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Hansen Bailey Environmental Consultants
08-Jun-2018

# Dartbrook Mine Modification 7

## Aboriginal Archaeological and Cultural Heritage Impact Assessment

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## Aboriginal Archaeological and Cultural Heritage Impact Assessment

Client: Hansen Bailey Environmental Consultants

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Prepared by

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# Quality Information

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Date 08-Jun-2018

Prepared by Geordie Oakes

Reviewed by Andrew McLaren

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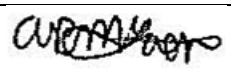
| A | 16-April-2018 | Technical Review | Andrew McLaren/Senior Heritage Specialist |  |
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# Executive Summary

AECOM Australia Pty Ltd (AECOM) was commissioned by Hansen Bailey on behalf of Australian Pacific Coal Limited (AQC) to prepare an Aboriginal Archaeological and Cultural Heritage Impact Assessment (AACHIA) for a proposed modification to DA 231-7-2000 to facilitate further mining operations at Dartbrook Mine, located approximately 5 km north of the town of Muswellbrook in the Upper Hunter Valley of NSW. This assessment forms part of an Environmental Assessment (EA) being prepared by Hansen Bailey to support an application to modify DA 231-7-2000 under Section 75W of *the Environmental Planning and Assessment Act 1979* (EP&A Act).

This AACHIA documents the results of AECOM's assessment and has been compiled with reference to the NSW Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).

AQC is seeking to modify DA 231-7-2000 to facilitate further mining operations at Dartbrook Mine. This modification application will be made under Section 75W of the EP&A Act. The Modification includes the following changes to the approved operations at Dartbrook Mine:

- Mining of the Kayuga seam using bord and pillar mining methods as an alternative to the approved longwall panels;
- Altering the coal clearance system for transferring Run of Mine (ROM) coal to the coal handling infrastructure at the East Site; and
- Extending the period of approval by 5 years.

The study area for this AACHIA comprises a roughly square shaped *c.*3.2 ha parcel of land located approximately 300 m west of the existing East Site and 5 km north of the town of Muswellbrook in the Upper Hunter Valley of NSW. It lies on the very eastern extent of the Hunter River floodplain, approximately 1.1 km east of the Hunter River, and is currently utilised for cropping. The study area, as defined, encompasses all land proposed for ground surface impacts as part of the Modification. Within the study area, AQC proposes to construct a new mine shaft for transferring coal to the East Site. Registered as part of Lot 1 and Lot 2 on DP835733, land within the study area falls wholly within the locality of Aberdeen in the Muswellbrook Shire Council Local Government Area (LGA) and is situated in the Parish of Russell in the County of Durham.

A search of the AHIMS database was undertaken on 22 May 2017 for a 10 x 10 km area centred on the study area land resulting in the identification of 121 Aboriginal sites comprising 116 open artefact sites (i.e., isolated artefacts and artefact scatters) and five scarred trees. Consideration of the location of previously recorded sites indicates that no previously recorded sites are located within the study area, with the closest site – open artefact site 'Brouns Mountain 6 7;' (AHIMS ID#37-2-0536) – located 330 m to the east.

A field team of one AECOM archaeologist (Geordie Oakes) and three RAPs representatives completed the archaeological survey of the study area on Friday 6 April 2018. Survey across the study area identified a modified rural landscape with historical disturbances resulting from vegetation clearance, grazing and ploughing. The majority of the study area comprises the distal portion of Hunter River floodplain with land on the eastern boundary rising slightly to form the footslope of the eastern ridgeline. A number of natural (non-artefactual) quartz and quartzite angular fragments and pebbles were scattered across the study area likely derived from the underlying geology and fractured from numerous ploughing events. Nonetheless, ***no*** Aboriginal objects were identified during the field survey. Subsurface archaeological sensitivity was assessed as low due to its distance from any watercourse. RAPs present during the survey likewise suggested that land within the study area was of low sensitivity due to its distance from the Hunter River and historical disturbances, including ploughing.

On the basis of the above findings, the following recommendations are made:

1. No Aboriginal heritage constraints have been identified within the study area. As such, no further heritage works or reporting are considered warranted; and
2. Should a previously unidentified Aboriginal objects be identified at any point during the carrying out of the Modification, the standard procedure outlined in Section 10.2 should be adopted.

# 1.0 Introduction & Background

## 1.1 Introduction

AECOM Australia Pty Ltd (AECOM) was commissioned by Hansen Bailey on behalf of Australian Pacific Coal Limited (AQC) to prepare an Aboriginal Archaeological and Cultural Heritage Impact Assessment (AACHIA) for a proposed modification to Development Consent DA 231-7-2000 to facilitate further mining operations at Dartbrook Mine, located approximately 5 km north of the town of Muswellbrook in the Upper Hunter Valley of NSW (Figure 1). This assessment forms part of an Environmental Assessment (EA) being prepared by Hansen Bailey to support an application to modify DA 231-7-2000 under Section 75W of *the Environmental Planning and Assessment Act 1979* (EP&A Act).

This AACHIA documents the results of AECOM's assessment and has been compiled with reference to the NSW Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).

## 1.2 The Modification

AQC Dartbrook Management Pty Limited (AQC) is the proprietor of the Dartbrook Mine, located in the Upper Hunter Valley of NSW. AQC is a wholly owned subsidiary of Australian Pacific Coal Limited. Dartbrook Mine is managed in accordance with Development Consent DA 231-7-2000 granted under the *Environmental Planning and Assessment Act 1979* (EP&A Act). DA 231-7-2000 allows for longwall mining operations to be carried out until 5 December 2022. However, Dartbrook Mine has been in care and maintenance since December 2006.

AQC is seeking to modify DA 231-7-2000 to facilitate limited bord and pillar mining within the already approved longwall mining area at Dartbrook Mine. This modification application has been made under Section 75W of the EP&A Act.

The Modification proposes the following:

- Bord and pillar mining in part of the Kayuga coal seam as an alternative to the already approved longwall mining activities;
- An alternative method of transferring Run of Mine (ROM) coal to the coal handling infrastructure at the East Site; and
- Extending the approval period under DA 231-7-2000 by 5 years (until 5 December 2027).

DA 231-7-2000 authorises longwall mining activities in the Wynn, Kayuga, Mt Arthur and Piercefield coal seams. The Modification proposes bord and pillar mining in part of the Kayuga seam, as an alternative to the approved longwall mining activities. Bord and pillar mining will be designed and undertaken in a manner such that subsidence is imperceptible for all practical purposes. The proposed bord and pillar workings will be located within the Approved Kayuga Seam Mining Area. That is, the Modification will not increase the footprint of mining operations at Dartbrook Mine.

The proposed bord and pillar mining will facilitate the extraction of up to 10 Mt of ROM coal over a 10 year period. The maximum production rate that may be achieved in a single year by the proposed bord and pillar mining is 1.5 Mtpa. This is within the approved maximum production rate of 6 Mtpa.

DA 231-7-2000 allows for ROM coal to be transferred from the mine workings to the East Site via the Hunter Tunnel. The Hunter Tunnel is an underground roadway that passes beneath the Hunter River and New England Highway. The conveyors in the Hunter Tunnel were removed by the previous owners of Dartbrook Mine during the care and maintenance phase. As such, AQC has developed an alternative coal clearance system for the Modification. ROM coal will be brought to the surface at the Kayuga Entry. Haul trucks will then transport ROM coal from the Kayuga Entry to a new shaft site to be located directly above the Hunter Tunnel. The new shaft site will include a materials delivery shaft

for transferring ROM coal into the Hunter Tunnel. The coal will then be conveyed beneath the New England Highway to the East Site.

DA 231-7-2000 allows for mining activities to be undertaken until 5 December 2022. To enable the proposed bord and pillar mining activities to be conducted, the Modification seeks to extend the period of approval by 5 years (until 5 December 2027).

Figures showing the proposed bord and pillar workings, and the proposed coal clearance system are provided in Appendix A.

## 1.3 Study Area

The study area for this AACHIA, shown on Figure 2 and Figure 3, comprises a roughly square shaped *c.*3.2 ha parcel of land located approximately 300 m west of the East Site and 5 km north of the town of Muswellbrook in the Upper Hunter Valley of NSW. It lies on the very eastern extent of the Hunter River floodplain, approximately 1.1 km east of the Hunter River, and is currently utilised for cropping. The study area, as defined, encompasses all land proposed for ground surface impacts as part of the Modification. Within the study area, AQC proposes to construct a new mine shaft for transferring coal to the East Site.

Registered as part of Lot 1 and Lot 2 on DP835733, land within the study area falls wholly within the locality of Aberdeen in the Muswellbrook Local Government Area (LGA) and is situated in the Parish of Russell in the County of Durham.

## 1.4 Assessment Objectives

The overarching objectives of this AACHIA are as follows:

- to identify the Aboriginal cultural heritage values of the study area by way of background research, archaeological survey and consultation with Registered Aboriginal Parties (RAPs);
- to assess the potential impact of the Modification on the identified Aboriginal cultural heritage values of the study area;
- to provide an appropriate management strategy for avoiding or minimising potential harm to the identified Aboriginal cultural heritage values of the study area; and
- to compile an AACHIA report that will assist DP&E in their assessment of the Modification application.

## 1.5 Assessment Methodology

This assessment has been undertaken in accordance with OEH's *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011), *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a) and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b). As such, its key requirements have been:

- to conduct a search of OEH's Aboriginal Heritage Information Management System (AHIMS);
- to review the landscape context of the study area, with specific consideration to its implications for past Aboriginal land use;
- to review relevant archaeological and ethnohistoric information for the study area and environs;
- to prepare a predictive model for the Aboriginal archaeological record of the study area;
- to undertake an archaeological field investigation;
- to identify, notify and register Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the study area;
- to provide RAPs with information about the scope of the proposed works and Aboriginal heritage assessment process;

- to facilitate a process whereby RAPs can:
  - contribute culturally appropriate information to the proposed assessment methodology;
  - provide information that will enable the cultural significance of Aboriginal objects and/or places within the study area to be determined; and
  - have input into the development of cultural heritage management options.
- to prepare and finalise an AACHIA with input from RAPs.

## 1.6 Project Team

Geordie Oakes (Senior Archaeologist, AECOM) managed all aspects of the Aboriginal heritage assessment detailed herein and was the primary author of this report. Hansen Bailey completed all Aboriginal consultation for this assessment including arranging participation of RAPs in the archaeological assessment and the writing of Section 3 (Aboriginal Community Consultation) of this report.

Geordie holds a Bachelor of Arts (Honours) degree in historic and prehistoric Archaeology from Sydney University and a Graduate Certificate in Paleoanthropology from the University of New England. Geordie has over ten years of Australian Aboriginal cultural heritage management experience.

## 1.7 Report Structure

This report contains eleven sections. This section - **Section 1.0** - has provided background information on the Modification and the assessment undertaken. The remainder of the report is structured as follows:

- **Section 2.0** outlines the statutory framework within which this assessment has been undertaken;
- **Section 3.0** details the Aboriginal community consultation program undertaken for this assessment;
- **Section 4.0** describes the existing environment of the study area and its associated archaeological implications;
- **Section 5.0** summarises relevant ethnohistoric information for the study area;
- **Section 6.0** describes the archaeological context of the study area on a regional and local scale. Predictions regarding the nature of the study area's Aboriginal archaeological record are also provided;
- **Section 7.0** describes the archaeological survey including methodology and results;
- **Section 8.0** assess the archaeological (scientific) and cultural significance of the study area;
- **Section 9.0** provides an assessment of the potential impacts of the Modification on identified Aboriginal heritage values;
- **Section 10.0** details an appropriate management strategy for the identified Aboriginal heritage values of the study area; and
- **Section 11.0** lists the references cited in-text.

**Figure 1 Regional Context**

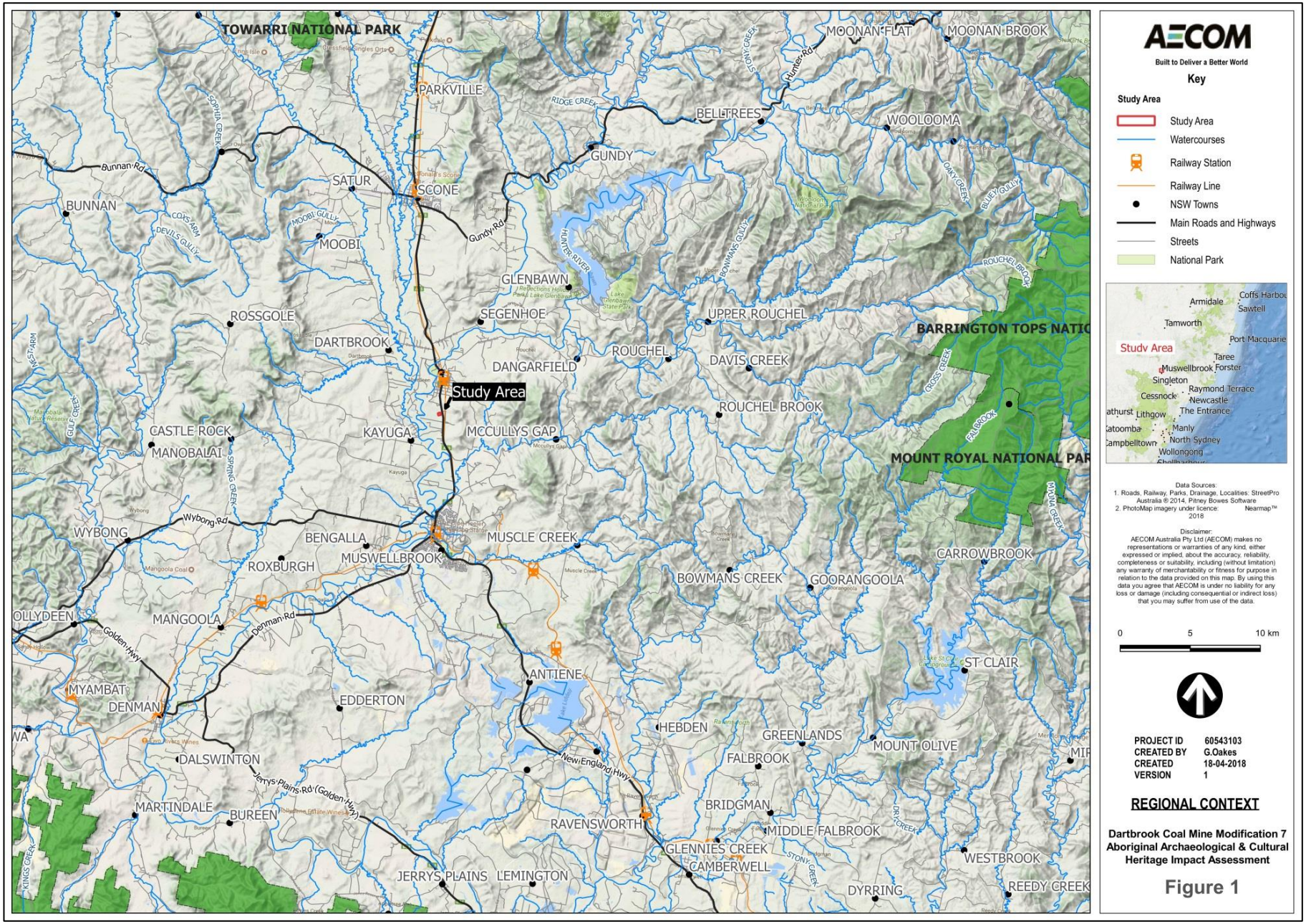


**Figure 2 Study Area**

**Figure 3 Study Area Detail**

# 2.0 Applicable Policy & Legislation

## 2.1 Commonwealth Legislation

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

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (the ATSIHP Act) provides for the preservation and protection of places, areas and objects of particular significance to Indigenous Australians. The stated purpose of the ATSIHP Act is the *"preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition"* (Part I, Section 4).

Under the Act, '*Aboriginal tradition*' is defined as *"the body of traditions, observances, customs and beliefs of Aboriginals generally or of a particular community or group of Aboriginals, and includes any such traditions, observances, customs or beliefs relating to particular persons, areas, objects or relationships"* (Part I, Section 3). A '*significant Aboriginal area*' is an area of land or water in Australia that is of *"particular significance to Aboriginals in accordance with Aboriginal tradition"* (Part I, Section 3). A '*significant Aboriginal object*', on the other hand, refers to an object (including Aboriginal remains) of like significance.

For the purposes of the Act, an area or object is considered to have been be injured or desecrated if:

a. In the case of an area:
   i. it is used or treated in a manner inconsistent with Aboriginal tradition;
   ii. the use or significance of the area in accordance with Aboriginal tradition is adversely affected; and
   iii. passage through, or over, or entry upon, the area by any person occurs in a manner inconsistent with Aboriginal tradition
b. in the case of an object:
   i. it is used or treated in a manner inconsistent with Aboriginal tradition.

The ATSIHP Act can override state and territory laws in situations where a state or territory has approved an activity, but the Commonwealth Minister prevents the activity from occurring by making a declaration to protect an area or object. However, the Minister can only make a decision after receiving a legally valid application under the ATSIHP Act and, in the case of long term protection, after considering a report on the matter. Before making a declaration to protect an area or object in a state or territory, the Commonwealth Minister must consult the appropriate minister of that state or territory (Part 2, Section 13).

No declarations relevant to the study area have been made under the ATSIHP Act.

### 2.1.2 Native Title Act 1993

The *Native Title Act 1993* (NTA) provides for the recognition and protection of native title for Aboriginal peoples and Torres Strait Islanders. The NTA recognises native title for land over which native title has not been extinguished and where persons able to establish native title are able to prove continuous use, occupation or other classes of behaviour and actions consistent with a traditional cultural possession of those lands. It also makes provision for Indigenous Land Use Agreements (ILUA) to be formed as well as a framework for notification of Native Title Stakeholders for certain future acts on land where Native Title has not been extinguished.

Searches of the *Schedule of Applications (unregistered claimant applications*), *Register of Native Title Claims*, *National Native Title Register*, *Register of Indigenous Land Use Agreements* and *Notified Indigenous Land Use Agreements* were undertaken in April 2018, with one relevant listing identified for the study area.

The National Native Title Register lists one Native Title claim over the study area. Claim details are provided in Table 1.

**Table 1 Native Title Claim**

| ID | Name | Date Lodged | Status | Type | Determination |
|---|---|---|---|---|---|
| NC2013/006 | Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People | 19-08-2013 | Active | Claimant | None |

### 2.1.3 Environment Protection and Biodiversity Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) took effect on 16 July 2000. Under Part 9 of the EPBC Act, any action that is likely to have a significant impact on a matter of National Environmental Significance may only progress with approval of the Commonwealth Minister for the Environment and Energy. An action is defined as a project, development, undertaking, activity, series of activities, or alteration. An action will also require approval if:

- It is undertaken on Commonwealth land and will have or is likely to have a significant impact;
- It is undertaken outside Commonwealth land and will have or is likely to have a significant impact on the environment on Commonwealth land; and
- It is undertaken by the Commonwealth and will have or is likely to have a significant impact.

The EPBC Act defines 'environment' as incorporating both natural and cultural environments and therefore includes Aboriginal heritage. Under the Act, protected heritage items are listed on the National Heritage List (items of significance to the nation) or the Commonwealth Heritage List (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate (RNE), which was closed in 2007 and is no longer a statutory list. Statutory references to the RNE in the EPBC Act were removed on 19 February 2012. However, the RNE remains an archive of over 13,000 heritage places throughout Australia.

Searches of the National Heritage List, Commonwealth Heritage List and RNE were undertaken in April 2018, with no relevant listings identified for the study area.

## 2.2 State Legislation

### 2.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act), administered by DP&E, requires that consideration be given to environmental impacts as part of the land use planning process in NSW. In NSW, environmental impacts are interpreted as including impacts to Aboriginal and non-Aboriginal (i.e., European) cultural heritage.

The application to modify DA 231-7-2000 has been made under Section 75W of the EP&A Act. The Development Consent (DA 231-7-2000) for Dartbrook Mine was granted on 28 August 2001 under Part 4 of the EP&A Act (as it was then). The granting of DA 231-7-2000 occurred prior to the enactment of Section 75W. However, Clause 8J(8) the *Environmental Planning & Assessment Regulation 2000* provides that certain Development Consents can be modified pursuant to Section 75W of the EP&A Act. Clause 8J(8) relevantly states:

> *(8) For the purposes only of modification, the following development consents are taken to be approvals under Part 3A of the Act and section 75W of the Act applies to any modification of such a consent:*
>
> *(a) a development consent granted by the Minister under section 100A or 101 of the Act,*
>
> *(b) a development consent granted by the Minister under State Environmental Planning Policy No 34—Major Employment-Generating Industrial Development,*
>
> *(c) a development consent granted by the Minister under Part 4 of the Act (relating to State significant development) before 1 August 2005 or under clause 89 of Schedule 6 to the Act,*

*(d) a development consent granted by the Land and Environment Court, if the original consent authority was the Minister and the consent was of a kind referred to in paragraph (c).*

*The development consent, if so modified, does not become an approval under Part 3A of the Act.*

DA 231-7-2000 was granted under Part 4 of the EP&A Act prior to 1 August 2005. Therefore, Clause 8J(8)(c) enables the modification of DA 231-7-2000 under Section 75W of the EP&A Act.

Impacts to Aboriginal heritage values associated with approved State Significant Development are typically managed under Aboriginal Cultural Heritage Management Plans (ACHMPs). ACHMPs are statutorily binding once approved by DP&E.

### 2.2.2 Aboriginal Land Rights Act 1983

The Aboriginal Land Rights Act 1983 (ALR Act) was established to return land in NSW to Aboriginal peoples through a process of lodging claims for certain Crown lands. The Act, administrated by the NSW Department of Aboriginal Affairs, is a compensatory regime which recognises that land is of spiritual, social, cultural and economic importance to Aboriginal people. The ALR Act establishes the NSW Aboriginal Land Council (NSWALC) and a network of over 120 autonomous Local Aboriginal Land Councils (LALCs) and requires these bodies to:

a. to take action to protect the culture and heritage of Aboriginal persons in the LALC's area, subject to any other law; and

b. to promote awareness in the community of the culture and heritage of Aboriginal persons in the LALC's area.

LALCs constituted under the ALR Act can make claims. The Registrar of the ALR Act has responsibility for maintaining the Register of Aboriginal Land Claims under section 166 of the Act. All land claims that have been made since the Act came into force in 1983 have been recorded in the Register.

Consultation with the Registrar of the ALR Act in March 2018 has indicated that the study area does not have any Registered Aboriginal Owners pursuant to Division 3 of the ALR Act.

### 2.2.3 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act), administered by OEH, is the primary legislation for the protection of Aboriginal cultural heritage in NSW. The NPW Act gives the Secretary of OEH responsibility for the proper care, preservation and protection of 'Aboriginal objects' and 'Aboriginal places', defined under the Act as follows:

- An *Aboriginal object* is any deposit, object or material evidence (that is not a handicraft made for sale) relating to Aboriginal habitation of NSW, before or during the occupation of that area by persons of non-Aboriginal extraction (and includes Aboriginal remains).
- An *Aboriginal place* is a place declared so by the Minister administering the NPW Act because the place is or was of special significance to Aboriginal culture. It may or may not contain Aboriginal objects.

Part 6 of the NPW Act provides specific protection for Aboriginal objects and places by making it an offence to harm them and includes a 'strict liability offence' for such harm. A 'strict liability offence' does not require someone to know that it is an Aboriginal object or place they are causing harm to in order to be prosecuted. Defences against the 'strict liability offence' in the NPW Act include the carrying out of certain 'Low Impact Activities', prescribed in Clause 80B of the *National Parks and Wildlife Amendment Regulation 2010* (NPW Regulation), and the demonstration of due diligence.

An AHIP issued under Section 90 of the NPW Act is required if impacts to Aboriginal objects and/or places cannot be avoided. An AHIP is a defence to a prosecution for harming Aboriginal objects and places, provided that the harm occurred in accordance with the conditions of an AHIP. Consultation with Aboriginal communities is required under OEH policy when an application for an AHIP is considered and is an integral part of the process. AHIPs may be issued in relation to a specified

Aboriginal object, Aboriginal place, land, activity or person or specified types or classes of Aboriginal objects, Aboriginal places, land, activities or persons.

Section 89A of the NPW Act requires notification of the location of Aboriginal sites that are the property of the Crown within a reasonable time, with penalties for non-notification.

## 2.3 Local Government

### 2.3.1 Muswellbrook Local Environmental Plan 2009

Clause 5.10 of the *Muswellbrook Local Environmental Plan 2009* (MLEP 2009) provides specific provisions for the protection of heritage items, heritage conservation areas, archaeological relics, Aboriginal objects and Aboriginal places of heritage significance within the Muswellbrook LGA.

Under Section 2 of Clause 5.10 of the MLEP 2009, development consent is required for any of the following:

a. demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):

   (i) a heritage item,

   (ii) an Aboriginal object,

   (iii) a building, work, relic or tree within a heritage conservation area,

b. (b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,

c. (c) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,

d. (d) disturbing or excavating an Aboriginal place of heritage significance,

e. (e) erecting a building on land:

   (i) on which a heritage item is located or that is within a heritage conservation area, or

   (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,

f. (f) subdividing land:

   (i) on which a heritage item is located or that is within a heritage conservation area, or

   (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.

In relation to Aboriginal heritage, Section 5 of the MLEP 2009 states the consent authority must, before granting consent under this clause to the carrying out of development in an Aboriginal place of 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 by means of an adequate investigation and assessment (which may involve consideration of a heritage impact statement), and

b. notify the local Aboriginal communities, in writing or in such other manner as may be appropriate, about the application and take into consideration any response received within 28 days after the notice is sent.

Schedule 5 of the MLEP 2009 provides a list of heritage items, conservation areas and archaeological sites within the Muswellbrook LGA. A review of the list indicates there are no Aboriginal objects or places of heritage significance located within the study area.

# 3.0 Aboriginal Community Consultation

Aboriginal community consultation acknowledges the right of Aboriginal people to be involved, through direct participation, on matters that directly affect their heritage. Involving Aboriginal people in all facets of the assessment process ensures that they are given adequate opportunity to share information about cultural values, and to actively participate in the development of appropriate management and/or mitigation measures. The successful identification, assessment and management of Aboriginal cultural heritage values are dependent on an inclusive and transparent consultation process.

