2035.

The Bayswater Water and Other Associated Operational Works Project (the Project) would ensure the continued safe, efficient and reliable operation of Bayswater until its retirement and provide the opportunity for improvements based on post-installation advances in water and wastewater management.

The key features of the project may include:

- Augmentation of the existing Bayswater ash dam to provide additional ash storage capacity, involving minimal additional ground disturbance.
- Improvements to water management structures and systems to ensure continued collection and reuse of process water and return waters from the Bayswater ash dam.
- Improvements to the management of water and waste materials within the coal handling plant sediment basin and associated drainage system.
- Increasing coal ash recycling activities to produce up to 1,000,000 tonnes per annum of ash derived product material and reuse of coal ash.
- Upgrades to existing fly ash harvesting infrastructure including the installation of weighbridges, construction of a new 240 tonne silo, tanker wash facility and additional truck parking.
- Construction and operation of a new coal ash pipeline to Ravensworth Void No. 3 for ash emplacement.
- Construction and operation of a salt cake landfill facility to dispose of salt cake waste from the approved salt caking plant to be constructed at the Bayswater water treatment plant.
- Construction and operation of a borrow pit(s) on AGL Macquarie land to facilitate the improvements proposed for the Project and other works on AGL Macquarie land.
- Ancillary infrastructure works including repositioning of underground pipelines to above ground, replacement or upgrading of ageing pipelines, vegetation clearing associated with maintaining existing infrastructure, including along pipeline/transmission corridors and drainage canals as well as necessary for the construction of feedlines as required.



20th June 2019

Subject: Seeking Aboriginal knowledge holders to assist Jacobs, on behalf of AGL Macquarie to prepare a cultural heritage assessment report for the Bayswater Water and Other Associated Operational Works Project

The Project is located within the Bayswater Power Station on the New England Highway within the Local Government Areas of Muswellbrook and Singleton, as shown in Attachment A.

Jacobs, on behalf of AGL Macquarie is currently drafting an Environmental Impact Statement in accordance with Division 4.7 of the *Environmental Planning and Assessment Act 1979* (NSW).

As per the consultation guidelines, Jacobs, on behalf of AGL Macquarie is seeking registrations of interest from Aboriginal people who hold cultural knowledge relevant to the Project area. The purpose of consultation with the Aboriginal community is to assist AGL Macquarie in the preparation of a cultural heritage assessment report, and to assist in the assessment and approval of the Project by the NSW Minister for Planning.

Jacobs are inviting registrations of interest in the process of community consultation from Aboriginal person(s) or groups who hold cultural knowledge relevant to determining the significance of Aboriginal objects and/or places at or between Muswellbrook, Howick, Lemington, Liddell and Ravensworth.

Please note that Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010) requires the proponent to advise OEH and the LALC of Aboriginal people who have registered an interest in the Project. Please advise if you **do not** want your details forwarded to OEH.

We hope you or your organisation choose to participate in this Project and enclose for your completion a Notice to Register. **These completed forms need to be returned to Jacobs by 5pm 5<sup>th</sup> July 2019.**

Yours sincerely,

A black rectangular box redacting the signature of the sender.

A black rectangular box redacting the name of the sender.

Project Archaeologist  
Level 7, 177 Pacific Highway, North Sydney NSW 2060

A black rectangular box redacting the address of the sender.



# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, \_\_\_\_\_ (NAME)

\_\_\_\_\_ (ORGANISATION)

\_\_\_\_\_ (POSITION)

\_\_\_\_\_ (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

*(Tick if relevant)*

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is *(Please tick preferred method and provide details below)*:

☐ Email ☐ Mail ☐ Fax ☐ Phone

Email  
Address: \_\_\_\_\_

Mailing  
address: \_\_\_\_\_

Fax: \_\_\_\_\_

Phone: \_\_\_\_\_

# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED]

A1 INDIGENOUS SERVICES \_\_\_\_\_(ORGANISATION)

OWNER \_\_\_\_\_(POSITION)

[REDACTED] \_\_\_\_\_(ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

*(Tick if relevant)*

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is *(Please tick preferred method and provide details below)*:

☐ Email ☐ Mail ☐ Fax ☐ Phone

Email Address; [REDACTED] ( PREFERRED METHOD CONTACT )

Mailing address: [REDACTED]

Phone: [REDACTED]

# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, ABORIGINAL NATIVE TITLE CONSULTANTS (NAME)

[REDACTED] (ORGANISATION)

2 WORKERS

[REDACTED] (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

☐ Email

☒ Mail

☐ Fax

☒ Phone

Email

Address: \_\_\_\_\_

Mailing  
address: \_\_\_\_\_

Fax: \_\_\_\_\_

Phone: \_\_\_\_\_

**From:** [REDACTED]  
**Sent:** Wednesday, 26 June 2019 4:30 PM  
**To:** [REDACTED]  
**Subject:** FW: [EXTERNAL] heritage Culture Bayswater

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

FYI

[REDACTED] | [Jacobs](#) | Environmental Planner | Buildings and Infrastructure | Eastern Asia Pacific  
[REDACTED]  
Level 7, 177 Pacific Highway North Sydney NSW 2060 Australia | PO Box 632 North Sydney NSW 2059 [www.jacobs.com](http://www.jacobs.com)

---

**From:** [REDACTED]  
**Sent:** Wednesday, 26 June 2019 3:54 PM  
**To:** [REDACTED] [\[REDACTED@jacobs.com\]](mailto:[REDACTED@jacobs.com])  
**Subject:** [EXTERNAL] heritage Culture Bayswater

Amna,

AGA Services would like to express an interest in being involved in the Bayswater Power Station Project.

AGA Services is an Aboriginal owned partnership business that aims to assist proponents in undertaking cultural heritage work according to all processes and approved conditions, while ensuring compliance to work specific practices.

Our Organisation is fully insured and registered with OEH. We have undertaken work on all types of sites. Please do not hesitate to contact us if you require more information.

Yours truly

[REDACTED] [REDACTED] [REDACTED]

Please note that all emails and information for AGA Services should be done via [REDACTED] at present.  
thank you

**From:** [REDACTED]  
**Sent:** Wednesday, 29 May 2019 2:57 PM  
**To:** [REDACTED]  
**Subject:** [EXTERNAL] Registration of Interest - AGL Bayswater Water and Other Associated Operational Works Project.

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Dear Clare,

Please accept my registration of interest for Aliera French Trading to be included in the consultation process and upcoming Aboriginal Cultural fieldworks for the AGL Bayswater Water and Other Associated Operational Works Project.

I am Aliera French the Owner/Operator of Aliera French Trading.  
Should you require any further information please feel free to contact me as necessary. My details are as follows:

Contact Name: [REDACTED]  
[REDACTED]  
Blacksmiths NSW 2281  
Contact Number: [REDACTED]  
Email: [REDACTED]@[REDACTED].com

I look forward to working with you.

[REDACTED]  
Owner/Manager  
Aliera French Trading

[REDACTED]  
Owner/Manager  
Aliera French Trading



**From:** [REDACTED]  
**Sent:** Sunday, 23 June 2019 11:07 PM  
**To:** [REDACTED]  
**Subject:** [EXTERNAL] RE: Cultural Heritage Assessment Report for the Bayswater Water and Other Associated Operational Works Project

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Clare,  
  
Thank you for your email.

The Awabakal Traditional Owners Aboriginal Corporation appreciates Jacobs in contacting us regarding the AGL Macquarie to prepare a cultural heritage assessment report for the Bayswater Water and Other Associated Operational Works Project, however would like to inform Jacobs that the AGL Project is not within our Traditional Cultural Boundary and therefore are unable to make any comments on the Aboriginal Cultural Heritage for the area.

If you require any further information please do not hesitate in contacting me.

Kind regards,  
Kerrie Brauer



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**From:** [REDACTED]  
**Sent:** Thursday, 20 June 2019 1:15 PM  
**To:** [REDACTED]  
**Subject:** Cultural Heritage Assessment Report for the Bayswater Water and Other Associated Operational Works Project

Dear Kerrie,

AGL Macquarie Pty Limited (AGL Macquarie) own and operate the Bayswater Power Station, located approximately 16 km south-east of Muswellbrook. Commissioned in 1985, water and wastewater infrastructure and site improvements are required to ensure the continued operational and environmental performance of Bayswater until its expected retirement in 2035. The Project is located within the Bayswater Power Station on the New England Highway within the Local Government Areas of Muswellbrook and Singleton, as shown in Attachment A.

Jacobs, on behalf of AGL Macquarie is currently drafting an Environmental Impact Statement in accordance with Division 4.7 of the Environmental Planning and Assessment Act 1979 (NSW). As per the consultation guidelines, Jacobs, on behalf of AGL Macquarie, has been made aware that you may hold cultural knowledge relevant to the Project area. The purpose of consultation with the Aboriginal community is to assist AGL Macquarie in the preparation of a cultural heritage assessment report, and to assist in the assessment and approval of the Project by the NSW Minister for Planning.

Jacobs are therefore inviting registrations of interest in the process of community consultation from Aboriginal person(s) or groups who hold cultural knowledge relevant to determining the significance of Aboriginal objects and/or places at or between Muswellbrook, Howick, Lemington, Liddell and Ravensworth. If you wish to be included in the consultation for this project, please complete the Notice to Register attached to this email by **5pm 5<sup>th</sup> July 2019**.

Thank you in advance for your response.  
Yours sincerely,

Amna Robinson, on behalf of  
[REDACTED]rch | Jacobs  
Archaeologist | Asia Pacific Buildings & Infrastructure  
Acting Team Leader – Environmental Sciences  
[REDACTED]

NOTICE - This communication may contain confidential and privileged information that is for the sole use of the intended recipient. Any viewing, copying or distribution of, or reliance on this message by unintended recipients is strictly prohibited. If you have received this message in error, please notify us immediately by replying to the message and deleting it from your computer.


**From:** [REDACTED]  
**Sent:** Wednesday, 26 June 2019 4:30 PM  
**To:** [REDACTED]  
**Subject:** FW: [EXTERNAL] Heritage Culture Bayswater

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

FYI

[REDACTED]  
[REDACTED]  
[REDACTED] [cobs.com](#)

---

**From:** [REDACTED]  
**Sent:** Wednesday, 26 June 2019 3:46 PM  
**To:** [REDACTED]   
**Subject:** [EXTERNAL] Heritage Culture Bayswater

[REDACTED]

Cacatua would like to express an interest in being involved in Heritage Culture Bayswater project.

Cacatua is an Aboriginal owned business created to assist proponents and Archaeologists to undertake cultural heritage archaeological assessment according to all processes and approved conditions. Our aim is to provide quality Aboriginal cultural heritage works, while ensuring compliance to work specific practices. Our Organisation is fully insured and registered with OEH. The staffs of Cacatua have undertaken work on all types of sites. Please do not hesitate to contact us if you require more information.

Yours truly  
[REDACTED]  
Manager

# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED] \_\_\_\_\_ (NAME)

CORROBOREE ABORIGINAL CORPORATION \_\_\_\_\_ (ORGANISATION)

DIRECTOR \_\_\_\_\_ (POSITION)

[REDACTED] \_\_\_\_\_ (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

*(Tick if relevant)*

☒ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is *(Please tick preferred method and provide details below)*:

☒ Email ☐ Mail ☐ Fax ☐ Phone

Email Address: [REDACTED]

Mailing address: [REDACTED]

Mob: [REDACTED]

Phone: [REDACTED]

# Notice of Registration

To: Miss ( [REDACTED] )  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED] (NAME)

Gidawang Walang Cultural Heritage Consultancy  
(ORGANISATION)

Cultural Project officer (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

☒ Email

☐ Mail

☐ Fax

☐ Phone

Email

Address: [REDACTED]

Mailing

address: \_\_\_\_\_

Fax: \_\_\_\_\_

Phone: \_\_\_\_\_

## Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: c [REDACTED]

I, [REDACTED] (NAME)

[REDACTED] (ORGANISATION)

MANAGER (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW 2010)*.

My preferred method of communication is (Please tick preferred method and provide details below):

☐ Email

☐ Mail

☐ Fax

☐ Phone

Email

Address: [REDACTED]

Mailing

address: AS ABOVE

Fax:

Phone: [REDACTED]



# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED] (NAME)

HUNTER VALLEY CULTURAL SURVEYING (ORGANISATION)

MANAGER (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

☒ Email

☐ Mail

☐ Fax

☒ Phone

Email

Address: [REDACTED]

Mailing

address: AS ABOVE

Fax:

Phone: [REDACTED]

# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED] \_\_\_\_\_ (NAME)

[REDACTED] Jarban + Mugrebea \_\_\_\_\_ (ORGANISATION)

[REDACTED] Owner manager \_\_\_\_\_ (POSITION)

[REDACTED] \_\_\_\_\_ (A)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)

I confirm that I am authorised to register on behalf of this organisation.

*(Tick if relevant)*

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is *(Please tick preferred method and provide details below)*:

☒ x Email ☒ x Mail ☐ Fax ☐ Phone

Email Address: [REDACTED] \_\_\_\_\_

Mailing address: [REDACTED] \_\_\_\_\_

Fax: \_\_\_\_\_

# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [g \[REDACTED\]](#)

[REDACTED]	NAME
KAUWUL WONN1 CONTRACTING	ORGANISATION
DIRECTOR	POSITION
[REDACTED]	ADDRESS

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

*(Tick if relevant)*

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is *(Please tick preferred method and provide details below)*:

☒ Email    ☒ Phone

Email

Address: [REDACTED]

Phone: [REDACTED]



# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED] (NAME)

Lower Hunter Wonnarua Cultural Services (ORGANISATION)

Wonnarua Elder (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation. ✓

(Tick if relevant)

I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

Email ☒ Mail ☐ Fax ☐ Phone ☐

Email Address: [REDACTED]

Mailing address: [REDACTED]

Fax: \_\_\_\_\_

Phone: [REDACTED]



# Notice of Registration

To: Miss ( [REDACTED] )  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: ( [REDACTED] )

I, ( [REDACTED] ) (NAME)

( [REDACTED] )  
Lower Wonnarua Tribal Consultancy (ORGANISATION)

Manager (POSITION)

( [REDACTED] ) (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

✓ I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

☒ Email

☒ Mail

☐ Fax

☒ Phone

Email

Address: ( [REDACTED] )

Mailing

address: ( [REDACTED] )

Fax: \_\_\_\_\_

Phone: ( [REDACTED] )



# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED] (NAME)

Merrigarn (ORGANISATION)

Director (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

☒ Email ☐ Mail ☐ Fax ☐ Phone

Email Address: [REDACTED]

Mailing address: [REDACTED]

Fax: \_\_\_\_\_

Phone: [REDACTED]

Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: c [REDACTED]

I J [REDACTED] (NAME)

Muragadi Heritage ORGANISATION)

Director (POSITION)

[REDACTED] ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

0 I DO NOT wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

<input checked="" type="radio"/> Email	<input type="radio"/> Mail	<input type="radio"/> Fax	<input type="radio"/> Phone
--	----------------------------	---------------------------	-----------------------------

Email Address: [REDACTED]

Mailing address: [REDACTED]

Fax: N/A

Phone [REDACTED]

Notice of Registration

To: Miss C [REDACTED]

Heritage Consultant

Jacobs

Level 7, 177 Pacific Highway

NORTH SYDNEY NSW 2060

Email: c [REDACTED]

I [REDACTED]

(NAME)

Murra Bidgee Mullangari

(ORGANISATION)

Director

(POSITION)

[REDACTED]

(ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I DO NOT wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

Email

Mail

Fax

Phone

Email Address: m [REDACTED]

Mailing address: [REDACTED]

Fax: N/A

Phone [REDACTED]

# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED] (NAME)

*Nunawanna Aboriginal Corporation* (ORGANISATION)

*Chairperson* (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

☒ Email

☒ Mail

☐ Fax

☐ Phone

Email Address: [REDACTED]

Mailing address: [REDACTED]

Fax: \_\_\_\_\_

Phone: [REDACTED]

**From:** [REDACTED]  
**Sent:** Thursday, 20 June 2019 2:09 PM  
**To:** Leever, Clare  
**Subject:** [EXTERNAL] Re: Cultural Heritage Assessment Report for the Bayswater Water and Other Associated Operational Works Project

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Clare,

Thank you for the notification, could you please register our interest in this project on the behalf of the PCWP Registered Native title claimant for the Wonnarua people.

Regards  
[REDACTED]  
Registered native title claimant PCWP  
Tocomwall PTY Limited  
[REDACTED]

*Breach of Confidentiality*  
This email and any files transmitted with it are confidential and intended solely for the use of the individual to whom they are addressed. If you have received this email in error please notify the sender. This message contains confidential information and is intended only for the individual named. If you are not the named addressee you should not disseminate, distribute or copy this e-mail. Please notify the sender immediately by e-mail if you have received this e-mail by mistake and delete this e-mail from your system. If you are not the intended recipient you are notified that disclosing, copying, distributing or taking any action in reliance on the contents of this information is strictly prohibited. *Although the company has taken reasonable precautions to ensure no viruses are present in this email, the company cannot accept responsibility for any loss or damage arising from the use of this email or attachments.*

On 20 Jun 2019, at 2:04 pm, [REDACTED] <[REDACTED]@[REDACTED].com> wrote:

[REDACTED],

AGL Macquarie Pty Limited (AGL Macquarie) own and operate the Bayswater Power Station, located approximately 16 km south-east of Muswellbrook. Commissioned in 1985, water and wastewater infrastructure and site improvements are required to ensure the continued operational and environmental performance of Bayswater until its expected retirement in 2035. The Project is located within the Bayswater Power Station on the New England Highway within the Local Government Areas of Muswellbrook and Singleton, as shown in Attachment A.

Jacobs, on behalf of AGL Macquarie is currently drafting an Environmental Impact Statement in accordance with Division 4.7 of the Environmental Planning and Assessment Act 1979 (NSW). As per the consultation guidelines, Jacobs, on behalf of AGL Macquarie, has been made aware that you may hold cultural knowledge relevant to the Project area. The purpose of consultation with the Aboriginal community is to assist AGL Macquarie in the preparation of a cultural heritage assessment report, and to assist in the assessment and approval of the Project by the NSW Minister for Planning.

Jacobs are therefore inviting registrations of interest in the process of community consultation from Aboriginal person(s) or groups who hold cultural knowledge relevant to determining the significance of Aboriginal objects and/or places at or between Muswellbrook, Howick, Lemington, Liddell and Ravensworth. If you wish to be included in the consultation for this project, please complete the Notice to Register attached to this email by **5pm 5<sup>th</sup> July 2019**.

Thank you in advance for your response.  
Yours sincerely,

[REDACTED], on behalf of  
[REDACTED]  
GradDipArch | Jacobs  
Archaeologist | Asia Pacific Buildings & Infrastructure  
Acting Team Leader – Environmental Sciences  
[REDACTED]  
[REDACTED] | [www.jacobs.com](http://www.jacobs.com)

---

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[REDACTED]

<Notice of Registration\_dft02.docx>



# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED] (NAME)

Ungaroo Aboriginal Corporation (ORGANISATION)  
Chairperson (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant) ✓

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

☒ Email

☐ Mail

☐ Fax

☒ Phone

Email Address: [REDACTED]

Mailing address: [REDACTED]

Fax: [REDACTED]

Phone: [REDACTED]

# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, \_\_\_\_\_ (NAME)

Wanaruah Local Aboriginal Land Council \_\_\_\_\_ (ORGANISATION)

CEO \_\_\_\_\_ (POSITION)

\_\_\_\_\_ (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

*(Tick if relevant)*

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is *(Please tick preferred method and provide details below)*:

☐ Email ☐ Mail ☐ Fax ☐ Phone

Email Address: \_\_\_\_\_

Mailing address: \_\_\_\_\_

Fax: \_\_\_\_\_ Email NOT Fax \_\_\_\_\_

Phone: \_\_\_\_\_ or 02 \_\_\_\_\_

# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I, [REDACTED] (NAME)

WATTAKA W.C.C SERVICES (ORGANISATION)

MANAGER (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

☒ Email

☐ Mail

☐ Fax

☒ Phone

Email

Address: [REDACTED]

Mailing

address: AS ABOVE

Fax: [REDACTED]

Phone: [REDACTED]

# Notice of Registration

To: Miss [REDACTED]  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: [REDACTED]

I [REDACTED] (NAME)

Widescope Indigenous Group \_\_\_\_\_ (ORGANISATION)

RAP \_\_\_\_\_ (POSITION)

[REDACTED] \_\_\_\_\_ (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

*(Tick if relevant)*

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is *(Please tick preferred method and provide details below)*:

☒ Email ☐ Mail ☐ Fax ☐ Phone

Email  
Address: [REDACTED]  
\_\_\_\_\_

Mailing  
address: \_\_\_\_\_

Fax: \_\_\_\_\_

Phone: [REDACTED] or Admin  
[REDACTED]  
\_\_\_\_\_

**From:** [REDACTED]  
**Sent:** Monday, 13 May 2019 2:33 PM  
**To:** [REDACTED]  
**Subject:** [EXTERNAL] FW: Seeking Aboriginal knowledge holders for the Bayswater Water and Other Associated Operational Works Project  
**Attachments:** Template.pdf

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Clare

Jess has forwarded this on to me seeking knowledge holders, the WNAC are knowledge holders and would like to be consulted on this project

cheers

[REDACTED]  
**CEO - Wonnarua Nation Aboriginal Corporation**  
[REDACTED]  
Singleton Delivery Centre 2330

---

**From:** [REDACTED]  
**Sent:** Monday, 13 May 2019 12:28 PM  
**To:** [REDACTED]  
**Subject:** Fwd: Seeking Aboriginal knowledge holders for the Bayswater Water and Other Associated Operational Works Project

FYI for your information see attachment and information for your reference please contact Clare and let her know if you are interested

[REDACTED] SLSO Aboriginal Communities Officer  
**Natural Resources Management**  
[REDACTED]  
[REDACTED] [REDACTED] [REDACTED]  
[REDACTED] [REDACTED] [REDACTED]  
**W:** [www.hunter.lis.nsw.gov.au](http://www.hunter.lis.nsw.gov.au) : [www.facebook.com/HunterLLS](https://www.facebook.com/HunterLLS)

I pay my respects to all First Nations people of the lands in which i work and acknowledge their long connections to the land we are on and extend that respect to all custodians today.

----- Forwarded message -----  
**From:** [REDACTED]  
**Date:** Mon, May 13, 2019 at 11:04 AM  
**Subject:** Seeking Aboriginal knowledge holders for the Bayswater Water and Other Associated Operational Works Project  
**To:** [REDACTED]

13 May 2019

Attention: [REDACTED]  
Singleton Local Land Services

Via Email [jess.waters@lls.nsw.gov.au](mailto:jess.waters@lls.nsw.gov.au)

**Subject:** Seeking Aboriginal knowledge holders to assist AGL Macquarie to prepare a cultural heritage assessment report for the Bayswater Water and Other Associated Operational Works Project

Dear [REDACTED]

AGL Macquarie Pty Limited (AGL Macquarie) own and operate the Bayswater Power Station, located approximately 16 km south-east of Muswellbrook. Commissioned in 1985, water and wastewater infrastructure and site improvements are required to ensure the continued operational and environmental performance of Bayswater until its expected retirement in 2035.

The Bayswater Water and Other Associated Operational Works Project (the Project) would ensure the continued efficient operation of Bayswater until its retirement, replace and/or upgrade ageing infrastructure, and provide the opportunity for improvements based on post-installation advances in water and wastewater management. The Project area shown in the attached document will be refined to a disturbance footprint and provided to Registered Aboriginal Parties upon their identification.

Jacobs, on behalf of AGL Macquarie is currently drafting an Environmental Impact Statement in accordance with Division 5.7 of the *Environmental Planning and Assessment Act 1979 (NSW)*. Jacobs, on behalf of AGL Macquarie, is therefore seeking Aboriginal knowledge holders to assist in the assessment of the Project and provide input into the preparation of a cultural heritage assessment report (CHAR).

In accordance with section 4.1.2 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010), it would be appreciated if your organisation could please provide a list of the names of, or pass this request along to, Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects or Aboriginal places for the proposal within the concept proposal area.

Thank you for your assistance and advice in this matter. If you have any questions or would like to discuss this further, please don't hesitate to contact me.

Yours sincerely,

[REDACTED]



# Notice of Registration

To: Miss ( [REDACTED] )  
Heritage Consultant  
Jacobs  
Level 7, 177 Pacific Highway  
NORTH SYDNEY NSW 2060  
Email: ( [REDACTED] )

I, [REDACTED] (NAME)

YINARR CULTURAL SERVICES (ORGANISATION)

CEO - STAKEHOLDER (POSITION)

[REDACTED] (ADDRESS)

wish to be registered by Jacobs, on behalf of AGL Macquarie as an Aboriginal Party to be consulted as part of the **AGL Bayswater Water and Other Associated Operational Works Project (WOAOW)**

I confirm that I am authorised to register on behalf of this organisation.

(Tick if relevant)

☐ I **DO NOT** wish for my details to be forwarded to OEH pursuant to Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

My preferred method of communication is (Please tick preferred method and provide details below):

☒ Email

☒ Mail

☐ Fax

☐ Phone

Email

Address: [REDACTED]

Mailing

address: [REDACTED]

Fax: \_\_\_\_\_

Phone: [REDACTED] \_\_\_\_\_



1/64 Allara Street,  
Canberra City ACT 2600  
PO Box 237, Civic Square ACT 2608  
Australia  
T +61 2 6246 2700  
F +61 2 6246 2799  
[www.jacobs.com](http://www.jacobs.com)

August 6, 2019

Project Name: AGL Bayswater Water and Other Associated Works Project

**Subject: Supply of project information and methodology document**

Dear [REDACTED]

Jacobs (on behalf of AGL) are providing an archaeological survey methodology document to all Registered Aboriginal Parties (RAPs) and cultural knowledge holders for the Bayswater Water and Other Associated Works Project.

A field survey is scheduled to take place in early to mid-September, and is anticipated to take 1-2 days. Further details and requirements for site officers can be found within the attached methodology document. Please provide the name and availability of any site officer who will participate in the field survey. If available, provide a copy of relevant insurances to Jacobs to allow registration on our supplier database, otherwise a third party provider may have to be used to engage site officers with the requisite insurance coverage.

Please carefully review the attached document for further information and if you have any questions don't hesitate to contact me via phone, email, or postal addresses provided below.

Yours sincerely

[REDACTED]  
Senior Archaeologist  
[REDACTED]

**Macgregor, Oliver**

---

**From:** [REDACTED]

[REDACTED]

[REDACTED]

|

[REDACTED]

|

[REDACTED]

**A1**

**Indigenous Services**

Contact: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Hi,

A1 supports the Draft ACHAR.

A1 would like to be involved in any future field works and meetings

Thank you

[REDACTED]

---

**From:** [REDACTED]

**Sent:** Thursday, 24 October 2019 2:45 PM

**To:** [REDACTED]

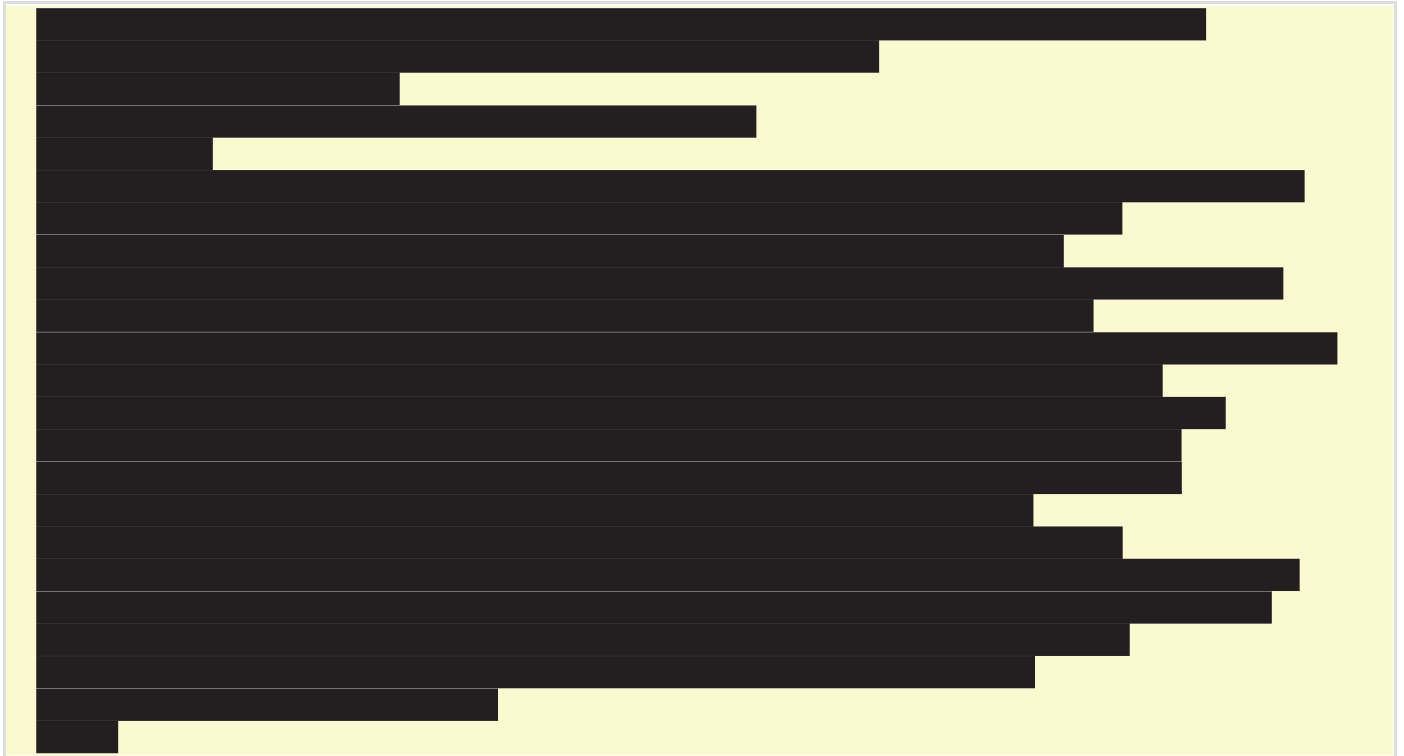
[REDACTED]

## Jacobs File Transfer System

[REDACTED] has sent you a file archive, with the following message:

Please provide comment back by 21 November 2019

If you trust [REDACTED] use the URL below to pick up the file archive (you may need to copy and paste it into your browser):



You have 15 days to pick up this file archive; after 15 day(s) (Midnight 11/7/2019), it will be deleted. This is an automated e-mail. Thank you for using the Jacobs File Transfer System.

## Appendix A: Consultation log

Date	To	From	Medium	Brief Description
26/Apr/19	National Native Title Tribunal	Jacobs	Online search	Search for Native Title owners or claimants
10/May/19	Office of the Registrar, <i>Aboriginal Land Rights Act 1983</i>	Jacobs	Mail	Requesting details of potential RAPs - Agency Letter
10/May/19	Wanaruah LALC	Jacobs	Mail	Requesting details of potential RAPs - Agency Letter
10/May/19	NTSC	Jacobs	Mail	Requesting details of potential RAPs - Agency Letter
10/May/19	Newcastle OEH	Jacobs	Mail	Requesting details of potential RAPs - Agency Letter
10/May/19	Singleton Local Land Services	Jacobs	Mail	Requesting details of potential RAPs - Agency Letter
10/May/19	Muswellbrook Council	Jacobs	Mail	Requesting details of potential RAPs - Agency Letter
10/May/19	Singleton Council	Jacobs	Mail	Requesting details of potential RAPs - Agency Letter
10/May/19	Office of the Registrar, <i>Aboriginal Land Rights Act 1983</i>	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
10/May/19	Wanaruah LALC	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
10/May/19	NTSC	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
10/May/19	Newcastle OEH	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
10/May/19	Singleton Local Land Services	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
10/May/19	Muswellbrook Council	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
10/May/19	Singleton Council	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
13/May/19	Muswellbrook Council	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
13/May/19	Singleton Local Land Services	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
13/May/19	Office of Environment and Heritage - Hunter	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
13/May/19	NTSCorp	Jacobs	Email	Requesting details of potential RAPs - Agency Letter



Date	To	From	Medium	Brief Description
13/May/19	Wanaruah Local Aboriginal Land Council	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
13/May/19	Office of the Registrar, Aboriginal Land Rights Act 1983	Jacobs	Email	Requesting details of potential RAPs - Agency Letter
13/May/19	Jacobs	Post master - mail administrator	Email	The message to the Wanaruah Local Aboriginal Land Council was undelivered
13/May/19	Jacobs	Singleton Local Land Services	Email	Automatic reply - email received
13/May/19	Jacobs	Office of the Registrar, <i>Aboriginal Land Rights Act 1983</i>	Email	Requesting more details
13/May/19	Jacobs	Singleton Local Land Services	Email	The SLISO Officer will pass our request to the HLL's Aboriginal Advisory Committee members from the Muswellbrook area
13/May/19	Jacobs	Wanaruah Local Aboriginal Land Council	Email	Registered their interest
13/May/19	Jacobs	Singleton Local Land Services	Email	Informing us that the primary contact for all consultation relating to Aboriginal Heritage is the Wanaruah Land Council.
17/May/19	Jacobs	Muswellbrook Council	Email	Informing us that the Aboriginal Groups in Muswellbrook Shire Council area are: Wanaruah Local Aboriginal Land Council, Hunter Valley Aboriginal Corporation and Tocomwall.
23/May/19	Jacobs	Jacobs - Senior Environmental Planner	Email	Suggested to contact the Wonnarua Nation Aboriginal Corporation
27/May/19	Jacobs	Office of the Registrar,	Email	Suggested to contact the Wanaruah Local Aboriginal Land Council

Date	To	From	Medium	Brief Description
		<i>Aboriginal Land Rights Act 1983</i>		
30/May/19	Jacobs	Office of Environment and Heritage - Hunter	Email	Aboriginal Stakeholder List
Supply of invitations to register for the project				
20/Jun/19	Aboriginal Native Title Elders Consultants - [REDACTED]	Jacobs	Mail	Sending invitation letter to register as RAP
20/Jun/19	[REDACTED]	Jacobs	Mail	Sending invitation letter to register as RAP
20/Jun/19	Lower Wonnaruah Tribal Consultancy Pty Ltd - [REDACTED]	Jacobs	Mail	Sending invitation letter to register as RAP
20/Jun/19	Roger Matthews Consultancy - [REDACTED]	Jacobs	Mail	Sending invitation letter to register as RAP
20/Jun/19	Wonnarua Culture Heritage - [REDACTED]	Jacobs	Mail	Sending invitation letter to register as RAP
20/Jun/19	Wonnarua Elders Council - [REDACTED]	Jacobs	Mail	Sending invitation letter to register as RAP
20/Jun/19	[REDACTED]	Jacobs	Mail	Sending invitation letter to register as RAP
20/Jun/19	Upper Hunter Wonnarua Council Inc	Jacobs	Mail	Sending invitation letter to register as RAP
20/Jun/19	A1 Indigenous Services	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	AGA Services	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Aliera French Trading	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Awabakal Traditional Owners Aboriginal Corporation	Jacobs	Email	Sending invitation letter to register as RAP

Date	To	From	Medium	Brief Description
20/Jun/19	Bathurst Local Aboriginal Land Council	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Cacatua Culture Consultants	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Cacatua Culture Consultants	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Corroboree Aboriginal Corporation	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Culturally Aware	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	D F T V Enterprises	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Deslee Talbott Consultants	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Didge Ngunawal Clan	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Divine Diggers Aboriginal Cultural Consultants	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Gidawaa Walang & Barkuma Neighbourhood Centre Inc.	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Gomerol People (c/- NTSCORP Ltd)	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Hunter Traditional Owner	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Hunter Valley Aboriginal Corporation	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Hunter Valley Aboriginal Corporation	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Hunters & Collectors	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Indigenous Learning	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Jarban & Mugrebea	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Jumbunna Traffic Management Group Pty Ltd	Jacobs	Email	Sending invitation letter to register as RAP

Date	To	From	Medium	Brief Description
20/Jun/19	Karuah Local Aboriginal Land Council	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Kauma Pondee Inc.	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Kawul Cultural Services	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Kawul Pty Ltd (trading as Wonn1 Sites)	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Lower Hunter Aboriginal Incorporated	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Lower Hunter Wonnarua Cultural Services	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Mayaroo	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Merrigarn	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Mindaribba Local Aboriginal Land Council	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Muragadi	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Murra Bidgee Mullangari Aboriginal Corporation	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Myland Cultural & Heritage Group	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Nunawanna Aboriginal Corporation	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Tocomwall (acting on behalf of the Plains Clan of the Wonnarua People (PCWP))	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Ungooroo Aboriginal Corporation	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Wallagan Cultural Services	Jacobs	Email	Sending invitation letter to register as RAP

Date	To	From	Medium	Brief Description
20/Jun/19	Wanaruah Local Aboriginal Land Council	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Wattaka Wonnarua CC Service	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Widescope Indigenous Group	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Wonnarua Nation Aboriginal Corporation	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Yarrowalk (A division of Tocomwall Pty Ltd)	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	Yinarr Cultural Services	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	[REDACTED]	Jacobs	Email	Sending invitation letter to register as RAP
20/Jun/19	[REDACTED]	Jacobs	Email	Sending invitation letter to register as RAP
Supply of 'AGL Bayswater Project Information and Methodology'				
6/Aug/19	A1 Indigenous Services	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	AGA Services	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Aliera French Trading	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Cacatua Culture Consultants	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Corroboree Aboriginal Corporation	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Didge Ngunawal Clan	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'



Date	To	From	Medium	Brief Description
6/Aug/19	Hunter Traditional Owner	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Jarban & Mugrebea	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Kawul Pty Ltd trading as Wonn1 Sites	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Lower Hunter Wonnarua Cultural Services	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Merrigarn	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Muragadi	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Murra Bidgee Mullangari	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Nunawanna Aboriginal Corporation	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Tocomwall (acts on behalf of the Plains Clan of the Wonnarua People (PCWP))	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Ungooroo Aboriginal Corporation	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Wanaruah Local Aboriginal Land Council	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Wattaka Wonnarua CC Service	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Widescope Indigenous Group	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'

Date	To	From	Medium	Brief Description
6/Aug/19	Wonnarua Nation Aboriginal Corporation	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
6/Aug/19	Yinarr Cultural Services	Jacobs	Email	Email bounced
6/Aug/19	Yinarr Cultural Services	Jacobs	Email	Supplied 'AGL Bayswater Project Information and Methodology'
7/Aug/19	Aboriginal Native Title Elders Consultants	Jacobs	Mail	Supplied 'AGL Bayswater Project Information and Methodology'
7/Aug/19	Crimson-Rosie	Jacobs	Mail	Supplied 'AGL Bayswater Project Information and Methodology'
7/Aug/19	Gidawaa Walang Cultural Heritage Consultancy	Jacobs	Mail	Supplied 'AGL Bayswater Project Information and Methodology'
7/Aug/19	Hunter Valley Cultural Surveying	Jacobs	Mail	Supplied 'AGL Bayswater Project Information and Methodology'
7/Aug/19	Lower Wonnaruah Tribal Consultancy Pty Ltd	Jacobs	Mail	Supplied 'AGL Bayswater Project Information and Methodology'
Responses to method document, and survey preparation				
6/Aug/19	Jacobs	Corroboree Aboriginal Corporation	Email	Wishes to supply a site officer. Supplied insurance.
6/Aug/19	Jacobs	Nunawanna Aboriginal Corporation	Email	Wishes to supply a site officer. No insurance supplied.
7/Aug/19	Jacobs	Didge Ngunawal Clan	Email	Wishes to supply a site officer. Supplied insurance.
9/Aug/19	Jacobs	Widescope [REDACTED]	Email	Wishes to supply a site officer. Supplied insurance.

Date	To	From	Medium	Brief Description
14/Aug/19	Jacobs	Aboriginal Native Title Elders Consultants [REDACTED]	Phone	Wishes to take part in survey, along with husband John. Will send email with insurance. Asked about another project ('Musswellbrook bypass') which they feel aggrieved about as only Scott Franks and 'the land council' were involved. Wished to know whether Jacobs were the company carrying out that project.
14/Aug/19	Jacobs	Aboriginal Native Title Elders Consultants [REDACTED]	Email	Margaret sent her insurance documents via the Wanaruah Land Council's email address.
14/Aug/19	Jacobs	Aboriginal Native Title Elders Consultants [REDACTED]	Phone	Checking that email with insurance had come through. Stated that she is happy to be contacted via the Land Council's email address (Wanaruah Admin <admin@wanaruahlandcouncil.com.au>)
15/Aug/19	Jacobs	Muragadi	Email	Wishes to supply a site officer. No insurance supplied.
19/Aug/19	Jacobs	Wonnarua Nation Aboriginal Corporation	Email	Wishes to supply a site officer (Laurie Perry). Insurance supplied.
19/Aug/19	Jacobs	Murrabidgee Mullangari	Email	Wishes to supply a site officer. No insurance supplied.
20/Aug/19	Jacobs	Gidawaa Walang Cultural Heritage Consultancy	Email	Wishes to supply a site officer (Craig Horne). Insurance supplied.
20/Aug/19	Jacobs	Wanaruah Local Aboriginal Land Council	Email	Happy with methodology. Looks forward to hearing from Jacobs re the project in future. Doesn't state a desire to supply a site officer

Date	To	From	Medium	Brief Description
5/Sep/19	Aboriginal Native Title Elders Consultants ( [REDACTED] )	Jacobs	Phone	Informed Margaret of the timetable for fieldwork. Informed that an invitation to online induction needs to be supplied to her. Margaret said that Wanaruah Land Councils email address would be the appropriate address to send it to. Margaret stated that both she and John Matthews would attend the survey, but they would only invoice for one person.
5/Sep/19	Wanaruah Local Aboriginal Land Council ( [REDACTED] )	Jacobs	Phone	Asked Noel which email address is currently valid for Wanaruah LALC. Notified Noel that Jacobs would be sending through invitations to carry out online inductions to John and Margaret Matthews. Checked whether Wanaruah LALC would be supplying a fieldworker - Noel confirmed they will be.
9/Sep/19	Jacobs	Wanaruah Local Aboriginal Land Council	Email	Supplied insurance
4/Sep/19	All RAPs supplying field representatives	Jacobs	Email	Notification of upcoming fieldwork dates and expected duration
4/Sep/19	Jacobs	Didge Ngunawal Clan	Email	Stated that they would provide a field representative on the upcoming survey
5/Sep/19	Wanaruah Local Aboriginal Land Council (Noel Downs)	Jacobs	Email	Notified the land council that invitations for online induction would be sent through soon. Asked for the land council to supply insurance documents covering their representative.
6/Sep/19	Jacobs	Wonnarua Nation Aboriginal Corporation	Email	Informed Jacobs that WNAC is unable to supply a field representative for the survey
13/Sep/19	Wanaruah Local Aboriginal Land Council ( [REDACTED] )	Jacobs	Email	Informed Jacobs that there are several problems with the 'existing cultural heritage knowledge' section of the Method document. Supplied some background literature on Aboriginal groups in the study area, and stated that the pre

Date	To	From	Medium	Brief Description
				1830's epidemic was chicken pox rather than smallpox as Jacobs' report states.
13/Sep/19	Jacobs	Didge Ngunawal Clan	Email	Supplied invoice for survey fieldwork
16/Sep/19	Wanaruah Local Aboriginal Land Council	Jacobs	Email	Thanked WLALC for the literature they supplied on Aboriginal groups in the Hunter Valley, and stated that these works will be incorporated into the upcoming ACHAR.
17/Sep/19	Didge Ngunawal Clan	Jacobs	Email	Forwarded Didge Ngunawal Clan's invoice to Nicholas Woodward (AGL), cc'd DNC on email.
17/Sep/19	Jacobs	Corroborree Aboriginal Corporation	Email	Requested invoicing details.
17/Sep/19	Corroborree Aboriginal Corporation	Jacobs	Email	Supplied Nicholas Woodward's email address, for invoicing.
Supply of draft ACHAR				
24/Oct/19	Cacatua Culture Consultants	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Nunawanna Aboriginal Corporation	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	A1 Indigenous Services	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Wanaruah Local Aboriginal Land Council	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Corroborree Aboriginal Corporation	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Didge Ngunawal Clan	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Jarban & Mugrebea	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Muragadi	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Lower Hunter Wonnarua Cultural Services	Jacobs	Email	Supplied draft ACHAR.



Date	To	From	Medium	Brief Description
24/Oct/19	Widescope Indigenous Group	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Yinarr Cultural Services	Jacobs	Email	Supplied draft ACHAR.
25/Oct/19	Aboriginal Native Title Elders Consultants	Jacobs	Mail	Supplied draft ACHAR.
25/Oct/19	Crimson-Rosie	Jacobs	Mail	Supplied draft ACHAR.
25/Oct/19	Hunter Valley Cultural Surveying	Jacobs	Mail	Supplied draft ACHAR.
25/Oct/19	Lower Wonnaruah Tribal Consultancy Pty Ltd	Jacobs	Mail	Supplied draft ACHAR.
24/Oct/19	AGA Services	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Aliera French Trading	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Gidawaa Walang Cultural Heritage Consultancy	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Hunter Traditional Owner	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Kawul Pty Ltd trading as Wonn1 Sites	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Merrigarn	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Murra Bidgee Mullangari	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Tocomwall (acts on behalf of the Plains Clan of the Wonnarua People (PCWP))	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Ungooroo Aboriginal Corporation	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Wattaka Wonnarua CC Service	Jacobs	Email	Supplied draft ACHAR.
24/Oct/19	Wonnarua Nation Aboriginal Corporation	Jacobs	Email	Supplied draft ACHAR.
Responses to draft ACHAR				

Date	To	From	Medium	Brief Description
3/Nov/19	Jacobs	A1 Indigenous Services	Email	Advised that A1 Indigenous Services support the draft ACHAR, and would like to be involved in any future fieldwork and meetings associated with the project.