Aboriginal community consultation for the current assessment was undertaken by Hansen Bailey in accordance with OEH's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a) (Consultation Requirements). The results of the consultation process undertaken are detailed below. Associated correspondence is provided in Appendices B to H.

## 3.1 Stage 1 - Notification and Registration

The aim of Stage 1 of the Consultation Requirements is to identify, notify and register Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the study area.

### 3.1.1 Consultation with Regulatory Agencies

Section 4.1.2 of the Consultation Requirements stipulates that proponents are responsible for ascertaining, from reasonable sources of information, the names of Aboriginal people who may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places. Proponents are required to compile a list of Aboriginal people who may have an interest for the proposed study area and hold knowledge relevant to determining the cultural significance of Aboriginal objects and/or places by writing to:

a. the relevant regional office of the NSW Office of Environment & Heritage (OEH);
b. the relevant Local Aboriginal Land Council(s);
c. the Registrar, Aboriginal Land Rights Act 1983 for a list of Aboriginal owners;
d. the National Native Title Tribunal for a list of registered native title claimants, native title holders and registered Indigenous Land Use Agreements;
e. Native Title Services Corporation Limited (NTSCORP Limited);
f. The relevant local council(s); and
g. The relevant catchment management authorities for contact details of any established Aboriginal reference group.

In accordance with this requirement, the following agencies were contacted via letter on 29 November 2017 requesting information on relevant Aboriginal persons and organisations (Appendix B):

- Office of Environment and Heritage (OEH);
- Wonnarua Local Aboriginal Land Council (WLALC);
- National Native Title Tribunal (NNTT);
- NTSCORP Limited;
- Muswellbrook Shire Council (MSC); and
- Local Land Services (LLS).

Responses were received from four agencies and are attached as Appendix C:

- WLALC;
- OEH;
- NNTT; and
- MSC.

### 3.1.2 Public Notification

Section 4.1.3 of the Consultation Requirements requires that, in addition to writing to the Aboriginal people identified by the agencies listed in Section 3.1.1, the proponent must also place a notice in the local newspaper circulating in the general location of the proposed project. The notification must outline the project and identify its location.

In accordance with this requirement, a public notice was placed in the Muswellbrook Chronicle on 1 December 2017 (Appendix D). The closing date for registration via this notice was 15 December 2017, which provided the necessary minimum 14-day period for expressions of interest.

Responses to the notice were provided by four organisations (listed in Table 2).

### 3.1.3 Invitations for Expressions of Interest

Section 4.1.3 of the Consultation Requirements requires that proponents must write to the Aboriginal people whose names were obtained through the regulatory agencies and the relevant Local Aboriginal Land Council(s) to notify them of the proposed project and invite them to register an interest in participating in a process of community consultation.

In accordance with this requirement, on 6 February 2018, a letter inviting expressions of interest and containing summary information on the project was sent to all Aboriginal persons and organisations identified by the regulatory agencies. A total of 78 Aboriginal stakeholders were invited to register an interest in being consulted. The closing date for expressions of interest was 20 February 2018.

A total of 20 organisations registered an interest in the assessment. Summary information on all RAPs, including registration dates, is provided in Table 2.

**Table 2 Registered Aboriginal Parties**

| Organisation | Date of registration | Method | Contact Person |
|---|---|---|---|
| Wanaruah Local Aboriginal Land Council | 5/12/17 | Email | Noel Downs |
| Culturally Aware | 12/12/17 | Email | Tracey Skene |
| Hunter Valley Aboriginal Corporation | 13/12/17 | Email | Ross Paharu |
| Wonn1 Consulting | 13/12/17 | Email | Arthur Fletcher |
| Tocomwall | 7/2/18 | Email | Scott Franks |
| Didge Ngunawal Clan | 7/2/18 | Email | Paul Boyd |
| Aboriginal Native Title Elders Consultants | 7/2/18 | Phone | Margaret Matthews |
| Upper Hunter Heritage Consultants | 7/2/18 | Phone | Darryl Matthews |
| Divine Diggers Aboriginal Cultural Consultants | 8/2/18 | Email | Deidre Perkins |
| Ungooroo Aboriginal Corporation | 8/2/18 | Email | Allen Paget |
| Stephen Talbott | 9/2/18 | Email | Stephen Talbott |
| Mindaribba Local Aboriginal Land Council | 9/2/18 | Email | Tara Dever |
| Jarban + Mugrebea | 12/2/18 | Email | Les Atkinson |
| Lower Hunter Aboriginal Incorporated | 12/2/18 | Email | David Ahoy |
| Lower Hunter Wonnarua Cultural Services | 13/2/18 | Email | Tom Miller |
| Amanda Hickey Cultural Services | 16/2/18 | Email | Amanda Hickey |
| A1 Indigenous Services | 16/2/18 | Email | Carolyn Hickey |
| Yinarr Cultural Services | 20/2/18 | Email | Kathie Steward Kinchela |
| Murra Bidgee Mullangari Aboriginal Corporation | 20/2/18 | Email | Ryan Johnson |
| Muragadi Heritage Indigenous Corporation | 20/2/18 | Email | Jesse Carroll-Johnson |

### 3.1.4 Notification of Registered Aboriginal Parties (RAPs)

Section 4.1.6 of the Consultation Requirements requires that the proponent make a record of the names of each Aboriginal person who registered an interest and provide a copy of that record, along with a copy of the EOI letter forwarded to the Aboriginal parties, to the relevant OEH regional office and LALC. Section 4.1.5 of the Consultation Requirements provides the opportunity for Aboriginal persons to withhold their details from being forwarded to these parties.

In accordance with these requirements, on 20 March 2018, a list of all RAPs that had not requested their details be withheld was forwarded to the relevant OEH regional office and the Wonnarua LALC. A copy of the EOI letter sent out on 6 February 2018 and the newspaper advertisement was included in this correspondence (Appendix E).

## 3.2 Stage 2 - Presentation of Information about Project

The aim of Stage 2 of the Consultation Requirements is to provide RAPs with information about the scope of the proposed project and the proposed cultural heritage assessment process.

For the current assessment, presentation of information about the study area and proposed development was provided to RAPs as part of the registration of interest process detailed in Section 3.1.3. Basic information on the proponent and proposed development was included in the Expression of Interest (EOI) letter mailed on 6 February 2018.

## 3.3 Stage 3 – Gathering Information about Cultural Significance

The aim of Stage 3 of the Consultation Requirements is to facilitate a process whereby RAPs can:

a. Contribute to culturally appropriate information gathering and the assessment methodology;

b. Provide information that will enable the cultural significance of Aboriginal objects and/or places on the proposed study area to be determined; and

c. To have input into the development of any cultural heritage management measures.

For the current assessment, consultation with RAPs regarding the cultural heritage values of the study area included:

- A request with the draft assessment methodology for any initial comments regarding the Aboriginal cultural heritage values of the study area;
- Discussion of cultural heritage values during fieldwork; and
- The provision of a draft report to all RAPs for comment prior to finalisation.

### 3.3.1 Draft Assessment Methodology

Sections 4.3.1 and 4.3.2 of the Consultation Requirements require that the proponent present and/or provide the proposed methodology for the cultural heritage assessment to RAPs and that RAPs be given a minimum of 28 days to review and provide feedback on this methodology.

All RAPs for the current assessment were provided with a draft of AECOM's proposed assessment methodology sent out on 1 March 2018. RAPs were given a minimum of 28 days to review and provide feedback on this methodology (Appendix F).

Thirteen responses were received from RAPs relating to the draft methodology. No specific cultural heritage values relating to the study area were identified by RAP respondents. WLALC identified a number of culturally significant sites located in the Upper Hunter more broadly. However, none of these sites are located within the study area. RAP responses are summarised in Table 4, with written responses attached as Appendix G.

**Table 3 RAP responses to draft methodology**

| Registered Aboriginal Party | Date | Method | Summary of response | Hansen Bailey response |
|---|---|---|---|---|
| Murra Bidgee Mullangari | 2-March-18 | Email | Agree with the methodology | None required |
| Didge Ngunawal Clan | 2-March-18 | Email | Agree with the methodology | None required |
| Muragadi Heritage | 6-March-18 | Email | Agree with the methodology | None required |
| Jarban + Mugrebea | 7-March-18 | Email | Agree with the methodology | None required |
| Ungooroo Aboriginal Corporation | 7-March-18 | Email | Agree with the methodology | None required |
| Culturally Aware | 8-March-18 | Email | Agree with the methodology | None required |
| Divine Diggers Aboriginal Cultural Consultants | 8-March-18 | Email | Agree with the methodology | None required |
| Hunter Valley Aboriginal Corporation | 14-March-18 | Email | Agree with the methodology | None required |
| Lower Hunter Aboriginal Incorporated | 28-March-18 | Email | Agree with the methodology | None required |
| Yinarr Cultural Services | 28-March-18 | Email | Agree with the methodology | None required |
| Stephen Talbott | 3-March-18 | Email | Agree with the methodology | None required |
| Wanaruah Local Aboriginal Land Council | 3-April-18 | Email | I have nothing to add to the methodology | None required |
| Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People NSD1680/2013 | 29-March-18 | Email | Do not support the methodology | Discussed below |

Registered Native Title party Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People NSD1680/2013 stated they do not support the methodology. Comments on the methodology were provided by Mr Franks (as representative of the Registered Native Title party) via emails on 20 March and 29 March 2018, and telephone conversation on 21 March 2018.

Mr Franks' objected to the methodology on the basis that all Aboriginal parties who expressed an interest were accepted as Registered Aboriginal Parties. Mr Franks contends that an anthropological assessment should have been undertaken to determine who is a "proper Knowledge holder to assess the land within our registered Native title area" (quoted from Mr Franks' email dated 29 March 2018). In particular, Mr Franks raised Section 3.3.1 of the Consultation Requirements, which states that:

> *In some cases, the information required for decision making will be held by Aboriginal people with statutory recognition for certain lands:*
>
> - *Aboriginal owners in accordance with the NSW ALR Act*
>
> *and/or*
>
> - *Native title holders or registered native title claimants in accordance with the Native Title Act 1993 (Cth) and NSW Native Title Act 1994*

Relying on this excerpt, Mr Franks argued that only certain persons (namely, registered title claimants) can provide cultural knowledge. In response, Hansen Bailey explained that the consultation process was undertaken in accordance with the "Consultation stages" prescribed by Section 4 of the Consultation Requirements. In particular, Section 4.1.2 states that:

*4.1.2 Proponents are responsible for ascertaining, from reasonable sources of information, the names of Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/or places.*

As explained in Section 3.1.1, the names of Aboriginal persons who may hold relevant cultural knowledge were obtained from the regulatory authorities listed in Section 4.1.2 of the Consultation Requirement. Section 4.1.3 of the Consultation Requirement states that *"Proponents must write to the Aboriginal people whose names were obtained in step 4.1.2 and the relevant Local Aboriginal Land Council(s) to notify them of the proposed project".* Section 4.1.3 does not provide proponents with any discretion to decide which Aboriginal persons to consult with. In accordance with this provision, Hansen Bailey contacted **all** Aboriginal persons identified by regulatory authorities and invited them to register an interest.

Nonetheless, Hansen Bailey provided Mr Franks with an opportunity to provide cultural knowledge on several occasions and agreed to engage the group to complete a cultural values report for the Modification. During discussions with AECOM archaeologist Andrew McLaren, Mr Franks indicated that it was difficult to complete a cultural values report for the Modification due to the small size of the study area, and that cultural values reporting should be reserved for future proposals at Dartbrook Mine where a larger landscape could be assessed.

### 3.3.2 Archaeological Survey

The following RAPs participated in the fieldwork component of this AACHIA:

**Table 4 RAP field representatives by organisation**

| Registered Aboriginal Party | Field representative(s) |
|---|---|
| Wanaruah Local Aboriginal Land Council | Dave Horton |
| Ungooroo Aboriginal Corporation | Allen Paget |
| Didge Ngunawal Clan | Chad Gowan |

RAP field representatives involved in the visual inspection identified the following social or cultural values for the study area in conversation with the AECOM archaeologist:

- The Hunter River would have been a focal point for Aboriginal people camping in the area; and
- Subsurface archaeological sensitivity of the study area was assessed as low due to the distance from the Hunter River and previous disturbance.

## 3.4 Stage 4 - Review of Draft Assessment Report

The aim of Stage 4 of the Consultation Requirements is to prepare and finalise an AACHIA with input from RAPs.

In accordance with Section 4.4.2 of the Consultation Requirements, on 19 April 2018 all RAPs were sent a draft of this AACHIA for review and comment. The specified closing date for comments was 18 May 2018, which provided the necessary minimum 28 day review period. However, all RAP comments were accepted up to submission of the AACHIA.

RAP responses are summarised in Table 5, with written responses attached as Appendix H. No other RAPs provided comment on the draft report.

**Table 5 RAP responses to draft AACHIA**

| Registered Aboriginal Party | Date | Method | Summary of response | Hansen Bailey response |
|---|---|---|---|---|
| Murra Bidgee Mullangari | 14-May-2018 | Email | Agrees with the content of the report | None required |
| Didge Ngunawal Clan | 20-May-2018 | Email | Agrees with the content of the report | None required |

| Registered Aboriginal Party | Date | Method | Summary of response | Hansen Bailey response |
|---|---|---|---|---|
| Muragadi Heritage | 14-May-2018 | Email | Agrees with the content of the report | None required |
| Lower Hunter Aboriginal Inc. | 16-May-2018 | Email | Agrees with the content of the report | None required |
| Divine Diggers Aboriginal Cultural Consultants | 14-May-2018 | Email | Happy with the project | None required |

# 4.0 Landscape Context

This section reviews the landscape context of the study area as a basis for predicting the character of past Aboriginal occupation within it and its associated archaeological record. Consideration of the landscape context of the study area is predicated on the now well established proposition that the nature and distribution of Aboriginal archaeological materials are closely connected to the environments in which they occur. Environmental variables such as topography, geology, hydrology and the composition of local floral and faunal communities will have played an important role in influencing how Aboriginal people moved within and utilised their respective Country. Amongst other things, these variables will have affected the availability of suitable campsites, drinking water, economic[1] plant and animal resources, and raw materials for the production of stone and organic implements. At the same time, an assessment of historical and contemporary land use activities, as well as geomorphic processes such as soil erosion and aggradation, is critical to understanding the formation and integrity of archaeological deposits, as well any assessments of Aboriginal archaeological sensitivity.

## 4.1 Physical Setting

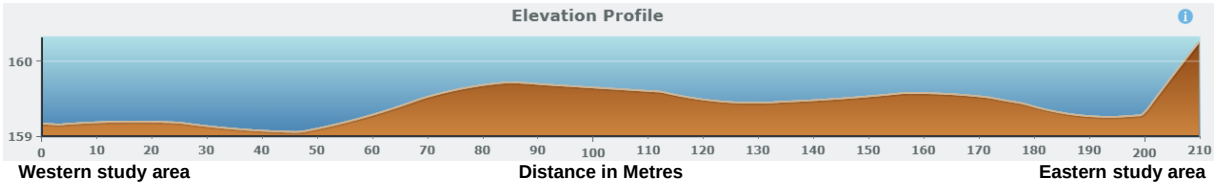
The study area for this AACHIA, shown on Figure 2, comprises a roughly square shaped *c.*3.2 ha parcel of land located approximately 300 m west of the existing Dartbrook CHPP and 5 km north of the town of Muswellbrook in the Upper Hunter Valley of NSW. It lies on the very eastern extent of the Hunter River floodplain, approximately 1.1 km east of the Hunter River, and is currently utilised for cropping.

Reference to the Geological Name Register (GNR) of NSW indicates that the study area falls wholly within the locality of Aberdeen in the Muswellbrook Shire Council LGA. Registered as part of Lot 1 and Lot 2 on DP835733, the study area is situated in the Parish of Russell in the County of Durham.

## 4.2 Topography

The study area lies within the physiographic region referred to as the Central Hunter Foothills subregion of the broader Sydney Basin Bioregion, and characterised by undulating lowlands with rounded to steeply-inclined hills and rock outcropping on ridges formed on Permian-era bedrock (Morgan, 2001; Mitchell, 2001). The study area is located on the distal eastern portion of Hunter River floodplain, approximately 1.1 km east of the river's current channel. To the east of the study area, the floodplain gives way to a locally-prominent N-S trending ridgelines with multiple E-W trending spurs.

**Figure 4 Elevation Profile**




## 4.3 Hydrology

The study area is located within the Hunter River catchment, with the Hunter River located approximately 1.1 km to the west (Plate 1). The Hunter River is the most significant water body in the Hunter Valley Region, and in the area near the study area generally flows in a north-south direction through a channel approximately 50-100 m wide and approximately 3-6 m deep. The Hunter River cuts across a well-developed floodplain, which can be up to several kilometres wide at its widest point. A single unnamed 1st order ephemeral drainage line is mapped within the study area. However, this drainage was not visible during the survey and likely comprised a very ephemeral drainage line which has historically been filled.

[1] I.e., edible and/or otherwise useful (e.g., medicine, clothing)

**Plate 1 View west across study area showing floodplain and Hunter River associated with the treeline at rear of photo(Source: AECOM 2018)**

## 4.4 Geology

Reference to the 1:25 000 Geological Series Sheet for the Hunter Coalfields Region (9033) indicates that the surface geology of the study area has been mapped as part of the Late Permian aged Jerrys Plans Subgroup (Pswj) of the Permian Wittingham Coal Measures Supergroup, which has been described as consisting of coal seams, claystone (tuffaceous), siltstone, sandstone and conglomerate (Figure 6).

However, consideration of the topographic context of the study area suggests that it's surface geology most likely comprises Quaternary Alluvium (Qa) associated with the Hunter River. Locally occurring Quaternary alluvial deposits have been described as consisting of gravel, sand and silt.

Compared with those associated with Sydney's Hawkesbury-Nepean river system and its major tributaries (e.g., Carter, 2011; Doelman et al., 2015) Fergusson et al., 2011; Jensen, 1911; Nanson & Young, 1987, 1988; Nanson et al., 1987; Smith, 1979; Stockton & Nanson, 2004; Walker & Hawkins, 1957), the Cainozoic gravel deposits of Hunter River have been subject to little concentrated research, with the most notable investigations to date undertaken as part of archaeological salvage projects and geological assessments linked to sand and gravel extraction (e.g., Brownlow, 1980; Esteves, 1998; MacRae, 1989; McDonald & Davidson, 1998; Webb, 1989; White, 1998; see also Raggatt, 1938). These deposits, which occur along and adjacent to the Hunter River in the form of gravel banks and elevated "palaeochannel remnants", contain a range of rock types suitable for flaked and/or edge ground stone tool manufacture [2], with the two most commonly exploited materials comprising silicified

[2] Marked differences in the composition of the detrital loads of the "upper" and "lower" Hunter Rivers reflect the differing geology of their respective source areas. Unlike the upper Hunter, which drains Carboniferous volcanic terrain to the north and northeast

tuff (mudstone) and silcrete. Other, less commonly utilised materials include chert, chalcedony, quartz, quartzite, petrified wood, basalt and other volcanics. Clasts are typically rounded to well-rounded in shape and range in size from pebbles to boulders.

## 4.5 Soils

Soils within the Site Boundary have been mapped as forming part of the Hunter soil landscape. (Figure 7). Soils of the Hunter soil landscape cover the floodplain and terraces of the Hunter River and its major tributaries. Dominant soils include Brown Clays, Black Earths, Alluvial Soils and Red Podzolic Soils, with the last of these occurring on high level river terraces. Topsoils in floodplain contexts include clay loams, clays, sandy loams and clayey sands (Kovac and Lawrie, 1991: 213-214).

of the Hunter region and has detrital load dominated by acid volcanics and 'chert' clasts, the lower Hunter River receives significant sediment inputs from the erosion of Triassic sandstones to west and south and has a detrital load dominated by quartz sand with lesser amounts of 'chert' and ironstone pebbles (MacRae, 1989: 13). Ratios of gravel to sand for the upper and lower Hunter Rivers have been calculated at 2:1 and 1:3 respectively (MacRae, 1989: 13).

**Figure 5 Landform & Hydrology**

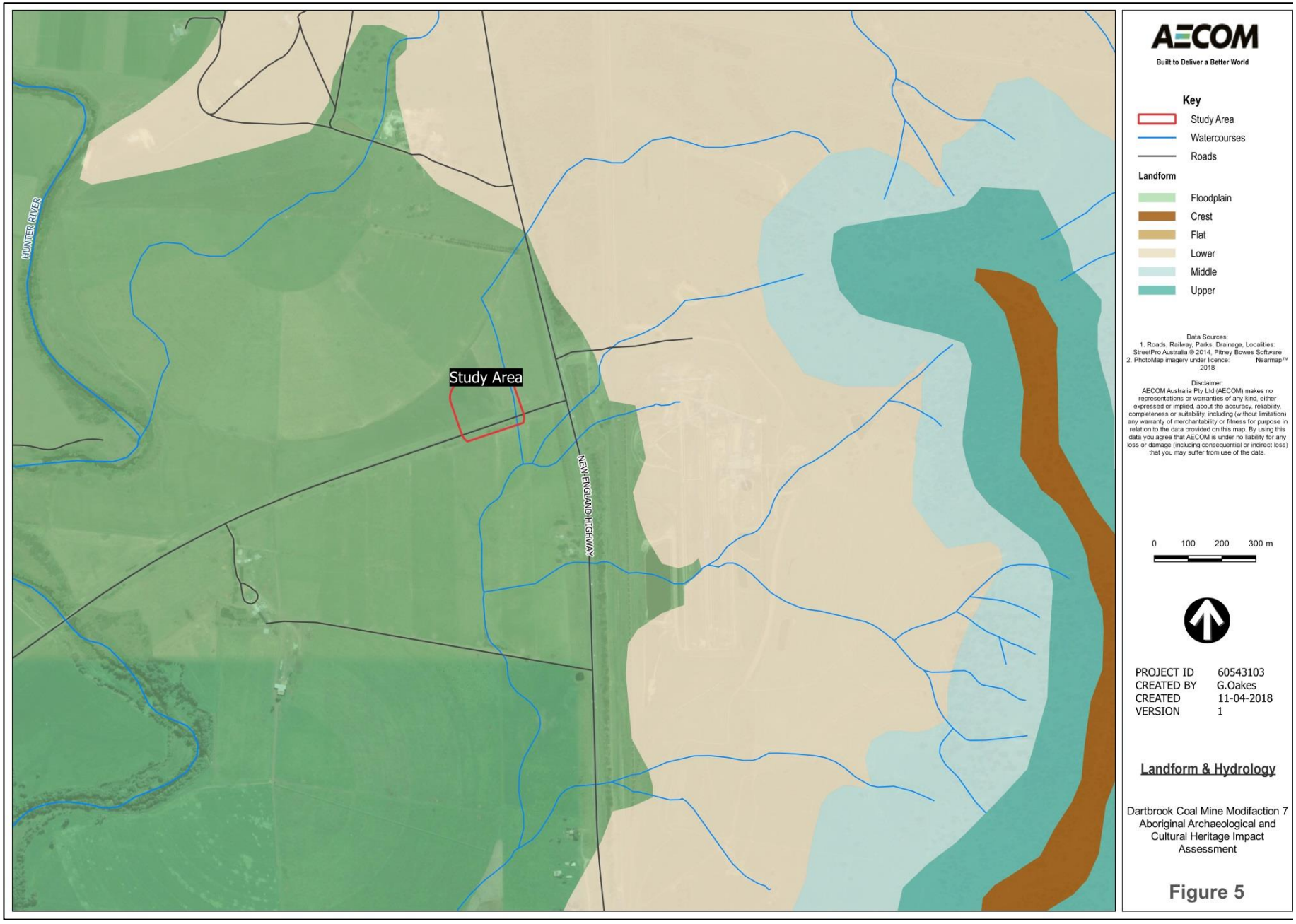


**Figure 6 Geology**

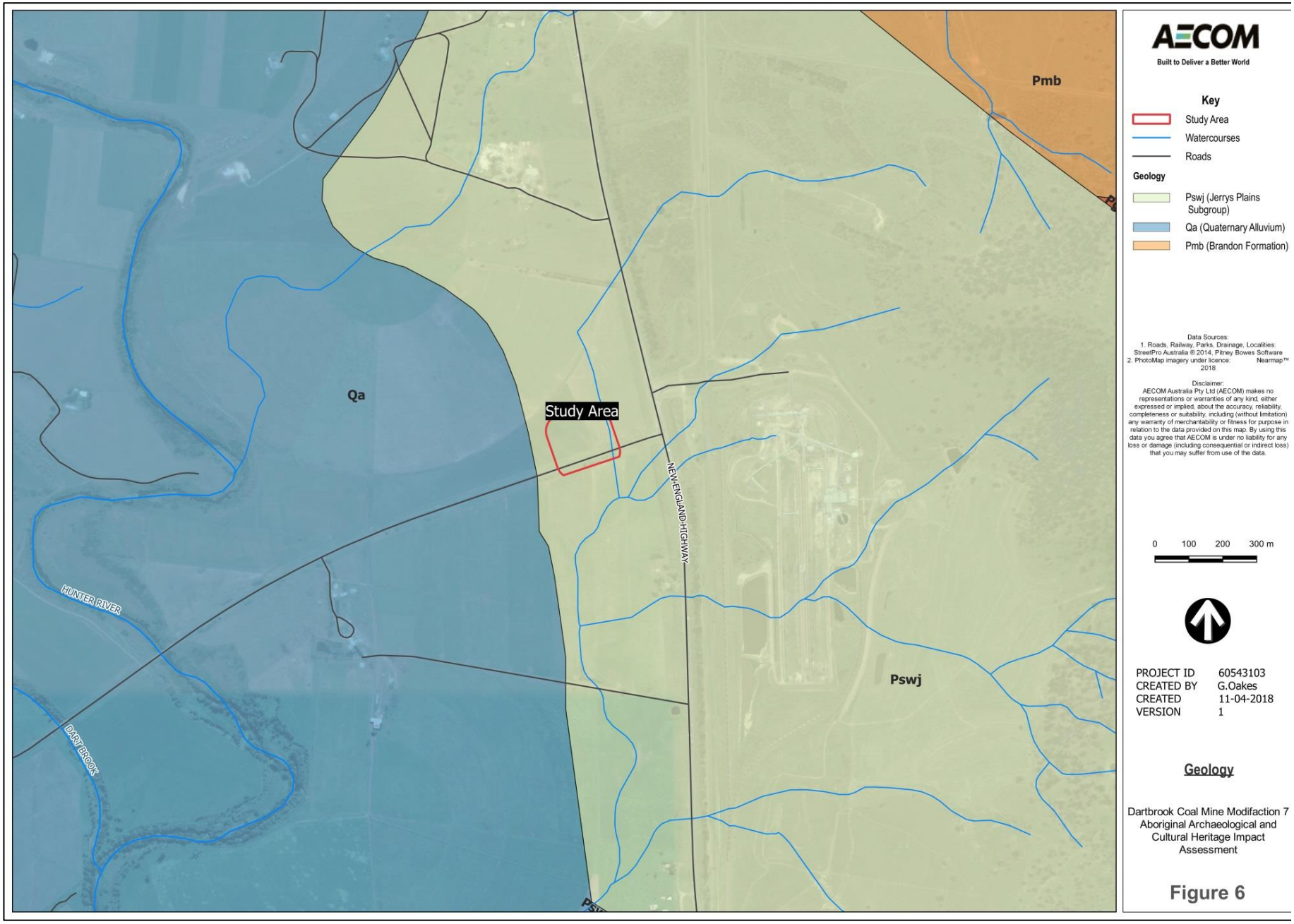
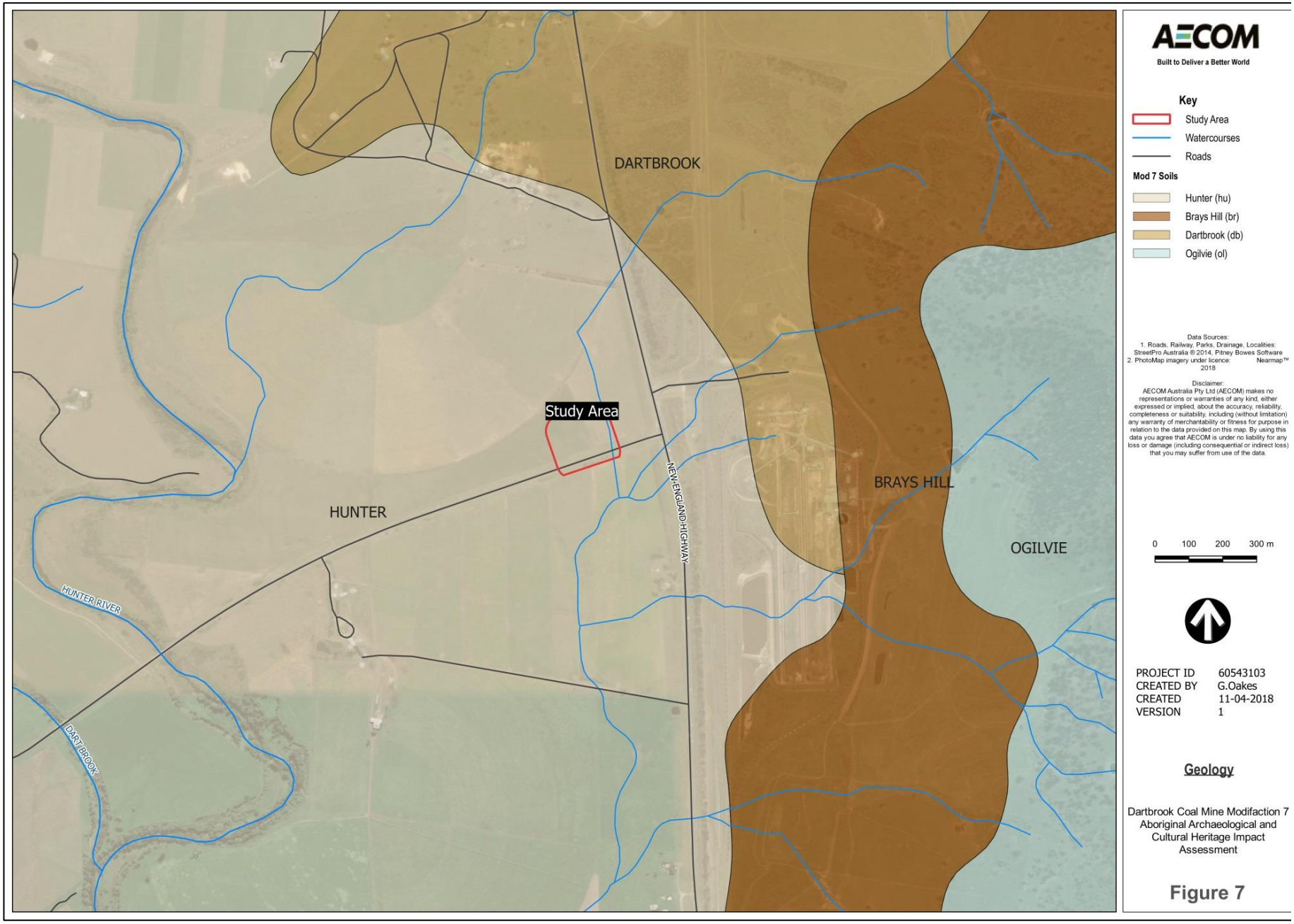


**Figure 7 Soil Landscapes**



## 4.6 Flora and Fauna

Native vegetation within the study area has been extensively modified as a result of agricultural and pastoral land use activities, having been cleared historically for grazing and/or cropping. Vegetation today consists predominantly of exotic grassland with a small line of planted trees lining Dartbrook Road. Nonetheless, field observations and available reference materials suggest that the pre- and early-post European settlement native vegetation regime of the site would have consisted primarily of Ironbark, Grey Box, White Box, and Rough-barked Angophora (HLA-Envirosciences Pty Ltd, 2000).

## 4.7 Historical Context and Land Use

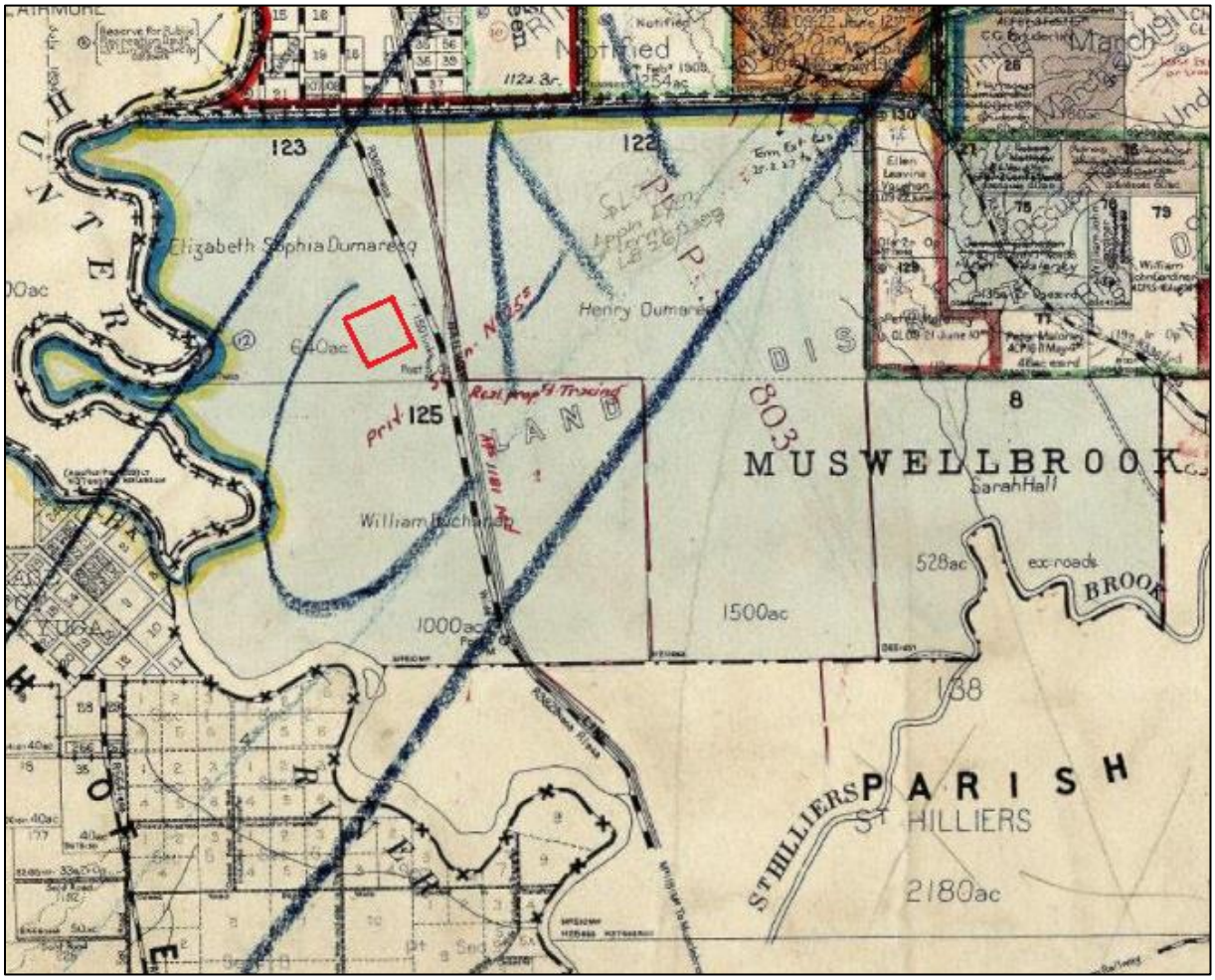
The Upper Hunter region has a long history of rural land use for a variety of agricultural and industrial activities, predominantly grazing and coal mining. The Hunter region was initially identified as an area of rich resources in 1797, when Lieutenant John Shortland found coal at the mouth of the Hunter's River, as it was then known. A convict settlement was established at the mouth of the River in 1801 to gather coal and timber and burn shells for lime (Hunter, 2010).

The 1810s saw increased pressure on land around Sydney, especially following several years of drought. The farmers on the Hawkesbury River around Windsor petitioned Governor Macquarie to allow exploration inland. In 1819, Macquarie authorised men to find an overland route into what is now the Hunter Valley. The leader of this party, Windsor chief constable John Howe, exclaimed it was the best pasture he had seen since leaving England. Confirmation of the overland route was undertaken in 1820 (Hunter, 2010). Macquarie rewarded the men in this second party with land grants around what is today Singleton. Land was quickly surveyed and by 1823 grants along rivers and creeks had been issued. Settlement, however, seems to have been of a slower pace. A traveller in 1827 said that the area was inhabited by single shepherds with their flocks (Hunter, 2010).

In 1829, Jerrys Plains was surveyed as a town, although it had been a campsite for travellers for some years previous. The town was not proclaimed until 1840 and official grants were not given until several years later. Despite the absence of official land ownership, development of the town continued. Muswellbrook was proclaimed in 1833, although again, there had been earlier settlement in the vicinity. The surrounding area was largely used for grazing and cropping, with an increasing focus on dairying. Coal mining commenced in the 1890s, but did not become intensive until the 1980s and 1990s.

Early Twentieth Century parish maps for the Parish of Russell indicate that early landowner of the study area was Elizabeth Sophia Dumaresq, wife of Colonel Henry Dumaresq, who held a 640 acre grant encompassing the study area (Figure 8). During the 1820s and 1830s, the Dumaresq family received grants and purchased property in the Scone area (Binney, 1933).

**Figure 8 Russell Parish map (study area in red) (source: Department of Lands)**




Land use within the study area from this early settlement period until today has focussed on cattle/sheep grazing and cropping. Historical aerials provide a framework for assessing the nature and extent of previous land disturbance across the study area. Examination of aerials from 1964 (Figure 9), 1972 (Figure 10), 2009 (Figure 11) and 2017 (Figure 12) provided below, attest to a range of land use activities and associated ground surface impacts across the site including:

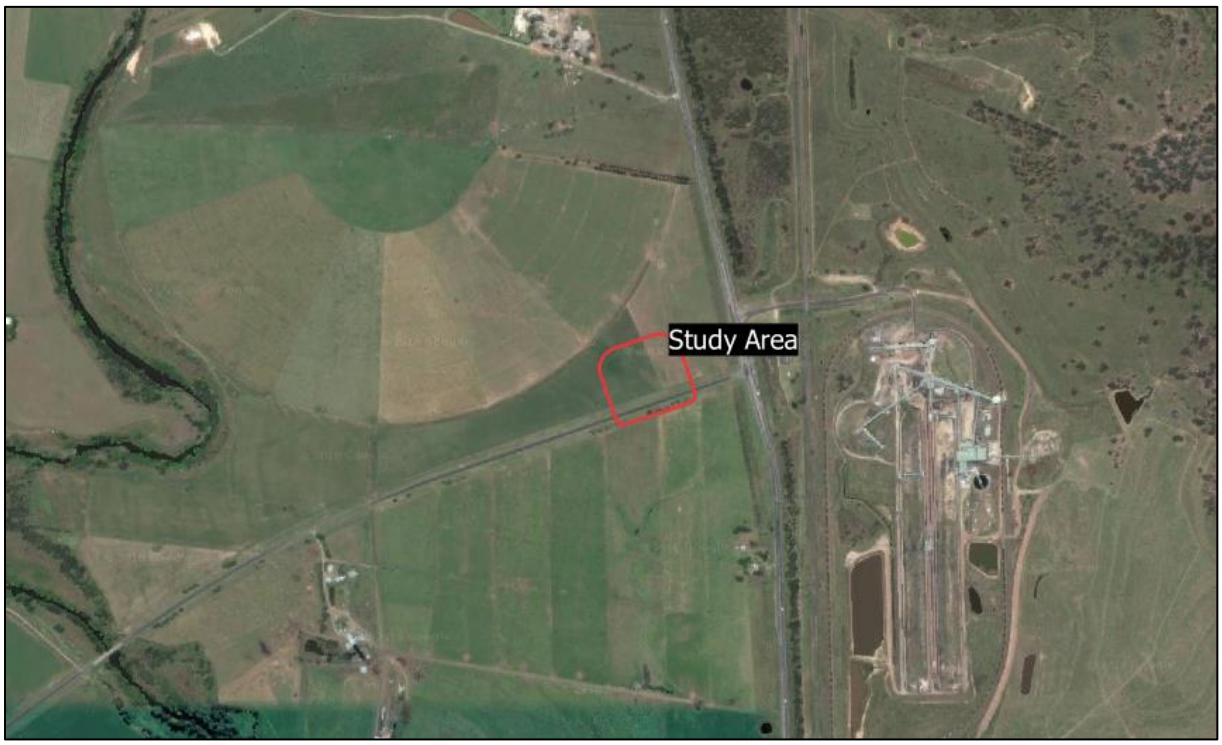
- Extensive native vegetation clearance prior to 1964;
- Pastoral activities, including livestock grazing, fencing and the construction of a farm dams and access tracks prior to 1964;
- Ploughing across the majority of the study area from 1964 to present;
- Construction of the Western Access Road through the centre of the study area *c.*2000; and
- Tree planting in the southern study area *c.*2000;

**Figure 9 1964 aerial photograph of the study area (Source: Land & Property Information NSW)**


**Figure 10 1972 aerial photograph of the study area (Source: Land & Property Information NSW)**

**Figure 11 2009 aerial photograph of the study area (Source: Land & Property Information NSW)**


**Figure 12 2017 aerial photograph of the study area (Source: Land & Property Information NSW)**



## 4.8 Key Observations

Key observations to be drawn from a review of the existing environment of the study area are as follows:

- The study area lies within the physiographic region referred to as the Central Hunter Foothills subregion of the broader Sydney Basin Bioregion, and characterised by undulating lowlands with rounded to steeply-inclined hills and rock outcropping on ridges formed on Permian-era bedrock (Morgan, 2001; Mitchell, 2001).
- No watercourses are mapped within the study area with the closest, the Hunter River, located 1.1 km to the west.
- The study area is located on the distal eastern portion of Hunter River floodplain, approximately 1.1 km east of the river's current channel. To the east of the study area, the floodplain gives way to a locally-prominent N-S trending ridgelines with multiple E-W trending spurs.
- Reference to the 1:25 000 Geological Series Sheet for the Hunter Coalfields Region (9033) indicates that the surface geology of the study area has been mapped as part of the Late Permian aged Jerrys Plans Subgroup (Pswj) of the Permian Wittingham Coal Measures Supergroup, which has been described as consisting of coal seams, claystone (tuffaceous), siltstone, sandstone and conglomerate. However, consideration of the topographic context of the study area suggests that it's surface geology most likely comprises Quaternary Alluvium (Qa) associated with the Hunter River. Locally occurring Quaternary alluvial deposits have been described as consisting of gravel, sand and silt.
- Prior to European settlement, the floral and faunal resources of the study area and environs will have been sufficient to facilitate intensive and/or repeated occupation by Aboriginal people.
- Examination of historical aerial imagery for the study area indicates a range of historical land use activities and associated ground surface impacts. Major activities/impacts include native vegetation clearance, the construction of farm dams, access tracks, roads and ploughing.

# 5.0 Ethnohistoric Context

## 5.1 Introduction

Information regarding the ways in which Aboriginal people likely used pre-contact landscapes is available to archaeologists through two primary sources: archaeological (i.e., survey and excavation) data and historical records. Section 6.0 summarises the Aboriginal archaeological context of the study area on both a regional and local scale. This section builds on this foundation by summarising relevant ethnohistoric information for the study area and environs. As in other parts of New South Wales and Australia more broadly, non-Aboriginal people occupying the Upper Hunter Valley began to document Aboriginal culture from first contact, with explorers, missionaries, settlers and the like recording their observations of Aboriginal people and/or their material culture in letters, journals and official reports. Many of these accounts are overtly Eurocentric in tone and the content and veracity of some is, at best, questionable. Nonetheless, taken together, they form an important source of information on Aboriginal lifeways at the time of British colonisation and can, in conjunction with available archaeological data, be used to generate working predictive models of prehistoric Aboriginal land use.

Key sources, both primary and secondary, for the post-contact languages and lifeways of the Aboriginal people occupying the Hunter Valley at the time of contact include: Backhouse (1843), Barrallier (1802), Brayshaw (1987), Caswell (1841), Capell (1970), Dawson (1830), Ebsworth (1826), Enright (1900, 1901, 1932, 1933, 1936, 1937), Elkin (1932), Fawcett (1898a, 1898b), Ford (2010), Gunson (1974) , Hale (1846), Fraser (1892), Haslam et al. (1984), Larmer (1898), Lissarrague (2006), Matthews(1898, 1903), Miller (1887), McKiernan (1911), Threlkeld (1827, 1834, 1836, 1850), Scott (1929) and Sokoloff (1980). Although a detailed review of these sources is beyond the scope of this report, information of particular relevance to the current assessment is summarised below.

## 5.2 Language Groups and Boundaries

As highlighted by Brayshaw (1987) and a number of other researchers (e.g., ERM, 2004; Kuskie 2012), reconstructing the social and territorial organisation of the Aboriginal groups occupying the Hunter Valley at contact is extremely difficult given the enormous social upheaval that preceded any formal investigations into their languages and lifeways. The sometimes contradictory nature of primary historical records has likewise complicated the situation as has the tendency of early observers to describe all named groups of Aboriginal people, regardless of size and/or composition, as 'tribes' (Brayshaw, 1987: 36).

According to Tindale's (1974) oft-cited tribal map, the current study area is located within Wonnarua territory, close to the boundary with the Geawegal (Figure 13). Tindale (1974 describes the territory of the Wonnarua as a 5,200 $km^2$ area stretching from "a few miles" north of Maitland west to the Dividing Range and south to the divide north of Wollombi. To the south of the Wonnarua, Tindale (1974) places the Darkinjung, whose tribal territory is described as a 4,700 $km^2$ area extending south of watershed of Hunter River, from "well south" of Jerrys Plains, east toward Wollombi and Cessnock, south to Wisemans Ferry on the Hawkesbury River, and west to the divide east of Rylstone. To the west of the Wonnarua were the Wiradjuri, one of the largest groups in NSW occupying an area of 97,100 $km^2$ extending from the Lachlan River to Rylstone and Mudgee. To the east of the Wonnarua were the Worimi and Awabakal. The Worimi, according to Tindale (1974), occupied a 3,900 $km^2$ area extending from the Hunter River to Forster, near Cape Hawke, inland to near Gresford and south to Maitland, while the Awabakal he describes as occupying a 1,800 $km^2$ area centred on Lake Macquarie, south of Newcastle. Finally, to the north on the Wonnarua, Tindale (1974) places the Geawegal tribe, who are described as occupying the northern tributaries of the Hunter River to Murrurundi and being present at Muswellbrook, Aberdeen, Scone and Mount Royal Range.

Although widely cited, it should be noted that Tindale's boundaries for the Awabakal 'tribe' do not accord with those provided by the missionary Reverend Lancelot Threlkeld, who established an Aboriginal mission at Belmont on Lake Macquarie in 1826[3] (the 'Bahtahbah' mission) and is widely regarded as one of the pioneers of Aboriginal studies in New South Wales owing to his detailed

[3] Subsequently relocated to Toronto in 1831and named 'Ebenezer' mission

recordings, with the assistance of influential Awabakal leader Biraban (aka John McGill), of the language and lifeways of the Aboriginal people occupying the Hunter River Estuary.

Writing in 1828, for example, Threlkeld described the territory of the Awabakal as consisting of:

> *"The land bounded (to the South) by Reid's Mistake the entrance to Lake Macquarie, (to the North) by Newcastle & Hunter's River, (to the West) by five islands on the head of Lake Macquarie 10 miles west of our station. This boundary, about 14 miles N and S by 13 E and W, is considered as their own land" (Threlkeld 1828 in Ford, 2010: 339) (Figure 14)*

Tindale's (1974) and Threlkeld's (1828) contradictory accounts notwithstanding, what is clear from available historical records is that the former's oft-cited division of the Awabakal and Wonnarua into two separate 'tribes' does not adequately capture what was at contact a complex system of social and territorial organisation involving numerous local descent groups (i.e., clans) and bands who, critically, spoke the same language. As Lissarague (2006: 7) has recently observed, "the evidence from archival sources suggests that the language described by Threlkeld as 'The language of the Hunter River and Lake Macquarie' was spoken by people now known as Awabakal, Kuringgai and Wonnarua". Lissarague (2006), for her part, has named this language the Hunter River and Lake Macquarie language (HRLM language) and notes that it may also have been spoken by Tindale's (1974) Geawegal 'tribe'.


**Figure 13 Excerpt from Tindale's (1974) tribal map (from Kuskie, 2012: 38, Fig. 7, after Tindale, 1974)**

Critical to current interpretations of the boundaries of the HRLM language are the observations of Reverend Threlkeld. Threlkeld's own account of the boundaries of this language, which comes from his 1838 report to the then NSW Legislative Council's Committee on the Aborigines Question, is reproduced below:

> *"The native languages throughout New South Wales, are, I feel persuaded, based upon the same origin; but I have found the dialects of various tribes differ from those which occupy the country around Lake Macquarie; that is to say, of those tribes occupying the limits bounded by North Head of Port Jackson, on the south, and Hunter's River on the north, and extending inland about sixty miles, all of which speak the same dialect.*

*The native of Port Stephen's use a dialect a little different, but not so much so as to prevent our understanding one another' but at Patrick's Plains the difference is so great, that we cannot communicate with each other; there are blacks who speak both dialects" (Threlkeld 1838 in Ford, 2010).*

Threlkeld's (1825) earlier observation that "the natives here [i.e., at Lake Macquarie] are connected in a kind of circle extending to the Hawkesbury and Port Stephens" is also worthy of note here (Threlkeld, 1825 in Ford, 2010: 328).

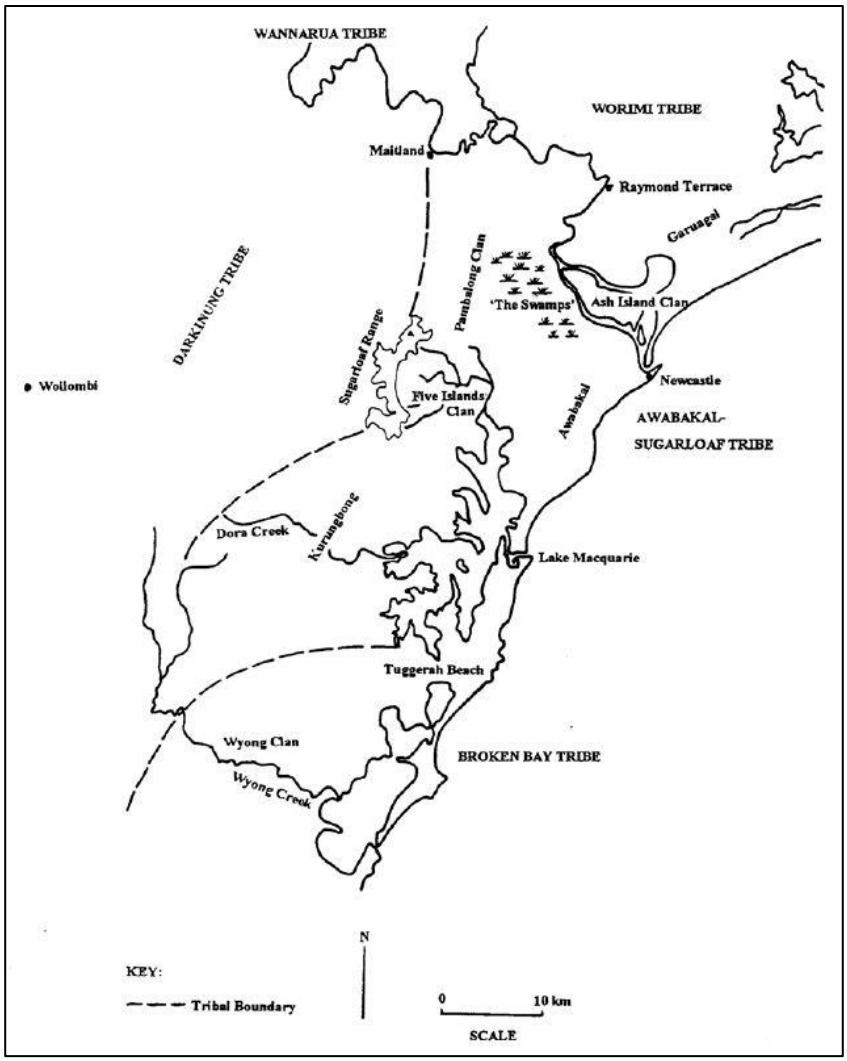



**Figure 14 Gunson's (1974) tribal map for the lower Hunter Valley, based on the observations of Reverend Lancelot Threlkeld (from Kuskie, 2012: 39, Fig. 8, after Gunson, 1974).**

Threlkeld's observations provide strong *primary* evidence for the existence of a single shared language for Tindale's (1974) Awabakal and Wonnarua 'tribes'. At the same time, they suggest that this language differed from that spoken by the Worimi around Port Stephens, being the Kutthung or Kattang language described by Enright (1900, 1901), and those spoken by Aboriginal groups occupying the Mid and Upper Hunter Valley, namely Darkinjung and Kamilaroi (Brayshaw 1987; Ford, 2010). Although Threlkeld's proposed southern extent for the HRLM language does not accord with the observations of other early sources, principally R.H. Matthews, his suggestion of a single shared language for the Aboriginal groups occupying the catchments between the Hawkesbury River estuary of Broken Bay and the estuarine areas of the Lower Hunter River is well supported by available historical records and associated linguistic research (see, in particular, Capell, 1970; Ford, 2010)

Ford's (2010) recently completed historiographic analysis provides further insight into the social and territorial organisation of the Aboriginal groups occupying the Hunter Valley at contact. Based on his own detailed review of available historical records, Ford (2010) has argued that, contrary to popular

beliefs, the actual 'tribal' and/or language name for the HRLM-speaking Aboriginal groups occupying the estuarine areas of the lower Hunter River at contact was *Wannungine* and not Awabakal, with the latter term coined, alongside 'Guringai' (now Kuringgai), by Scottish ex-school teacher and Maitland resident John Fraser in 1892 (Fraser, 1892).