## **Appendix B. Archaeological Project Information and Methodology Document**



## **AGL Bayswater**

AGL Macquarie

### **Aboriginal Cultural Heritage Assessment Project Information and Methodology**

Draft | D1

06 August, 2019

IA215400



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## Executive Summary

AGL Macquarie Pty Limited (AGL Macquarie) own and operate the Bayswater Power Station, located south-east of Muswellbrook in the Local Government Areas of Muswellbrook and Singleton.

Jacobs, on behalf of AGL Macquarie is currently drafting an Environmental Impact Statement (EIS) for the Bayswater Water and Other Associated Works (WOAOW) project in accordance with Division 4.7 of the *Environmental Planning and Assessment Act 1979 (NSW)*.

This document presents the proposed method for the assessment of Aboriginal cultural heritage. The information and results of the survey will be documented in an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Project.

The features of the Project would include (see Figure 2-1):

- Augmentation of the existing Bayswater ash dam to provide additional ash storage capacity while involving minimal ground disturbance.
- Improvements to water management structures and systems to ensure continued collection and reuse of process water and return waters from the Bayswater ash dam.
- Improvements to the management of water and waste materials within the coal handling plant sediment basin and associated drainage system.
- Increasing coal ash recycling activities to produce up to 1,000,000 tonnes per annum of ash derived product material and reuse of coal ash.
- Upgrades to existing fly ash harvesting infrastructure including the installation of weighbridges, construction of a new 240 tonne silo, tanker wash facility and additional truck parking.
- Construction and operation of a new coal ash pipeline to Ravensworth Void No. 3 for ash emplacement.
- Construction and operation of a salt cake landfill facility to dispose of salt cake waste.
- Construction and operation of up to four borrow pits to facilitate the improvements proposed for the project and other works on AGL Macquarie land.
- Ancillary infrastructure works including vegetation clearing associated with maintaining existing infrastructure, including along pipeline/transmission corridors.

The Aboriginal cultural heritage assessment process will involve the following tasks:

- Desktop assessment of what is known about the archaeological resource of the project area and its surrounds from previous research
- Development of a methodology for archaeological survey (this document)
- Survey of the areas proposed to be impacted by the project
- Reporting – an ACHAR will be prepared to the requirements of the *Code of Practice* (DECCW, 2010b), the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a) and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011). The report will:
  - Synthesise the results of technical investigations, including the desktop assessment and archaeological survey
  - Include an assessment of the significance of any Aboriginal objects and record any Aboriginal cultural heritage values identified

- Include an impact assessment and provide management and mitigations measures to inform any AHIP application as required.
- Site records on the AHIMS database will be updated as necessary.

The field survey will systematically investigate the areas proposed to be impacted by the proposed works.

The survey will endeavour to investigate the proposed impact areas in full. No sub-sampling of these areas will be employed.

This document is provided to all Registered Aboriginal Parties (RAPs) to invite comments and feedback on the proposed Aboriginal cultural heritage assessment process. RAPs are also invited to provide information on the cultural significance and values of Aboriginal objects and places relevant to the area of proposed works.

## Abbreviations and acronyms

ACHAR	Aboriginal Cultural Heritage Assessment Report
AGL Macquarie	AGL Macquarie Pty Ltd
AHIMS	Aboriginal heritage information management system
AHIP	Aboriginal Heritage Impact Permit
DECCW	Department of Environment, Climate Change and Water NSW
Jacobs	Jacobs Group (Australia) Pty Ltd
NSW	New South Wales
OEH	Office of Environment and Heritage
PAD	Potential Archaeological Deposit
RAP	Registered Aboriginal Party
WOAOW	Water and Other Associated Operational Works

## 1. Introduction

### 1.1 Background and purpose of this document

AGL Macquarie Pty Limited (AGL Macquarie) own and operate the Bayswater Power Station, located approximately 16 km south-east of Muswellbrook. Commissioned in 1985, water and wastewater infrastructure and site improvements are required to ensure the continued operational and environmental performance of the power station until its expected retirement in 2035.

The proposed Water and Other Associated Operational Works (WOAOW) project (referred to here as 'the Project') at the Bayswater Power Station would ensure the continued safe, efficient and reliable operation of Bayswater until its retirement. This project provides the opportunity for improvements based on post-installation advances in water and wastewater management.

The Project is located within the Bayswater Power Station on the New England Highway within the Local Government Areas of Muswellbrook and Singleton.

Jacobs, on behalf of AGL Macquarie is currently drafting an Environmental Impact Statement (EIS) for the assessment of infrastructure and water upgrade works, in accordance with Division 4.7 of the *Environmental Planning and Assessment Act 1979 (NSW)*.

This document presents the proposed method for the assessment of Aboriginal cultural heritage through the archaeological survey of the area of proposed works (hereafter referred to as the 'project area'). The results of this assessment will be presented in an Aboriginal Cultural Heritage Assessment Report (ACHAR).

This proposed methodology has been designed to conform to the requirements of the following advisory documents and guidelines:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH, 2011).
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b)
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (Part 6 National Parks and Wildlife Act, 1974)* (DECCW, 2010a)

### 1.2 Objective of community consultation

Consultation provides the Aboriginal community the opportunity to improve assessment results by:

- Sharing relevant information about the cultural significance and values of Aboriginal object(s) and/or place(s).
- Contributing to the assessment of cultural and scientific significance of Aboriginal object(s) and/or place(s).
- Reviewing and commenting on the proposed methods of assessing cultural heritage within the project area (this document).
- Contributing to the development of cultural heritage management options and recommendations for Aboriginal object(s) and/or place(s) within the subject area.
- Commenting and providing feedback on the draft Aboriginal Cultural Heritage Assessment Report (ACHAR) before it is submitted to the relevant government agency.

## **2. Project information**

### **2.1 The Hunter Valley and the Bayswater Power Station**

The Bayswater Power Station is located approximately 20km south of Muswellbrook and to the west of the New England Highway. The project area lies within the Central Lowlands landscape, characterised by undulating low hills, ranging in elevation from 140m - 330m. Wisemans Creek and an unnamed 1<sup>st</sup> order drainage line pass through the project area.

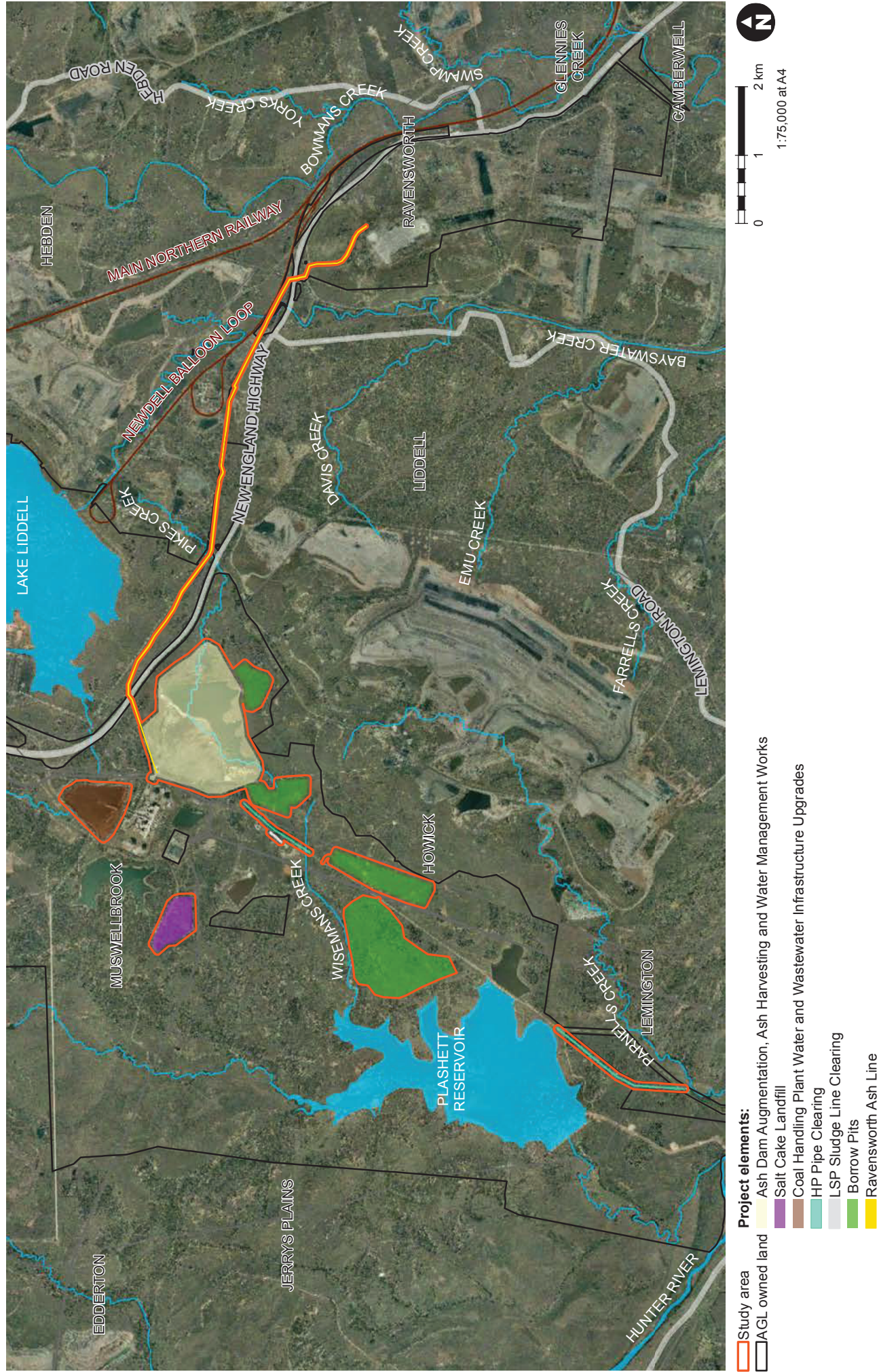
Bayswater Power Station was commissioned in 1985, and its design reflects progress and improvements in power generation technology. Four evaporative cooling towers stand out as the site's most distinctive feature. AGL acquired Liddell and Bayswater power stations – previously known collectively as Macquarie Generation – from the NSW Government in September 2014. AGL Macquarie is one of Australia's major electricity generators. Over recent years Bayswater power station has produced approximately 15,000 GWh of electricity a year, enough power for two million average Australian homes and families. In conjunction with the Liddell Power Station the Bayswater Power Station produces approximately 12% of the electricity needed by consumers in eastern Australia.

### **2.2 What is being proposed**

The features of the Project are presented in Figure 2-1 and would include:

- Augmentation of the existing Bayswater ash dam to provide additional ash storage capacity while involving minimal ground disturbance;
- Improvements to water management structures and systems to ensure continued collection and reuse of process water and return waters from the Bayswater ash dam;
- Improvements to the management of water and waste materials within the coal handling plant sediment basin and associated drainage system;
- Increasing coal ash recycling activities to produce up to 1,000,000 tonnes per annum of ash derived product material and reuse of coal ash;
- Upgrades to existing fly ash harvesting infrastructure including the installation of weighbridges, construction of a new 240 tonne silo, tanker wash facility and additional truck parking;
- Construction and operation of a new coal ash pipeline to Ravensworth Void No. 3 for ash emplacement;
- Construction and operation of a salt cake landfill facility to dispose of salt cake waste;
- Construction and operation of up to four borrow pits to facilitate the improvements proposed for the Project and other works on AGL Macquarie land;
- Ancillary infrastructure works including vegetation clearing associated with maintaining existing infrastructure, including along pipeline/transmission corridors.





**Figure 2-1** Indicative plan showing the project features and extent of the proposed project area



### 3. Existing cultural heritage knowledge

#### 3.1 Aboriginal Context

The Hunter river system, about 160km north of Sydney, contains many fertile and well-watered valleys. Aboriginal people were documented living in the Hunter Valley by Europeans who first visited and settled in the area (Gunson, 1974). The Hunter Valley was first described in writing by Sir Thomas Mitchell in 1831 who defined it as “being park-like” with light forest and grassy glades, populated by many different animals such as marsupials, birds and rivers full of shellfish and fish (Mitchell, 1839). The area contained many species of edible nuts, wild grains and berries. Today the native animal and plant communities within the project area are extensively modified as a result of European land use practices and introduced species.

The Hunter Valley contains a range of ecological zones within a relatively small area. Major rivers and smaller watercourses would have provided relatively easy access to fresh water across most of the region. Ecological communities would have varied considerably from low lying watered areas around rivers and streams, to open and forested areas on valley floors, hills and mountainous regions bordering the valley to the north, south and west. The area would likely have supported a large population of Aboriginal people.

The impact of disease and violence on Aboriginal populations unfortunately makes it difficult to estimate the size of the pre-contact population. The overall number of different Aboriginal groups and the location of their territorial boundaries were severely affected by a smallpox epidemic beginning in or before 1789. Soon after European arrival in Sydney, the arrival of smallpox in the local Aboriginal population was recorded. Despite the coincidence of these two events, it is now known that smallpox had originally been contracted by Aboriginal people living in Arnhem Land, who caught the disease from fishermen from Southeast Asia (Butlin, 1985; Campbell, 2002; Macknight, 1986). The disease had spread across the continent to arrive on the east coast.

Mortality rates from the epidemic are difficult to measure precisely, but are likely to have been around 80 percent (Butlin, 1983). Mortality could plausibly have been as high as 98 percent based on observations of smallpox’s effects on previously unexposed populations in other continents (Hiscock, 2008: 14). The epidemic resulted in movements of people across the landscape, and possibly the disappearance of some previously existing groups. In Sydney, Governor Arthur Phillip recorded that many Aboriginal people migrated inland, away from the settlement, in an attempt to escape the disease (Phillip, 1789). Lieutenant-Governor David Collins recorded a group that had been reduced to three survivors negotiating to merge with another group, and also observed a group that had been reduced to a single survivor (Collins, 1798).

The impact of the smallpox epidemic on the distribution of Aboriginal groups across the landscape is likely to have been severe. Hiscock (2008: 14) sums up the effect of smallpox by stating it would have “altered the operation of Aboriginal life”. This alteration resulted from the reduction in population and other effects flowing on from this. The possible disappearance of some groups through mortality and group mergers, the mass migration of people fleeing the disease, the depopulation of areas, and the incursion of groups into abandoned or depopulated lands, would have substantially altered the social landscape of Aboriginal groups that had existed prior to the epidemic. The tribal boundaries mapped by European researchers after contact are those of a population that had survived the epidemic (and further epidemics that followed) and had adapted their occupation of the landscape in response to it.

Violence toward Aboriginal populations from European settlers would probably have had effects similar to disease. The impact of violence on Aboriginal groups and the operation of Aboriginal society would have been substantial. Conflict with European settlement would have altered the ways in which Aboriginal society functioned, compared with the pre-contact period. As with disease, conflict caused Aboriginal groups to move off land they had previously occupied, to give up sources of food and other resources that they had previously utilized, and to alter their use of the landscape to avoid the risk of encountering European settlers. Conflict, like disease, would have drastically altered the distribution of Aboriginal groups across the landscape. The areas occupied by groups

before European contact, and the overall number of groups, is likely to have differed from the picture we have from post-contact historical records.

Although disease and violence had substantial effects on the demographics of Aboriginal groups, its effects on Aboriginal cultural practises are impossible to estimate. It is important to note that these processes did not extinguish Aboriginal culture. Aboriginal traditional knowledge and elements of pre-contact Aboriginal culture, both tangible and intangible, survive today.

Records from the early nineteenth century describe Aboriginal communities living in the Hunter Valley and a textual source dated April 1825 stated that in the lower Goulburn although no Aboriginal had been seen there were found “their recent mark on the Trees and fired country” (Moore, 1969, p. 20). David R. Moore, Curator of Anthropology of the Australian Museum in 1969, described the Aboriginal groups who lived in the Hunter Valley. He wrote that at the time of the first European arrival the Hunter Valley territory was divided between many Aboriginal communities, such as:

- The Geawegal in the upper Hunter from the Mount Royal Range to Muswellbrook;
- The Wonarua from the middle Hunter down to Maitland;
- The Gaddhng from the Hunter estuary and Port Stephens;
- The Gamilaroi to the north and the Wirandhuri to the south of the upper Goulburn;
- The Awabagal around Lake Macquarie (south of the Hunter Valley);
- The Darginung on the northern side of the Hawkesbury (Moore, 1969).

Moore’s description is consistent with Tindale’s later mapping of Aboriginal groups, the only point of difference being that Tindale depicts the Worimi group covering an area along the coast from the Hunter estuary to Wallis Lake (Horton, 1996; Tindale, 1974). The groups identified by Tindale, and by earlier European researchers, are generally language groups. Finer-grained groupings almost certainly existed within these language groups. It should be noted also that various alternative spellings exist for the groups listed above.

In 1965 the first systematic archaeological survey of the Hunter and Goulburn Valley was undertaken by the Australian Museum and by July 1984 the National Parks and Wildlife Service (NPWS) site register contained records of 1.650 archaeological sites in the Hunter Region, revealing the high heritage value of this area (Moore, 1969).

Surface distributions of stone artefacts, variously referred to as artefact scatters, open sites, and open camp sites, are by far the most common and widely distributed form of Aboriginal archaeological site in the Hunter Valley. Flaked stone artefacts dominate the archaeological assemblages of this area and, in the majority of cases, these were recorded on open artefact sites. Grindstones, charcoal, animal bone, shell and ochre both entire or fragmentary have also been recorded (AECOM, 2013). Other types of Aboriginal sites present in the region include scarred trees, shell middens, quarries, grinding grooves, burials and rock shelters.

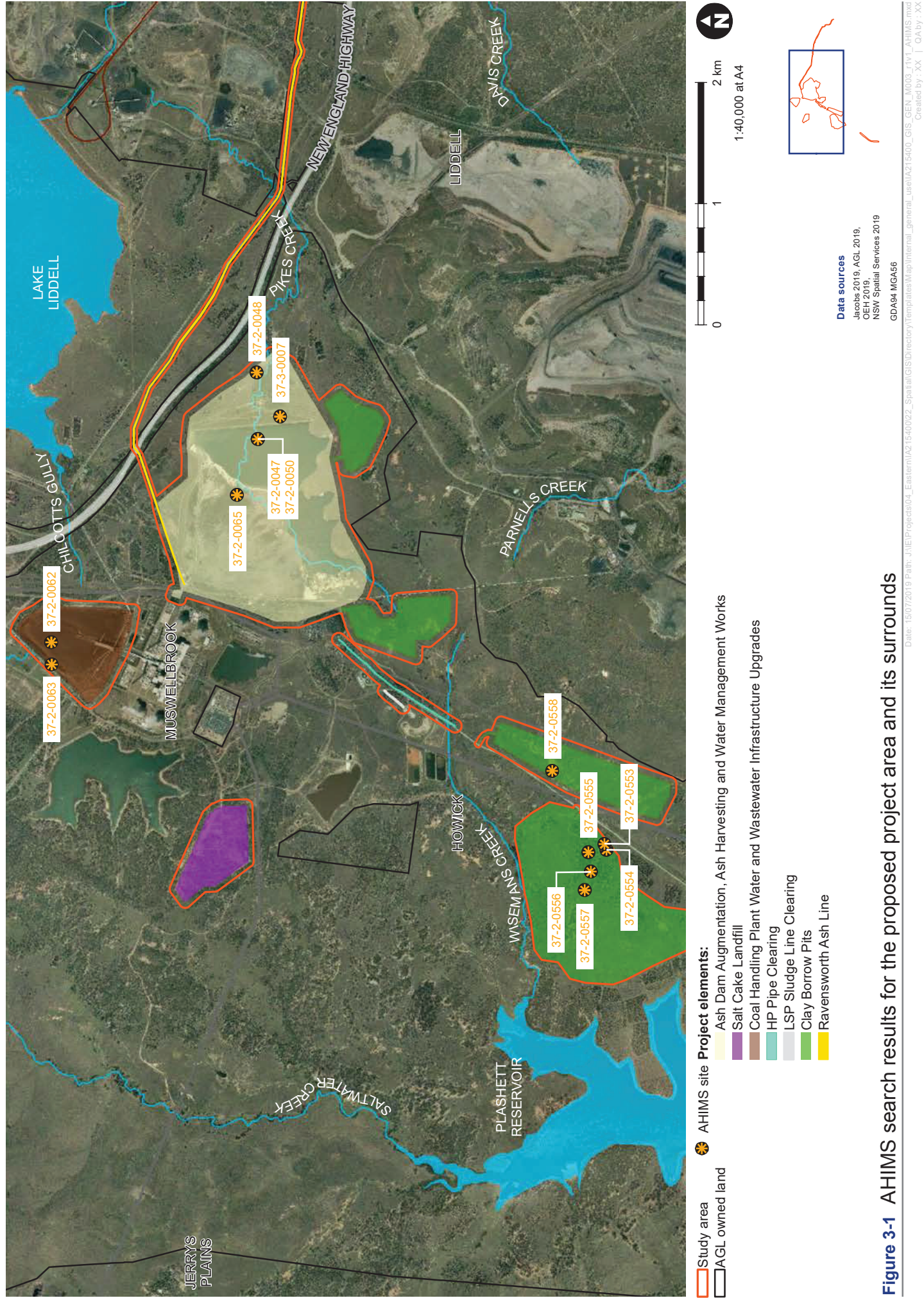
### 3.2 Aboriginal Heritage Information Management System (AHIMS) searches

Jacobs carried out a search of the Aboriginal Heritage Information Management System (AHIMS) on 15 July 2019. The footprint of the Project and a 50m buffer zone was used as the search area.

Fifteen previously recorded sites are present within the search area, one of which is recorded as being destroyed. All sites are artefact scatters on open ground.

The list of AHIMS site records is provided in Appendix A. Figure 3-1 overleaf shows the location and extent of Aboriginal sites listed on the AHIMS within and in proximity to the project area.





### 3.3 Previous archaeological assessments in the project area and surrounding region

One of the first archaeological investigations of the project area was carried out between 1976-1979 as part of the Mt. Arthur Project. Associate Professor L.K. Dyll from Newcastle University surveyed three mining sites with the intent of discovering Aboriginal artefacts. He found artefacts in three small areas of open ground (The Electricity Commission of New South Wales, 1979).

In 1979, the electricity commission of New South Wales in relation to the Bayswater Power Station project concluded that the only Aboriginal sites within the area were located within the Saltwater Creek reservoir area. It recommended salvage of these Aboriginal heritages before the area was flooded (The Electricity Commission of New South Wales, 1979).

Dyll (1980) carried out a survey immediately south of the Bayswater Colliery, recording three sites on the banks of Saddler's creek. The sites were scatters of flaked stone artefacts, including cores and backed artefacts. The artefacts were made from chert, rhyolite and quartz.

Dyll (1981a) carried out a survey immediately south of Mount Arthur, recording 24 open sites along Saltwater and Saddlers Creeks. The sites were stone artefact scatters, two of which contained more than 500 artefacts. Artefacts recorded included backed artefacts, ground stone axes, choppers and grindstones.