The term *Wannungine,* Ford (2010: 343) notes, was the term that celebrated surveyor and self-taught anthropologist R.H Matthews recorded as the language or tribal name for Aboriginal peoples occupying the coastline southward from the Hunter River estuary to 'Lane Cove', but not extending to the north shore of Port Jackson, and east to the coastal range[4]. Matthews also identified the term *Wannerawa,* applying it to the southern part of the identified Wannungine area (i.e., around Broken Bay) (Ford, 2010: 344).

Thus, although correctly identified by Matthews, it is Ford's contention that it is Miller's (1887) misapplication of the term *Wannerawa*, *as* 'Wonnarua', to the Mid and Upper Hunter Valley, subsequently reinforced through the publications of disgraced journalist J.W. Fawcett (1898a, 1898b), that has resulted in the historical anomaly of the *Wannerawa* (Miller's (1887) 'Wonnarua') being placed in the Mid and Upper Hunter. Miller's (1887: 352) reference to the principal ornament of the Wonnarua being a "nautilus shell cut into an oval shape and suspended from the neck" is cited as further evidence that Miller should actually have meant his Wonnarua to be coastal people (Ford, 2010: 354). Contrary to Miller's (1887) and Fawcett's (1898a, 1898b) widely cited accounts, Ford's research suggests that, at the time of first European settlement, the mid Hunter was, in fact, occupied by Darkinjung-speaking peoples, whose territory encompassed the ranges bounded by the Hawkesbury River floodplain to the south and the Hunter River floodplain to the north and was bordered to the east/northeast by the coastal *Wannungine (*aka *Wannerawa*) (Ford, 2010: 10). Bordering the Darkinjung to the west/northwest, in the Upper Hunter, were Kamilaroi-speaking peoples, who Ford (2010: 467) suggests had penetrated over the Liverpool Range and were occupying the Hunter Valley as early as 1819.

## 5.3 Social Organisation

In common with other regions of New South Wales (e.g., Attenbrow, 2010) and Australia more broadly (Peterson, 1976), available historical records suggest that the primary units of social organisation amongst the Aboriginal language groups present in the Hunter Valley at contact were the clan and band. Although these terms are often used interchangeably (e.g., Kohen, 1993), following Attenbrow (2010), a distinction can, in fact, be drawn between the two, with clans comprising local descent groups and bands, land-using groups who, though not necessarily all of the same clan[5], camped together and cooperated daily in hunting, fishing and gathering activities. Individual bands will have habitually occupied and exploited the resources of particular tracts of land within the overall territory of their clan. However, the territorial boundaries of each band will have been permeable or elastic in the sense of complex kinship ties facilitating inter-band territorial movements and the reciprocal use and/or exchange of resources (Brayshaw, 1987: 36).

The size of the individual bands occupying the Hunter Valley at contact appears to have varied considerably and was no doubt activity and season dependent (Brayshaw, 1987). However, an upper limit of around 70 individuals, consisting of several families, is suggested by available historical records (see, in particular, Table B in Brayshaw, 1987). Individual band sizes notwithstanding, much larger groups of Aboriginal people, numbering in the hundreds, are known to have come together for events such as corroborees, ritual combats and feasts (e.g., Anon, 1877; Scott, 1929: 32; Threlkeld in Gunson, 1974: 55).

Fawcett (1898b) notes the existence of four exogamous clans amongst the Wonnarua, with different clan names for men and women:

> *"The Wonnah-ruah tribe, like most other tribes, was divided into four classes or clans, and the laws of consanguinity, which existed in this tribe, as other tribes, effectually barred a man's marriage with the women of his own class or clan and also with the class or clan of his mother. Every man in the Wonnah-ruah tribe was either an Ippye (Ipai), a Kumbo, a*

[4] From north to south: the Sugarloaf Range, the Watagan Rage and Peats Ridge.
[5] Some individuals may have been related through marriage.

*Murree (Murri), or a Kubbee (Kubbi); and every women an Ippatha (Ipatha), a Butha, a Matha or a Kubbeetha (Kubbitha)" (Fawcett, 1898b: 180).*

## 5.4 Settlement and Subsistence

Available historical records attest to exploitation, for food and other resources (e.g., skins for clothing), of a large and diverse range of terrestrial, avian and aquatic fauna by Aboriginal peoples occupying the Hunter Valley at contact. A broad economic division between 'coastal' and 'inland' groups is also evidenced, with the subsistence regimes of those living along the coast geared principally towards the exploitation of marine foods and those of inland groups based chiefly on the exploitation of land mammals (e.g., Ebsworth, 1826: 80).

The diet of inland Aboriginal groups occupying the Hunter Valley at contact consisted of a variety of freshwater animal foods, with kangaroos, wallabies, bandicoots, echidnas, possums, flying foxes, kangaroo-rats, koalas, dingos, lizards, goannas and snakes variously reported as having been hunted and/or eaten (see Brayshaw, 1987; Haslam et al., 1984 and Sokoloff, 1980 for primary references). Various species of freshwater and estuarine fish, eels and mussels were also consumed, as were turtles (e.g., Anon, 1877b; Cunningham, 1827: 151; Grant, 1803: 61). Possums appear to have been a favoured food, particularly in inland areas, with a number of early accounts detailing their method of capture and remarking on the tree climbing skills of the Aboriginal people involved (e.g., Dawson, 1830: 238; Scott, 1929: 21). Flying foxes, too, appear to have actively sought out by groups in both areas (e.g., Anon, 1877a; Scott, 1929: 23), though not by the Awabakal at Lake Macquarie who held the animal in high esteem (Threlkeld in Gunson, 1974: 206). Macropods were sometimes stalked and speared by individual huntsmen (Dawson, 1830: 216; Threlkeld in Gunson, 1974: 190). However, their capture was more commonly a communal exercise (Dawson, 1830: 182; Scott, 1929: 20; Threlkeld in Gunson, 1974: 191). Threlkeld (in Gunson, 1974: 206) and Fawcett (1898a: 153) report the burning off of particular tracts of land to promote new growth and attract kangaroos and wallabies.

References to the hunting and consumption of a variety of birds, including the emu, are also present in the writings of a number of early observers (e.g., Fawcett, 1898a; Scott, 1929: 23; Threlkeld in Gunson, 1974: 55, 65). Fawcett (1898a: 153) reports the use of nets to trap emus and use of returning boomerangs to bring down "ducks and other birds". Larvae, namely 'Cabra' or shipworm (Teredo navalis) and other tree dwelling grubs, appear to have been a popular foodstuff in both coastal and inland areas (Anon, 1877b; Scott, 1929: 21-22). Honey collected from the hives of native bees was both eaten directly and mixed with water to form a sweetened drink (Breton, 1833: 195; Dawson, 1830: 60; Scott, 1929: 34-35; Threlkeld in Gunson, 1974: 67, 124).

Compared with their faunal counterparts, the plant food resources of coastal and inland groups are poorly represented in the writings of early colonial observers. Nonetheless, available descriptions do suggest that plants formed a regular part of the diets of groups in both areas. Fern roots, likely those of the bracken fern (*Pteridium esculentum*) and various water ferns (*Blenchum spp.*), appear to have played an important role in the diets of those Aboriginal people occupying the estuarine reaches of the Hunter River (Barrallier, 1802: 81-82; Dawson, 1830: 92; Ebsworth, 1826: 71; Threlkeld in Gunson, 1974: 19). Other plant foods mentioned in the writings of early observers include yams, macrozamia seeds, various fruits and the stems of the water lily (Backhouse, 1843: 380; Caswell, 1841; Scott, 1929: 41; Threlkeld in Gunson, 1974: 74). Nectar obtained from the blossoms of the grass tree (Xanthorrhoea spp.) and flower spikes of the dwarf banksia was also consumed (Dawson, 1830: 244).

Regarding levels of residential mobility, available records suggest that this was generally quite high. Fawcett (1898a), for example, notes of the Wonnarua that: "they had no permanent settlements, but roamed about from place to place within their tribal district, in pursuit of game and fish, which was their chief sustenance, making use periodically of the same camping grounds, generation after generation, unless some special cause operated to induce them to abandon them". Dawson's (1830: 172) observation that "they [being the Aboriginal people of Port Stephens area] seldom…stay more than a few days at these places [their camps], frequently not more than one night" is similarly suggestive, as is the 1877 observation, by an anonymous long-term resident of Maitland, that the Aboriginal people with whom he was familiar in the Maitland area "appeared to lead a very restless kind of life, constantly on the move, shifting their camps from one place to another, seldom remaining more than three or four days in one camp" (Anon, 1877e). Along the coast, Sokoloff (1980: 8) has suggested

seasonal differences in settlement duration, noting that “the relative abundance of marine sources of food in summer tended to make the natives more sedentary at this time”.

As for the selection of campsites, we limited are to Fawcett’s (1898a: 152) observation that “in choosing the site, proximity to freshwater was one essential, some food supply a second, while a vantage ground in case of attack from an enemy was a third important item”.

## 5.5 Material Culture

Aboriginal material culture is explicitly linked to the natural environment and resource availability. For the Hunter Valley, available historical records identify an extensive array of hunting and gathering ‘gear’ and provide detailed insight into associated materials and manufacturing processes. The form and construction of everyday domestic structures are likewise well documented. Brayshaw (1987), in particular, provides a useful synthesis of both forms of material culture and highlights regional variability in raw material acquisition and utilisation between coastal and inland groups.

Campsites and domestic structures are well-represented in the accounts of early observers and were often the subject of illustration (Plate 2 and Plate 3). Huts, commonly referred to as "gunyers" or “gunyahs”, were of timber and bark construction. Fawcett (1898a: 152) describes the form and construction of huts as follows:

> “A couple, or three, forked sticks, a few straight ones, and some sheets of bark, stripped from trees growing nearby, supplied the requisites for the construction of their home. The forked sticks were thrust into the ground and the straight ones placed horizontally in the forks. The sheets of bark were then set up against the horizontal poles in a slanting position, the bark of the structure being toward the windy point of the compass. The sides were frequently enclosed for further shelter, but the front was generally open. Before each one was a small fire, which was seldom allowed to go out, and which was used for warmth, or to cook by”.

Similar hut forms and construction methods can be found in the accounts of several other early observers, for example, Scott (1929: 13), Dawson (1830: 171-72), Caswell (1841) and Threlkeld (in Gunson, 1974: 45).

Alongside its use in hut manufacture, tree bark also served as the primary construction medium for canoes, an integral component of the material culture repertoire of Aboriginal peoples occupying the Hunter Valley at contact. Available descriptions indicate that canoes were manufactured by bending, with the assistance of fire, a suitable sheet of bark into shape and securing the ends with bark cord or other ‘wild vines’ (Ebsworth, 1826: 82; Dawson, 1830: 79; Fawcett, 1898a; Mrs Ellen Bundock in Brayshaw, 1987: 60; Scott, 1929: 38-39; Threlkeld in Gunson, 1974;). Scott (1929: 39) reports that the gaps between the cord bindings at either end of the canoe were plugged with clay. Clay hearths were also added for warmth and cooking (Threlkeld in Gunson 1974; Scott, 1929: 39). At Lake Macquarie, leaking canoes were repaired by sewing patches of tea tree bark over damaged areas and sealing them with melted grass tree resin (Threlkeld in Gunson, 1974: 54).

Spears, which feature prominently in the literature, were an important component of men’s ‘gear’ and were used in hunting, fishing, combat and ceremony (Scott, 1929: 35; Threlkeld in Gunson, 1974: 67-68). Spears for all purposes, Brayshaw (1987: 65) notes, were of composite manufacture and alongside sea shells, iron tomahawks and pieces of bottle glass, were important trade items, with significant numbers traded inland for possum skin rugs and fur cord (Dawson, 1830: 135-136; Threlkeld in Gunson, 1974: 65). Various hard woods and grass tree stems served as primary spear shafts and were shaped using shell scrapers and pieces of glass (Dawson, 1830: 67, 135; Scott, 1929: 35; Threlkeld in Gunson, 1974: 67-68).

**Plate 2** **Joseph Lycett's '*Aborigines resting by camp fire, near the mouth of the Hunter River*', ca.1820 (Source: National Library of Australia)**

**Plate 3** **Augustus Earle's '*A Native Camp of Australian Savages near Port Stevens, New South Wales*', 1826 (Source: National Library of Australia)**

Threlkeld (in Gunson, 1974: 67) describes the manufacture and use of three different types of spears in the Lake Macquarie area, namely the fishing spear, the hunting spear and the battle spear. Primary shafts, in all three instances, comprised grass tree stems. However, differing types of points were added according to function. For the fishing spear, Threlkeld (in Gunson, 1974) describes the affixing of bone barbs onto three or four 'shorter spears' of fire-hardened wood, themselves fastened to the main spear shaft with bark thread and grass-tree gum, while the hunting spear is described as being equipped with a single hard wood point. The battle spear, Threlkeld (in Gunson, 1974: 67) reports, also had a single hard wood point but differed from its hunting counterpart in having "pieces of sharp quartz stuck along the hard wood joint on one side so as to resemble the teeth of a saw" (Threlkeld in Gunson, 1974: 66). The substitution of glass for quartz on battle spears is also known to have occurred. In common with the Lake Macquarie area, Scott (1929: 35) notes the use, around Port Stephens, of different types of spears for hunting, fishing and combat. Differing functions aside, spears of all varieties were launched using spearthrowers or woomeras, also of composite manufacture (Brayshaw, 1987: 66).

Hatchets, like spears, were an important component of men's 'gear' and were used for variety of tasks including bark and wood removal, animal butchery, cutting toeholds in trees to facilitate climbing and extracting game and honey from logs and trees (Anon, 1877a; Dawson, 1830: 202; Scott, 1929: 41; Threlkeld in Gunson, 1974: 67). Known as *mogo*, hatchets were composite implements consisting of an edge-ground stone hatchet head and withe or flat, hardwood handle, the former secured to the latter using grass tree resin and cord (Dawson, 1830: 202; Fawcett, 1898a: 153; Scott, 1929: 40). Hatchets, Scott (1929: 5) notes, were carried by men in belts worn around the waist. Post-contact, stone hatchets appear to have been rapidly replaced by iron substitutes (Brayshaw, 1987: 66; Dawson, 1830: 16).

Other notable items of men's gear described in the accounts of early observers include several types of hard wood clubs, two types of shield (one broad and one narrow) and returning and non-returning hard wood boomerangs (Anon, 1877b; Scott, 1929: 36-38; Threlkeld in Gunson, 1974: 41, 68). Threlkeld (in Gunson, 1974: 68) also describes the use of a "wooden sword" similar to a boomerang but with "a handle at one end with a bend contrary to the blade".

As for women's gear, Brayshaw (1987: 65) notes that, in addition to their daily use in gathering activities, digging sticks, also known as yamsticks, were status symbols that were sometimes used during altercations. These implements, up to 2m long and *c*.4cm in diameter, were manufactured out of hardwoods, were fire-hardened and typically not decorated (Brayshaw, 1987: 65). Cord used in the manufacture of fishing lines and nets was made by women using the bark of various trees (e.g., the Cabbage-tree (*Livistona australis*) and the Kurrajong (*Brachychiton populneus*) and is reported as having been extremely strong and durable (Ebsworth, 1826: 79; Dawson, 1830: 67; Scott, 1929: 17). Dilly-bags were used by women for carrying small items such as fish-hooks, prepared bark cord, lumps of grass tree resin and food (e.g., fish and shellfish) and were worn slung around the head and draped down the back (Ebsworth, 1826: 79-80).

Fish-hooks were reportedly manufactured out of oyster and pearl shell (Caswell, 1841; Dawson, 1830: 66, 308; Ebsworth, 1826: 79; Threlkeld in Gunson, 1974: 54). Threlkeld (in Gunson, 1974: 54) reports that a suitable shell was simply "ground down on a stone until it became the shape they wished". However, However, Dyall's (2004) analysis of excavated examples from the Birubi Point midden complex suggests a more complex, multi-stage production process. Pieces of fine sandstone, shale and quartzite were used for filing down the hooks (Sokoloff, 1980: 23).

Awls or 'needles' manufactured out of kangaroo bone were used in the repair of canoes and the sewing of skin cloaks (Fawcett, 1898a; Threlkeld in Gunson, 1974: 54). Items of clothing, where worn, included spun possum-fur belts, worn only by men, possum fur headbands and cloaks or rugs made from sewn kangaroo and possum skins (Dawson, 1830: 15-16; Scott, 1929: 5). Cloaks were worn by both men and women.

Alongside women's dilly bags, early accounts indicate the production and use of a variety of other containers, with tea tree bark a common construction material. Threlkeld (in Gunson, 1974: 67, 156), for example, refers to tea-tree bark 'cups' and wooden 'bowls' "formed from some large protuberance of a growing tree" while Dawson (1830: 250) refers to "small baskets" made from tea tree bark.

Notably, references to the production and/or use of flaked stone artefacts are virtually absent from the historical record. Excluding hatchets, Threlkeld's (in Gunson, 1974: 67) reference to the use of "pieces of sharp quartz" for barbing battle spears remains the only known primary reference in this respect. Brayshaw (1987: 68), for her part, has proposed that effective absence of flaked stone artefacts from the historical record may be a product of the fact that such artefacts were not being used at the time of European settlement, having been replaced with other materials (e.g. shell, glass, wood and bone)[6]. However, she also acknowledges that their use may simply have escaped the notice or interest of early observers.

## 5.6 Ceremony and Ritual

Evidence for ceremonial or ritual behaviour amongst the Aboriginal groups occupying the Hunter Valley at contact can be found in the accounts of a number early observers (e.g., Anon, 1877c; Dawson, 1830; Enright, 1936; Fawcett, 1898a, 1898b; Scott, 1929; Threlkeld in Gunson, 1974), with documented 'ceremonial' activities including corroborees, male initiation ceremonies, marriage, ritual combat and various burial, body adornment and modification practices. Although limited in number, references to spiritual beliefs of the Aboriginal groups occupying the region are also present and attest to regional variability in belief systems.

Male initiation ceremonies, in which boys were "initiated into the privileges of manhood" (Fawcett, 1898a: 153), are described by Enright (1936), Fawcett (1898a), Scott (1929) and Threlkeld (in Gunson, 1974). Amongst the Wonnarua, Fawcett (1898a: 152) notes that the male initiation ceremony was known as *Boorool*. Enright (1936: 86), writing on the Worimi people, refers to the ceremony as the *Keeparra* while Scott (1929: 29) cites the terms *poombit* and *bora* in his recollections, noting that the latter was a colloquial term for the former. Initiation grounds, referred to by Scott (1929: 29) as 'poombit grounds', were elaborately prepared and consisted of one or two[7] cleared circles in secluded areas of bushland. Images of animals and other designs were carved into surrounding trees and, in some cases, "figures of raised earth were created on the ground" (Brayshaw, 1987: 83). Threlkeld (in Gunson, 1974: 50-51, 63-65) describes attending, in November 1825, a ceremony "prepatrory to removing the front tooth of several young men who would then be capable of marrying a wife". The site of this ceremony, Threlkeld (in Gunson, 1974) reports, was known as the "Mystic Ring, or Porrobung" and consisted of a circle "thirty-eight feet in diameter" with a small hillock at is centre. Trees near the ring were marked with "representations of locusts, serpents &c on the bark chopped with an axe".

As for the ceremonies themselves, Enright (1936: 87) reports that the *Keeparra*, in which "candidates learnt all those laws which governed his future life", lasted approximately one month but was "only a prelude to a long system of instruction which lasted some five years". Fawcett (1898a: 154), meanwhile, describes a ceremony involving tests of skill and endurance, the teaching of tribal laws, "emblematical dances" and the restricted involvement of women. Scott (1929: 28-34), too, describes the restricted involvement of women and dancing in the poombit or bora ceremonies of the Port Stephens area. Alongside their other important roles, medicine men or native doctors, known as *Karaji* (also spelt *Karadjys*), appear to have played an active role in initiation ceremonies and, together with group elders, were responsible for overseeing initiates' observance of instructed laws (Enright, 1936; Fawcett, 1898a).

Alongside its use in the initiation ceremonies described above, body painting with animal fat and/or ochre was undertaken as part of corroborees and for the purposes of ritual combat. For men, tooth avulsion, body scarification and septum piercing appear to have been undertaken in ceremonies subsequent to that associated with initiation (Fawcett, 1898b; Scott, 1929). Regarding items of personal adornment, Miller (1887: 3543) notes that the "principal ornament" of the Wonnarua was a "nautilus shell cut into an oval shape and suspended from the neck" while Fawcett (1898a: 153), also writing on the Wonnarua, reports that "the girls often adorned themselves with flowers, bone or reed ornaments, and shell necklaces". References to the dressing of men's hair in a conical form with tufts of grass attached are present in Dawson (1830) and Anon (1877c).

[6] Historic references (e.g., Dawson 1830: 67, 135; Scott 1929: 35) to the use of shell scrapers and/or fragments of bottle glass for the shaping/sharpening of wooden spears provide some support for this suggestion.
[7] Where two circles were used, these were separated by a distance of up to 400 m.

Available historical records suggest that burial in the earth was the most common form of burial practised by Aboriginal groups occupying the Hunter Valley at contact, with tea tree bark widely used as a burial shroud (Fawcett, 1898b: 180; McKiernan, 1911: 889; Miller, 1877: 354; Scott, 1929: 3; Threlkeld in Gunson, 1974: 47, 89, 100). Grave goods consisted of items of personal gear such as spear and hatchets (McKiernan, 1911: 889; Threlkeld in Gunson, 1974: 47, 89, 100). Cremation is also known to have been practiced but is poorly represented in the historical record (Threlkeld in Gunson, 1974: 99).

Regarding inter-group conflict, Haslam et al. (1981) have noted of the Hunter Valley as a whole that, although skirmishes were common, major clashes were infrequent. Ritual combat appears to have linked principally to unsanctioned territorial incursions and the abduction of women (Fawcett, 1898b).

Gunson (1974) notes a distinct difference between the spiritual beliefs of the Aboriginal groups occupying the inland and coastal portions of the Hunter Valley at contact. In contrast to the Awabakal of Lake Macquarie[8], for example, whose supreme spiritual entity was known as *Koun* (pronounced cone), the inland Wonnarua and Kamilaroi are believed to have venerated the prominent sky cult hero *Biame*. Threlkeld (1834 in Keary 2009) reports that Koun was known by three names - *Ko-in*, *Tip-pa-kál*, and *Pór-ráng* - and describes him as follows:

> *"in appearance like a black; he resides in the thick brushes or jungles; he appears occasionally by day, but mostly at night. In general he precedes the coming of the natives from distant parts, when they assemble to celebrate certain mysteries, as knocking out the tooth in the mystic rite, or when performing some dance. He appears painted with pipe clay, and carries a fire-stick in his hand; but, generally, it is the doctors, a kind of Magicians, who alone perceive him, and to whom he says, 'Fear not, come and talk.' At other times he comes when the blacks are asleep, takes them up as an eagle does his prey, and carries them away. The shout of the surrounding party often occasion him to drop his burthen; otherwise, he conveys them to his fireplace in the bush, where close to the fire he carefully deposits his load. The person carried tries to cry out, but cannot feeling almost choked: at daylight, Ko-in disappears, and the black finds himself conveyed safely to his own fire-side!"*

## 5.7 Post Contact History

As in other parts of NSW and Australia more generally, the early post-contact history of the Aboriginal people of the Hunter Valley is primarily one of dispossession and loss, with traditional hunting and camping grounds rapidly claimed and settled by Europeans and populations decimated by introduced diseases. However, active resistance and friendly relations are also attested in available records.

As highlighted by Brayshaw (1987), the introduction of European diseases had a devastating impact on the Aboriginal population of the Hunter Valley, with diseases such as smallpox, typhoid, influenza, scarlet fever, measles, diphtheria, whooping cough and croup causing or contributing to the deaths of large numbers of Aboriginal people. Major small pox epidemics between April and May 1789 and from 1829 to 1831 are known to have had a particularly deleterious impact on the valley's Aboriginal population (Butlin, 1983).

The loss of traditional hunting grounds and a decline in the abundance of game that populated these areas have also been identified as factors relevant to the marked population decline that accompanied European settlement of the Hunter Valley, as has the sexual violence perpetrated by non-Aboriginal men against Aboriginal women (Turner & Blyton, 1995). The destruction, over time, of the complex systems of social and territorial organisation that existed prior to contact has likewise been attributed to such factors, as has the collapse of traditional settlement and subsistence regimes.

Today, modern Awabakal, Wonnarua and Worimi people retain strong cultural connections to the Hunter Valley and are actively involved in the protection and promotion of their culture for future generations.

[8] Dawson's (1830: 153, 158, 163 219, 220, 322) multiple references to an "evil spirit of woods" known as "Coen" suggest that the Worimi of the Port Stephens area, like the Awabakal, venerated *Koun* as opposed to *Biame.*

# 6.0 Archaeological Context

This section describes the archaeological context of the study area on a regional and local scale. Archaeological data of relevance to this area, including the results of previous archaeological investigations within and surrounding the study area, are reviewed in order to contextualise the results of the current assessment.

## 6.1 Regional Context - The Hunter Valley

### 6.1.1 Introduction

Formal archaeological interest in the Aboriginal archaeological record of the Hunter Valley can be traced to the late 1930s, with then Curator of Anthropology at the Australian Museum Fred McCarthy undertaking an archaeological reconnaissance of the Valley in 1939 (Moore, 1970: 29). McCarthy's subsequent investigation, with F.A. Davidson, of an extensive open artefact site on a terrace of the Hunter River at Gowrie, near Singleton, is widely regarded as the first serious archaeological study of stone artefacts in the Hunter Valley proper (McCarthy & Davidson, 1943). MCarthy's early endeavours aside, more detailed investigation of the Valley's Aboriginal archaeological record did not begin until the mid-to-late1960s, a period that witnessed a series of archaeological surveys and site excavations completed as part of the Australian Museum's long term and wide ranging archaeological research project into the Aboriginal prehistory of the Hunter Valley (Moore, 1969, 1970, 1981).

Intensive development activities since this time have secured the Hunter Valley's place as one of the most intensively investigated archaeological regions in Australia, with hundreds, if not thousands, of Aboriginal archaeological investigations involving survey and/or excavation having now been undertaken, the majority as part of larger environmental impact assessments associated with coal mining projects. Not surprisingly, these investigations have varied significantly in scale and scope, ranging from targeted small-scale surveys to complex, multi-phase survey and excavation projects over large areas. Nonetheless, together, they have generated a large and diverse body of evidence for past Aboriginal occupation, with thousands of Aboriginal sites now registered on OEH's Aboriginal Heritage Information Management System (AHIMS) database. Together with Dean-Jones and Mitchell's (1993) pioneering environmental study, existing syntheses of the Aboriginal archaeological record of the Hunter Valley (e.g., ERM, 2004; Hughes, 1984; Koettig, 1990; MacDonald & Davidson, 1998) provide a suitable interpretive framework for the current assessment. Key research themes are detailed in brief in the following sections.

### 6.1.2 Open Artefact Sites: Distribution, Contents and Definition

Surface and subsurface distributions of stone artefacts, variously referred to as open artefact sites, open sites and open camp sites, are by far and away the most common and widely distributed form of Aboriginal archaeological site in the Hunter Valley (ERM, 2004; Hughes, 1984; MacDonald & Davidson, 1998). Other site types, such as scarred trees, shell middens, quarries, grinding grooves, burials and rock shelters with deposit and/or art or PAD, have also been identified but are comparatively rare. Accordingly, open artefact sites remain the most intensively investigated component of the Aboriginal archaeological record of the Hunter Valley, with site distribution, site structure and the technology of backed artefact manufacture, in particular, comprising key research topics (Baker 1992a, 1992b, 1992c; Hiscock 1986a, 1986b, 1993a; Koettig 1992, 1994; Moore 1997, 2000; White 1999, 2012).

As highlighted by Hughes (1984) and reiterated by numerous other researchers (e.g., ERM 2004;Koettig & Hughes, 1983, 1985; Koettig 1992,1994;Kuskie, 2000; Rich, 1992), existing archaeological survey data for the Hunter Valley indicate a strong trend for the presence of open artefact sites along watercourses, specifically, on creek banks and 'flats' (i.e., flood/drainage plains), terraces and bordering slopes. Although this distribution pattern can be attributed in part to geomorphic dynamics and archaeological sampling bias, with extensive fluvial erosion activity along watercourses resulting in higher levels of surface visibility and, by extension, concentrated survey effort, an occupational emphasis on watercourses is supported by the results of several large scale subsurface salvage projects (e.g., Koettig, 1992, 1994; Kuskie & Clarke, 2004; Kuskie & Kamminga, 2000; MacDonald & Davidson, 1998; OzArk, 2013; Rich, 1992; Umwelt, 2006, Umwelt, in prep). Collectively, these projects have also shown that assemblage size and complexity tend to vary

significantly in relation to both landform and stream order, with larger, more complex[9] assemblages concentrated on elevated, low gradient landform elements adjacent to higher order streams.

In the Lower Hunter Valley, a similar pattern has been identified for the permanent to semi-permanent wetlands of the Hunter 'delta' (e.g., Kuskie, 1994; Kuskie & Kamminga, 2000; Umwelt, 2006, in prep). Outside of these contexts, surface and subsurface artefact distributions have typically been found to be sparse and discontinuous and are often referred to as 'background scatter'.

Flaked stone artefacts dominate archaeological assemblages from recorded open artefact sites within the Hunter Valley (Hiscock 1986), with heat fractured rock also well represented. Items such as complete and fragmentary grindstones, hammerstones, edge-ground hatchet-heads, ochre and shell have also been identified though comparatively infrequently. With the notable exception of 'knapping floors', a relatively common component of the open artefact site record of the Hunter Valley, associated archaeological features (e.g., hearths and heat treatment pits) have likewise proven elusive (for examples see Koettig, 1992; Kuskie & Kamminga, 2000).

Defined in slightly different ways by different researchers, knapping floors can be broadly defined as spatially-discrete activity areas in which primacy was given to the reduction of one or more stone packages (White, 1999:152). Recorded knapping floors in the Hunter Valley vary considerably in size and complexity, with some of the largest and most complex examples identified through excavation as opposed to survey. Backed artefacts are a common feature of knapping floors and most of these features were likely specifically associated with their production. At Narama, near Ravensworth, a detailed analysis of the contents of knapping floor and non-knapping floor assemblages revealed significant differences between the two, including variation in the frequency of backed artefacts, other retouched and/or utilised tools and cores, and the application of different reduction strategies (Rich, 1992). Together with differences in the spatial distribution of the two forms of assemblage, this evidence was used to suggest that backed artefact production within the Narama landscape was a highly structured activity, and that knapping floors assemblages were the product of a more restricted range of behaviours than more generalised scatters. Although limited to a single landscape, evidence from other parts of the Valley (e.g., Hiscock, 1986; Koettig, 1992, 1994) provides further support for the suggestion that backed artefact manufacture in the Hunter Valley was a highly structured activity.

Although relevant to a variety of site types, geomorphic processes such as soil erosion, colluvial/fluvial aggradation and aeolian transportation are of particular relevance to the identification and definition of open artefact sites. As in other archaeological contexts (e.g., Attenbrow 2010; Fanning & Holdaway 2004; Fanning *et al*. 2009; Holdaway *et al*. 2000), it is now widely accepted by archaeologists working in the Hunter Valley that the visibility and distribution of open artefact sites within the region are, for the most part, products of contemporary and historical geomorphic processes which have variously exposed and obscured them. As demonstrated by numerous large scale archaeological salvage projects within the Valley (e.g., Koettig, 1992, 1994; Kuskie & Clarke, 2004; Kuskie & Kamminga, 2000; MacDonald & Davidson, 1998; OzArk, 2013; Rich, 1992; Umwelt, 2006,Umwelt, in prep), surface artefacts invariably represent only a fraction of the total number of artefacts present within recorded surface open artefact sites, with the majority occurring in subsurface contexts. Artefact exposure, unsurprisingly, is highest on erosional surfaces and lowest on depositional ones. At the same time, in many areas, surface artefacts have been shown through large-scale subsurface testing to form part of more-or-less continuous subsurface distributions of artefacts, albeit with highly variable artefact densities linked to environmental variables such as distance to water, stream order and landform.

Such evidence has posed a significant analytical and interpretive dilemma for archaeologists working in the Hunter Valley. Defining sites on the basis of surface artefacts alone is clearly problematic, with modern site boundaries frequently reflecting the size and distribution of surface exposures as opposed to the actions of Aboriginal people in the past. Nonetheless, for pragmatic reasons, this has been the most commonly used approach, with 'distance' and 'density-based' definitions dominating. In the Hunter Valley, two of the most commonly employed distance-definitions are '*two artefacts within 50m of each other*' and '*two artefacts within 100 m of each other*'. Neither definition is derived from a particular theoretical approach or body of empirical research - they are simply pragmatic devices for

[9] Those containing a wider variety of raw materials and technological types and/or higher mean artefact densities and features such as knapping floors and hearths.

site definition. Definitions based on artefact density also vary in their particulars. However, one of most commonly used definitions is that which isolates, within an arbitrarily defined 'background scatter' of one artefact per 100 m², higher density clusters that are subsequently defined as 'sites'.

While not widely employed, Kuskie's (1994, 2000) system of open artefact site definition, developed for use in the Hunter Valley and other surrounding regions, is also worthy of note here. In short, this system is predicated on the definition of 'survey areas' within broader 'Archaeological Terrain Units' (ATUs), with the latter comprising discrete, recurring areas of land defined on the basis of landform element and slope class, and the former, an area of a single ATU bounded on all sides by different ATUs (Kuskie, 2000: 65-67).

Within this overarching environmental scheme, open artefact sites are defined by the presence of one or more stone artefacts within a survey area, with site boundaries corresponding with the boundaries of the broader survey area irrespective of the visible extent of artefacts within it. Spatially discrete occurrences of stone artefacts within a given site boundary are referred to as 'loci' (Kuskie, 2000: 65-66).

### 6.1.3 Flaked Stone Artefact Technology

Flaked stone artefacts are a ubiquitous element of the Aboriginal archaeological record of the Hunter Valley and, as such, have assumed a pre-eminent role in archaeological reconstructions of past Aboriginal land use in the region. To date, hundreds, if not thousands, of surface-collected and excavated chipped stone assemblages from the Hunter Valley have been analysed, with individual assemblage sizes, research questions, aims, analytical methodologies and terminological schemes varying significantly between researchers and projects. Studies to date have ranged from basic descriptive accounts of assemblage composition in typological terms to detailed reconstructions of specialised knapping techniques through rigorous technological analyses (including conjoining) and, in some instances, experimental research. Particularly informative analyses in the context of the Hunter Valley include those undertaken by Hiscock (1986a, 1986b, 1993a), Koettig (1992, 1994), Moore (1997, 2000), White (1999, 2012) and Baker (1992a, 1992b, 1992c).

As highlighted by Koettig (1994) and others (e.g., Hiscock 1986a; Hughes 1984), available technological and typological data for surface collected and excavated flaked stone artefact assemblages from the Hunter Valley suggest that the majority of these assemblages belong to what is known as the 'Australian small-tool tradition', a term coined by Gould (1969) to describe what was then thought to be first the first appearance, in the mid- Holocene[10], of a new suite of chipped stone tool forms in the Aboriginal archaeological record of Australia, including Bondi points, geometric microliths, adzes and points (both unifacially and bifacially flaked). Complex, hierarchically-organised reduction sequences associated with the production of these tools contrast markedly with the simple sequences of earlier periods (Moore, 2011). Tools of the Australian small-tool tradition, it has been suggested, formed part of a portable, standardised and multifunctional tool kit aimed specifically at risk reduction (Hiscock, 1994, 2006). Stone artefact assemblages from late Pleistocene and early Holocene contexts, in contrast, are described by archaeologists as belonging to the 'Australian core tool and scraper tradition', a term first used by Bowler *et al*. (1970) to describe the Pleistocene assemblages recovered from Lake Mungo in western New South Wales. Bowler *et al*. (1970) saw the main components of these assemblages - core tools, steep-edged scrapers and flat scrapers - as characteristic of early Australian Aboriginal assemblages and as being of a distinctly different character to those associated with small-tool tradition.

In southeastern Australia, including the Hunter Valley, the Australian small-tool and core tool and scraper traditions are most commonly described in terms of McCarthy's (1967) *Eastern Regional Sequence* (ERS) of stone artefact assemblages. Based on appreciable changes in the composition of chipped stone artefact assemblages over time, the ERS hypothesises a three phase sequence of 'Capertian' (earliest), 'Bondaian*'* and 'Eloueran' (most recent) assemblages and was developed on the basis of McCarthy's (1948, 1964) pioneering analyses of stratified chipped stone assemblages from Lapstone Creek rockshelter, on the lower slopes of the Blue Mountains eastern escarpment, and Capertee 3 rockshelter in the Capertee Valley north of Lithgow. At present, the most widely cited

[10] Note that more recent research into the chronology of backed artefacts and points in Australia (e.g., Hiscock & Attenbrow, 1998, 2004; Hiscock, 1993b) has demonstrated a long history of production and use for these implement types, with both now known to have been produced in the early Holocene and likely in the late Pleistocene as well.

characterisation of the ERS is that of a four-phase sequence beginning with the *Pre-Bondaian* (McCarthy's *Capertian*) and moving successively through the Early, Middle and Late phases of the *Bondaian*, the last of which equates to McCarthy's (1967) *Eloueran* phase. The tripartite division of the Bondaian is based principally on the presence/absence and relative abundance of backed artefacts (Attenbrow, 2010: 101). However, other factors, such as changes in the abundance of bipolar artefacts and different stone materials, as well as the presence/absence of edge-ground hatchet-heads are also relevant.

**Table 6 McCarthy's Eastern Regional Sequence (ERS) of stone artefact assemblages**

| Current phasing | McCarthy's (1967) Phasing | Approximate date range | Backed artefact frequency | Bipolar artefacts | Edge-ground hatchet heads |
|---|---|---|---|---|---|
| Pre-Bondaian | Capertian | 40,000-8,000 BP | Absent | Rare | Absent |
| Early Bondaian | Bondaian | 8,000-4,000 BP | Very low | Rare | Absent |
| Middle Bondaian | | 4,000-1,000 BP | Very high | Increasingly common | Present |
| Late Bondaian | Eloueran | 1,000 BP to European contact | Very low | Very common | Present |

Existing assemblage data indicate that Aboriginal knappers occupying the Hunter Valley utilised a diverse range of lithic raw materials for flaked stone artefact manufacture (Hughes, 1984). However, two rock types - silcrete and silicified tuff (also known as mudstone) - overwhelmingly dominate the region's existing stone artefact record and appear to have been routinely selected for this task, likely due to both basic raw material abundance and their desirable flaking qualities (Hiscock, 1986a). Alongside other, less-commonly exploited raw materials, such as quartz, quartzite, chalcedony, chert, petrified wood and various fine-grained volcanics, both are available in alluvial and colluvial gravel deposits[11] associated with the Hunter River and its tributaries (Raggatt, 1938; see also Hiscock 1986a:14-16). Widely distributed and easily accessible, it would appear that these deposits functioned as the primary source of lithic raw materials for Aboriginal flaked stone tool manufacture in the Hunter Valley proper.

In the Hunter Valley, asymmetrical and symmetrical backed artefacts dominate the retouched components of surface collected/recorded and excavated flaked stone assemblages. Accordingly, the technology of backed artefact manufacture has been a particular focus of research (e.g., Baker, 1992a; Hiscock, 1993a; Koettig, 1992, 1994; Moore, 2000). Studies by Hiscock (1993a), Moore (2000) and others (e.g., Baker, 1992a; Koettig, 1992, 1994; White, 1999, 2012) have demonstrated that backed artefact manufacture in the Hunter Valley was a highly structured activity involving a complex system of raw material procurement, transportation, preparation and reduction. Differences in the technological character of recovered cores and conjoin sets across the Valley indicate a significant degree of variability in the strategies used by Aboriginal knappers to produce blanks for backed artefact manufacture (Figure 15). Heat treatment, notably, appears to have been integral component of the backed artefact manufacturing process, with evidence for the thermal alteration of stone packages throughout the reduction process both abundant and widespread. As Hiscock (1993:66) has observed, "the thermal alteration of Hunter Valley silcrete drastically improves flaking qualities and increases the lustre and smoothness of the fracture surface". Compared with silcrete, evidence for the thermal alternation of indurated mudstone blanks is rare (e.g., Koettig, 1992) and likely reflects the generally higher 'raw' flaking quality of this material.

Alongside the reconstruction of backed artefact manufacturing processes, the identification of diachronic change in Bondaian lithic technology in the Hunter Valley has also received considerable analytical and interpretive attention (e.g., Baker, 1992c; Haglund, 1989; Hiscock, 1986a, 1986b). Hiscock's (1986a) pioneering attribute analysis of a sample of unretouched mudstone flakes recovered from the Sandy Hollow 1 rockshelter excavated by Moore (1970) is of particular significance in this regard and can be regarded as the foundation upon which subsequent studies have been carried out.

[11] I.e., active point and mid-channel gravel bars, as well as elevated terrace and palaeochannel remnants.

This analysis sought to test a tripartite division of the Sandy Hollow 1 (SH1) assemblage made on the basis of chronological changes in the frequency of backed artefacts. Three phases were recognised: the *Pre-Bondaian*, with no backed artefacts, the *Phase I Bondaian*, with numerous backed artefacts and the *Phase II Bondaian*, with few backed artefacts. Attribute analysis of a sample of 742 complete mudstone flakes from Square AA revealed technological changes consistent with this division, including, but not limited to, changes in the relative frequency of platform preparation and overhang removal as well as flake shape and platform size (see Table 7).

**Table 7 Hiscock's relative dating scheme for the Sandy Hollow 1 flaked stone assemblage (after Hiscock, 1986a: 100)**

| Phase | Date range | Flake type | Knapping practices employed for flake production | Backed artefact frequency |
|---|---|---|---|---|
| Pre-Bondaian | >1300 BP | Medium-sized, relatively squat flakes with very large platforms | • Large amounts of force applied with little control;<br>• Most normal or inward directions of force application;<br>• Imprecise blow application;<br>• Use of relatively low platform angles on cores;<br>• Very little platform preparation of any kind;<br>• Many blows delivered to cortical surfaces;<br>• No platform faceting;<br>• Infrequent overhang removal; and<br>• Low to moderate amounts of core rotation. | Absent |
| Phase I Bondaian | 1300-800 BP | Larger and more elongate flakes with medium sized platforms | • Relatively high amounts of force;<br>• Mostly normal or inward directions of force application;<br>• Imprecise blow applications;<br>• High platform angles;<br>• Large amounts of platform preparation (principally facetting and larger platform flaking);<br>• Infrequent overhang removal; and<br>• High amounts of core rotation. | Numerous |
| Phase II Bondaian | 800 BP - Contact | Relatively small and squat flakes with small platforms | • Low to moderate amounts of force;<br>• Outward directions of force application;<br>• Precise application of force;<br>• High platform angles;<br>• Moderate amounts of platform preparation (flaking onto platform but no faceting)<br>• Frequent overhang removal; and<br>• Moderate to low amounts of core rotation. | Few |

Having established the validity of the three phase Bondaian sequence at SH1, Hiscock applied the same attribute analysis to a series (n = 15) of flaked stone assemblages recovered from open artefact sites on the Mount Arthur North and Mount Arthur South coal leases and found that individual assemblages could be assigned to one of the three Bondaian phases recognised at SH1. On this basis, Hiscock (1986b) proposed that the attribute analysis employed at SH1 could serve as a relative dating system for open sites in the Hunter Valley. Given the number of open artefact sites within the region, this argument was particularly ground-breaking and has prompted several archaeologists to apply Hiscock's analysis to assemblages from other areas, albeit with mixed success (e.g., Dean-Jones, 1992; Baker, 1992c; Haglund, 1989; Rich, 1991). Difficulties in replicating Hiscock's results, Holdaway (1993:29) has suggested, likely stems from spatial variability in the methods used by Aboriginal knappers to reduce stone, variability itself linked to variables such as raw material type and accessibility, site function and stylistic differences between Aboriginal groups.

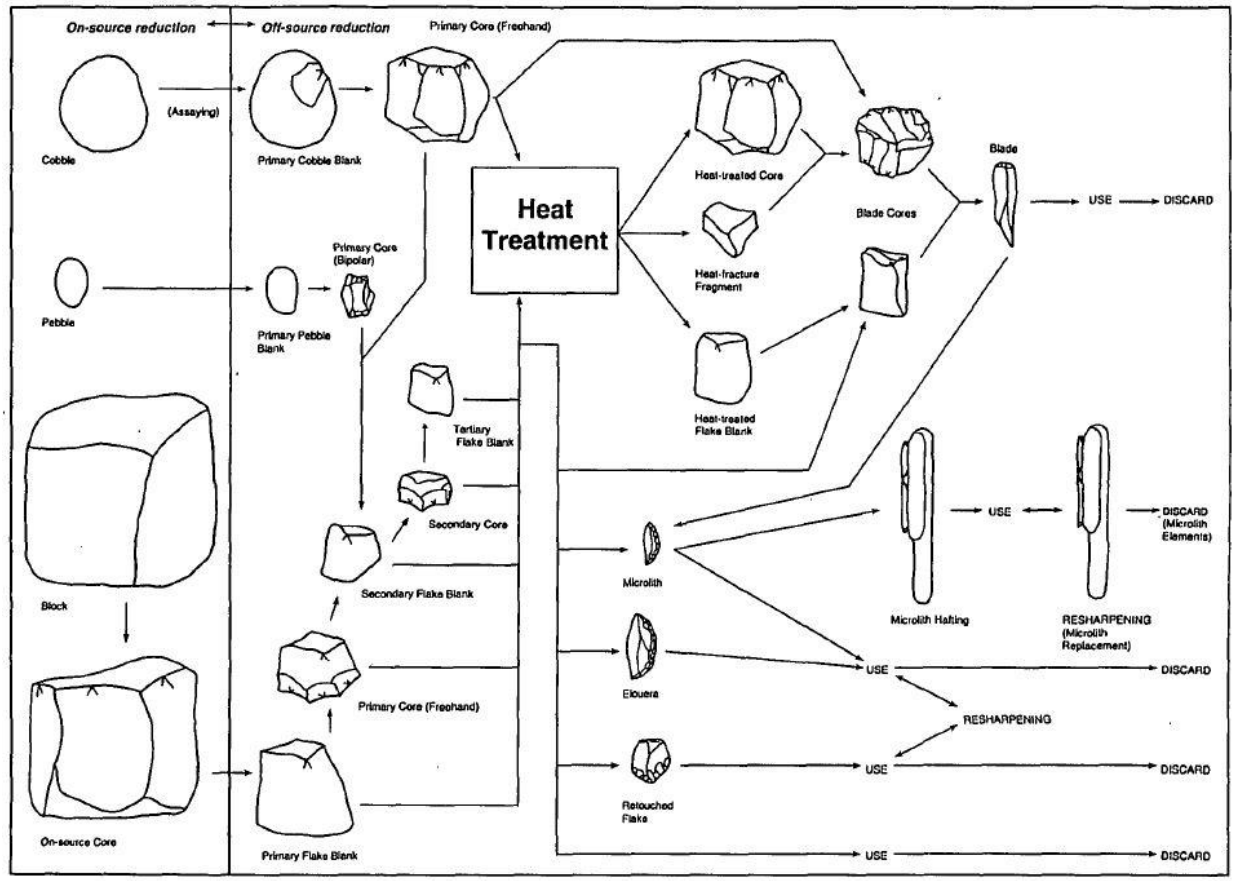



**Figure 15 Moore's (2000) reduction model for the technology of Hunter Valley microlith assemblage (from Moore 2000: 29, Fig. 5)**

### 6.1.4 Aboriginal Stone Quarrying: Australia & the Hunter Valley

Investigations of Aboriginal stone quarry sites in Australia began more than a century ago ((Helms, 1895; Noetling, 1907, 1908)). From the late 19th Century to the mid-20th Century these investigations largely comprised simple descriptive accounts of quarry sites and their contents, focusing on artefact typologies, types of activities undertaken and site ownership (Doleman, 2008). During the 1970's, reflecting broader changes to archaeological theory and development of processual methodologies (Binford, 1980; Binford & Binford, 1968), quarry sites were incorporated into studies of settlement system organisation and their role in such systems explored.

However, despite the long history, comparatively few quarry sites in Australia have been subject to detailed investigations, particularly on mainland Australia in comparison to Tasmania (Reid, 1998). In their evaluation of previous work on stone quarries in Australia, Hiscock et al. (1993:78-80) recognised four major areas of research involving quarries including:

1. Manufacturing technology;
2. Organisation of production;
3. Organisation of stone distribution; and
4. Logistical and settlement patterns.

A fifth area of research, the focus of Doleman's (2008) BAR Series, is the study of technical organisation, that is, studies that link artefact patterning and variability to technological strategies used by hunter-gatherers to adapt to their particular environment. Combined, these studies have produced a wealth of information about how stone was procured and reduced at quarry sites alongside the organisation of behaviour and distribution of material across the landscape. However, as noted by Hiscock et al. (1993) despite the potential for quarries to reveal important information about past societies, overall our knowledge of quarries is "diminutive and patchy".

As to the definition of what constitutes a quarry, definitions have varied amongst researchers ranging from simply a source of stone artefact raw material in the form of pebbles, cobbles and/or boulders (utilised or not) through to sites where only particular types of reduction activities were taking place (e.g., tool manufacture). In search of definition that was inclusive of the full range of activities linked to stone procurement, Hiscock et al. (1993) proposed the definition – "the location of an exploited stone source" as this incorporates both mines and non-mines, alongside quarries where visible manifestations of use are not available. On the basis of this broad definition, three attributes might reasonably be expected at quarry sites. Firstly, there must be a source of raw material suitable for the production of stone tools. Secondly, there may be either evidence of modification of this raw material (artefacts) or thirdly evidence of procurement in the form of excavation and/or gathering. Evidence of modification/procurement will vary according to the type of quarry i.e., underground or surface, hardstone or ochre for example. For surface hardstone quarries, Hiscock et al. (1993:61) suggest the main indications of quarrying will be a source of stone with an associated reduction activity, petrological distinctiveness of material and debris created from breaking stone too large to transport, or evidence of rock removal i.e., impact scars, use of wedges or fires to shatter rock.