Dyll (1981b) reviewed all Aboriginal sites recorded during surveys of the Mount Arthur Coal Lease area. This report records a number of sites along the banks of Saltwater creek. One scatter of stone artefacts recorded covered more than one acre, extending up to 100m back from the creek bank. The report also records 27 axe grinding grooves on a sandstone shelf. The great majority of sites recorded are open artefact scatters and are located adjacent to the creek.

Hughes (1981) carried out a survey of a proposed extension to the Bayswater Colliery, recording nine Aboriginal sites. The sites were open artefact scatters, six of which are located on creek lines.

In 1992 Pacific Power carried out a survey of a proposed slurry pipeline and water storage pond within the Bayswater Ash Disposal Project. The area was assessed as being highly modified by European settlement and Aboriginal sites were likely to have been disturbed or destroyed (Pacific Power, 1992). Six sites were identified: five artefact scatters and one isolated artefact. The number of artefacts found per site varied from 2 to greater than 200. These sites were identified as outside the proposed area of impact. Avoidance and protection were recommended. Subsequent test excavation in the area of the proposed work identified an absence of artefacts in subsurface deposits.

In 1993 an environmental impact assessment of the Bayswater Power Station was undertaken as part of the Fly Ash Disposal in Ravensworth No.2 Mine Void and Mine Rehabilitation project. As part of the assessment an examination of Heritage registers and field examination was performed. The research showed no European heritage items along the transport corridor and two Aboriginal open artefacts scatter sites and an isolated Aboriginal artefact (Pacific Power, 1993).

Umwelt Australia (1997) carried out a survey of three areas of the southern section of the Bayswater No. 3 mining lease. These areas included a coal processing plant, haul road and mine access road, overland conveyer and stockpile area. The survey recorded 36 sites comprising 28 open artefact scatters and eight isolated artefacts. The majority of sites were located adjacent to watercourses, namely Saddlers Creek and its tributaries. Sites were located on the watercourses' banks, as well as on elevated ground such as upper slopes and ridge tops adjacent to the watercourses. Artefacts included retouched flakes and cores, and one hammerstone.

In 2007 an assessment of the Bayswater Power Station was undertaken as part of the Bayswater Power Station River Intake Project. During the survey an isolated mudstone flake was identified. Due to the lack of further sites



in the project area, it was inferred that extensive levels of past disturbance had impacted and destroyed sites in the area (McCardle Cultural Heritage Pty Ltd, 2007).

An archaeological assessment of the Bayswater Liddell Power Generation complex was carried out in 2009, recording 47 Aboriginal sites. All sites were open artefact scatters and isolated artefacts. The number of artefacts per scatter varied from 11 up to 250 with the majority of sites (n.36) containing fewer than 10 artefacts. It was noted that flat areas associated with Saltwater Creek and its tributaries contained surface sites and potential for associated PAD and that elevated landforms and hillslopes were landforms with low archaeological sensitivity (AECOM, 2009).

In 2017 a survey was undertaken as part of the Aboriginal due diligence assessment for the Bayswater Ash Dam Overland Water Pipeline. The survey recorded ground Surface Visibility (GSV) within the project area between 31-50%. No surface artefacts were identified during this inspection. A search of the AHIMS, covering an area approximately 17.8km by 13.5km identified a total of 102 sites outside the pipeline's footprint. These 102 sites included artefact scatters (n.78), isolated artefacts (n.15), sites destroyed under the condition of an AHIP (n.8) and a single modified tree. The majority of sites consist of artefacts identified on exposed ground surfaces. From these results it was concluded that the area did not contain areas of subsurface potential, and that this was probably due to erosion and past disturbance (AECOM, 2017).

A preliminary Aboriginal heritage assessment for proposed electrical works modifications at the Bayswater Brine Concentrator Decant Basin (BCDB) was carried out in 2018 and as part of the assessment a search of the AHIMS database was completed. This search identified 113 Aboriginal archaeological sites (two sites were classified as "destroyed") (AECOM, 2018).

These assessments demonstrate that the area has been subject to past disturbance, particularly during the post-contact period, which has probably impacted the Aboriginal heritage of the area and reduced the overall number of sites. Previous assessments suggest also that Aboriginal sites are most likely to occur in flat areas associated with water sources and that their number is expected to be higher in areas near permanent water sources. Elevated areas away from watercourses, and slopes are expected to contain fewer Aboriginal sites. These results feed into the predictive model outlined in the following section.

### 3.4 Predictive model

The following predictive model is used to identify areas of archaeological sensitivity. The model is based on a 'land system' or 'archaeological landscape' model of site location. This type of model predicts site location based on known patterns of site distribution in similar landscape regions.

The predictive model is based on:

- A review of previous models developed for the project area.
- An assessment of the results of the previous archaeological assessments reviewed in Section 3.3.
- The interpretation of the distribution patterns of known sites close to the project area.
- A study of previous impacts to the project area and the potential effects of these impacts on the archaeological record.

The following specific predictive points are noted for the landscape the proposed project footprint sits within:

- Elevated landforms adjacent to watercourses have high archaeological potential. Existing archaeological data for the Hunter Valley indicate a strong trend for the presence of open sites along watercourses, specifically, on creek banks and 'flats' (i.e. flood/drainage plains), terraces and bordering slopes.
- Landforms adjacent to permanent watercourses have a higher archaeological potential than those adjacent to ephemeral watercourses.

- The most common site type will be surface and sub-surface scatters of stone artefacts.
- Other site types that may present in the landscape are quarries, grinding grooves and scarred trees.
- The most commonly occurring material will be indurated mudstone/silicified tuff followed by silcrete. Other materials such as chert and quartz are also likely to be present.
- Where present, sub-surface archaeological deposits are most likely to be within 200 m of a water source (river or creek).
- Ridgelines and hills will have a lower density of sites than basal slopes and valley floors.
- Within the road corridor surface and sub-surface deposits are likely to be heavily disturbed and may contain areas of imported fill.

A number of post-depositional processes can result in disturbance or destruction of archaeological sites. Identifying areas of high disturbance is an important factor in the predictive model. Disturbance can alter the patterns of site location expected from the points above. The following general predictive points relate to the effects of site disturbance:

- Landforms adjacent to watercourses and which have been subject to frequent or high-energy flooding events will have reduced archaeological potential.
- Steep hillslopes have reduced archaeological potential, as sites will be more likely to have been displaced by downslope movement and surface erosion.
- European land-use practises can have a range of impacts to sites. Road corridors will have low archaeological potential, particularly if heavily graded or capped with imported material. Areas that have been excavated, inundated by dammed watercourses, or buried under fill or stockpiled materials will have low archaeological potential.

Many post-depositional processes result in the movement of artefacts away from their original location and context, without resulting in damage or destruction to the artefacts themselves. Some post-depositional processes will result in the destruction of some, but not all, artefacts within a site. Only severe impacts will destroy or remove all Aboriginal objects from a landform. Factoring post-depositional disturbance into the assessment of a landform's archaeological potential should consequently take a precautionary approach. A landform should be assumed to retain archaeological potential unless there is compelling evidence for severe disturbance that can be confidently inferred to have removed all sites from the landform.

## **4. Proposed methodology for the cultural heritage assessment**

### **4.1 Aboriginal Cultural Heritage Assessment**

The Aboriginal cultural heritage assessment will involve the following tasks:

- Desktop assessment of what is known about the archaeological resource of the project area and its surrounds from previous research.
- Development of a method for archaeological survey (this document).
- Survey of the areas proposed to be impacted by the project.
- Reporting – an ACHAR will be prepared. The report will satisfy the requirements of the *Code of Practice* (DECCW, 2010b), the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a) and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011). The report will:
  - Synthesise the results of technical investigations, including the desktop assessment and archaeological survey
  - Include an assessment of the significance of any Aboriginal objects and record any Aboriginal cultural heritage values identified
  - Include an impact assessment and provide management and mitigations measures to inform any AHIP application as required.
- Each report will be reviewed by RAPs. Information, comments and feedback received from RAPs will be incorporated into the final version of the report.
- Site records on the AHIMS database will be updated as necessary.

### **4.2 Aboriginal community input points during the assessment process**

Input and feedback can be provided by RAPs at any time throughout the assessment process. Jacobs will specifically seek input and feedback from RAPs at several points during the process (following procedures outlined in DECCW, 2010a):

- During Stage 2 – Initial presentation of information about the proposed project.
- During Stage 3 - Providing RAPs with the draft proposed methodology (this document). RAPs are invited to provide feedback on the proposed methodology, and to identify cultural heritage values associated with the project area.
- During fieldwork.
- During Stage 4 - Providing RAPs with the draft Aboriginal Cultural Heritage Assessment Report. RAPs will be invited to provide feedback on the report, and any further information they wish to be included.

### **4.3 Archaeological Field Survey**

The field survey will systematically investigate the areas proposed to be impacted by the project.

The survey will be carried out on foot by a team of archaeologists and Aboriginal representatives.

The survey will investigate the proposed impact areas in full. No sub-sampling of these areas will be employed. Areas that are assessed by field teams as having no potential for archaeological material to be present, for

example because of previous impacts and ground disturbance, will not be surveyed. The decision to exclude areas in this way will be made in the field, through a consensus of all field team members.

The ground survey team will consist of two archaeologists as well as Aboriginal representatives. The field survey is aimed at locating Aboriginal objects and areas of Potential Archaeological Deposit (PAD) containing subsurface archaeological material.

Where archaeological sites are encountered, the following attributes will be recorded:

- Site location (single point for isolated artefacts, or as a boundary drawn around larger sites such as artefact scatters);
- Site type;
- Landform context;
- Vegetation type;
- Land use;
- Categories of features and artefacts present on the site;
- Orientation/aspect of the site;
- Observations on individual stone artefacts: stone material type; artefact type; platform surface; platform type; termination type; cross-section category; length, width and thickness in millimetres;
- Observations on modified trees: living status of tree; condition of tree; condition of scar; tree species; length and width of scar; height above ground; presence of regrowth; depth of scar (height of regrowth); shape of scar; orientation of scar; presence/absence of axe marks;
- Observations of other specific site types (grinding groove, art, shell scatter, closed site) following the requirements of OEH site recording forms;
- Photographs of the site and individual site features/artefacts will be taken as judged necessary by the field team;
- Any other comments or information as judged relevant by the field team.

Any previously recorded sites within the footprint of the project will be searched for during the survey. If found, these sites will be recorded following the same procedure as newly identified sites. If survey teams are unable to find previously recorded sites, this will be noted in the report.

The survey will also record land disturbance, survey coverage variables (ground exposure and archaeological visibility) and landform types across the project area.

Data will be captured using iPad notebooks, handheld GPS, and compact digital camera. Standard measuring tools such as tape measures and callipers will be used.

#### **4.4 Survey logistics and requirements for Aboriginal participants**

At least five days prior to fieldwork, Jacobs will contact RAPs with details of fieldwork schedule, including meeting location, start and finish times, and expected fieldwork duration. Details of relevant inductions and safety regulations applying to the areas of the Bayswater site being accessed will also be communicated to RAPS at that time.

#### **4.5 Sensitive cultural information and management protocol**

RAPs have the opportunity to provide Jacobs with information on the project area and the surrounding region, including information on cultural heritage values. Information will be accepted at any point during the cultural heritage assessment process prior to the finalisation of the ACHAR (see section 4.2).

It is possible that during this consultation process, RAPs will provide sensitive cultural information to which access needs to be restricted.

In the event that such information is supplied, the RAP supplying the information should state to Jacobs how they wish that information to be treated, and how access to the information should be restricted.

Jacobs will follow the stated wishes provided by the RAP group in question when managing and using the information provided to Jacobs. All stated restrictions of access, communication and publication of the information will be followed. These might include:

- Restrictions on reproducing the information (in whole or in part) in reports
- Restrictions on reproducing the information in reports provided to different audiences (for example, the version provided to the client, the version provided to OEH and the AHIMS database)
- Restrictions on communication of the information in other ways
- Restrictions on the location/storage of the information
- Other required processes relating to handling the information
- Any names and contact details of persons authorised within the relevant Aboriginal group to make decisions concerning the information, and their degree of authorisation.
- Any details of any consent given in accordance with customary law
- Any restrictions on access to and use of the information by RAPs.

Please consider the above list when providing your statement of requirements regarding any culturally sensitive information.

#### **4.6 Critical timelines**

Critical timelines are outlined in Table 1 overleaf. Please note that the following deadlines are estimates at this stage in the process and are provided to allow forward planning of personnel and resources.



Table 1: Critical timelines for the AGL Bayswater Project

Project Item	Date
Provision of comments on the proposed methodology presented in this document	Within 28 days from delivery of this document
Archaeological survey	Early-mid September
Provision of the draft ACHAR (which include the proposed management and mitigation measures) to RAPs for review.	Mid-late September
Provision of comments on the draft ACHAR	Within 28 days from delivery of the draft report
Gathering of information on cultural significance and cultural values associated with Aboriginal objects and places within or relevant to the project area	Ongoing throughout the process until finalisation of the draft ACHAR
Finalisation of the ACHAR in consideration of comments received	October-November

#### 4.7 Contact details

For more information and to discuss this project, please do not hesitate to contact:

[REDACTED]

Senior Archaeologist

Jacobs

Level 1, 64 Allara Street, Canberra ACT 2601


[REDACTED]

[REDACTED]

## 5. References

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## Appendix A. AHIMS search results

Office of  
Environment  
& Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : IA215400 02

Client Service ID : 434896

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-2-0554	P7/Flashette; Contact	AGD Recorders	56	305500	6410100	Open site	Valid	Artefact:- Permits	Open Camp Site	2238
37-2-0555	P8/Flashette; Contact	AGD Recorders	56	305480	6410250	Open site	Valid	Artefact:- Permits	Open Camp Site	2238
37-2-0556	P9/Flashette; Contact	AGD Recorders	56	305320	6410230	Open site	Valid	Artefact:- Permits	Open Camp Site	2238
37-2-0557	P10/Flashette; Contact	AGD Recorders	56	305170	6410280	Open site	Valid	Artefact:- Permits	Open Camp Site	2238
37-2-0558	P11/Flashette; Contact	AGD Recorders	56	306150	6410550	Open site	Valid	Artefact:- Permits	Open Camp Site	2238
37-2-0047	Pikes Gulby; Contact	AGD Recorders	56	308888	6412976	Open site	Valid	Artefact:- Permits	Open Camp Site	4525
37-2-0048	Pikes Gulby; Contact	AGD Recorders	56	309436	6412986	Open site	Valid	Artefact:- Permits	Open Camp Site	4525
37-2-0050	Pikes Gulby; Contact	AGD Recorders	56	308888	6412976	Open site	Valid	Artefact:- Permits	Open Camp Site	4525
37-2-0063	Liddell/Tinkers Creek; Contact	AGD Recorders	56	307027	6414679	Open site	Valid	Artefact:- Permits	Open Camp Site	4525
37-2-0065	Liddell/Pikes Gulby; Contact	AGD Recorders	56	308427	6413150	Open site	Valid	Artefact:- Permits	Open Camp Site	4525
37-3-0491	NARDELL N2 Contact	AGD Recorders	56	314000	6412100	Open site	Valid	Artefact:- Permits	Open Camp Site	103364
37-2-0553	P6/Flashette; Contact	AGD Recorders	56	305550	6410120	Open site	Valid	Artefact:- Permits	Open Camp Site	2238
37-3-0007	Pikes Gulby; Contact	AGD Recorders	56	309074	6412796	Open site	Valid	Artefact:- Permits	Open Camp Site	4525
37-2-0062	Tinkers Creek/Liddell; Contact	AGD Recorders	56	307210	6414682	Open site	Valid	Artefact:- Permits	Open Camp Site	4525
37-3-1128	REA256 Contact	GDA Recorders	56	313859	6412438	Open site	Destroyed	Artefact:- Permits	Open Camp Site	4525

Report generated by AHIMS Web Service on 15/07/2019 for Clare Leavers for the following area at Search using shape-file IA215400\_Study\_Area\_Merge.SHP with a buffer of 0 meters.  
Additional Info : Target site inspection. Number of Aboriginal sites and Aboriginal objects found is 15  
This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such act or omission.

## **Appendix C. AHIMS site cards**



37-2-0047

1. Map Name Singleton ..... 5. Site No. 37-2-47 .....  
2. Scale 1:250,000 ..... 6. Site type OPEN .....  
3. Grid ref 3967-9936 ..... (Campsite) .....  
4. Site name(s) Pikes Gully ..... 7. Classification .....  
8. Air photo ref .....  
9. Cadastral .....  
10. Land Status Coal leases ..... 11. ....

## 12. Directions for site relocation

From New England highway north of Ravensworth,  
walk across the paddocks.

13. Owner ..... 14. Tenant/Manager .....  
Address ..... Address .....  
.....  
Attitude ..... Attitude .....

## 15. Site Description

The paddock on the south side of the creek had been ploughed. Very few stone flakes, but there were flaking cores 150m along the stream and up to 70m south of it. Core collection 10 (1 yellow chert, 1 red rhyolite, 1 acid volcanic, 1 milky quartz, 2 blueish quartz, 2 bluish quartzite, 2 pinkish quartzite). Labelled Pikes Gully

16. Reasons for investigation Environmental Impact Study for E.C. N.W.  
17. Condition Material ~~by~~ disturbed by streambeds, ploughing.  
.....  
18. Interpretation nil .....  
19. Visitation nil .....  
20. Recommendations nil .....  
.....

+



## 21. Environmental description of site locality

Bare grazing paddocks, with an occasional eucalypt surviving in the watercourse. The creek is permanent at this point, though choked with silt.

No wildlife was seen this far downstream, but there are kangaroos in the headwaters.

The summers are very hot (over 40°C), the winters cool.

## 22. Relation to other sites in locality

There are surface campsites both upstream and downstream in Pikes Gully; these are reported on separate sheets.

## 23. Details of artifact collections

Australian Museum.

24. Is plan or diagram of site attached? Yes/No

25. Are annotated photographs attached? Yes/No How many? nil

26. Other additions

27. Importance of site to Aborigines Unknown

28. Source of this information Nil

29. Oral sources of information nil

30. Written references nil

31. Recorded by Prof LK Drell. Filed by

Address Uni of Newcastle  
Shortland NSW 2308

Date 18/12/78

Date



37-2-0048

1. Map Name ..... SINGLETON ..... Moswalsbrough .. 5. Site No. 37-2-48 ..  
2. Scale ..... 1:250,000 ..... 1:63360... 6. Site type ..... OPEN .....  
3. Grid ref .. 3973,9936 and 3967,9936 .....  
4. Site name(s) .. Pikes Gully ..... 7. Classification .....  
8. Air photo ref ..... nil .....  
9. Cadastral ..... Unknown .....  
10. Land Status ..... Coal leases ..... 11. ....

## 12. Directions for site relocation

From the New England highway north of Ravensworth, walk across the paddocks.

13. Owner ..... Unknown ..... 14. Tenant/Manager .....  
Address ..... Address .....  
.....  
Attitude ..... Attitude .....

## 15. Site Description

At 3973,9936: There are occasional stone flakes along the north bank of Pikes Gully from a site at 3981,9934 (reported separately) to this one. On the southern bank, opposite a minor creek junction, there were a few stone flakes. A collection of cores was made (one chert, one grey quartzite, one bluish quartzite). Labelled "Pikes Gully 973,936 XII-78". In this side creek, at 3980,9930, saw one chert core (not collected).

~~At 3967,9936: The paddock on the south side of the creek had been ploughed. Very few stone flakes, but there were flaking cores for 150 m along the stream and up to 70 m south of it. Core Collection: 10 (1 yellow chert; 1 red rhyolite; 1 acid volcanic; 1 milky quartz; 2 bluish quartz; 2 bluish quartzite; 2 pinkish quartzite). Labelled "Pikes Gully 967,936 XII-78".~~

~~No scarred trees, faunal remains, charcoal.~~

16. Reasons for investigation Environmental impact survey for Electricity Commission.  
17. Condition ..... Material disturbed by stormwater, ploughing. .... of NSW .....  
.....  
18. Interpretation ..... nil .....  
19. Visitation ..... nil .....  
20. Recommendations ..... nil .....  
.....

+

**21. Environmental description of site locality**

Bare grazing paddocks, with an occasional eucalypt surviving in the watercourse. The creek is permanent at this point, though choked with scum.

No wildlife was seen this far downstream, but there are kangaroos in the headwaters.

The summers are very hot (over 40°C), the winters cool.

**22. Relation to other sites in locality**

There are surface campsites both upstream and downstream in Pikes Gully; these are reported on separate sheets.

**23. Details of artifact collections**

See Item 15 for some collections of cores. These are lodged with The Australian Museum.

24. Is plan or diagram of site attached?

~~Yes~~/No

25. Are annotated photographs attached?

~~Yes~~/No

How many? NIL

26. Other additions nil

27. Importance of site to Aborigines

Unknown

28. Source of this information nil

29. Oral sources of information nil

30. Written references nil

31. Recorded by Prof. L.K. Dyal

Filed by

J Evans

Address University of Newcastle  
Shortland NSW 2308.

Date 18/12/78.

Date



37-2-0050

1. Map Name .. SINGLTON ..... 1.: 250000. .... 5. Site No. 37-2-50  
2. Scale .. Muswellbrook ..... 1.: 63360 ..... 6. Site type .... OPEN  
3. Grid ref .. 3973,9936 and 3967,9936 .....  
4. Site name(s) .. Pikes Gully ..... 7. Classification .....  
8. Air photo ref ..... nil .....  
9. Cadastral ..... Unknown .....  
10. Land Status .. Coal leases ..... 11. ....

12. Directions for site relocation

From the New England Highway north of Ravensworth, walk across the paddocks.

13. Owner .. Unknown ..... 14. Tenant/Manager .....  
Address ..... Address .....  
.....  
Attitude ..... Attitude .....

15. Site Description

~~At 3973,9936: There are occasional stone flakes along the north bank of Pikes Gully from a site at 3984,9934 (reported separately) to this one. On the southern bank, opposite a minor creek junction, there were a few stone flakes. A collection of cores was made (one chert, one grey quartzite, one bluish quartzite) labelled "Pikes Gully 973,936 XII-78". In the side creek, at 3980,9930, saw one chert core (not collected).~~  
At 3967,9936: The paddock on the south bank had been ploughed. Very few stone flakes, but there were flaking cores for 150 m along the stream and up to 70 m south of it. Core collection: 10 (1 yellow chert; 1 red rhyolite; 1 acid volcanic; 1 milky quartz; 2 bluish quartz; 2 bluish quartzite; 2 pinkish quartzites). Labelled "Pikes Gully 967,936 XII-78".

No scarred trees, faunal remains, charcoal.

16. Reasons for investigation Environmental impact survey for Electricity Commission..  
17. Condition .. Material disturbed by stormwater, ploughing ..... of NSW .....  
.....  
18. Interpretation ..... nil .....  
19. Visitation ..... nil .....  
20. Recommendations ..... nil .....



**21. Environmental description of site locality**

Bare grazing paddocks, with an occasional eucalypt surviving in the watercourse.  
The creek is permanent at this point, though choked with scum.

No wildlife was seen this far downstream, but there are kangaroos in the headwaters.

The summers are very hot (over 40°C), the winters cool.

**22. Relation to other sites in locality**

There are surface campsites both upstream and downstream in Pikes Gully; these are reported on separate sheets.

**23. Details of artifact collections**

See item 15 for some collections of cores.

These are lodged with The Australian Museum.

**24. Is plan or diagram of site attached?**

~~Yes~~/No

**25. Are annotated photographs attached?**

~~Yes~~/No

How many? NIL

**26. Other additions**

nil

**27. Importance of site to Aborigines**

Unknown

**28. Source of this information**

nil

**29. Oral sources of information**

nil

**30. Written references**

nil

**31. Recorded by** Prof. L.K.Dyall

Filed by

J. Evans

Address University of Newcastle  
Shortland NSW 2308.

Date 18/12/78

Date

37-2-50



Upper Hunter/Lamwook

from 3949.9955 to 3950.9957 REGISTER COPY



37-2-0062

1. Map Name ... SINGLINGTON ..... 1:250000 ..... 5. Site No. ... 37-2-62 .....  
2. Scale ... Muswellbrook ..... 1:63360 ..... 6. Site type ... OPEN .....  
3. Grid ref 3949,9957;3950,9955;3949,9955;3950,9957... .....  
4. Site name(s) ... Tinkers Creek / Liddell ..... 7. Classification .....  
8. Air photo ref ..... nil .....  
9. Cadastral ..... Unknown .....  
10. Land Status .. Crown land ..... 11. ....

## 12. Directions for site relocation

These sites are accessible from Electricity Commission service roads. Details are somewhat pointless since a major power station is about to be built here.

13. Owner .. Electricity Commission ..... 14. Tenant/Manager .....  
Address .. Liddell ..... Address .....  
.....  
Attitude ..... Cooperative ..... Attitude .....

## 15. Site Description

At 3949,9957: A scatter of stone flakes in cattle tracks, for some 30 m on both sides of the minor creek which joins from the west. Random collection of 3 implements (1 used chert flake; 1 used chert elouera; 1 large siliceous blade). Labelled "Tinkers Ck A 949,957 XII-78".

At 3950,9955: A series of three scatters of stone flakes along about 80 m of the east bank; Site B had the most (over 50 flakes on 100 sq.m). Random collection. Cores: 4 (2 chert; 1 coarse rhyolite; 1 coarse siliceous). Implements: 6 (1 broken used chert blade; 5 used flakes of which two are chert, two quartzite, two a fine-grained blue siliceous rock). Label "TINKERS CK B (950,955) XII-78"

At 3949,9955: On opposite bank to previous site, 100 m up from road: a scatter of large flaking cores and hearths on flat ground.

At 3950,9957: On the east bank, downstream from the road: a scatter of hearths and flakes on flat ground. There were a few flakes on the high west bank. Random collection. Labelled "Tinkers Ck C XII-78".

Cores: 2 (one yellow rhyolite; one quartzite).

Implements: 3 (one massive edge-used flake 23.0 x 14.0 x 5.0 cm, of coarse quartzite; one battered cobble of blue basalt; one pebble cleaver 14.0 x 10.1 x 4.2 cm, of quartzite)

No faunal remains, charcoal, scarred trees.

16. Reasons for investigation .. Environmental impact survey for Electricity Commis-...  
17. Condition ..... The first two sites are disturbed ..... ion of NSW .....  
by stormwater. The two with hearths appear to be little disturbed. ....  
18. Interpretation ..... nil .....  
19. Visitation ..... nil .....  
20. Recommendations ..... nil .....

+

**21. Environmental description of site locality**

The creek was a stinking mudpatch in its middle reaches but there was water in the lower reach (Site C). The land is still used for grazing, but in the middle reaches there are stands of casuarinas.

Wildlife: None seen.

Climate: Summers hot (over 40°C), winters cool.

---

**22. Relation to other sites in locality** Numerous other sites in Tinkers Creek. Over the headwater ridge is Saltwater Creek whose large sites I reported in 1976.

**23. Details of artifact collections**

See Item 15. The material is lodged with The Australian Museum.

---

**24. Is plan or diagram of site attached?** ~~Yes~~/No

**25. Are annotated photographs attached?** ~~Yes~~/No      How many?      nil

**26. Other additions**      nil

---

**27. Importance of site to Aborigines**      Unknown

**28. Source of this information**      nil

---

**29. Oral sources of information**      nil

**30. Written references**      nil

---

**31. Recorded by**      Prof. L.K. Dyal

**Filed by** *Joan Sutta*

**Address**      University of Newcastle  
                  Shortland NSW 2308.

**Date**      18/12/78

**Date**      7.2.80

upper Hunter / Lameroosh

3  
from 3947.9955 REGISTER COPY  
to 3952.9966



37-2-0063

1. Map Name ..... SINGLETON ..... 250000 ..... 5. Site No. .... 37-2-63 .....  
2. Scale ..... Muswellbrook ..... 1:63360 ..... 6. Site type ..... OPEN .....  
3. Grid ref ..... 3952,9966; 3952,9962; 3948,9956; 3947,9955 .....  
4. Site name(s) ..... Tinkers Creek / Liddell ..... 7. Classification .....  
8. Air photo ref ..... nil .....  
9. Cadastral ..... Unknown .....  
10. Land Status ..... Crown land ..... 11. ....

## 12. Directions for site relocation

Access to upper Tinkers Creek is from Electricity Commission service roads entered through Liddell Power Station. The first two sites are reached by walking up the creek. The last two are downstream from the road giving access to the freshwater storage dam. 3948,9956 is 200 m below the road, on bare ground on the north bank. 3947,9955 is on the south bank, 100 m below the road.

13. Owner Electricity Commission ..... 14. Tenant/Manager .....  
Address ..... Liddell ..... Address .....  
.....  
Attitude ..... Cooperative ..... Attitude .....

## 15. Site Description

At 3952,9966: Stony ground amongst casuarinas. Occasional stone flakes on the west bank, upstream of a minor fork. Rare flakes on the opposite bank.  
At 3952,9962: The low (2-3 m) east bank has eroded areas. In the space of 40 m, saw over 100 flakes.  
At 3948,9956: At 200 m downstream from the dam road, on the north bank, there was a scatter of flakes (about 100) on the bare bank, some 4 m high at this point. One (broken) backed blade was noted.  
At 3947,9955: The south bank (4 m high) has been recut as a spillway, exposing a few flakes (about 40 were noted) in the space of 50 m.

These are surface scatters. There were no faunal remains, charcoal, or scarred trees, or hearths.

16. Reasons for investigation ..... Environmental impact survey for Electricity Commission ...  
17. Condition ..... All material has been moved by stormwater, ..... of NSW .....  
..... and one lot by bulldozing .....  
18. Interpretation ..... nil .....  
19. Visitation ..... nil .....  
20. Recommendations ..... nil .....  
.....



21. Environmental description of site locality

The land has been used for grazing, but is now being allowed to return to a natural state. Large casuarinas grow along the watercourse, and casuarina scrub has regenerated. Some grazing continues under lease arrangements.

The creek is permanent, and its flow is now controlled from a dam.

Wildlife: None seen here, but there were kangaroos lower down the creek.

Climate: Summers here are very hot (over 40°C), the winters cool.

---

22. Relation to other sites in locality

Numerous other sites in Tinkers Creek have been reported on separate sheets.

This valley connects (via the ridge) with Saltwater Creek (for whose sites see my 1976 reports).

---

23. Details of artifact collections

None collected

---

24. Is plan or diagram of site attached?

~~Yes~~/No

25. Are annotated photographs attached?

~~Yes~~/No

How many? *NIL*

26. Other additions

*nil*

---

27. Importance of site to Aborigines

Unknown

28. Source of this information

*nil*

---

29. Oral sources of information

*nil*

30. Written references

*nil*

---

31. Recorded by Prof. L.K. Dyal

Filed by

*Josie Sutha*

Address

University of Newcastle  
Shortland NSW 2308

Date 18/12/78

Date

*7.2.80*



# National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444.

Standard Site Recording Form Revised 5/88



37-2-0553

1:250,000 map sheet: SINGLETON NPWS Code 132

AMG Grid reference 305550 mE 6400120 mN

Full reference - please include leading digits

250K 250K  
25K 5/6 25K

Scale of map used for grid reference ☒ 25K, 50K (preferred) ☐ 100K ☐ 250K

Please use largest scale available

1:25K, 50K, 100K map name: JERRYS PLAINS

## HEAD OFFICE USE ONLY:

NPWS Site no: 37-2-553Site types: 2Accessioned by: J.D. Date: 11-6-92Data entered by: S. Fields Date: 24-6-92

Owner/Manager:

Address:

Site name: P6 Locality/property name: PLASHETTENPWS District: Region: CENTRAL

Reason for investigation

Portion no: 78

Parish: HOWICK

Photos taken? YES

How many attached? 1

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff.  
(Draw diagram on separate sheet.)

see mapOther sites in locality? YESSite Types include: Artifact scatter

Are sites in NPWS Register?

Have artefacts been removed from site?

By whom?

When?

Deposited where?

Is site important to local Aborigines?

Give contact(s) name(s) + address(es) WANARUAH LALCContacted for this recording? YES - assisted in field

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report).

Assessment Cultural Heritage Stage 2: Hunter ValleyKoethig 1992

NPWS Report Catalogue #

2238

Checklist:

surface visibility,

damage/disturbance/

threat to site

Condition of site:

Poor - construction of drainage under road has cut through bank

Recommendations for management &amp; protection (attach separate sheet if necessary):

none

Site recorded by:

Address/Institution:

M. KoethigDate: August 1991



## SITE POSITION &amp; ENVIRONMENT

OFFICE USE ONLY: NPWS site no: 37-2-553

1. Land form a. beach/hill slope/ridge top, etc: b. site aspect: c. slope:  
 d. mark on diagram provided or on your own sketch the position of the site: e. Describe briefly:



- f. Local rock type: g. Land use/effect:

2. Distance from drinking water: Source:

- 3 Resource Zone associated with site (estuarine, riverine, forest etc):

- 4 Vegetation:

- 5 Edible plants noted

- 6 Faunal resources (include shellfish):

- 7 Other exploitable resources (river pebbles, ochre, etc)

Site type:

## DESCRIPTION OF SITE &amp; CONTENTS.

Note state of preservation of site &amp; contents. Do NOT dig, disturb, damage site or contents.

CHECKLIST TO HELP  
 length, width, depth,  
 height of site, shelter,  
 deposit, structure,  
 element eg. tree scar,  
 grooves in rock.

DEPOSIT: colour,  
 texture, estimated  
 depth, stratigraphy,  
 contents-shell, bone,  
 stone, charcoal, density  
 & distribution of these,  
 stone types, artefact  
 types.

ART area of surface  
 decorated, motifs,  
 colours, wet, dry  
 pigment, technique of  
 engraving, no. of  
 figures, sizes,  
 patination.

BURIALS: number &  
 condition of bone,  
 position, age, sex,  
 associated artefacts.

TREES: number, alive,  
 dead, likely age, scar  
 shape, position, size,  
 patterns, axe marks,  
 regrowth.

QUARRIES: rock type,  
 debris, recognisable  
 artefacts, percentage  
 quarried.

OTHER SITES EG  
 structures (fish traps,  
 stone arrangements,  
 bora rings, mia mias),  
 mythological sites, rock  
 holes, engraved groove  
 channels, contact sites  
 (missions massacres  
 cemeteries) as  
 appropriate









# National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444.

Standard Site Recording Form Revised 5/88



37-2-0554

1:250,000 map sheet: SINGLETON NPWS Code 137

AMG Grid reference 305500 mE 6410100 mN

Full reference - please include leading digits

250K 250K  
25K 25K

5/6

Scale of map used for grid reference ☒ 25K, 50K (preferred) ☐ 100K ☐ 250K

Please use largest scale available

1:25K, 50K, 100K map name: JERRYS PLAINS

## HEAD OFFICE USE ONLY:

NPWS Site no: 37-2-554Site types: 2Accessioned by: J.D. Date: 11-6-92Data entered by: Stiebs Date: 24-6-92

Owner/Manager:

Address:

Site name: P7Locality/property name: PLASHETTE

NPWS District:

Region: CENTRAL

Reason for investigation

Portion no: 78

Parish: HOWICK

Photos taken? YES

How many attached? 2

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff.  
(Draw diagram on separate sheet.)

Other sites in locality? YESSite Types include: Artefact scatters

Are sites in NPWS Register?

Have artefacts been removed from site?

When?

By whom?

Deposited where?

Is site important to local Aborigines?

Give contact(s) name(s) + address(es) WANARUAH LALCContacted for this recording? YES - assisted in field

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report):

Assessment Cultural Heritage Stage 2: Hunter Valley  
Koethig 1992

NPWS Report Catalogue #

2238

Checklist:  
surface visibility,  
damage/disturbance/  
threat to site

Condition of site:

Poor - heavily eroded -

Recommendations for management &amp; protection (attach separate sheet if necessary):

None

Site recorded by:  
Address/institution:

M. KoethigDate: August 1991





37-2-554

REGISTER COPY



P7



[X] New recording

[ ] Additional Info

REGISTER COPY



# National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444

Standard Site Recording Form Revised 5/88



37-2-0555

1:250,000 map sheet: SINGLETON NPWS Code 37

AMG Grid reference

Full reference - please include leading digits

250K 250K  
 305480 mE 6410250 mN  
 25K 5/6 25K

Scale of map used for grid reference  
Please use largest scale available
☒ 25K, 50K (preferred)
 ☐ 100K
 ☐ 250K
1:25K, 50K, 100K map name: JERRY'S PLAINS

HEAD OFFICE USE ONLY:

NPWS Site no: 37-2-555Site types: 2Accessioned by: S.D. Date: 11-6-92Data entered by: S-field Date: 24-6-92

Owner/Manager:

Address:

Site name: P8Locality/property name: PLASHETTE

NPWS District:

Region: CENTRAL

Reason for investigation

 Portion no: 78  
 Parish: HOWICK

 Photos taken? YES  
 How many attached? 2

 How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff.  
 (Draw diagram on separate sheet.)

 Other sites in locality? YES  
 Are sites in NPWS Register?
Site Types include: Artifact scatters
 Have artefacts been removed from site?  
 By whom?

 When?  
 Deposited where?

Is site important to local Aborigines?

Give contact(s) name(s) + address(es) WANARUAH LALSContacted for this recording? YES - assisted in field

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report).

Assessment Cultural Heritage Stage 2: Hunter Valley  
Koethig 1992

NPWS Report Catalogue #

2238

 Checklist:  
 surface visibility,  
 damage/disturbance/  
 threat to site

Condition of site:

Poor at erosion - undisturbed Unit A on  
flats to north

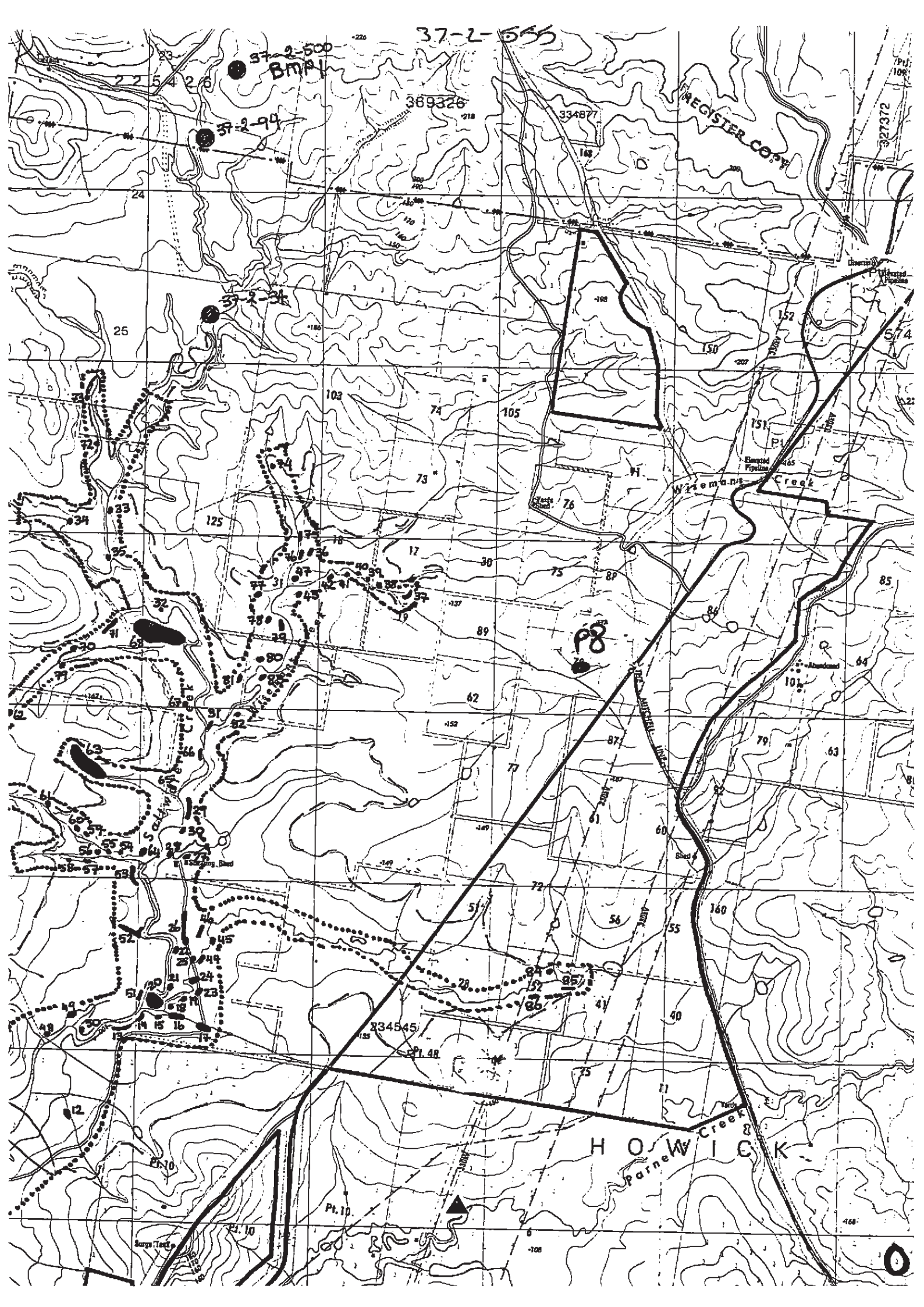
Recommendations for management &amp; protection (attach separate sheet if necessary):

Would need testing if to be disturbed

 Site recorded by:  
 Address/institution:

M. Koethig

 Date: August 1991





37-2565

REGISTER COPY



8A



# National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444  
Standard Site Recording Form Revised 5/88



37-2-0556

1:250,000 map sheet: SINGLETON NPWS Code 13,7

AMG Grid reference 305320 mE 6410230 mN  
Full reference - please include leading digits  
25K 25K 5/6 25K

Scale of map used for grid reference ☒ 25K, 50K (preferred) ☐ 100K ☐ 250K  
Please use largest scale available

1:25K, 50K, 100K map name: JERRYS PLAINS

## HEAD OFFICE USE ONLY:

NPWS Site no: 37-2-556Site types: 2Accessioned by: J.D. Date: 11-6-92Data entered by: S. Fields Date: 24-6-92

Owner/Manager:

Address:

Site name: P9Locality/property name: PLASHETTE

NPWS District:

Region: CENTRAL

Reason for investigation

Portion no: 78  
Parish: HOWICK

Photos taken? YES  
How many attached? 1

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff.  
(Draw diagram on separate sheet.)

Other sites in locality? YES  
Are sites in NPWS Register?

Site Types include: Artefact scatters

Have artefacts been removed from site?  
By whom?

When?  
Deposited where?

Is site important to local Aborigines?  
Give contact(s) name(s) + address(es) WANARUAH LALC

Contacted for this recording? YES - Assisted in field  
(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report):

Assessment Cultural Heritage Stage 2: Hunter Valley  
Koethig 1992

NPWS Report  
Catalogue #

2238

Checklist:  
surface visibility,  
damage/disturbance/  
threat to site

Condition of site:  
Reasonable

Recommendations for management &amp; protection (attach separate sheet if necessary):

Would require testing prior to impact

Site recorded by: M. Koethig  
Address/institution:

Date: 1991



## SITE POSITION &amp; ENVIRONMENT

OFFICE USE ONLY: NPWS site no: 37-2-556

1. Land form a. beach/hill slope/ridge top, etc: b. site aspect: c. slope:  
 d. mark on diagram provided or on your own sketch the position of the site: e. Describe briefly:



- f. Local rock type: g. Land use/effect:

2. Distance from drinking water: Source:

3. Resource Zone associated with site (estuarine, riverine, forest etc):

4. Vegetation:

5. Edible plants noted:

6. Faunal resources (include shellfish):

7. Other exploitable resources (river pebbles, ochre, etc):

Site type:

## DESCRIPTION OF SITE &amp; CONTENTS.

Note state of preservation of site & contents. Do NOT dig, disturb, damage site or contents.

CHECKLIST TO HELP  
 length, width, depth,  
 height of site, shelter,  
 deposit, structure,  
 element eg. tree scar,  
 grooves in rock.

DEPOSIT: colour,  
 texture, estimated  
 depth, stratigraphy,  
 contents-shell, bone,  
 stone, charcoal, density  
 & distribution of these,  
 stone types, artefact  
 types.

ART area of surface  
 decorated, motifs,  
 colours, wet, dry  
 pigment, technique of  
 engraving, no. of  
 figures, sizes,  
 patination.

BURIALS: number &  
 condition of bone,  
 position, age, sex,  
 associated artefacts.

TREES: number, alive,  
 dead, likely age, scar  
 shape, position, size,  
 patterns, axe marks,  
 regrowth.