In terms of reduction activities associated with raw material sources, Moore (2000:29) divides these into on-source reduction activities and off-source reduction, and notes that both were practiced by Hunter Valley knappers, with procurement generally focussed on Hunter River gravels. Researchers in the Hunter Valley have contended that evidence of quarrying at gravel sources will tend to produce a low density background scatter of flakes and flaked cobbles that are the results of assaying (and cobble rejection) through to high densities associated with systematic reduction activities (i.e., flaking and heat shattering of stone) (Jones et al. 1988; Rich 1998, Moore 2000). Moreover, on-source reduction is argued to produce flake blanks considerably larger than those produced off-source, with the blanks considered to be early stages in the reduction sequence (Peter Hiscock & Mitchell, 1993; M. Moore, 2000). Heating may also have also been utilised to split boulders into more manageable packages (White, 1998). Moore (1997) suggests that raw material procurement and on-site reduction may have been undertaken during logistical forays or 'embedded' during the carrying out of subsistence tasks.

As discussed in Section 6.1.3, existing artefact assemblage data for the Hunter Valley indicate Aboriginal people utilised a diverse range of lithic raw materials for flaked stone artefact manufacture albeit with a focus on silcrete and silicified tuff. Other, less-commonly exploited raw materials, such as quartz, quartzite, chalcedony, chert, petrified wood and various fine-grained volcanics have also been identified. Accordingly, quarry sites in the Hunter Valley would be expected to contain exploitable clasts of these materials with higher frequencies of silcrete and silicified tuff. Previous studies have suggested that the Hunter River Gravels are the most well-known source of silicified tuff, silcrete, and quartz raw materials in Hunter Valley (Dean-Jones et al. 1993; Moore 2000). Exposed at numerous locations in the valley, both as active gravel bars and elevated terrace/ palaeochannel remnants, they have been recorded at Muswellbrook, Denman, Jerrys Plains and Singleton (P. Dean-Jones & Mitchell, 1993). Raw materials, including silicified tuff and silcrete, are thought to be locally derived, reflecting the Hunter River's underlying geology, and smaller deposits of non-local material transported from other parts of the system (MacDonald and Davidson 2005).

In context of the Hunter Valley, Aboriginal stone quarry sites are a comparatively rare component of the archaeological record, with only eight instances, for example, recorded on the AHIMS database (search completed in 2012) of which two are recorded as potential raw material sources without associated evidence of exploitation. The remaining known six sites vary in relation to raw materials present, intensity of use and their topographical locations. A review of available site cards for the sites indicates that exposed silcrete cobbles of varying sizes were an almost universally present raw material, being recorded at five of the six locations and exclusively at three locations. Cobbles of silicified tuff (i.e., mudstone, chert) were recorded, alongside silcrete at three sites, and quartzite/quartz at three locations. Estimates of the total number of artefacts were recorded on only four site cards with artefacts numbers ranging from five to several hundred. In three instances, initial stages of reduction were noted, including shattered cobbles, large flakes and minimally modified cores. In almost all cases, quarry sites were recorded within 1 km of the Hunter River or its major tributaries, amongst alluvial and colluvial gravel deposits. Despite the presence of quarry sites in both the Upper and Lower Hunter Regions, only one has been excavated and subject to detailed investigation - the B10 quarry site (White 1998).

Nonetheless, Moore (2000:29) noted, during an inspection of riverbed gravels near Jerrys Plains and a gravel quarry south of Maison Dieu Road, a number of silcrete and tuff cores thought to represent on-source reduction. No detailed recording was made of these finds. In addition, Hughes and Lance (in Hiscock 1986:14-16) identified 22 Aboriginal mudstone cores within a 1200 square metre section of large gravel bar (80 m wide and 1.5 km long) at the mouth of the Goulburn River near Denman.

### 6.1.5 Chronology and Texture-Contrast Soils

Evidence for late Pleistocene and/or early Holocene Aboriginal occupation of the Hunter Valley is rare, with dated and undated evidence from these periods obtained from only a handful of sites, two of which (i.e., Moffats Swamp Dune & Galloping Swamp) are located on the Valley's coastal plain (AMBS, 2002; Baker, 1994; Hughes & Hiscock, 2000; Koettig, 1986; Kuskie, in prep.; Rich, 1993; Scarp Archaeology, 2009). As recently discussed by Hughes et al. (2014), the dearth of early sites in the central lowlands of the Hunter Valley can be attributed to long term geomorphic and soil formation processes which have acted to either remove completely or widely disperse older archaeological materials.

Studies by Koettig (1990), Baker (1994) and Kuskie (in prep) suggest that the flaked stone technology employed by Aboriginal knappers occupying the Hunter Valley during the terminal Pleistocene/early Holocene was focused on the opportunistic or non-specific reduction of early reduction cores (*sensu* Moore 2000) - some of which were very large. Core reduction appears to have geared towards the production of robust flakes for immediate use or retouch into simple scrapers, with no evidence for the complex, hierarchically-organised reduction sequences typical of the mid-to-late Holocene. Tool edges, Moore (2000:36) notes, were refurbished by unifacial retouching. A preference for volcanic materials over silcrete and mudstone has also been noted (Baker, 1994; Koettig, 1990;1992:5), as has the paucity of evidence for deliberate heat treatment (Moore, 2000)

In contrast to the late Pleistocene/early Holocene, evidence for mid-to-late Holocene Aboriginal occupation of the Hunter Valley abounds, with numerous excavated sites producing assemblages that can be confidently ascribed to these periods on the basis of radiometric dates and/or their typological/technological profiles. Taken at face value, available radiocarbon determinations suggest a progressive increase in the Aboriginal population of the Hunter Valley over the course of the Holocene (Attenbrow, 2004). However, as argued by Hiscock (2008) on a national scale, it seems likely that the directional population growth suggested by such data is, to a certain extent at least, a product of differential site preservation, with younger sites better preserved than older ones. Other factors, such as the burial of older sites through sediment deposition and aeolian processes and bias in the location of archaeological surveys and excavations, may also be relevant.

Critical to any discussion concerning the antiquity of Aboriginal occupation within the Hunter Valley are the well-documented difficulties surrounding the dating of open artefact sites with active 'biomantles' (*sensu* Paton et al. 1995; see Dean-Jones & Mitchell, 1993; Balek 2002; Hofman 1986; Johnson et al. 2005; Johnson 1989; Paton et al. 1995; Peacock & Fant 2002; Stein 1983). In the Hunter Valley, the term biomantle is typically used as a collective descriptor for the 'A' soil horizons of the Valley's dominant texture contrast or duplex soil profiles[12], which tend to be relatively thin (<30 cm), and exhibit extensive evidence of bioturbation in the form of roots, open/infilled burrows, live insects and/or earthworms and stone lines[13]. As highlighted by Dean-Jones & Mitchell (1993) and others (e.g., Balek 2002; Johnson 1989), excavated finds assemblages from archaeological sites with active biomantles are subject to a range of interpretive constraints, with intact depositional stratigraphy unlikely to be preserved and inset archaeological features (e.g., hearths and heat treatment pits) representing the only reliable means of dating (with any specificity) intercepted archaeological events (Mitchell 2009: 4). Any stone artefacts discarded at the surface in landscapes with active biomantles are likely, over time, to have been incorporated into the soil profile through bioturbation, with depth of artefact burial ultimately corresponding to the base of major biological activity (i.e., the base of the biomantle). Where biomantles remain relatively undisturbed, patterns of artefact discard may be preserved. However, in heavily disturbed contexts, the preservation of such patterning is unlikely (Mitchell 2009: 4).

[12] Such profiles are characterised by loamy topsoils[12] and silty clay to clay subsoils, with boundaries between these two units typically clear to abrupt. Clayey subsoils have formed by *in situ* weathering of the parent material, while topsoils are derived from a combination of *in situ* weathering and the deposition of colluvially and/or fluvially transported materials.

[13] Stone lines, where present, typically occur at the interface between the A and B horizons.

For archaeologists working in the Hunter Valley, the analytical and interpretive constraints posed by intensive bioturbation have, in combination with a real paucity of dateable features, led to a reliance on the dating of excavated archaeological finds assemblages through relative means, specifically, through consideration of the typological and technological composition of associated flaked stone artefact assemblages and reference to a modified version of McCarthy's (1967) ESR, the broad temporal parameters of which are now well established (Table 6). While offering a useful chronological framework within which to assess diachronic changes in the stone artefact technologies and raw material use, the largely undated and palimpsest character of the Valley's lithic record represents a significant analytical and interpretive obstacle for period-specific reconstructions of Aboriginal mobility regimes (cf. Cowan 1999).

More broadly, Dean-Jones and Mitchell (1993: 63-64) have highlighted a series of geomorphic contexts within the Hunter Valley that they believe represent favourable locations for the preservation of Pleistocene and/or early Holocene archaeological evidence. These include:

- Rock shelters and large middens;
- Aeolian sand deposits (e.g., source bordering dunes);
- The distal portions of low angle alluvial fans;
- Stream junctions where each tributary has a different rate of sediment supply; and
- Colluvial deposits at the base of steeply inclined surfaces.

To date, the two contexts that been shown to have the potential to contain recognisable older archaeological materials include late Pleistocene windblown sand dunes/sheets (e.g., AMBS, 2002) and late Pleistocene/early Holocene colluvial deposits (e.g., Hughes & Hiscock, 2000).

### 6.1.6 Occupation models

A number of Aboriginal occupation models have been proposed for the Hunter Valley over the past three decades, with existing models based on varying combinations of archaeological, environmental and ethnohistoric data. Key models for the Central and Lower Hunter Valley include those developed by Haglund (1992), Koettig (1992, 1994), Kuskie (2000) and Kuskie and Kamminga (2000). These models are summarised in Table 8.

**Table 8 Aboriginal occupation models for the Hunter Valley**

| Researcher(s) | Year(s) | Project(s) | Area to which the model applies | Summary of model | Reference(s) |
|---|---|---|---|---|---|
| Koettig | 1992 & 1994 | Salvage of sites within the Camberwell and Bulga Coal Mine Leases | Central lowlands | • Repeated occupation of an area is likely to be represented by continuous, or near continuous, distributions of archaeological sites and/or features;<br>• Sporadic or less intensive occupation of an area is likely to be represented by non-continuous or more widely dispersed archaeological sites and/or features;<br>• Continuous to near- continuous distributions of archaeological evidence along watercourses suggest that Aboriginal people did not camp at specific locations;<br>• Frequency of occupation at a given location is likely to have been related to the availability of subsistence resources (e.g., food, water, lithic raw materials);<br>• Some locations may have been foci for Aboriginal occupation owing to the presence of particular resources (e.g., sandstone exposures suitable for grinding hatchet-heads); and<br>• The duration of occupation at a given location may be evidenced by levels of disturbance to associated archaeological deposits, with sites occupied for shorter duration potentially having more intact deposits, as the length of stay may have been insufficient to disperse artefacts or mask the original form of knapping floors. | Koettig, 1992, 1994 |
| Haglund | 1992 | Salvage of sites along Doctors Creek, Warkworth | Doctors Creek area, Central Hunter Valley | • Kangaroos, wallabies, and other large and small game would have been abundant in the area during dry periods, and would have been hunted by small hunting parties of men who would prepare and repair their hunting equipment in close proximity to watercourses;<br>• Larger family groups likely visited the area during wetter periods when watercourses would be flowing more reliably and moisture dependent plants occurred in greater abundance;<br>• Women and children would procure and process plant foods, such as ferns, yams and other tubers, in the vicinity of creeks and watercourses;<br>• Sporadic visits would have resulted in debris left behind being incorporated into the turf or buried by leaf litter and Casuarina needles more quickly than more intensive, long term visits; and<br>• While some equipment such as grindstones may have been retained and carried throughout the landscape, flakes and other implements were likely manufactured, utilised and discarded on an “as needed” basis. | Haglund, 1992 |
| Kuskie | 2000 | Archaeological survey of Mount Arthur North Coal Mine Lease | Mount Arthur Area, Central Hunter Valley | • The area has been occupied for at least the past 5,000 years;<br>• Occupation may extend as far back as 30,000 - 40,000 years;<br>• The area has predominantly been occupied by tribes of the Wonnarua language group, although members of neighbouring groups may also have sporadically | Kuskie, 2000 |

| Researcher(s) | Year(s) | Project(s) | Area to which the model applies | Summary of model | Reference(s) |
|---|---|---|---|---|---|
| | | | | visited and occupied the area.<br>• The Mount Arthur North area was likely utilised and occupied by Aboriginal people at varying intensities on a seasonal basis;<br>• Occupation was most intensive within 50m of the main watercourses (3rd and 4th order streams);<br>• Aboriginal occupants had a strong preference for camping on level ground adjacent to reliable water sources and potentially more abundant subsistence resources;<br>• Individual campsites were mainly occupied by single nuclear family groups and multiple family groups (bands);<br>• Larger campsites from broader gatherings of people likely took place along the nearby Hunter River flats;<br>• A greater range and frequency of activities were undertaken at camp sites, rather than in the surrounding landscape;<br>• Camp sites along the major watercourses were occupied by small groups of people for varying lengths of time, during both the course of the seasonal round and in different years.<br>• Occupation of camp sites throughout the entire Mount Arthur North area was predominantly sporadic rather than continuous;<br>• Occupation, such as focussed camping, likely also occurred along level to very gentle drainage depressions (particularly 1st and 2nd order streams). These water sources were likely to be intermittent and occupation along these lower order streams may only have occurred when standing water was available;<br>• Most camp sites involved overnight visits of small hunting parties rather than entire family groups;<br>• Other than focussed camping, activities engaged in across the Project area involved hunting activities (larger game) by small hunting parties of men, and gathering activities by small parties of women and children, along with transitory movement, procurement of lithic resources, and cultural activities.<br>• The utilisation of areas such as simple slopes, ridge crests, spur crests and minor watercourses was less intense than the valley flats where base camps were situated;<br>• Simple slopes were used during hunting or gathering activities in the course of the normal daily or seasonal round, to access higher ground or stone resources, or to move between camp sites. Ridge and spur crests were also used for these | |

| Researcher(s) | Year(s) | Project(s) | Area to which the model applies | Summary of model | Reference(s) |
|---|---|---|---|---|---|
| | | | | purposes and for accessing vantage points or moving to special ceremonial sites;<br>• Vantage points were important to the Aboriginal occupants of the area, particularly gentle to steep upper slopes adjacent to several ridges, which were mainly accessed by groups of men on hunting expeditions, or for security and/or cultural purposes;<br>• Silcrete and tuff were the preferred stone materials, both of which are locally available and likely procured from local sources during the course of the normal daily or seasonal round, with tuff being the preferred material for manufacture of flaked stone tools;<br>• These materials were also procured from other sources within the region, most notably the alluvial gravels of the nearby Hunter River;<br>• Chert, quartz, petrified wood, chalcedony, and porcellanite were also utilised to a lesser extent and were also procured from local sources, probably during the course of the normal seasonal round;<br>• Silcrete was deliberately heat treated to improve its flaking properties. This may have been undertaken at single locations (e.g. a campsite adjacent to a watercourse) or in different locations reflecting the stages of procurement, heat treatment, reduction and use);<br>• Manufacturing stone tools, particularly flaked implements, was likely a casual or opportunistic activity, conducted on an “as needed” basis;<br>• There was little emphasis on rationing or conservation of the use of most stone materials, due to their wide availability; and<br>• The manufacture of microblades (e.g. hunting spear barbs) was also widely undertaken. While likely a planned and organised activity, it did not necessarily occur at base camps, but may also have occurred in places traversed during the course of hunting expeditions on a more casual or opportunistic basis. | |
| Kuskie & Kamminga | 2006 | Salvage of sites impacted by the construction of the Hunter Expressway, near Black Hill | Black Hill - Woods Gully - Hexham Wetlands Locality, Lower Hunter Valley | • The locality was occupied by Aboriginal people of the Pambalong Clan and potentially clans of the broader Awabakal language group;<br>• Occupation focussed on wetlands, swamps, lakes, estuaries, the coastline, and potentially also the junctions of multiple resource zones;<br>• Occupation of the area has predominantly occurred within the past 4,000 years;<br>• Occupation may have extended as far back as 30,000 – 40,000 years, but few landscape contexts exist in which archaeological evidence of older occupation would be conserved; | Kuskie & Kamminga, 2000 |

| Researcher(s) | Year(s) | Project(s) | Area to which the model applies | Summary of model | Reference(s) |
|---|---|---|---|---|---|
| | | | | • Occupation encompassed the entire region, but at varying intensities, on a seasonal basis, and across different time periods within the overall time-span of occupation;<br>• Seasonal occupation of some resources and localities may not be evidenced in the extant archaeological record;<br>• Occupation of the area reflects a wide range of activities, including transition between locations, hunting, gathering, procurement and utilisation of lithic and other resources, camping, ceremonial and spiritual activities, and burial practices;<br>• Activities conducted and engaged in by the Aboriginal occupants of the area likely included: food procurement, processing, and consumption; production and maintenance of stone and wooden tools and implements; resource procurement; erection of shelters, children's play, ceremonial and spiritual activity, and social and political activity;<br>• Landscape features and variables such as topography, resources, proximity to water, aspect, slope, and cultural preference likely influenced the activities conducted by the Aboriginal occupants of the area;<br>• Few of the activities engaged in by past Aboriginal people are likely to be evident within the archaeological record, other than those involving the use of stone or where preservation conditions permit.<br>• Locally available indurated rhyolitic tuff was the preferred material for knapping and stone tool production, followed by silcrete, which was also able to be procured locally in terrace and alluvial gravels;<br>• Both tuff and silcrete were likely obtained during both daily and seasonal movements throughout the landscape on an "as needs" basis, not during "special purpose trips", and conservation of these materials was not a priority due to their wide availability;<br>• Other locally available stone materials including quartz, quartzite, acidic volcanics, chalcedony and chert were also utilised to a lesser extent;<br>• Non-locally available stone materials such as dacite and rhyodacite (used for grindstones) may have been obtained through trade or exchange with other cultural groups, through special purpose trips, or during visits to other areas during the seasonal round;<br>• Ochre was utilised for ceremonial purposes and may have been procured from sources near Lake Macquarie, the Hunter River, or from outside the region; | |

| Researcher(s) | Year(s) | Project(s) | Area to which the model applies | Summary of model | Reference(s) |
|---|---|---|---|---|---|
| | | | | • Heat treatment of silcrete was undertaken to improve flaking qualities and possibly to obtain desired colours;<br>• A reasonably high proportion of silcrete used in knapping activities was deliberately heat treated, but tuff was not;<br>• Microblade production was a widespread, likely planned and organised, activity with the primary goal of producing microliths (e.g. bondi points) for hunting implements/purposes.<br>• Microblade production may have occurred at both campsites and also in places on transitory routes during hunting expeditions, which may represent more casual or opportunistic behaviour;<br>• Production of microliths was time-consuming and the end result was likely highly desirable and socially valuable;<br>• The investment of time and energy in activities such as heat treatment of silcrete and production of microliths for hunting and fighting spears may have more social than utilitarian values, as floral and smaller faunal subsistence resources would probably have been most prominent in the economy of the local Aboriginal people.;<br>• Casual and opportunistic knapping or selection of flakes to meet requirements on an “as needs” basis was widespread.<br>• A high proportion of knapping products were likely discarded at the site of their manufacture, without use;<br>• Use of bipolar technique was uncommon;<br>• Floral subsistence resources were locally abundant, predominantly obtained and processed by women, and were consumed at campsites and at the site of procurement.<br>• Ferns may have been a staple of the local diet, along with the bulbs and roots of other wetland plants;<br>• Plant preparation sites may include camping places around the margins of Hexham Wetland and other swamps. Tools such as Worimi cleavers were utilised to pound the starch-rich rhizomes of bracken and swamp fern and the roots of other plants obtained from the wetlands;<br>• Eloueras may have been used for extracting the perennial herb cumbungi (*Typha australis*), abundant in the freshwater parts of wetlands, or less likely, tall spike rush (*Eleocharis sphacelata*);<br>• Less portable special tools such as Worimi cleavers and grindstones may have | |

| Researcher(s) | Year(s) | Project(s) | Area to which the model applies | Summary of model | Reference(s) |
|---|---|---|---|---|---|
| | | | | been deliberately stored at base camps;<br>• Faunal resources were processed and consumed at temporary hunters or gatherers camps, at nuclear base camps, campsites of larger congregations of people, and at the site of procurement;<br>• Men hunted for larger game, while women played a key role in gathering plants and obtaining smaller game;<br>• Hunting was a planned and coordinated event;<br>• Fish were obtained by several methods, including boating, hooks and lines, spearing, using hand nets, and creating fish traps;<br>• Strategic management of resources such as fish traps were aimed at increasing the reliability and productivity of food resources;<br>• Nuclear family base camps may have been strategically positioned in relation to food resources, at the conjunction of two or more subsistence zones, close to potable water, and on level or very gently inclined ground. Visual aspect and security may have also been important considerations.<br>• Site occupants of nuclear family base camps may have foraged within an area of up to 10km radius from the campsite;<br>• Campsites in more favourable locations may have been subject to more intensive occupation; and<br>• Community base camps or camps of larger congregations of people tended to be situated on level ground adjacent to plentiful food resources and potable water such as river terraces or flats. | |

## 6.2 Local Archaeological Context

### 6.2.1 Previous Archaeological Investigations within the Study Area

Existing AHIMS data indicates that numerous Aboriginal archaeological investigations incorporating survey and/or test excavation have been undertaken within the broader Dartbrook region since the 1980s. Investigations undertaken directly within the study area include targeted surveys by Dean-Jones (1989a, 1989b, 1989c, 1990) and Resource Planning Pty Ltd (1990) for the Dartbrook Coal Mine. In addition to these, targeted surveys have been undertaken across the Dartbrook region by Brayshaw (1981) for the proposed Bellambi open cut mine west of Dartbrook, by Effenberger (1993a, 1993b) for an optical fibre route and transmission line, by Ruig (1997) for the proposed Kayuga Open Cut which was to utilise existing Dartbrook infrastructure, by Ruig (1996) and HLA-Envirosciences Pty Ltd (2000a, 2000c, 2000d) for the Dartbrook Coal Mine, by CQCHM (2010) for the Mt Pleasant Coal Lease and by AECOM (2011, 2012) as part of due diligence assessments for geotechnical investigations.

One test excavation program was completed within the region by Dean-Jones (1992) as part of a subsurface investigation for the Dartbrook underground mine surface facilities west of the New England Highway. Summaries of these assessments are provided below and areas surveyed as part of each assessment shown on Figure 16:

- In 1981, Helen Brayshaw completed an archaeological survey as part of the Environmental Impact Statement (EIS) for a proposed open cut mine for the Bellambi Coal Company. During the survey, five open artefact sites and a potential scarred tree were identified with four artefact scatters along Sandy Creek and its tributaries and one on an elevated slope above the southern bank of Dartbrook. Artefact types included complete flakes, cores, scrapers, backed artefacts and a tula with utilised raw material including silcrete, tuff, quartz and petrified wood.
- In 1989 and 1990, Pam Dean-Jones completed several archaeological surveys within the study area to assess the locations of proposed surface infrastructure for the Dartbrook Underground Mine (i.e., coal handling preparation plant, tailings dam, washery, rail loop, coal stockpile, access roads etc.). During these surveys, approximately 20 Aboriginal sites were identified comprising 19 open artefact sites and one potential scarred tree.
- In 1990, Pam Dean-Jones also undertook a program of test excavation at the request of the NSW National Parks and Wildlife Services for proposed Dartbrook Underground Mine surface infrastructure located west of the New England Highway. Approximately 92 shovel probe test pits, each measuring 30cm x 30cm, were excavated at two locations adjacent to an ephemeral drainage line and dam. While six surface artefacts were identified during the excavation, only one artefact was recovered below the surface.
- In 1993, Effenberger completed archaeological survey along the proposed alignment of an optical fibre route planned between Scone to Elliston. Ten open artefact sites comprising nine isolated artefacts and one artefact scatter site which included scrapers, axes, cores and flakes.
- In 1996, Ruig completed archaeological survey of the proposed location of an evaporation and transpiration system for the Dartbrook Underground Mine. A total of three open artefact sites were identified, comprising two isolated artefacts and one artefact scatter with 66 artefacts. The Portion 13 area was assessed as highly disturbed and as having low archaeological sensitivity.
- In 1997, Ruig completed archaeological survey for the proposed Kayuga Open Cut mine, located resulting in the identification of 478 stone artefacts from 67 sites. Moderate archaeological sensitivity was assigned to the middle reaches of creeklines within the Kayuga area with subsurface archaeological deposit considered likely to occur within these areas. The remainder of the area was assessed as having low archaeological sensitivity.
- In 1990, Resource Planning Pty Ltd completed archaeological survey for the proposed location of Dartbrook Underground Mine surface infrastructure not previously surveyed as part of prior assessments. A single open artefact site, comprising 19 artefacts in two clusters, was

identified during the survey on the break of slope between Dart Brook floodplain and an adjacent hillslope.

- In 2000, HLA Envirosciences Pty Ltd completed multiple archaeological surveys for the Dartbrook Underground Extended Project. An initial survey was completed for proposed surface facilities located at the Kayuga Homestead and an overburden emplacement area at Browns Mountain. During this initial survey five new open artefact sites were identified within the Kayuga Homestead property and one open artefact site was identified within the overburden emplacement area at Browns Mountain. In addition, during these initial works archaeological survey was undertaken in areas outside proposed surface infrastructure sites, including an unnamed creek and a ridgeline, for the purposes of further clarifying the nature and extent of the archaeological resource associated with the Dartbrook Mine Lease. A further nine open artefact sites were identified in these areas, eight of which were associated with the creekline. After completion of the assessment and regulatory review, the NSW National Parks and Wildlife Service requested a more detailed survey strategy be developed for the project, with more landforms sampled within the Dartbrook Underground Mine footprint. Twelve additional open artefact sites were identified during the follow up survey with the majority of these sites associated with creek flats.
- In 2010, CQCHM completed archaeological survey south of the study area for the Mount Pleasant Coal Project. A total of 24 sites were identified within the southern portion of the Site Boundary all comprising open artefact sites.
- In 2011 and 2012, AECOM completed due diligence assessments for proposed geotechnical investigations for Dartbrook Coal. These site inspections resulted in the identification of two open artefact sites.