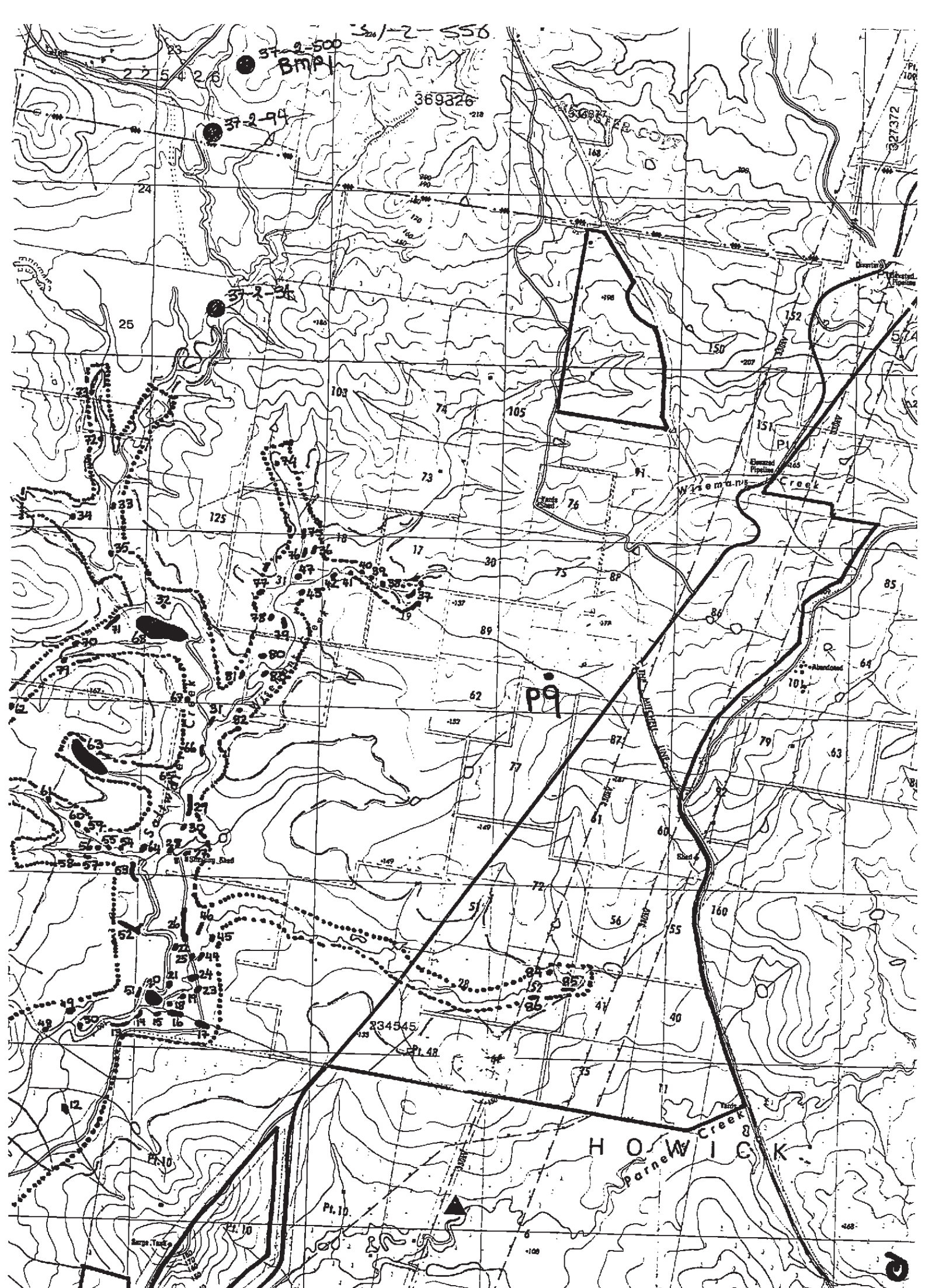
QUARRIES: rock type,  
 debris, recognisable  
 artefacts, percentage  
 quarried.

OTHER SITES EG  
 structures (fish traps,  
 stone arrangements,  
 bora rings, mia mias),  
 mythological sites, rock  
 holes, engraved groove  
 channels, contact sites  
 (missions massacres  
 cemeteries) as  
 appropriate



At  
inc  
At





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☒ New recording☐ Additional Info

# National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444  
Standard Site Recording Form Revised 5/88



37-2-0557

1:250,000 map sheet:

SINGLETON

NPWS Code

137

HEAD OFFICE USE ONLY:

NPWS Site no: 37-2-557

Site types: 2

Accessioned by: J.D. Date: 11-6-92

Data entered by: Sfield Date: 24-6-92

Owner/Manager:

Address:

AMG Grid reference

Full reference - please include leading digits

250K 250K  
305170 mE 6410280 mN  
25K 5/8 25K

Scale of map used for grid reference  
Please use largest scale available
☒ 25K, 50K (preferred) ☐ 100K ☐ 250K

1:25K, 50K, 100K map name:

JERRYS PLAINS

Site name:

PID

Locality/property name: PLASHETTE

NPWS District:

Region: CENTRAL

Reason for investigation

Portion no:

78 or 89

Parish:

HOWICK

Photos taken? YES

How many attached?

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff.  
(Draw diagram on separate sheet)

Other sites in locality? YES

Site Types include: Artefact scatters

Are sites in NPWS Register?

Have artefacts been removed from site?

When?

By whom?

Deposited where?

Is site important to local Aborigines?

Give contact(s) name(s) + address(es) WANARUAH LALC

Contacted for this recording? YES - assisted in field

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report)

Stage 2: Hunter Valley

Koethig 1992

2238

NPWS Report  
Catalogue #

Checklist:

surface visibility,  
damage/disturbance/  
threat to site

Condition of site:

Moderate - eroding

Recommendations for management &amp; protection (attach separate sheet if necessary):

Would require salvage if to be impacted

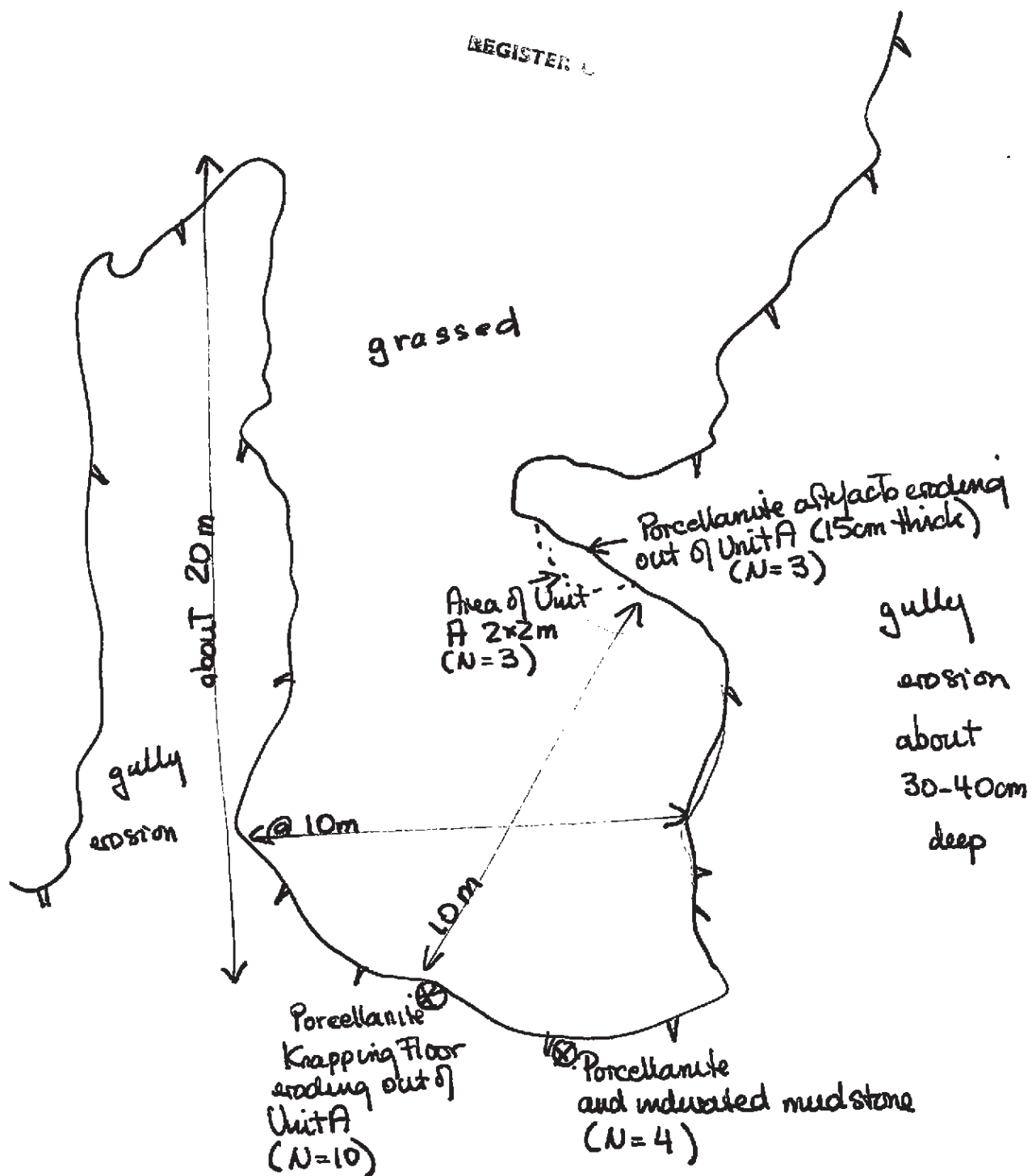
Site recorded by:

M. Koethig

Date:

August 1991

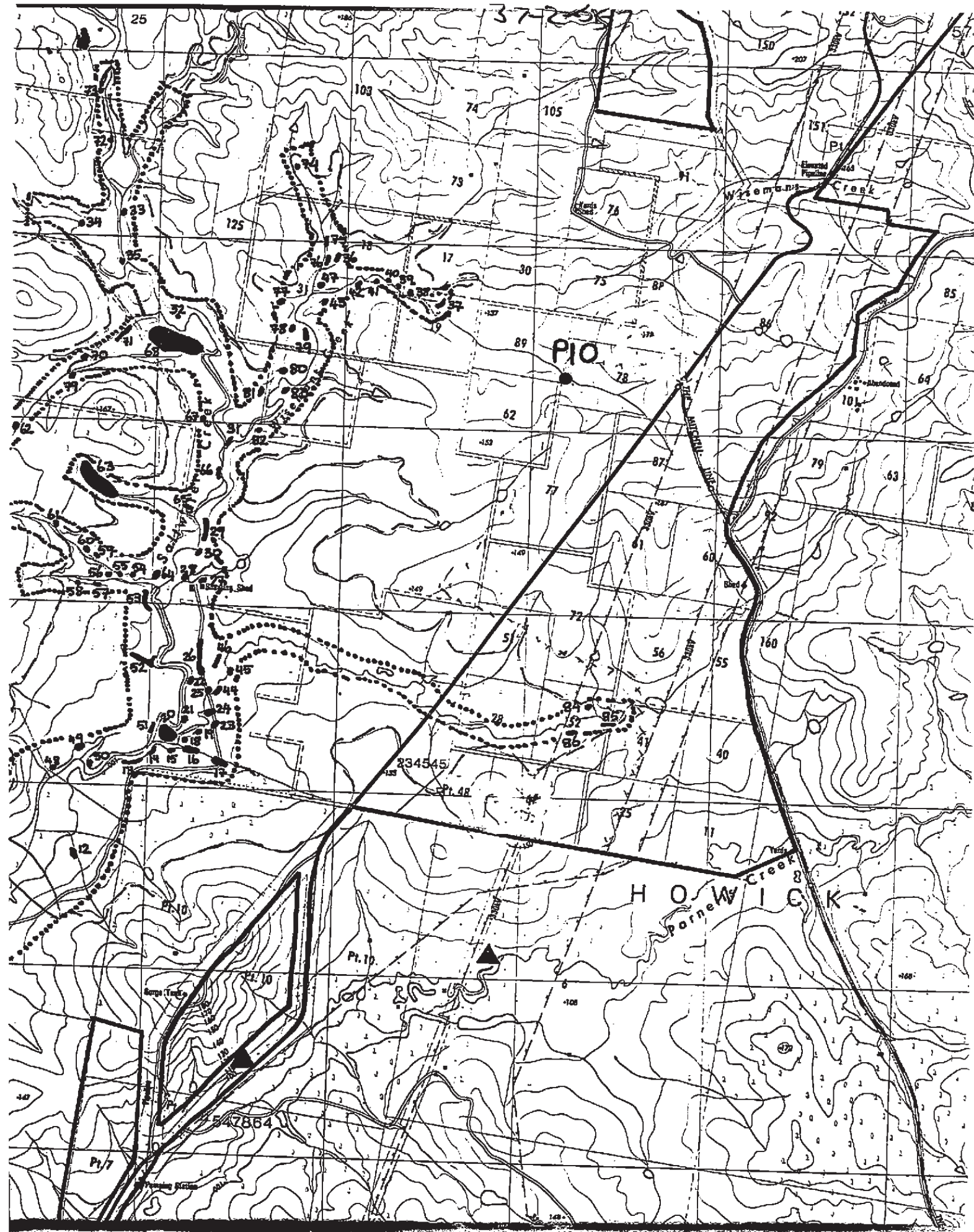
Address/Institution:



Site  
←

↓ channel





REGISTER COPY



# SITE POSITION & ENVIRONMENT

OFFICE USE ONLY: NPWS site no: 37-6-557

1. Land form a. beach/hill slope/ridge top, etc:
- b. site aspect:
- c. slope:
- d. mark on diagram provided or on your own sketch the position of the site:
- e. Describe briefly:

f. Local rock type:

2. Distance from drinking water:

3. Resource Zone associated with site (estuarine, riverine)

4. Vegetation:

5. Edible plants noted:

6. Faunal resources (include shellfish):

7. Other exploitable resources (river pebbles, ochre, etc):

Site type:

DESCRIPTION OF SITE & CONTENTS

Note state of preservation of site:

CHECKLIST TO HELP  
length, width, depth,  
height of site, shelter,  
deposit, structure,  
element eg. tree scar,  
grooves in rock.

DEPOSIT: colour,  
texture, estimated  
depth, stratigraphy,  
contents-shell, bone,  
stone, charcoal, density  
& distribution of these,  
stone types, artefact  
types

ART area of surface  
decorated, motifs,  
colours, wet, dry  
pigment, technique of  
engraving, no. of  
figures, sizes,  
patination.

BURIALS: number &  
condition of bone,  
position, age, sex,  
associated artefacts.

TREES: number, alive,  
dead, likely age, scar  
shape, position, size,  
patterns, axe marks,  
regrowth

QUARRIES: rock type,  
debris, recognisable  
artefacts, percentage  
quarried

OTHER SITES EG.  
structures (fish traps,  
stone arrangements,  
bora rings, mia mias),  
mythological sites, rock  
holes, engraved groove  
channels, contact sites  
(missions massacres  
cemeteries) as  
appropriate

Attach sketches etc. eg. plan  
indicate north, show scale.

Attach annotated photos (site)

Facing East







# National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444  
Standard Site Recording Form Revised 5/88



37-2-0558

1:250,000 map sheet: SINGLETON NPWS Code 137

AMG Grid reference 306150 mE 6410550 mN  
Full reference - please include leading digits  
250K 250K  
25K 5/6 25K

Scale of map used for grid reference ☒ 25K, 50K (preferred) ☐ 100K ☐ 250K  
Please use largest scale available

1:25K, 50K, 100K map name: JERRYS PLAINS

## HEAD OFFICE USE ONLY:

NPWS Site no: 37-2-558

Site types: 2

Accessioned by: S.D. Date: 11-6-92

Data entered by: S Field Date: 24-6-92

Owner/Manager:

Address:

Site name: P11

Locality/property name: PLASHETTE

NPWS District:

Region: CENTRAL

Reason for investigation

REGISTER COPY

Portion no: 86  
Parish: HOWICK

Photos taken? YES  
How many attached?

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff.  
(Draw diagram on separate sheet)

Other sites in locality? YES

Site Types include: Artifact scatter

Are sites in NPWS Register?

Have artefacts been removed from site?

When?

By whom?

Deposited where?

Is site important to local Aborigines?

Give contact(s) name(s) + address(es) WANARUAH LALC.

Contacted for this recording? YES - assisted in the field  
(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report).

NPWS Report  
Catalogue #

Stage 2 : Hunter Valley  
Koethig 1992

2238

Checklist:  
surface visibility,  
damage/disturbance/  
threat to site

Condition of site:

Very poor - possible in situ deposits further on bank

Recommendations for management & protection (attach separate sheet if necessary):

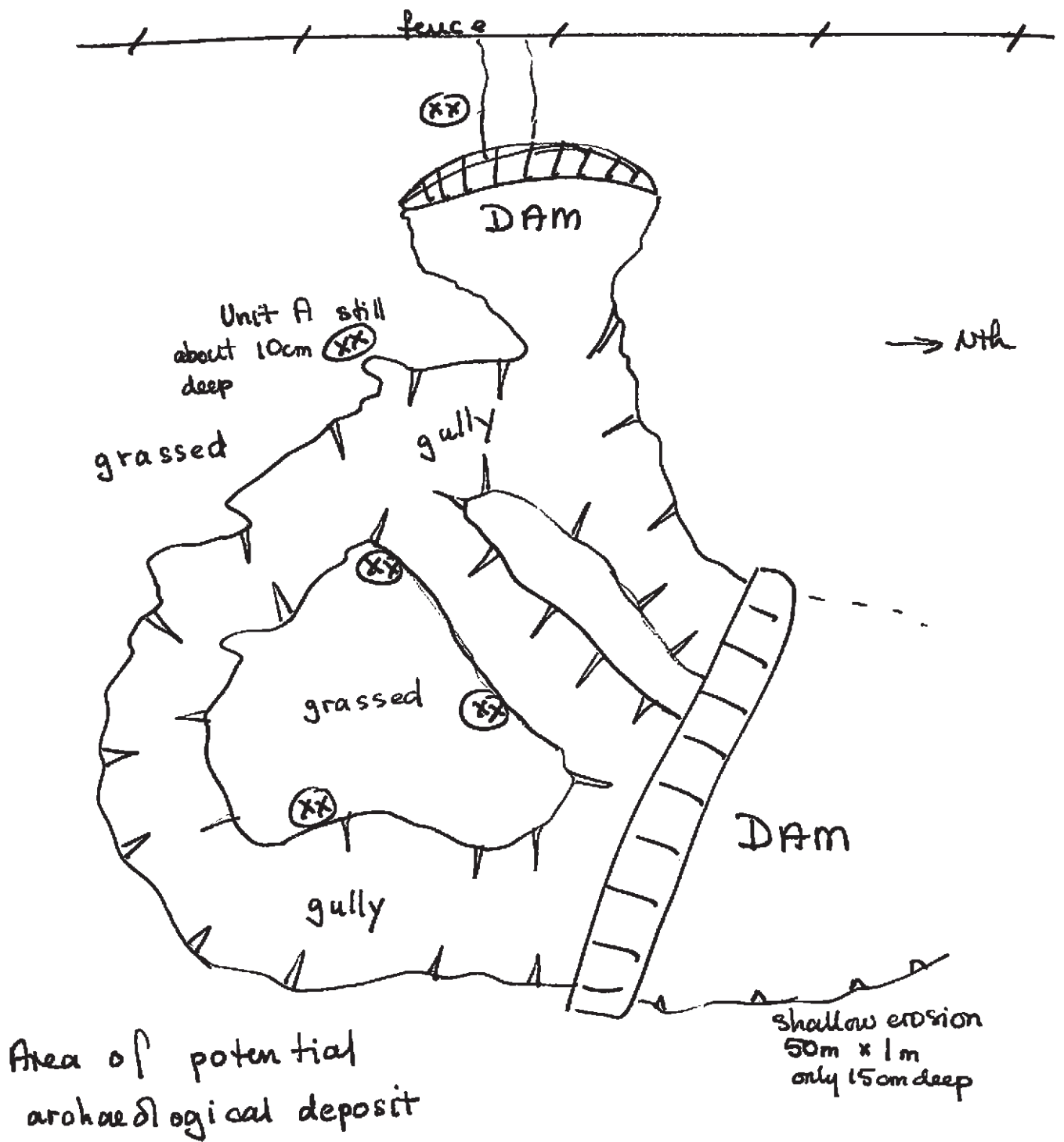
Needs testing to see if undisturbed deposits present if area to be impacted on

Site recorded by:

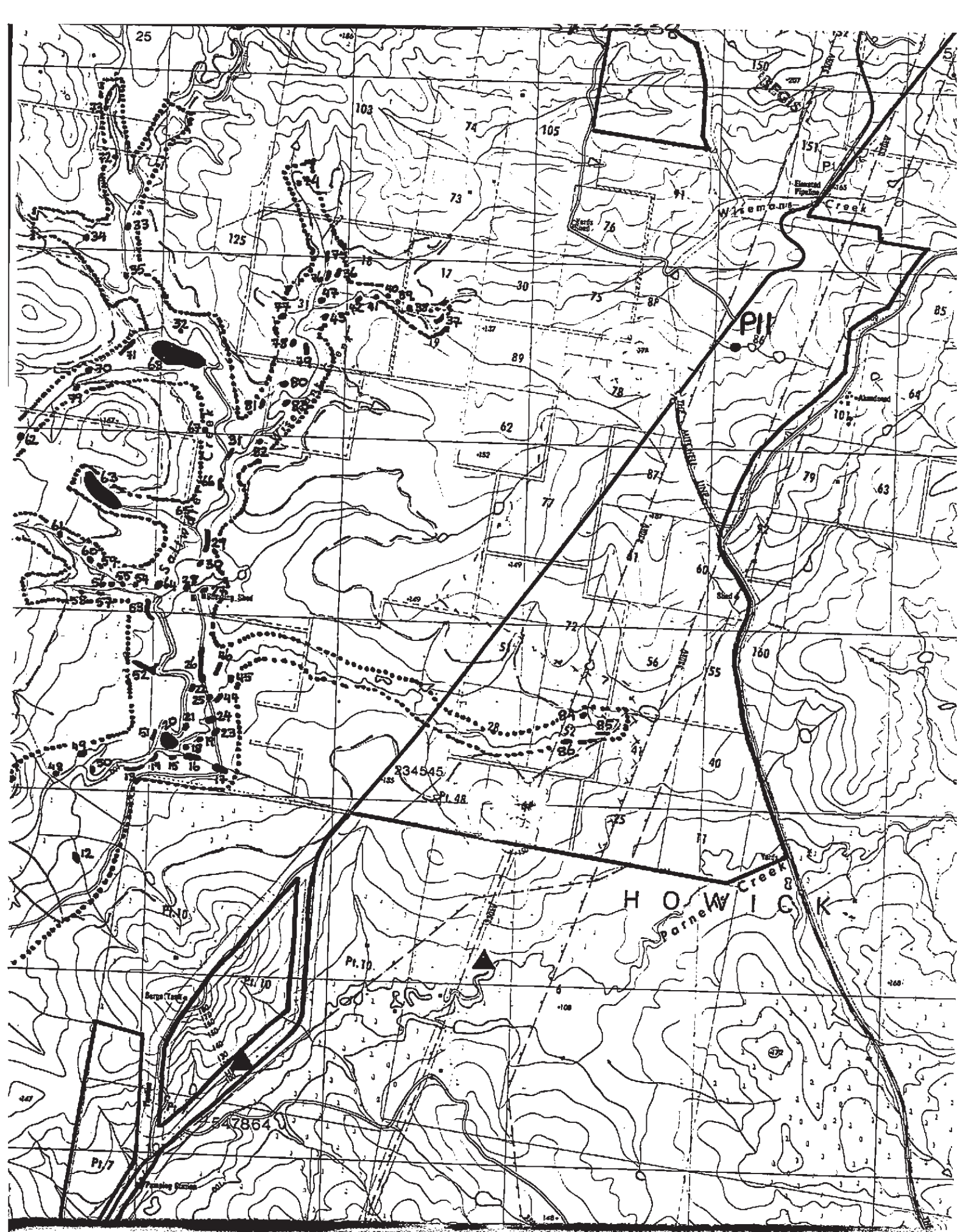
Address/Institution: H. Koethig

Date: August 1991

REGISTER COPY



(XX) = artefacts





SITE P11

37-2-558

REGISTER COPY

Facing East from below dam wall



1. Map Name ..... SINGLINGTON ..... Maxwellbrook 5. Site No. 37-3-7.1  
 2. Scale ..... 1:250,000 ..... 1:63360 6. Site type ... OPEN  
 3. Grid ref ..... 3969,9934  
 4. Site name(s) . PIKES GULLY ..... 7. Classification .....  
 8. Air photo ref ..... nil  
 9. Cadastral ..... unknown  
 10. Land Status . Coal leases ..... 11. ....  
 37-3-0007

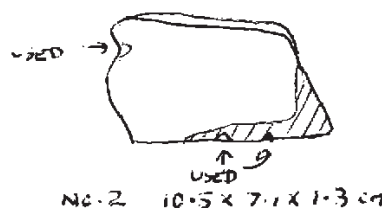
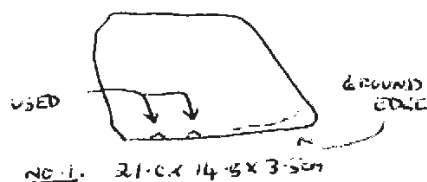
## 12. Directions for site relocation

From New England Highway north of Ravensworth, walk across paddocks. The site is on the east bank of a dry gully, but, since there are no convenient landmarks, cannot be precisely located.