**Figure 16 Previous Surveys**

### 6.2.2 AHIMS Database

The AHIMS database, administered by the NSW Office of Environment and Heritage (OEH), contains records of all Aboriginal objects reported to the Secretary of the Department of Premier and Cabinet in accordance with Section 89A of the *National Parks and Wildlife Act 1974*. It also contains information about Aboriginal places, which have been declared by the Minister to have special significance with respect to Aboriginal culture. Previously recorded Aboriginal objects and declared Aboriginal places are known as 'Aboriginal sites'.

A search of the AHIMS database was undertaken on 22 May 2017 for a 10 x 10 km area around the study area. This search resulted in the identification of 121 Aboriginal sites comprising 116 open artefact sites (i.e., isolated artefacts and artefact scatters) and five scarred trees (Table 9). A review of data associated with the listing indicates that one open artefact site and one scarred tree are listed as 'Destroyed' suggesting a total of 119 'Valid' AHIMS sites are located within the search area.

Consideration of the location of previously recorded sites indicates that no previously recorded sites are located within the study area, with the closest site – open artefact site 'Brouns Mountain 6 7;' (AHIMS ID#37-2-0536) – located 330 m to the east.

**Table 9 Site search results**

| Site Type | Count | % |
|---|---|---|
| Open artefact site (i.e., isolated artefacts and artefact scatters) | 115 | 97 |
| Scarred trees | 4 | 3 |
| **Total** | **119** | **100** |

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**Figure 17 AHIMS Registered Aboriginal Sites**

## 6.3 Archaeological Predictions

A review of the existing archaeological and environmental context of the study area suggests that material evidence of past Aboriginal activity within the area is likely to be restricted to flaked stone artefacts in surface and subsurface contexts. Accordingly, key predictions for the study area's Aboriginal archaeological record are as follows:

- The dominant raw material for flaked stone artefact production within the study area will be silicified tuff and/or silcrete.
- Flaked stone artefact assemblages will be dominated by flake and non-flake debitage items (sensu Andrefsky 2005), with formed objects (i.e., cores and retouched implements) comparatively poorly represented.
- Raw material sources suitable for knapping are unlikely to be present within the study area but may be associated with the Hunter River.
- Tool types of demonstrated chronological significance will be restricted to backed artefacts and/or edge-ground hatchet heads;
- Subsurface potential of the study area is assessed as low due to distance from the Hunter River. However, should Aboriginal objects be present, they are likely to have been buried by alluvial sediment.
- Historic ploughing is likely to have caused lateral and vertical displacement of any Aboriginal objects present within the study area.

# 7.0 Archaeological Survey

## 7.1 Aim and Objectives

The aim of the archaeological survey was to identify, record and map Aboriginal heritage values within the study area. These values include both the tangible remains of past Aboriginal activity (i.e. archaeological evidence) as well as intangible cultural values. To achieve these aims, the following specific survey objectives were developed:

- to comprehensively survey, by pedestrian transects, land within the study area.
- to identify and record Aboriginal archaeological sites (if present) within the study area.
- to inspect, where appropriate, areas of known or potential Aboriginal cultural value, including AHIMS sites, and areas identified by RAP representatives.
- to obtain sufficient data to facilitate the development of appropriate management and mitigation measures for identified Aboriginal sites and areas of archaeological sensitivity.

## 7.2 Methodology

A field team of one AECOM archaeologist (Geordie Oakes) and three RAPs representatives completed the archaeological survey of the study area on Friday 6 April 2018. A list of representatives who participated in the archaeological survey is provided in Section 3.0**.**

All survey was conducted on foot, with a total of seven transects executed across the study area. The location of each transect completed during the survey, including start and end points, was recorded using one of two handheld differential GPS units, with associated transect data (e.g., GSV and GI ratings) entered directly into the same unit upon the completion of each transect.

### 7.2.1 Site Definition

The definition, in spatial terms, of Aboriginal archaeological sites is a topic of considerable importance to modern cultural heritage management and one that has generated significant discussion in Australian archaeology (e.g., Doleman 2008; Holdaway, 1993; Holdaway et al. 1998, 2000; MacDonald & Davidson 1998; McNiven 1992; Robins 1997; Shiner 2008). Aboriginal archaeological sites can be broadly defined as places in the landscape that retain physical evidence of past Aboriginal activity. Such evidence, of course, can assume a range of forms, depending on the nature of the activity or activities that produced it, and can vary dramatically in quantity and extent. Some Aboriginal archaeological sites are, by their very nature, easy to define in spatial terms, with scarred trees and rockshelters, for example, readily distinguishable from their surrounding landscapes. Difficulties arise, however, for sites whose present-day physical extent is, more often than not, a product of geomorphic processes, as opposed to the actions of Aboriginal people in the past.

Although relevant to a variety of site types, geomorphic processes such as soil erosion and aggradation, are of particular relevance to identification and definition of surface scatters of stone artefacts, commonly referred to as ‘open camp sites’ or ‘artefact scatters’. It is, for example, now widely accepted that the archaeological visibility of such sites is, in most instances at least, entirely dependent on the operation of such processes, which will have acted variously to expose, conceal or remove completely associated archaeological materials (Dean-Jones & Mitchell 1993; Fanning et al. 2008, 2009; Shiner 2008). As demonstrated by countless large-scale excavations projects in south-eastern Australia, surface artefacts invariably represent only a fraction of the total number of artefacts present within these sites, with the majority occurring in subsurface contexts. Artefact exposure, unsurprisingly, is highest on erosional surfaces and lowest on depositional ones. At the same time, in many areas, surface artefacts have been shown to form part of more-or-less continuous subsurface distributions of artefacts, albeit with highly variable artefact densities linked to environmental variables such as stream order and landform.

Such evidence poses a significant analytical and interpretive dilemma. Defining sites on the basis of surface artefacts alone is clearly problematic, with modern site boundaries invariably reflecting the size and distribution of surface exposures as opposed to the actions of Aboriginal people in the past. Nonetheless, for pragmatic reasons, this is the most commonly used approach, with ‘distance’ and

'density-based' definitions dominating. In NSW, two of the most commonly employed distance-definitions are '*two artefacts within 50m of each other*' and '*two artefacts within 100 m of each other*'. Neither definition is derived from a particular theoretical approach or body of empirical research - they are simply pragmatic devices for site definition. Definitions based on artefact density also vary in their particulars. However, one of most commonly used definitions is that which isolates, within an arbitrarily defined 'background scatter' of one artefact/100 m², higher density clusters that are subsequently defined as 'sites'.

Non-site or distributional archaeology offers an alternative approach to distance and density-based site definitions (Ebert 1992; Foley 1981), with individual artefacts, not sites, treated as the basic units of analysis (for published Australian examples see Doelman 2008; Holdaway et al. 2000; McNiven 1992; Robins 1997; Shiner 2008). While recognising the interpretive potential of non-site approaches with respect to data analysis and discussion, their implementation in the context of cultural heritage management studies is difficult. Here, the identification of 'sites' is required for reasons of recording (i.e., their entry into site databases such as AHIMS) as well as ease of relocation, protection, and ongoing management. The identification of spatially-discrete 'sites', therefore, offers the most pragmatic approach to Aboriginal heritage management in impact assessment contexts (but see McDonald 1996 for a different approach).

For this assessment, the '*two artefacts within 100 m of each other*' definition was proposed.

## 7.3 Survey Results

### 7.3.1 Survey Coverage and Effective Coverage

As indicated in Section 7.2 and shown on Figure 18, a total of seven pedestrian transects were completed over the study area. While all parts of the study area were investigated, recorded transect data indicate that a total survey coverage of approximately 3.1 ha, representing around 96.9% of the total study area, was achieved.

Effective coverage estimates for each transect completed during survey, shown in Table 10 were good, with five exceeding 10%. Ground Surface Visibility (GSV) across the study area was generally good, ranging from 40-70% due to historic ploughing. Areas of enhanced GSV comprised erosion exposures and ploughed fields. Calculation of the total effective coverage achieved for the current survey indicates that around 18.07% (*c*.0.56 ha) of the survey area could be effectively surveyed for surface Aboriginal archaeological materials.

**Table 10 Effective coverage data for the current survey**

| Survey Unit | Landform Unit | Survey Unit Area (ha) | Visibility % | Exposure % | Effective coverage (ha) | Effective coverage % |
|---|---|---|---|---|---|---|
| Transect 1 | Flat | 0.48 | 70 | 20 | 0.07 | 14 |
| Transect 2 | Flat | 0.48 | 70 | 30 | 0.1 | 21 |
| Transect 3 | Flat | 0.48 | 70 | 40 | 0.13 | 28 |
| Transect 4 | Flat | 0.48 | 70 | 30 | 0.1 | 21 |
| Transect 5 | Flat | 0.48 | 70 | 30 | 0.1 | 21 |
| Transect 6 | Flat | 0.35 | 40 | 20 | 0.03 | 8 |
| Transect 7 | Flat | 0.35 | 40 | 20 | 0.03 | 8 |
| **Total** | **-** | **3.1** | **-** | **-** | **0.56** | **18.07** |

## 7.4 Aboriginal Heritage

Survey across the study area identified a modified rural landscape with historical disturbances resulting from vegetation clearance, grazing and ploughing. The majority of the study area comprises

the distal portion of Hunter River floodplain with land on the eastern boundary rising slightly to form the footslope of the eastern ridgeline. A number of natural (non-artefactual) quartz and quartzite angular fragments and pebbles were scattered across the study area. These were likely derived from the underlying geology and fractured from numerous ploughing events. Nonetheless, ***no*** Aboriginal objects were identified during the field survey. Subsurface archaeological sensitivity was assessed as low due to its distance from any watercourse.

RAPs present during the survey likewise suggested that land within the study area was of low sensitivity due to its distance from the Hunter River and historical disturbances, including ploughing.

**Figure 18 Survey Transects**

# 8.0 Significance Assessment

## 8.1 Principles of Assessment

Heritage sites hold value for different communities in a variety of different ways. All sites are not equally significant and thus not equally worthy of conservation and management (Pearson & Sullivan 1995: 17). One of the primary responsibilities of cultural heritage practitioners, therefore, is to determine which sites are worthy of preservation and management (and why) and, conversely, which are not (and why) (Smith & Burke 2007: 227). This process is known as *the assessment of cultural significance* and, as highlighted by Pearson and Sullivan (1995: 127), incorporates two interrelated and interdependent components. The first involves identifying, through documentary, physical or oral evidence, the elements that make a heritage site significant, as well as the type(s) of significance it manifests. The second involves determining the degree of value that the site holds for society (i.e., its cultural significance) (Pearson & Sullivan 1995: 126).

In Australia, the primary guide to the assessment of cultural significance is the *Australian ICOMOS Charter for Places of Cultural Significance* (1999), informally known as *The Burra Charter*, which defines cultural significance as the "aesthetic, historic, scientific, social or spiritual value for past, present or future generations" of a site or place (ICOMOS 1999: 2). Under the Burra Charter model, the cultural significance of a heritage site or place is assessed in terms of its aesthetic, historic, scientific and social values, none of which are mutually exclusive (Table 11). Establishing cultural significance under the Burra Charter model involves assessing all information relevant to an understanding of the site and its fabric (i.e., its *physical* make-up) (ICOMOS 1999: 12). The assessment of cultural significance and the preparation of a statement of cultural significance are critical prerequisites to making decisions about the management of any heritage site or place (ICOMOS 1999: 11).

With respect to Aboriginal heritage, it is possible to identify two major streams in the overall significance assessment process: the assessment of *scientific value(s)* by archaeologists and the assessment of *social (or cultural) value(s)* by Aboriginal people. Each is considered separately below.

**Table 11 Values relevant to determining cultural significance, as defined by The Burra Charter (ICOMOS 1999).**

| Value | Definition |
|---|---|
| Aesthetic | "Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use" (ICOMOS 1999: 12). |
| Historic | "Historic value encompasses the history of aesthetics, science and society...[a] place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may have historic value as the site of an important event" (ICOMOS 1999: 12). |
| Scientific | "The scientific or research value of a place will depend on the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information" (ICOMOS 1999:12). |
| Social | "Social value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group" (ICOMOS 1999: 12). |

## 8.2 Scientific Value

Scientific value refers to the importance of a place in terms of its rarity, representativeness and the extent to which it may contribute further information (i.e., its research potential) (OEH 2011: 9).

### 8.2.1 Rarity and Representativeness

*Rarity* and r*epresentativeness* are related concepts. Rarity refers to the relative uniqueness of a site within its local and regional context. The scientific significance of a site is assessed as higher if it is

unique or rare within either context. Conversely, it is considered to be of lower significance if it is common in one or both. The concept of representativeness, meanwhile, refers to the question of whether or not a site is "a good example of its type, illustrating clearly the attributes of its significance" (Burke & Smith 2004: 247). Representativeness is an important criterion as one of the primary goals of cultural heritage management is to preserve for future generations a representative sample of all archaeological site types in their full range of environmental contexts.

In common with rarity, assessments of representativeness within a region are dependent on the state of current knowledge concerning the number and type of archaeological sites present within that region[14]. This is a critical point, for as suggested by Kuskie (2000) and others (e.g., Bowdler 1981; Godwin 2011; Pearson & Sullivan 1995), the absence across most of Australia of regional-scale quantitative data for Aboriginal sites and places represents a major constraint in assessments of representativeness and rarity. As stressed by Bowdler (1981) some 30 years ago, detailed regional-scale assessments of the Aboriginal archaeological record of Australia are required to address this issue.

### 8.2.2 Research Potential

Research potential can be defined as the potential of an archaeological site to address what Bowdler (1981: 129) has referred to as "timely and specific research questions". These questions may relate to any number of issues concerning past human lifeways and environments and, as suggested by Bowdler's quote, will inevitably reflect current trends or problems in academic research (Burke & Smith 2004: 249). For their part, Bowdler and Bickford (1984: 23-4) suggest that the research potential of an archaeological site can be determined by answering the following series of questions:

1. Can the site contribute knowledge which no other resource can?
2. Can the site contribute knowledge which no other such site can?
3. Is this knowledge relevant to general questions about human history or other substantiative subjects?

Several criteria can be used to assess the research potential of an archaeological site. Particularly important in the context of Aboriginal archaeology are the intactness or integrity of the site in question, its complexity and its potential for archaeological deposit (NPWS 1997: 7). The connectedness of the site to other sites or natural landscape features may also be relevant.

*Integrity* refers to the extent to which a site has been disturbed by natural and/or anthropogenic phenomena and includes both the state of preservation of particular remains (e.g., animal bones, plant remains) and, where applicable, stratigraphic integrity. Assessments of archaeological integrity are predicated on the notion that undisturbed or minimally disturbed sites are likely to yield higher quality archaeological and/or environmental data than those whose integrity has been significantly compromised by natural and/or anthropogenic phenomena. Establishing levels of preservation or integrity in the context of a surface survey is difficult. Nonetheless, useful rating schemes are available for 'open' sites (Coutts & Witter 1977: 34) and scarred trees (Long 2003).

The *complexity* of a site refers primarily to the nature or character of the artefactual materials or features that constitute it but also includes site structure (e.g., the physical size of the site, spatial patterning in observed cultural materials). In the case of open artefact sites, for example, the principal criteria used to assess complexity are the site's size (i.e., number of artefacts and/or spatial extent), the presence, range and frequency of artefact and raw material types, and the presence of features such as hearths.

*Potential for archaeological deposit* refers to the potential of a site to contain subsurface archaeological evidence which may, through controlled excavation and analysis, assist in answering questions that are of contemporary archaeological interest. Assessing subsurface potential in the absence of subsurface investigation is difficult. Nonetheless, consideration of a range of factors, including the integrity of the site, the complexity of extant surface evidence, the nature of the local geomorphology (as established through surface observations and documentary research) and the results of previous archaeological excavations in the area, will help inform assessment of this criterion.

[14] There is, of course, a temporal fluidity to this criterion (i.e., as knowledge of the Aboriginal archaeology of a region increases, assessed levels of representativeness may change, a point of equal relevance to rarity).

*Connectedness* concerns the relationship between archaeological sites within a given area and may be expressed through a combination of factors such as site location, type and contents. It may, for example, be possible to establish a connection between a stone quarry and hatchet found nearby. Demonstrating connectedness archaeologically, however, is far from straightforward, especially when dealing with surface evidence alone. Ultimately, this difficulty rests with the need to demonstrate contemporaneity between sites that may have been created hundreds, if not thousands, of years apart. As Shiner (2008: 13) has observed, "much of the surface archaeological record documents the accumulation of materials from multiple behavioural episodes occurring over long periods of discontinuous time". Contemporaneity, then, needs to be demonstrated not assumed.

### 8.2.3 Identification Process for Current Assessment

For the current assessment, information on the scientific values of the study area has been obtained through a review of existing environmental and archaeological data for the study area, as detailed in Sections 4.0, and 5.0, and archaeological survey across the study area described in Section 7.3.

## 8.3 Assessment of Scientific Significance

No Aboriginal objects were identified during the archaeological survey. The potential for subsurface archaeological deposit was assessed as low due to distance to a source of potable water (watercourse) with historic disturbance including vegetation clearance, grazing and ploughing likely disturbing extant Aboriginal material.

## 8.4 Cultural Value

No Aboriginal objects or cultural values were identified during the assessment.

# 9.0 Impact Assessment

## 9.1 Summary of Proposed Impacts

A description of the activities proposed by the Modification is provided in Section 1.2. The only activity that has the potential to interact with Aboriginal objects is the disturbance of land for the construction of the shaft site above the Hunter Tunnel. Surface disturbance associated with these construction activities will be limited to within the study area.

The proposed bord and pillar mining will not result in any measurable subsidence (<20 mm). As such, there are no anticipated direct or indirect impacts associated with subsidence.

## 9.2 Impacts to Identified Aboriginal Sites

Given that no Aboriginal objects were identified within the study area, no impacts to Aboriginal objects or heritage values are anticipated to result from the Modification.

# 10.0 Management Recommendations

The following management recommendations are made regarding the identified Aboriginal heritage values of the study area, with recommendations made on the basis of:

- A review of previous archaeological investigations completed within and surrounding the study area;
- the results of the archaeological investigation described in Section 7.0.
- the significance and impact assessments detailed in Section 8.3 and 9.0; and
- consultation with RAPs.

## 10.1 Statutory Requirements

As indicated in Section 1.0, this AACHIA is to support a proposed modification to DA 231-7-2000 to facilitate further mining operations at Dartbrook Mine.

This AACHIA has been compiled with reference to the NSW Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).

## 10.2 Recommendations

1. No Aboriginal heritage constraints have been identified within the study area. As such, no further heritage works or reporting are considered warranted; and
2. Should a previously unidentified Aboriginal objects be identified at any point during works associated with the Modification, the following standard procedure should be adopted.

***Management of Previously Unrecorded Aboriginal Objects***

1. All works must cease immediately in the area to prevent any further impacts to the site;
2. Notify the Project Manager;
3. Engage a suitably qualified archaeologist and RAP representative to determine the nature, extent and significance of the site and provide appropriate management advice. Management action(s) will vary according to the type of evidence identified, its significance (both scientific and cultural) and the nature of potential impacts; and
4. Prepare and submit an AHIMS site card for the site.

***Human Skeletal Remains***

In the event that potential human skeletal remains are identified within the study area during the carrying out of the Modification, the following standard procedure (New South Wales Police Force, 2015; NSW Health, 2013) should be followed.

1. All work in the vicinity of the remains should cease immediately;
2. The location should be cordoned off and the NSW Police notified; and
3. If the Police suspect the remains are Aboriginal, they will contact the Office of Environment and Heritage and arrange for a forensic anthropologist or archaeological expert to examine the site.

Subsequent management actions will be dependent on the findings of the inspection undertaken under Point 3.

- If the remains are identified as modern and human, the area will become a crime scene under the jurisdiction of the NSW Police;

- If the remains are identified as pre-contact or historic Aboriginal, OEH and all RAPs are to be formally notified in writing. Where impacts to exposed Aboriginal skeletal remains cannot be avoided and reburial is agreed to as an appropriate management mitigation strategy, remains will be retrieved via controlled archaeological excavation and reburied outside of the Disturbance Boundary in a manner and location determined by OEH and the RAPs;
- If the remains are identified as historic non-Aboriginal, the site is to be secured and the NSW Heritage Division contacted; and
- If the remains are identified as non-human, work can recommence immediately.

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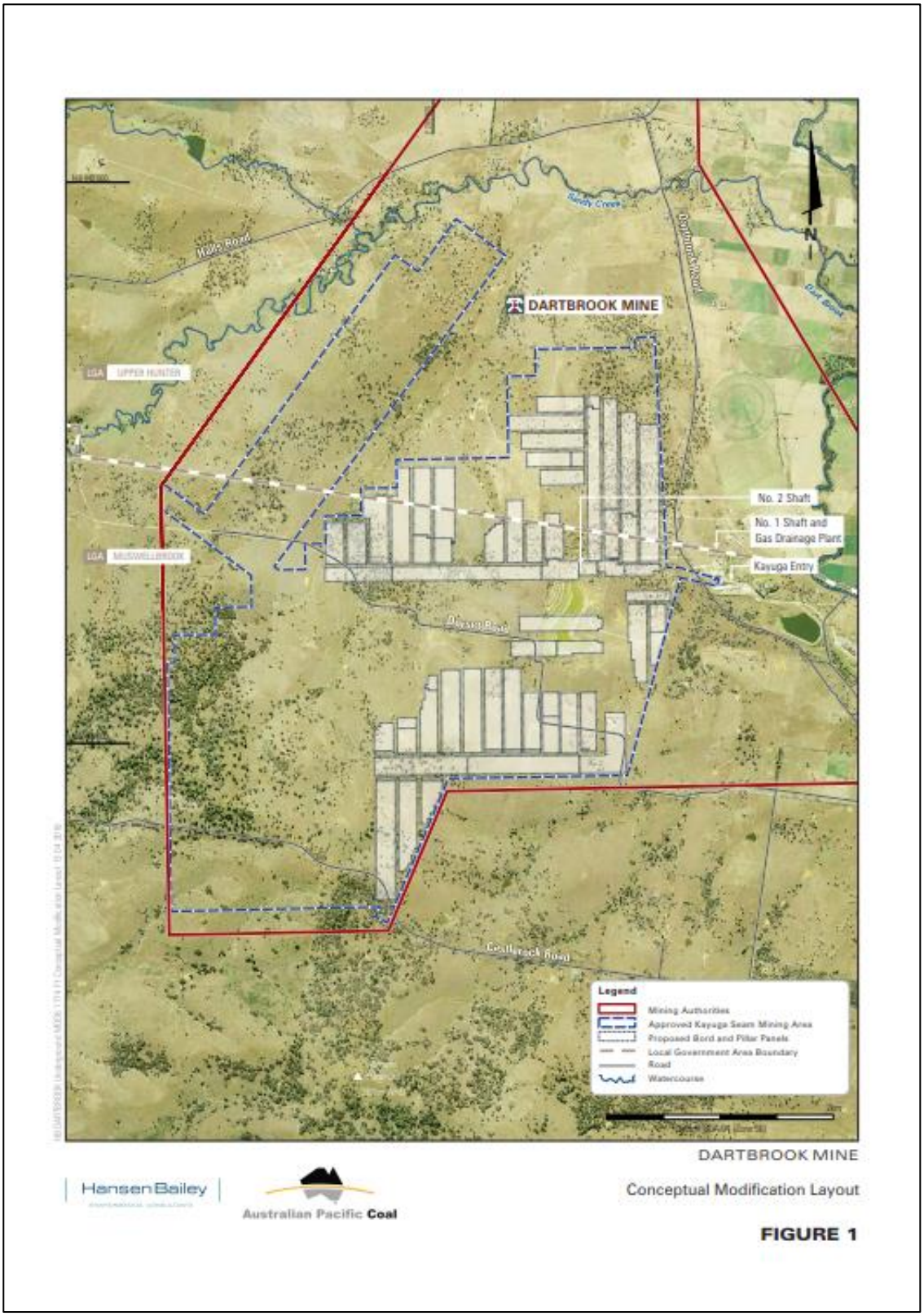
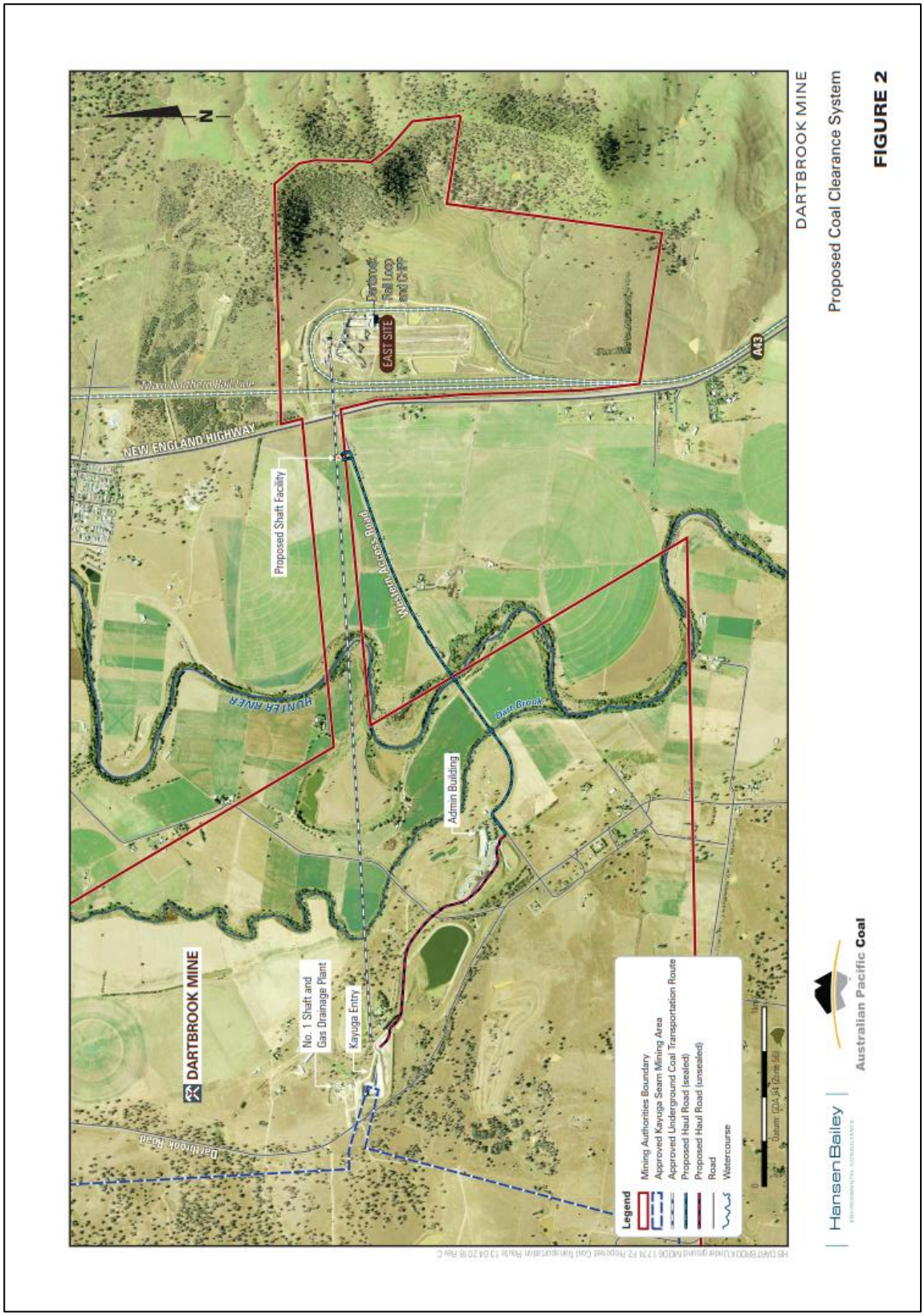
# Appendix A

## Modification 7 Figures

# Appendix A Modification 7 Figures




DARTBROOK MINE
Proposed Coal Clearance System
FIGURE 2
N
NEW ENGLAND HIGHWAY
EAST SITE
A43
Proposed Shaft Facility
Dartbrook Access Road
HUNTER RIVER
Dart Brook
Admin Building
DARTBROOK MINE
No. 1 Shaft and Gas Drainage Plant
Kayuga Entry
Dartbrook Road
Legend
Mining Authorities Boundary
Approved Kayuga Seam Mining Area
Approved Underground Coal Transportation Route
Proposed Haul Road (sealed)
Proposed Haul Road (unsealed)
Road
Watercourse
Hansen Bailey
Australian Pacific Coal

# Appendix B

Agency Letters

# Appendix B Agency Letters

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

29 November 2017

Hunter Local Land Services
98 John St
Singleton NSW 2330

Dear Sir/Madam,

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**NOTIFICATION AND INVITATION TO REGISTER AN INTEREST**

Australian Pacific Coal (AQC) owns the Dartbrook Mine, located approximately 8 km north of Muswellbrook.

AQC is seeking to identify Aboriginal stakeholders who wish to be consulted in relation to an Aboriginal Archaeology and Cultural Heritage Impact Assessment (ACHIA) associated with the Dartbrook Underground Mine. The purpose of this letter is to seek your assistance in identifying Aboriginal stakeholders that we should consult with in relation to the assessment.

The area of land identified for Assessment is freehold land, owned by AQC: Stair St, Kayuga 2333, Lot 1, DP 835733 and Lot 2, DP 835733.

Invitations to register an interest in the ACHIA are being advertised in the Muswellbrook Chronicle on 1 December 2017.

We ask that you please provide a written response to this letter by **14 December 2017** to allow us to proceed with the consultation process in a timely fashion. Should you have any queries in relation to this letter, please contact myself on 02 6575 2000.

Kind Regards,

Andrew Wu
*Environmental Scientist*

Hansen Bailey Pty Ltd (ABN 17 093 597 810)
**BRISBANE**
**Phone:** (07) 3226 0900 **Fax:** (07) 3226 0901
**Address:** Level 15, 215 Adelaide Street Brisbane Qld 4000 **Postal:** GPO Box 3285 Brisbane Qld 4001
**HUNTER VALLEY**
**Phone:** (02) 6575 2000 **Fax:** (02) 6575 2001
**Address:** 6/127-129 John Street Singleton NSW 2330 **Postal:** PO Box 473 Singleton NSW

]

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

29 November 2017

Muswellbrook Shire Council
PO Box 122
Muswellbrook NSW 2333

Dear Sir/Madam,

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**NOTIFICATION AND INVITATION TO REGISTER AN INTEREST**

Australian Pacific Coal (AQC) owns the Dartbrook Mine, located approximately 8 km north of Muswellbrook.

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Kind Regards,

Andrew Wu
*Environmental Scientist*

Hansen Bailey Pty Ltd (ABN 17 093 597 810)
**BRISBANE**
**Phone:** (07) 3226 0900 **Fax:** (07) 3226 0901
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Hansen Bailey
ENVIRONMENTAL CONSULTANTS

29 November 2017

National Native Title Tribunal
GPO Box 9973
Sydney NSW 2000

Dear Sir/Madam,

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**NOTIFICATION AND INVITATION TO REGISTER AN INTEREST**

Australian Pacific Coal (AQC) owns the Dartbrook Mine, located approximately 8 km north of Muswellbrook.

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Kind Regards,

Andrew Wu
*Environmental Scientist*

Hansen Bailey Pty Ltd (ABN 17 093 597 810)
**BRISBANE**
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**Address:** 6/127-129 John Street Singleton NSW 2330 **Postal:** PO Box 473 Singleton NSW

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

29 November 2017

Native Title Services Corporation
PO Box 2105
Strawberry Hills NSW 2012

Dear Sir/Madam,

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**NOTIFICATION AND INVITATION TO REGISTER AN INTEREST**

Australian Pacific Coal (AQC) owns the Dartbrook Mine, located approximately 8 km north of Muswellbrook.

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We ask that you please provide a written response to this letter by **14 December 2017** to allow us to proceed with the consultation process in a timely fashion. Should you have any queries in relation to this letter, please contact myself on 02 6575 2000.

Kind Regards,

Andrew Wu
*Environmental Scientist*

Hansen Bailey Pty Ltd (ABN 17 093 597 810)
**BRISBANE**
**Phone:** (07) 3226 0900 **Fax:** (07) 3226 0901
**Address:** Level 15, 215 Adelaide Street Brisbane Qld 4000 **Postal:** GPO Box 3285 Brisbane Qld 4001
**HUNTER VALLEY**
**Phone:** (02) 6575 2000 **Fax:** (02) 6575 2001
**Address:** 6/127-129 John Street Singleton NSW 2330 **Postal:** PO Box 473 Singleton NSW

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

29 November 2017

Office of Environment and Heritage
Federation House,
24 Moonee Street
Coffs Harbour NSW 2450

Dear Sir/Madam,

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**NOTIFICATION AND INVITATION TO REGISTER AN INTEREST**

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We ask that you please provide a written response to this letter by **14 December 2017** to allow us to proceed with the consultation process in a timely fashion. Should you have any queries in relation to this letter, please contact myself on 02 6575 2000.

Kind Regards,

Andrew Wu
*Environmental Scientist*

Hansen Bailey Pty Ltd (ABN 17 093 597 810)
**BRISBANE**
**Phone:** (07) 3236 0900 **Fax:** (07) 3236 0901
**Address:** Level 1b, 215 Adelaide Street Brisbane Qld 4000 **Postal:** GPO Box 3285 Brisbane Qld 4001
**HUNTER VALLEY**
**Phone:** (02) 6575 2000 **Fax:** (02) 6575 2001
**Address:** 6/127-129 John Street Singleton NSW 2330 **Postal:** PO Box 473 Singleton NSW

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

29 November 2017

Wanaruah Local Aboriginal Land Council
PO Box 127
Muswellbrook NSW 2333

Attention: Noel Downs

Dear Noel,

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**NOTIFICATION AND INVITATION TO REGISTER AN INTEREST**

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We ask that you please provide a written response to this letter by **14 December 2017** to allow us to proceed with the consultation process in a timely fashion. Should you have any queries in relation to this letter, please contact myself on 02 6575 2000.

Kind Regards,

Andrew Wu
*Environmental Scientist*

Hansen Bailey Pty Ltd (ABN 17 093 597 810)
**BRISBANE**
**Phone:** (07) 3226 0900 **Fax:** (07) 3226 0901
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**Phone:** (02) 6575 2000 **Fax:** (02) 6575 2001
**Address:** 6/127-129 John Street Singleton NSW 2330 **Postal:** PO Box 473 Singleton NSW

# Appendix C

Agency Responses

# Appendix C Agency Responses

NSW GOVERNMENT Office of Environment & Heritage

DOC17/604195
Dratbrook Mine OEH Aboriignal Sakeloher request

Mr Andrew Wu
Hansen Bailey
awu@hansenbailey.com.au

Dear Andrew,

**Dartbrook Mine, Muswellbrook LGA**

In response to your request under Section 4.1.2(a) of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010), please find attached a list of known Aboriginal parties that have self-nominated for Muswellbrook Shire Council Local Government Area (LGA). Please note the following information with respect to Aboriginal consultation for your project.

## Aboriginal stakeholder lists maintained by OEH are comprised of self-nominated individuals and organisations

Please note that the attached list is comprised only of self-nominated individuals and Aboriginal organisations who could have an interest in your project. The list is not vetted by OEH. As the list comprises only of self-nominated individuals and Aboriginal organisations, it is not necessarily an exhaustive list of all Aboriginal parties who may hold an interest in the project. Further consultation in accordance with step 4.1.2 of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010) is required to identify Aboriginal people who may hold either cultural or historical knowledge relevant to determining the significance of Aboriginal objects or places within your proposed project area.

## Ensure you document the consultation process

Please ensure all consultation undertaken in accordance with the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010) is documented within an Aboriginal Cultural Heritage Assessment Report (ACHAR). This must include copies of all correspondence sent to or received from all Registered Aboriginal Parties (RAPs) throughout the entire consultation process. Omission of these records in the final ACHAR may cause delays in the assessment of an Aboriginal Heritage Impact Permit (AHIP) application or a major project Aboriginal cultural heritage assessment, and could require parts of the consultation process to be repeated if the evidence provided to OEH does not demonstrate that the consultation process has been conducted in accordance with our consultation requirements.

## Demonstrate that reasonable consultation attempts have been made

Please ensure you provide evidence to demonstrate that reasonable attempts have been made to contact the relevant parties identified through step 4.1.2 of the *Aboriginal cultural heritage consultation*

Locked Bag 1002 Dangar NSW 2309
Level 4, 26 Honeysuckle Drive Newcastle NSW 2300
ABN 30 841 387 271
www.environment.nsw.gov.au

*requirements for proponents* (DECCW 2010). If this evidence is not provided, OEH may deem that the consultation process has not complied with the consultation requirements. Similarly, the proponent is required to record all feedback received from RAPs, along with the proponent's response to the feedback. Where concerns or contentious issues are raised by RAPs during the consultation process, OEH expects that reasonable attempts are made to address and resolve these matters, however OEH acknowledges that in some cases, this may not be achievable. In the case where conflict cannot be resolved, it is the responsibility of the proponent to record these differences and provide the necessary information in their ACHAR with their AHIP application or major project ACHAR.

## Consultation should not be confused with employment

As outlined in Section 3.4 of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010), the consultation process involves getting the views of, and information from, Aboriginal people and reporting on these. It is not to be confused with other field assessment processes involved in preparing a proposal and an application. OEH does not have any role with respect to commercial engagement. Where RAPs are engaged commercially to provide field services as part of an assessment process, that is a matter for the proponent to manage as they see fit. However, if a proponent is proposing to undertake consultation processes or elicit cultural information from RAPs during the course of conducting a field survey, OEH considers this to form part of the consultation process, and expects that all RAPs would be afforded the opportunity to be involved in the process.

## Contacting our office

To ensure we can respond to enquiries promptly, please direct future correspondence to our central mailbox: rog.hcc@environment.nsw.gov.au.

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

Yours sincerely

**STEVEN COX**
**Senior Team Leader Planning**
**Hunter Central Coast Branch**
**Regional Operations Division**

13 December 2017

NSW GOVERNMENT Office of Environment & Heritage

## Attachment A

### Hunter Central Coast Branch - Aboriginal Stakeholder Register for Muswellbrook Shire Council LGA

Please note that this list is valid at the time of sending only, and should not be used for subsequent projects.

| Organisation | First name | Surname | Address 1 | City | State | Post code | Landline | Mobile | Email |
|---|---|---|---|---|---|---|---|---|---|
| Aboriginal Native Title Elders Consultants | John and Margaret | Matthews | 4 Calgaroo Avenue | MUSWELLBROOK | NSW | 2333 | | 0417 725 956 | |
| AGA Services | Ashley, Gregory & Adam | Sampson | 22 Ibis Parade | WOODBERRY | NSW | 2322 | Donna Sampson 0403 765 019 | Ashley Sampson 0401 958 051 | aga.services@hotmail.com |
| Allera French Trading | Allera | French | 23B Gommera St | BLACKSMITHS | NSW | 2281 | | 0421 299 963 | Allera.french.trading@hotmail.com |
| Cacatua Culture Consultants | Donna & George | Sampson | 22 Ibis Parade | WOODBERRY | NSW | 2322 | | 0434 877 016 | cacatua4service@tpg.com.au |
| Crimson-Rosie | Jeffery | Matthews | 6 Eucalypt Avenue | MUSWELLBROOK | NSW | 2333 | 02 6543 4791 | | |
| Culturally Aware | Tracey | Skene | 7 Crawford Place | MILFIELD | NSW | 2325 | | 0474 106 537 | traceyamorrung-pa.com.au |

| Organisation | First name | Surname | Address 1 | City | State | Post code | Landline | Mobile | Email |
|---|---|---|---|---|---|---|---|---|---|
| D F T V Enterprises | Derrick | Vale Snr | 5 Mountbatten Close | RUTHERFORD | NSW | 2320 | | 0438 812 197 | deckavale@hotmail.com |
| Deslee Talbott Consultants | Deslee | Matthews | Unit 2 / 19 South Street | GUNNEDAH | NSW | 2380 | | 0431 205 336 | m-desley@hotmail.com |
| Divine Diggers Aboriginal Cultural Consultants | Deidre | Perkins | 6 Ashleigh Street | HEDDON GRETA | NSW | 2321 | 02 4937 4573 | 0425 654 290 preferred | dedemaree3@hotmail.com |
| Gidawaa Walang & Barkuma Neighbourhood Centre Inc. | Ann Hickey | Debbie Dacey-Sullivan | 76 Lang Street | KURRI KURRI | NSW | 2327 | 02 4937 1094 | Anne 0411 196 991 | gidawaa.walang@hotmail.com |
| Hunter Traditional Owner | Paulette | Ryan | 165 Susan Street | SCONE | NSW | 2337 | | 0431 109 001 | hto.paulette@gmail.com |
| Hunter Valley Aboriginal Corporation | Rhonda | Griffiths | 182 Bridge St | MUSWELLBROOK | NSW | 2333 | 02 6543 1180 | | h9738809@bigpond.net.au |
| Hunters & Collectors | Tania | Matthews | U211 Walowa St | NARRABRI | NSW | 2390 | 0409 193 612 | | Tamatthews10@hotmail.com |
| Jarban & Mugrebea | Les | Atkinson | 11 Nelson Street | CESSNOCK | NSW | 2325 | | 0466 316 069 | Les.atkinson@hotmail.com |
| Jumbunna Traffic Management Group Pty Ltd | Norm | Archibald | 17 Flobern Ave | WAUCHOPE | NSW | 2446 | | 0413 718 149 | jtmanagement@live.com.au |

Page 4

| Organisation | First name | Surname | Address 1 | City | State | Post code | Landline | Mobile | Email |
|---|---|---|---|---|---|---|---|---|---|
| Kawul Cultural Services | Vicky | Slater | 33 Gardner Circuit | SINGLETON | NSW | 2330 | | 0421 077 521 | Vicki.slater@hotmail.com |
| Kawul Pty Ltd trading as Wonn1 Sites | Arthur | Fletcher | 619 Main Road | GLENDALE | NSW | 2285 | 02 4954 7751 | 0402 146 193 | Wonn1sites@gmail.com |
| Lower Hunter Aboriginal Incorporated | David | Ahoy | 5 Killara Drive | CARDIFF SOUTH | NSW | 2285 | | 0421 329 520 | lowerhunteral@gmail.com |
| Lower Hunter Wonnarua Cultural Services | Lea-Anne Ball and Uncle Tommy Miller | | 51 Bowden Street | HEDDON GRETA | NSW | 2321 | 02 4937 2694 | 0402 636 521 (Uncle) | tn.miller@southernphone.com.au |
| Lower Wonnaruah Tribal Consultancy Pty Ltd | Barry | Anderson | 156 The Inlet Road | BULGA | NSW | 2330 | 02 6574 5303 | 0417 403 153 | |
| Murra Bidgee Mullangari Aboriginal Corporation | Ryan Johnson | & Darleen Johnson-Carroll | PO Box 246 | SEVEN HILLS | NSW | 2147 | | 0497 983 332 | murrabidgeemullangari@yahoo.com.au |
| Myland Cultural & Heritage Group | Warren | Schillings | 30 Taurus Street | ELERMORE VALE | NSW | 2287 | | 0431 392 554 | warren@yarnteen.com.au |

Page 5

| Organisation | First name | Surname | Address 1 | City | State | Post code | Landline | Mobile | Email |
|---|---|---|---|---|---|---|---|---|---|
| Roger Matthews Consultancy | Roger | Matthews | 15 Parkinson Avenue | MUSWELLBROOK | NSW | 2333 | | 0455 671 288 | |
| Ungooroo Aboriginal Corporation | Alan | Paget | PO Box 3095 | SINGLETON | NSW | 2330 | 02 6571 5111 | | admin@ungooroo.com.au |
| Wallagan Cultural Services | Maree | Waugh | PO Box 40 | CESSNOCK | NSW | 2325 | | 0439 813 078 | Mareewaugh30@hotmail.com |
| Wattaka Wonnarua CC Service | Des | Hickey | 4 Kennedy Street | SINGLETON | NSW | 2330 | 6573 3786 | 0432 977 178 | deshickey@bigpond.com |
| Widescope Indigenous Group | Steven | Hickey | 73 Russell Street | EMU PLAINS | NSW | 2750 | | 0425 232 056<br>0425 230 693 | Widescope.group@live.com |
| Wonnarua Culture Heritage | Gordon | Griffiths | 19 O'Donnell Crescent | METFORD | NSW | 2323 | 02 4934 6437 | 0401 028 807 | |
| Wonnarua Elders Council | Richard | Edwards | PO Box 844 | CESSNOCK | NSW | 2325 | | | |
| Wonnarua Nation Aboriginal Corporation | Laurie | Perry | 254 John St | SINGLETON | NSW | 2330 | 02 6571 5419 | 0412 593 020 | Lperry@optusnet.com.au |

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| Organisation | First name | Surname | Address 1 | City | State | Post code | Landline | Mobile | Email |
|---|---|---|---|---|---|---|---|---|---|
| Yarrawalk (A division of Tocomwall Pty Ltd), Tocomwall Pty Ltd on behalf of Scott Franks and Anor on behalf of the Plains Clans of the Wonnaru People NSD1680/2013 | Scott | Franks | PO Box 76 | CARRINGBAH | NSW | 1495 | | 0404 171 544 | scott@tocomwall.com.au |
| Yinarr Cultural Services | Kathleen | Steward Kinchela | Lot 5 Westwood Estate | MERRIWA | NSW | 2329 | | 0475 436 589 | yinarrculturalservices@bigpond.com dontminemeay@gmail.com |
| | Steve | Talbott | 73 Kiah Road | GILLIESTON HEIGHTS | NSW | 2321 | | 0429 662 911 | gomerol.namoi@outlook.com |
| | Kevin | Duncan | 95 Moala Parade | CHARMHAVEN | NSW | 2263 | | 02 4392 9346 0431 224 099 | kevin.duncan@bigpond.com |
| Didge Ngunawal Clan | Paul Boyd | & Lilly Carroll | 7 Siskin St | QUAKERS HILL | NSW | 2763 | | 042682 3944 | didgengunawalclan@yahoo.com.au |
| Indigenous Learning | Craig | Archibald | 2 Victoria Street | BELLBIRD HEIGHTS | NSW | 2325 | 0455 550 549 | 0467 229 507 | ilearning@bigpond.com |

Page 7

| Organisation | First name | Surname | Address 1 | City | State | Post code | Landline | Mobile | Email |
|---|---|---|---|---|---|---|---|---|---|
| Upper Hunter Wonnarua Council Inc | Rhoda & Georgina | Perry | PO Box 184 | SINGLETON | NSW | 2330 | | 0421 233 239 | |

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# Appendix D

Newspaper Advertisement – Muswellbrook Chronicle

# Appendix D Newspaper Advertisement – Muswellbrook Chronicle

**Public Notice**

Australian Pacific **Coal**

**Aboriginal Stakeholder Consultation**
**Dartbrook Mine**

Australian Pacific Coal (AQC) is seeking to identify Aboriginal stakeholders who wish to be consulted in relation to an Aboriginal Heritage Impact Assessment associated with the Dartbrook Underground Mine located 8 km north of Muswellbrook, NSW.

The purpose of community consultation with Aboriginal stakeholders is to assist AQC in undertaking an Aboriginal Heritage Impact Assessment over an area of approximately 2 hectares of AQC owned freehold land where some minor construction works are proposed. It is anticipated that this piece of work will be for 2 people for half a working day. Interested stakeholders who hold knowledge relevant to determining the cultural significance of Aboriginal objects and / or places in the area of the proposed project are invited to register their interest in writing to:

Andrew Wu
Hansen Bailey
Environmental Consultants
PO Box 473
SINGLETON NSW 2330
AWu@hansenbailey.com.au
Tel: 02 6575 2000
Fax: 02 6575 2001

Expressions of Interest should include current contact details. The closing date for registration is close of business on 15 December 2017.

# Appendix E

OEH & LALC RAP Notification

# Appendix E OEH & LALC RAP Notification

**From:** Andrew Wu
**To:** "Steven Cox"
**Cc:** "Andrew Roach"; James Bailey
**Subject:** RE: Contact Details of Registered Aboriginal Parties - Dartbrook Mine
**Date:** Tuesday, 20 March 2018 3:46:00 PM
**Attachments:** image001.png
180206 Dartbrook Invitation to Register Letters_Example.pdf
Dartbrook Registered Aboriginal Parties Contact Details.pdf

Hi Steven,

Australian Pacific Coal has submitted an application to modify the development consent for Dartbrook Mine, located near Aberdeen in the Upper Hunter Valley. You have previously provided contact details for Aboriginal persons that we ought to consult with.

In accordance with Section 4.1.3 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (the Requirements), written notice of the proposed Modification was provided to all Aboriginal parties identified by OEH and other relevant authorities (including the local Aboriginal land council). This letter (dated 6 February 2018) invited any interested persons to register an interest in the Aboriginal Cultural Heritage Impact Assessment to be undertaken for the Modification. Recipients of the letter were asked to register an interest by 20 February 2018 (i.e. 14 days after the notice was given). An example of the letter inviting registrations of interest is attached.

A total of 20 Aboriginal stakeholders (including the local Aboriginal land council) have registered an interest in the Modification. None of these stakeholders have advised that they did not wish for their contact details to be provided to OEH. In accordance with Section 4.1.6 of the Requirements, please find the contact details of all Registered Aboriginal Parties attached.

Feel free to contact me if you have any questions.

Regards,

**Andrew Wu**
*Senior Environmental Engineer*

**HANSEN BAILEY**
Tel: (02) 6575 2017
Fax: (02) 6575 2001
Email : awu@hansenbailey.com.au

**From:** Steven Cox [mailto:Steven.Cox@environment.nsw.gov.au]
**Sent:** Wednesday, 13 December 2017 1:33 PM
**To:** Andrew Wu
**Cc:** Nicole Davis
**Subject:** RAP list

Hi Andrew,

Please find attached the RAP list for your project.

Regards
Steven

**From:** Andrew Wu
**To:** "Admin-Wanaruah"
**Cc:** James Bailey; "Andrew Roach"
**Subject:** Dartbrook Mine - Contact Details of Registered Aboriginal Parties
**Date:** Tuesday, 20 March 2018 4:07:00 PM
**Attachments:** 180206 Dartbrook Invitation to Register Letters_Example.pdf
Dartbrook Registered Aboriginal Parties Contact Details.pdf

---

Hi Renee,

Australian Pacific Coal has submitted an application to modify the development consent for Dartbrook Mine. You have previously provided contact details for Aboriginal persons that we ought to consult with.

In accordance with Section 4.1.3 of the "Aboriginal cultural heritage consultation requirements for proponents 2010" (the Requirements), written notice of the proposed Modification was provided to all Aboriginal parties identified by Wanaruah Local Aboriginal Land Council and other relevant authorities (including the Office of Environment and Heritage). This letter (dated 6 February 2018) invited any interested persons to register an interest in the Aboriginal Cultural Heritage Impact Assessment to be undertaken for the Modification. Recipients of the letter were asked to register an interest by 20 February 2018 (i.e. 14 days after the notice was given). An example of the letter inviting registrations of interest is attached.

A total of 20 Aboriginal stakeholders (including the local Aboriginal land council) have registered an interest in the Modification. None of these stakeholders have advised that they did not wish for their contact details to be provided to Wanaruah Local Aboriginal Land Council. In accordance with Section 4.1.6 of the Requirements, please find the contact details of all Registered Aboriginal Parties attached.

Feel free to contact me if you have any questions.

Regards,
Andrew

Andrew Wu
Senior Environmental Engineer

HANSEN BAILEY
Tel: (02) 6575 2017
Fax: (02) 6575 2001
Email : awu@hansenbailey.com.au

-----Original Message-----
From: Admin-Wanaruah [mailto:admin.wanaruah@bigpond.com]
Sent: Tuesday, 5 December 2017 3:20 PM
To: Andrew Wu
Subject: Dartbrook Mine Aboriginal Archaeology & Cultural Heritage Impact Assessment

Good afternoon Andrew,

Please find attached a letter to register Wanaruah Lalc's interest as well as our list of Registered Aboriginal Parties.

Regards
Renee

--
Renee MacDonald
Administration Officer

Wanaruah Local Aboriginal Land Council

# Appendix F

## Draft Assessment