13. Owner . Various coal companies ..... 14. Tenant/Manager .....  
 Address . Ravensworth ..... Address .....  
 .....  
 Attitude .... Unknown ..... Attitude .....

## 15. Site Description

Four heavy slices were seen on the east bank of a deep-cut dry creek. There were no other stone flakes anywhere near, and no other signs of Aboriginal activity. All the slices were of yellow coarse-grained siliceous material. Two were collected. The others did not appear to have edge-grinding though in view of their weathered condition it was hard to be sure.



No. 1 has one edge which appears to be ground (but is very weathered) and has been used. On no. 2, there are two edges which are definitely ground, and there are signs of use.

Labelled "Pikes Gully G. ref 969,934"

16. Reasons for investigation Environmental impact survey for Electricity Commis-  
 17. Condition ..... Isolated finds lying on the ground ..... ion of NSW  
 .....  
 18. Interpretation . May represent tools used in eg. removal of tree bark .....  
 19. Visitation ..... nil .....  
 20. Recommendations ... nil .....  
 +



**21. Environmental description of site locality**

The area has been extensively grazed and has no trees left. The soil is deep alluvial, heavily eroded by the seasonal creek (which was dry when seen in December). The site is on the side of a steep hillside, covered with thistles.

Wildlife : A mob of eleven grey kangaroos was seen on top of the ridge.

Climate: Very hot (over 40<sup>0</sup>C ) in summer, cool in winter.

**22. Relation to other sites in locality**

There are surface campsites in the main watercourse of Pike's Gully  
(see separate report sheets)

**23. Details of artifact collections**

See item 15. The two implements are lodged with the Australian Museum.

24. Is plan or diagram of site attached? ~~Yes~~/No

25. Are annotated photographs attached? ~~Yes~~/No      How many?      NIL

26. Other additions      nil

27. Importance of site to Aborigines      Unknown

28. Source of this information      nil

29. Oral sources of information      Mr. W. Reynolds, of "Flashett", Jerry's Plains, has shown me a sandstone pick and an axe (with cutting edges ground on both ends) found "in Pike's Gully". He is the previous owner.

30. Written references      nil

31. Recorded by      Prof. L. E. Dyal

Filed by

Address      University of Newcastle  
Shortland NSW 2308

Date      18/12/78

Date



# Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220  
Standard Site Recording Form



37-3-0491

New Recording ☒ Additional

information ☐

## SITE IDENTIFICATION

Site name	Nardell - N2	NPWS Site Number	37-3-0491		
Owner/manager	Nardell Coal Corporation				
Owner Address	PO Box 528 Singleton 2330				
<b>LOCATION</b>					
Location	The site is in the Upper Hunter valley on the lower slopes of a hill about 100 metres north of the New England Highway, about 4.5 kilometres north east of Ravensworth and about 1.5 kilometres south-east of the Ravensworth Coal Terminal				
How to get to the site	Access is gained from the Nardell site office at the Ravensworth Coal Terminal. Follow the haul road west for about 1 kilometre then turn south onto an unsealed track that then runs east along the south side of the Macquarie Generation conveyor. Follow the unmade road east for about 1.5 kilometres. The site is located on the lower slopes of the hill just above a contour drain that runs across the slope.				
1:250,000 map name			NPWS map code		
AMG Zone	56	AMG Easting	314000	AMG Northing	6412100
Method for grid reference	Topographic map	Map scale (if method = map)	1:25,000	Map name	Camberwell 9133-3-S
NPWS District Name (see map)			NPWS Zone (see map)	Sydney Zone	
Portion no.			Parish	Liddel	

## SITE DESCRIPTION

Site type(s)	Open artefact scatter	Site type code (NPWS use only)	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead, likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	<p>The site consisted of at least 3 stone artefacts located on the lower slopes of a hill. The artefacts were identified over an area of about 20 square metres, 2 near the northern boundary of the study area, just south of the Macquarie conveyor and just above a drainage contour cut into and running south across the lower slopes of the hill. The third was located about twenty metres south, also on the lower slopes.</p> <p>The artefacts included:</p> <p>1x silcrete core, red, 59x39x26 (irregular shape with 3 negative flake scars) 1x mudstone flaked piece orange, 28x22x10 1x mudstone retouched flake, orange yellow mottled, 16x29x7.</p>		

0



# Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

## Standard Site Recording Form

SITE ENVIRONMENT					
Land form	lower slopes		Aspect	east	Slope 3 degrees
Mark position of the site					
Local rock type	sandstone		Land use/effect	clearing, grazing, land rehabilitation	
Distance from drinking water	500 metres		Source	Bayswater Creek	
Resource zone (eg. estuarine, river, forest)	woodland		Vegetation		
Edible plants			Faunal resources (include shellfish)		
Other exploitable resources (eg. ochre)					
Are there other sites in the locality	Yes	Are they in the Sites Register	Yes	Other site types include	Open artefact scatters
SITE MANAGEMENT					
Site condition	Disturbed		The area has been cleared and grazed. The Macquarie conveyor is about 10 metres north. A contour drainage line crosses the foot of the slope adjacent to the site.		
Management recommendations	Surface artefacts should be salvaged prior to further disturbance or destruction				
Have artefacts been removed from site	No		When		
By whom			Deposited at		
Consent applied for	<input type="checkbox"/>		Consent issued	<input type="checkbox"/>	
Date of issue			Consent number		
SITE INSPECTION AND RECORDING					
Reason for investigation	Part of an environmental impact assessment for Nardell Coal Mine				
Were local Aborigines contacted or present for the recording	<input type="checkbox"/> Not contacted <input checked="" type="checkbox"/> Contacted and present <input type="checkbox"/> Contacted but not present		Names and addresses	V. Perry, Wonnarua Tribal Council PO Box 184 Singleton NSW 2330	
Is the site important to local Aborigines	Yes				
Verbal/written reference sources	Archaeological Assessment of Proposed Mine Water Storage Dam Enlargement and Adjacent Areas, Nardell Coal Mine, Hunter Valley, NSW, Umwelt (Australia) P/L, 2000			ASR report number(s) (or title)	C- C-



# Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

## Standard Site Recording Form

Photographs taken	Yes	No. of Photos attached	1
Site recorded by	R. Fife, V. Perry	Date of recording	29 August, 2000
Address/institution	Umwelt (Australia) Pty Ltd PO Box 838, Toronto, NSW 2283		







Open Site

## Landform

## Landform Unit

- ☐ Stream bank
- ☐ Stream channel
- ☐ Swamp
- ☐ Terrace
- ☐ Terrace flat

0 degrees

## Land use

- ☐ Conservation
- ☐ Established urban
- ☐ Farming-intensive
- ☐ Farming-low intensity
- ☐ Forestry
- ☐ Industrial
- ☒ Mining
- ☐ Pastoral/grazing
- ☐ Recreation
- ☐ Semi-rural
- ☐ Service corridor
- ☐ Transport corridor
- ☐ Urban expansion
- ☐ Residential

## Water

Distance to permanent water source	550	metres
Distance to temporary water source	150	metres
Name of nearest permanent water source	Bayswater Creek	
Name of nearest temporary water	2nd order tributary	

<input type="checkbox"/>	Public	National Park / other Government Dept.
<input checked="" type="checkbox"/>	Private	

**I.D.**  (I.D. Office Use only)

[illegible]

A 10x10 grid map with compass directions (N, NE, E, SE, S, SW, W, NW) and a north arrow. The grid is composed of 10 columns and 10 rows. The compass directions are labeled at the corners: NW (top-left), N (top-center), NE (top-right), W (middle-left), E (middle-right), S (bottom-center), SW (bottom-left), and SE (bottom-right). A north arrow is located on the right side of the grid, pointing upwards.

## General Site Information

## Closed Site

## Shelter/Cave Formation

- ☐ Boulder
- ☐ Wind erosion
- ☐ Water erosion
- ☐ Rock collapse

## Rock Surface Condition

- ☐ Boulder
- ☐ Sandstone platform
- ☐ Silica gloss
- ☐ Tessellated
- ☐ Weathered
- ☐ Other platform

## Open Site

## Site Orientation

- ☐ N-S
- ☒ NE-SW
- ☐ E-W
- ☐ SE-NW
- ☐ N/A

## Condition of Ceiling

- ☐ Boulder
- ☐ Sandstone platform
- ☐ Silica gloss
- ☐ Tessellated
- ☐ Weathered
- ☐ Other platform

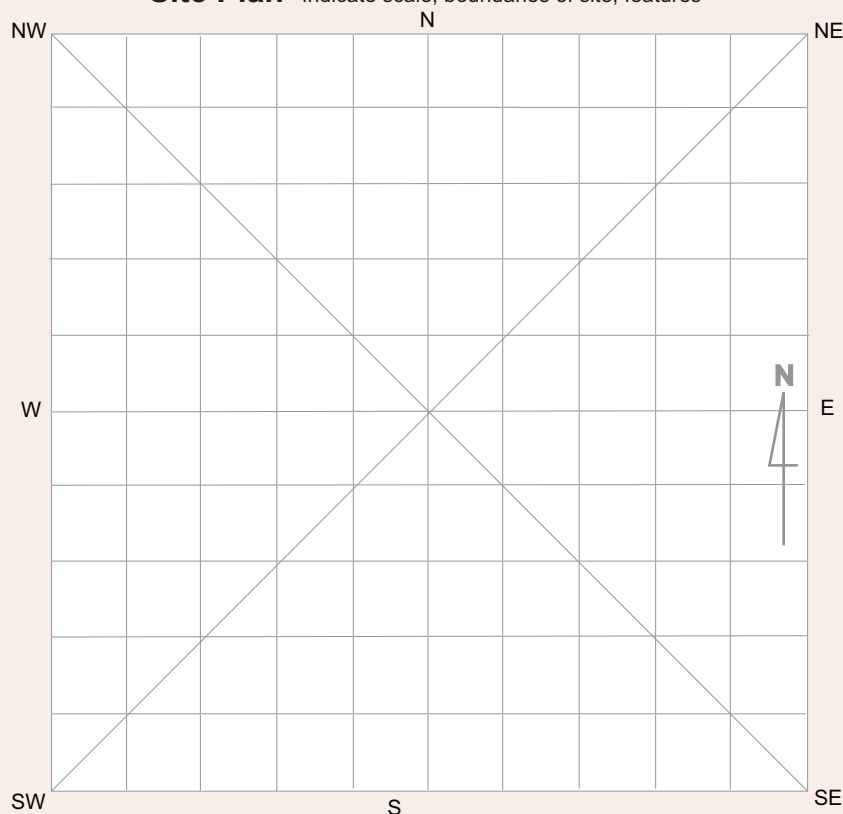
## Shelter Aspect

- ☐ North
- ☐ North East
- ☐ East
- ☐ South East
- ☐ South
- ☐ South West
- ☐ West
- ☐ North West

## Features

- ☐ 1. Aboriginal Ceremony & Dreaming
- ☐ 2. Aboriginal Resource & Gathering
- ☐ 3. Art
- ☒ 4. Artefact
- ☐ 5. Burial
- ☐ 6. Ceremonial Ring
- ☐ 7. Conflict
- ☐ 8. Earth Mound
- ☐ 9. Fish Trap
- ☐ 10. Grinding Groove
- ☐ 11. Habitation Structure
- ☐ 12. Hearth
- ☐ 13. Non Human Bone & Organic Material
- ☐ 14. Ochre quarry
- ☐ 15. Potential Archaeological Deposit
- ☐ 16. Stone Quarry
- ☐ 17. Shell
- ☐ 18. Stone Arrangement
- ☐ 19. Modified Tree
- ☐ 20. Water Hole

## Site Plan Indicate scale, boundaries of site, features



## Site Dimensions

## Closed Site Dimensions (m)

- Internal length
- Internal width
- Shelter height
- Shelter floor area

## Open Site Dimensions (m)

- Total length of visible site
- Average width of visible site
- Estimated area of visible site
- Length of assessed site area

## This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There is a vertical margin line on the left side, creating a narrow left margin. The paper appears to be from a notebook or a standard ruled document.

## Site Cultural & Scientific Analysis and Preliminary Management Recommendations

Aboriginal stakeholders involved in the Ravensworth EA (Umwelt 2010) have identified that all archaeological sites within the Ravensworth Project area are of cultural significance.

[illegible]

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## NPWS FEATURE RECORDING FORM - ARTEFACT

page 1

Site I.D. REA256

Site Name REA256

First recorded date April 2009

Importance Cannot be presently determined

No. of instances

1

Recorded by

Umwelt P/L

Yes No

Stone artefacts only

Yes

Artefacts collected

No

Permit issued

No

## Percentage of Non-stone Artefacts to Percentage of Stone Artefacts

0-9% 10-19% 20-29% 30-39% 40-49% 50-59% 60-69% 70-79% 80-89% 90-100%

0-9%

## Feature Context &amp; Condition

Scatter No.

Easting

3 1 3 8 5 9

Northing

6 4 1 2 4 3 8

## Density

## Dimensions

Yes No

(Artefact count per square metre)

1

15

Length (m)

2

Width (m)

Depth (m)

In situ

No

Stratified

No

## Feature Condition

## General Condition

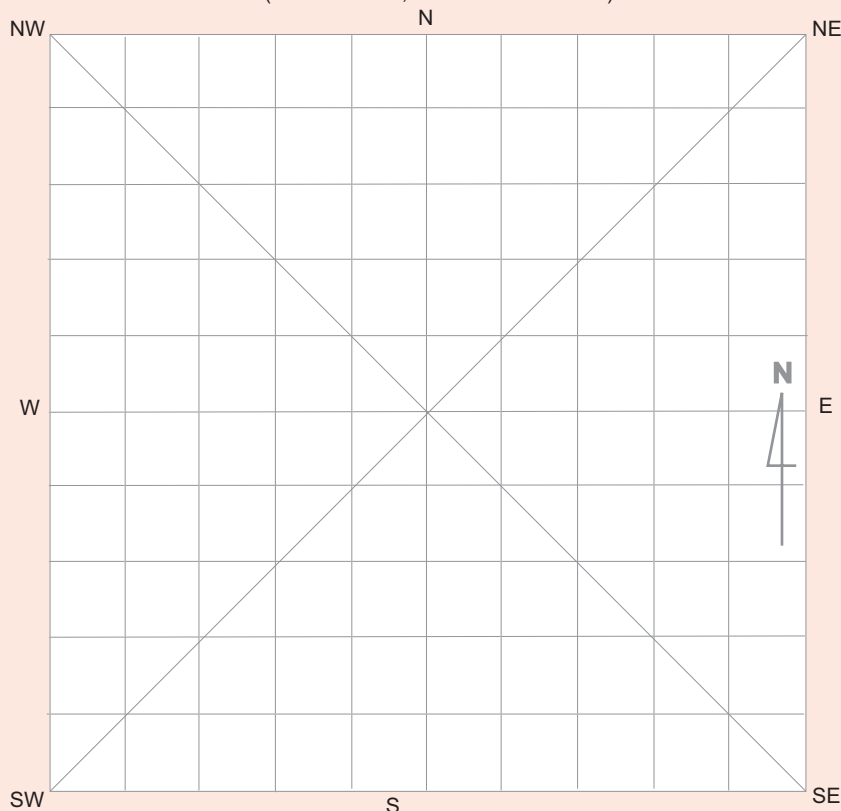
## Recommended Action

- ☐ Very good
- ☐ Good
- ☒ Poor

- ☐ Weathered
- ☐ Vehicle damage
- ☐ Surface water wash
- ☐ Fire damage
- ☒ Erosion
- ☐ Stock damage
- ☒ Exposed archaeological material

- ☐ Boardwalk
- ☐ Fencing
- ☐ Closure to public
- ☐ Continued inspection
- ☐ Fire hazard reduction
- ☐ Expert assessment
- ☐ Meeting with land manager
- ☐ Revegetation
- ☐ Signage
- ☐ Soil erosion control
- ☐ Track closure/re-routing
- ☐ Additional recording

## Feature Plan (Indicate scale, location of instances)



## Feature Environment

(Complete when *feature* environment differs to *site* environment, use attributes from cover card, p. 2)

- Land form
- Land form unit
- Slope
- Vegetation
- Land use

## Water

Distance to permanent water source  metresDistance to temporary water source  metres

Name of nearest permanent water source

Name of nearest temporary water

[illegible][illegible]

Material		Artefact Description		Platform Surface	Termination
Basalt	Clear glass	Adze	Flake tool	Cortex	Feather
Chert	Ceramic	Anvil	Flaked piece	Flake scar	Hinge
Fine grained siliceous	Porcelain	Axe	Hammerstone	More than one flake scar	Step
Granite	Tin can	Backed blade	Manuport	Faceted	Outrepassé
Quartz	Wire	Blade	Milling slab	Ground	Bipolar
Quartzite	Nail	Core	Mortar	Indeterminate	
Sandstone	Button	Core tool	Muller	Bipolar	
Silcrete	Shell	Cyclon	Nuclear tool		
Green glass	Bone	Distal fragment	Pirri		
Amber glass	Wood	Eloura	Proximal fragment	Platform Type	Cross Section
Amethyst glass	Resin	Flake	Tula	Wide	High/strong
			Other diagnostic type	Focal	High/weak
			Modified	Shattered	Low/weak
			Unworked	Indeterminate	Irregular
				Bipolar	

Comments:
The site boundary is defined by surface artefact distribution (1 m <sup>2</sup> ) on a 30 m <sup>2</sup> exposure exhibiting 90 per cent visibility and consists of one silcrete flake. The majority of these artefacts are located on the dam wall. The site has also been impacted by past vegetation clearing, stock trampling, and active sheet erosion which have acted to redeposit the observed artefacts. The above has also eroded the A1 and exposed the A2 soil horizons within the site.



Site I.D.

Site Name

First recorded date

Importance

Aboriginal Information Recorded?

No. of instances

Recorded by

Feature description

No. of scars

No. of carved panels

Feature Condition

☐ Very good

☐ Good

☐ Poor

Condition

☐ Weathered

☐ Ringbarked

☐ Fire damage

☐ Vehicle damage

☐ Insects/termites

☐ Rot

☐ Limb fall

☐ Stock damage

Recommended Action

☐ Fencing

☐ Closure to public

☐ Continued inspection

☐ Expert assessment

☐ Fire hazard reduction

☐ Insect removal

☐ Meeting with land manager

☐ Rubbish removal

☐ Signage

☐ Tree health assessment

☐ Track closure/re-routing

☐ Additional recording

Easting

Northing

Feature environment (Complete when *feature* environment differs to *site* environment, use attributes from cover card, page 2)

Land form

Land form unit

Slope

Vegetation

Land use

**Water**

Distance to permanent water source  metres

Distance to temporary water source  metres

Name of nearest permanent water source

Name of nearest temporary water

Feature Location Plan

Scar/Carved Panel Drawing

NW

N

NE

W

E

SW

S

SE

Indicate scale

Attach additional drawings

[illegible]

Site I.D.  Site Name

First recorded date  Importance  Aboriginal Information Recorded?

No. of instances

Recorded by

**Feature Description****Type of Grinding Feature**

- ☐ Broad
- ☐ Narrow/point
- ☐ Hollow
- ☐ Flat

**Profile Shape**

- ☐ 'U' shaped
- ☐ 'V' shaped
- ☐ Flat

**Seed Species Present**Recording date **Groove Function****Dimensions****Smallest****Largest**Length (mm) Length (mm) Groove count Width (mm) Width (mm) Cluster count Depth (mm) Depth (mm) **Feature Context & Condition**Easting Northing **Dimensions of Whole Feature**Length (m) Width (m) **Feature Condition**

- ☐ Very good
- ☐ Good
- ☐ Poor

**General Condition**

- ☐ Weathered
- ☐ Vandalised

**General Condition ctd**

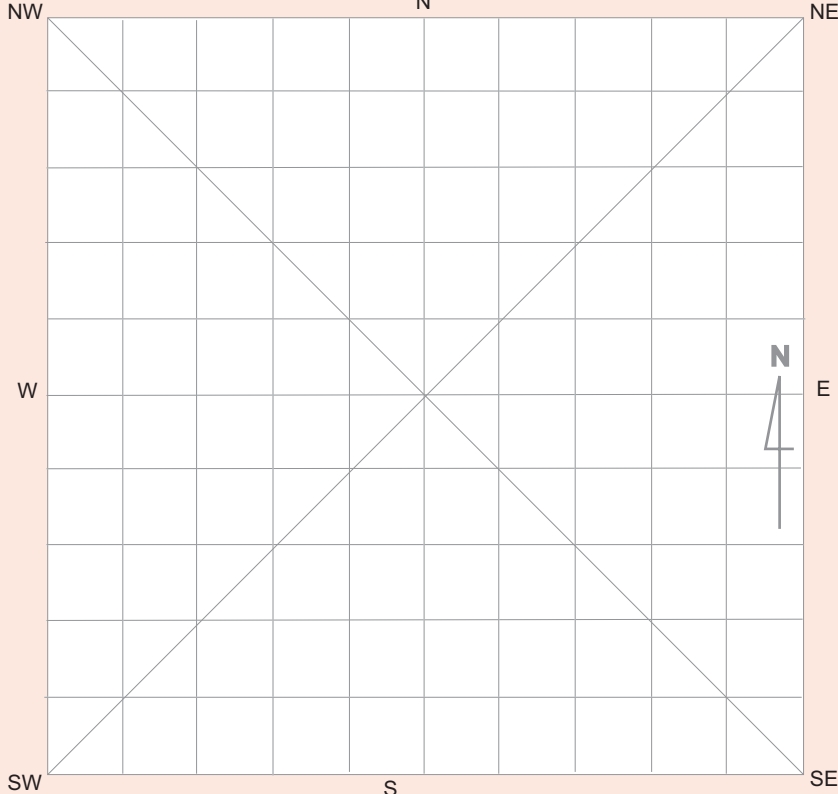
- ☐ Fire damage
- ☐ Surface water wash
- ☐ Graffiti
- ☐ Vehicle damage
- ☐ Erosion
- ☐ Stock damage

**Recommended Action**

- ☐ Boardwalk
- ☐ Cage/barrier/fencing
- ☐ Closure to public
- ☐ Continued inspection
- ☐ Expert assessment
- ☐ Graffiti removal
- ☐ Meeting with land manager
- ☐ Revegetation
- ☐ Rubbish removal
- ☐ Signage
- ☐ Erosion control
- ☐ Track closure/re-routing
- ☐ Additional recording

**Feature Plan**

(Indicate scale, location of instances)

**Feature Environment**(Complete when *feature* environment differs to *site* environment, use attributes from cover card, p. 2)

Land form

Land form unit

Slope

Vegetation

Land use

**Water**Distance to permanent water source  metresDistance to temporary water source  metres

Name of nearest permanent water source

Name of nearest temporary water

## Feature Context & Condition

- ☐ Rubbish removal
- ☐ Signage
- ☐ Erosion control
- ☐ Track closure/re-routing
- ☐ Additional recording

(Complete when *feature* environment differs to *site* environment, use attributes from cover card, p. 2)

Distance to permanent water source	<input type="text"/>	metres
Distance to temporary water source	<input type="text"/>	metres
Name of nearest permanent water source	<input type="text"/>	
Name of nearest temporary water	<input type="text"/>	

### Sketch and number motif groups

[illegible]

## NPWS FEATURE RECORDING TABLE - ART MOTIF

page 2

[illegible]

Motif			Application	Main		
			Technique	Colour	Art Location	Condition
Anthropomorphic	Female	Marine-Other	Abraded	Black	All over shelter surfaces	Faded
Bird	Fish	Other	Drawn	Mauve *	ceiling	Stained
Bird Track	Foot	Pattern	Other	N/A	Floor	Mineralisation Evident
Canoe	Hand	Quadruped	Painted	Orange *	Mostly near largest sheltered space	V brant Colours
Circle	Jellyfish	Reptile	Pecked	Other	Mostly on out of the way surfaces	Unweathered
Contact material culture	Kangaroo	Rifle	Pigment & Engraved	Red *	Other	Weathered
Duck	Line	Shield	Stencilled	White *	Wall	
Eel	Lizard	Ship	Form	Yellow *		
Emu	Macropod	Snake	Fill			
Emu track	Macropod Track	Spear	Line			
European figure	Male	Wallaby	Line+ Fill			
			Other			
			Pattern			

Comments:

[illegible]

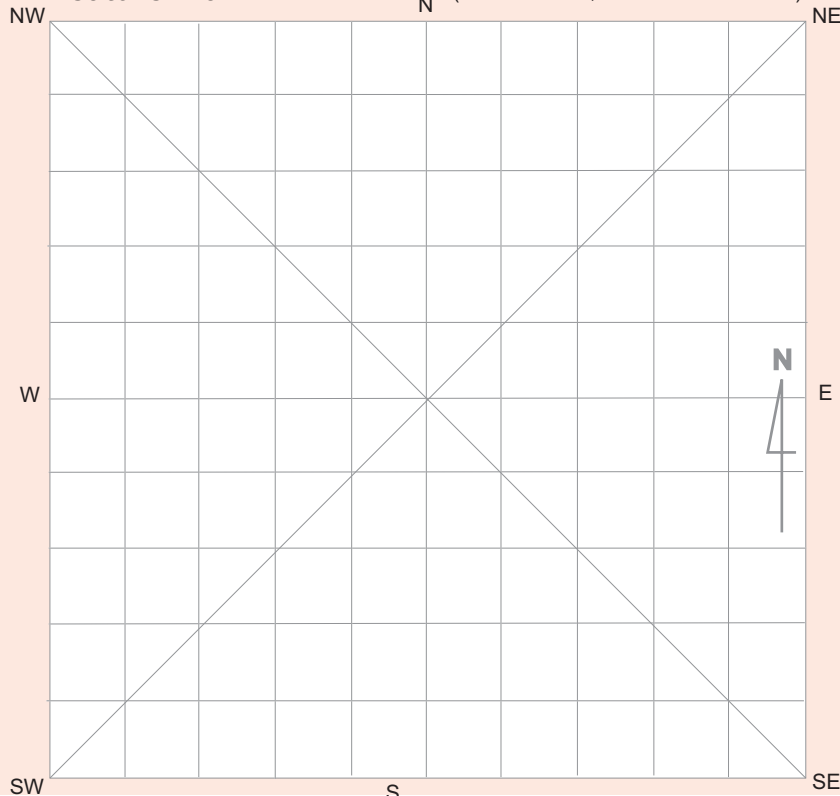


Site I.D. Site Name First recorded date  /  / Importance 

Aboriginal Information

Recorded? No. of instances Recorded by **Feature Context  
& Condition**Easting Northing **Dimensions of Whole Feature** Length (m) Width (m) Depth (m)**Shell Distribution**☐ Surface scatter☐ Stratified deposit☐ Mounded Distance to high water mark (m)**Feature Condition**☐ Very good☐ Good☐ Poor**General Condition**☐ Weathered☐ Vandalised☐ Surface water wash☐ Mineralisation☐ Graffiti**General Condition ctd**☐ Fire damage☐ Vehicle damage☐ Insects/termites☐ Erosion☐ Stock damage☐ Unstable structure☐ Exposed bone material☐ Exposed archaeological material**Recommended Action**☐ Boardwalk☐ Cage/barrier/fencing☐ Closure to public☐ Continued inspection☐ Expert assessment☐ Fire hazard removal☐ Graffiti removal☐ Meeting with land manager☐ Insect/bird nest removal☐ Revegetation☐ Rubbish removal☐ Signage☐ Erosion control☐ Track closure/re-routing☐ Additional recording**Feature Plan**

(Indicate scale, location of instances)

**Feature Environment**(Complete when *feature* environment differs to *site* environment, use attributes from cover card, p. 2) Land form Land form unit Slope Vegetation Land use**Water**Distance to permanent water source  metresDistance to temporary water source  metres

Name of nearest permanent water source

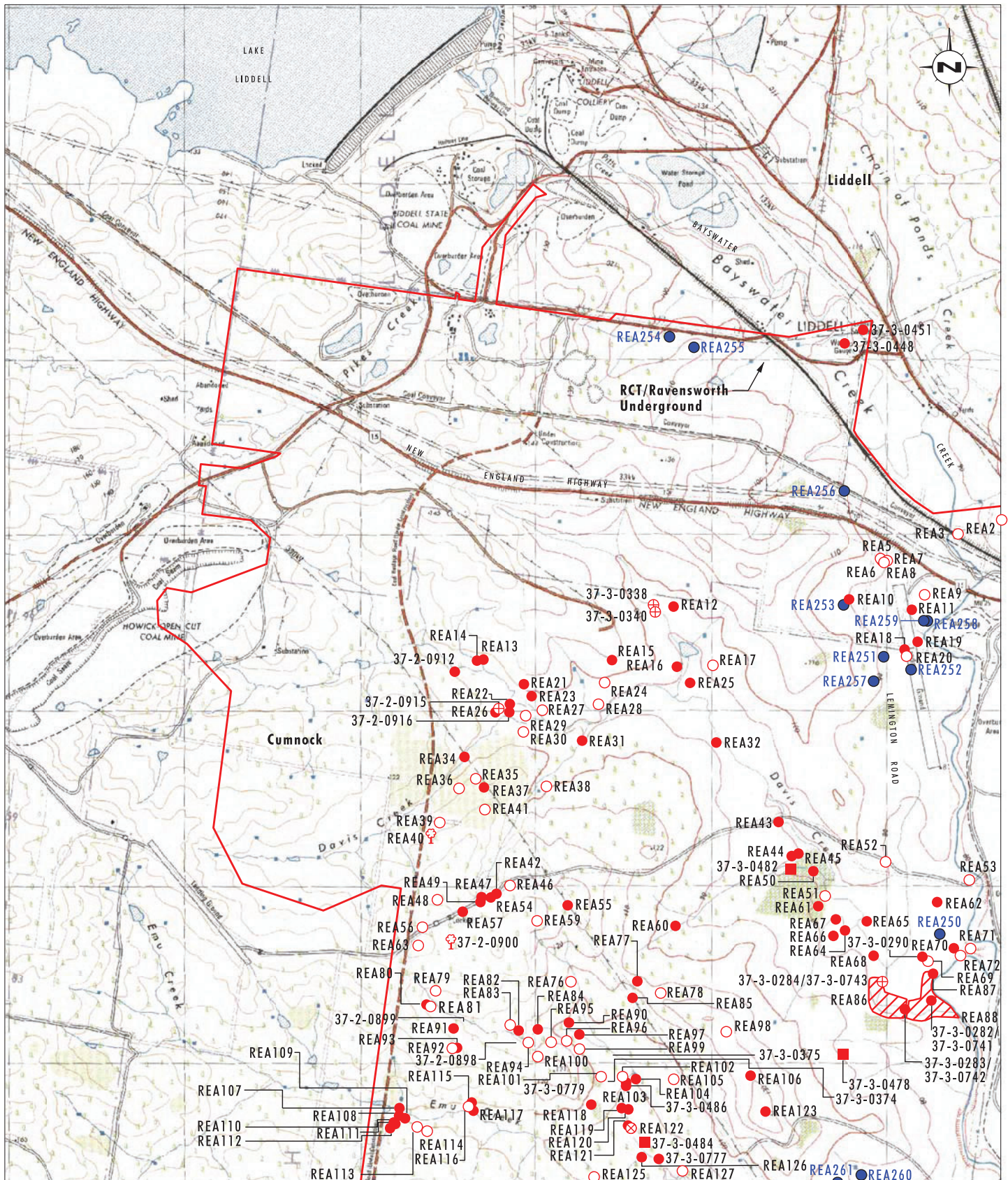
Name of nearest temporary water

% of this  
species shell to  
% total of other  
shell

Species		Percentage of this Species Shell to Percentage Total of other Shell
Anadara	Nerita	0 – 9%
Bimbala	Ocean Snail	10 – 19%
Chiton	Periwinkle	20 – 29%
Cowrie	Pippi	30 – 39%
Dog Cockle	Ribbed Cockle	40 – 49%
Duck Bill	Rock Oyster	50 – 59%
Limpit	Thiad	60 – 69%
Mud oyster	Triton	70 – 79%
Mutton Fish	Turban (large)	80 – 89%
		90 – 100%

[illegible]





Source: Ravensworth Operations 2009, HLA 2001 and ERM 1998, DECC 2009

0 0.5 1.0 1.5 km  
1:30 000

### Legend

- |  |   |  |
|--|---|--|
| <span style="border: 2px solid red; padding: 2px;"> </span> Project Area | Located Archaeological Site Type:   | <span style="color: blue;">●</span> Site Located During Due Diligence Inspection |
| <span style="border: 2px solid red; padding: 2px;"> </span>              | <span style="border: 2px solid red; padding: 2px;"> </span> Artefact Area |  |
| <span style="color: red;">●</span> Artefact Scatter                      | <span style="color: red;">○</span> Engraving Site                         |  |
| <span style="color: red;">○</span> Isolated Find                         | <span style="color: red;">⊕</span> Open Camp Site                         |  |
| <span style="color: red;">⊕</span> Scarred Tree                          | <span style="color: red;">⊗</span> Scarred Tree and Artefact Scatter      |  |
| <span style="color: red;">■</span> Not Provided                          |   |  |

REA Site Locations





PLATE 1  
View south-east over REA 256

# Aboriginal Site Impact Recording Form

**AHIMS Registrar**  
**PO Box 1967, Hurstville 2220 NSW**  
December 2010 DECCW 2010/1022

- 1 This form must be completed following impacts to AHIMS sites that are:
  - a) an outcome of test excavation carried out in accordance with the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW*
  - b) authorised by an Aboriginal Heritage Impact Permit (AHIP)
  - c) undertaken for the purpose of complying with environmental assessment requirements issued by the Department of Planning under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), or
  - d) authorised by a Part 3A project approval under the EP&A Act.
- 2 Completed forms must be submitted to the AHIMS Registrar ([www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm](http://www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm)).
- 3 This form is intended to complement (not replace) the AHIMS Site Recording Form. Where there is a need to provide detailed information about the nature of a site, use the AHIMS Site Recording Form.
- 4 This form does not replace the need to submit reports to DECCW (as specified by a condition of an AHIP or Part 3A approval). This form must be submitted in addition to any reports.

**AHIMS site ID:**

Site impact authorisation (select one)	Reference numbers, dates
<input type="checkbox"/> <b>Archaeological Code</b> (The impacts to this site were the result of test excavation carried out in accordance with the <i>Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW</i> .)	Date DECCW was notified (under requirement 15c of the Code): <input type="text"/> DECCW Regional office notified: <input type="text"/>
<input type="checkbox"/> <b>AHIP</b> (The impacts to this site were authorised by an AHIP.)	AHIP number: <input type="text"/> Date issued/signed: <input type="text"/> AHIMS permit ID/number: <input type="text"/>
<input type="checkbox"/> <b>Part 3A application</b> (The impacts to this site were undertaken for the purposes of complying with Part 3A environmental assessment requirements issued by the Department of Planning.)	Major project number: <input type="text" value="09_0176"/> Date environmental assessment requirements issued: <input type="text"/>
<input type="checkbox"/> <b>Part 3A approved project</b> (The impacts to this site were authorised by a project approval under Part 3A of the EP&A Act.)	or Date of project approval: <input type="text" value="11/02/2011"/>

## Site status following impacts:

- ☐ **Not a site** (The investigations concluded that this is not a site.)
- ☐ **Valid site** (The investigations confirmed that this is an Aboriginal site.)
- ☐ **Partially destroyed** (The site was partially destroyed following authorised impacts; a portion of the site remains in situ.)
- ☐ **Destroyed** (The site was completely destroyed following authorised impacts.)

## Geographic location

**Site name:**

**Easting:**  **Northing:**  **Coordinates must be in GDA (MGA)**

**Map sheet:**

**Zone:**  **Location method:**



## Primary recorder

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Ms	Lamond	Alison
Organisation:	Umwelt (Australia)	
Address:	75 York Street Teralba NSW 2284	
Phone:	49505322	E-mail: alamond@umwelt.com.au
Date recorded:	13/07/2012	Fax: 49505737

## Site information

Open/closed site:

### Features:

- |                                     |                                      |                          |   |
|-------------------------------------|--------------------------------------|--------------------------|---|
| <input type="checkbox"/>            | 1. Aboriginal ceremony and dreaming  | <input type="checkbox"/> | 11. Habitation structure                |
| <input type="checkbox"/>            | 2. Aboriginal resource and gathering | <input type="checkbox"/> | 12. Hearth                              |
| <input type="checkbox"/>            | 3. Art                               | <input type="checkbox"/> | 13. Non-human bone and organic material |
| <input checked="" type="checkbox"/> | 4. Artefact                          | <input type="checkbox"/> | 14. Ochre quarry                        |
| <input type="checkbox"/>            | 5. Burial                            | <input type="checkbox"/> | 15. Potential archaeological deposit    |
| <input type="checkbox"/>            | 6. Ceremonial ring                   | <input type="checkbox"/> | 16. Stone quarry                        |
| <input type="checkbox"/>            | 7. Conflict                          | <input type="checkbox"/> | 17. Shell                               |
| <input type="checkbox"/>            | 8. Earth mound                       | <input type="checkbox"/> | 18. Stone arrangement                   |
| <input type="checkbox"/>            | 9. Fish trap                         | <input type="checkbox"/> | 19. Modified tree                       |
| <input type="checkbox"/>            | 10. Grinding groove                  | <input type="checkbox"/> | 20. Water hole                          |

## Site condition

Written description of the condition of the AHIMS site (including relevant features) following the authorised impact of the site

REA 256 was recorded as an isolated artefact located on a partly modified spur in an exposure with good visibility, 150 metres from a second order tributary and 550 metres from the main channel of Bayswater Creek. The spur had a southerly outlook. There was very little vegetation at the site, with small amounts of introduced grasses. The site was determined to be in poor condition and had been modified by pipes that form the southwest boundary of the site, and impacts from a nearby coal conveyor.

The site boundary was defined by surface artefact distribution (1 m<sup>2</sup>) on a 30 m<sup>2</sup> exposure exhibiting 90 per cent visibility and consists of one silcrete flake. The majority of these artefacts were located on the dam wall. The site had also been impacted by past vegetation clearing, stock trampling, and active sheet erosion which had acted to redeposit the observed artefacts. The above had also eroded the A1 and exposed the A2 soil horizons within the site.

The site was collected on the 5/8/11 in accordance with the Ravensworth North Aboriginal Cultural Heritage Management Plan (Umwelt 2011).

The site is the location of a bridge over the New England Highway.

## Site map

Clearly demarcate the original AHIMS site boundary, show the boundaries of impacted areas and the areas where the site remains in situ. Display map coordinates.



## Methodology and results

Summary of the methodology and results of the activity or works undertaken through the authorised impacts, as relevant to the AHIMS site

The site was visited for collection on the 5/8/11 by a group of representatives of registered Aboriginal parties and an archaeologist.

Prior to collection all surface artefacts observed were individually flagged so that their distribution could be photographed and recorded. The coordinate of each artefact was recorded with sub-metre accuracy and bagged individually. Each bag was annotated with the coordinate and site name for later analysis.

One silcrete flake was collected.

Full details will be provided in the Ravensworth North salvage report.

## Management recommendations

Summary of any management recommendations for the AHIMS site

None, site destroyed.

## Post-investigation significance

Discuss if the scientific/archaeological or cultural significance of the site has changed in light of the results of the investigations or works conducted at the site.

The significance of the site will be addressed in the Ravensworth North salvage report.

## Additional comments

Full details will be provided in the Ravensworth North salvage report.

## Site photographs

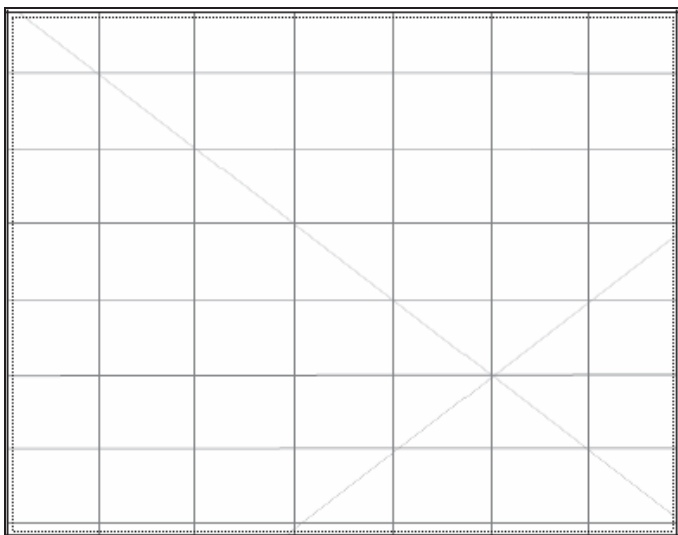
Include photographs of the authorised impacts activity, as relevant to the AHIMS site. Please keep photo size to a maximum of 200 kb.



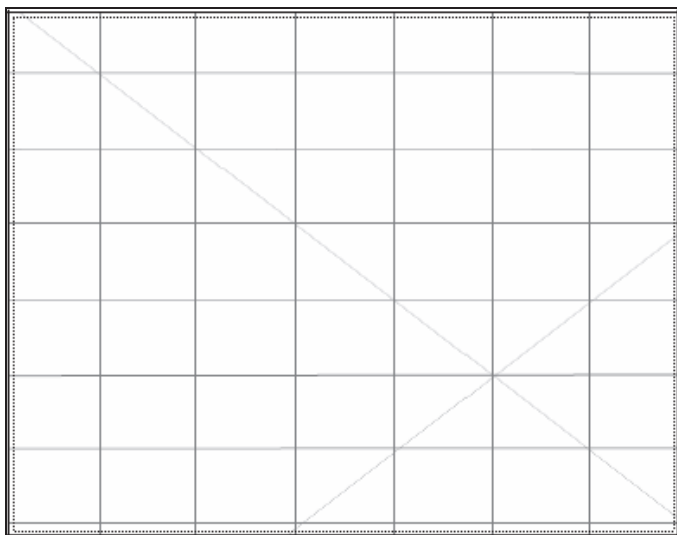
Description: Across site, view to the east.



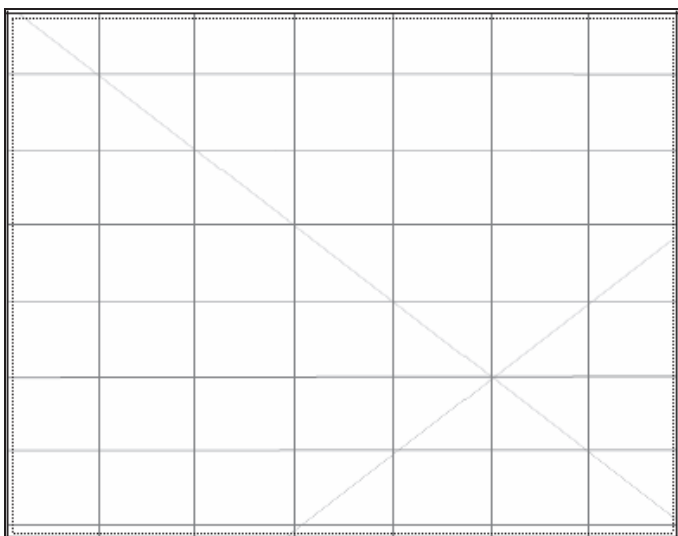
Description: Across site, view to the west.



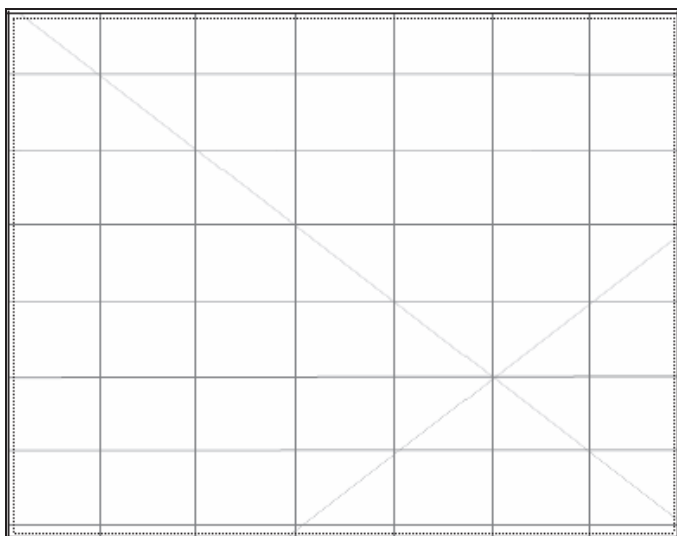
Description:



Description:



Description:



Description: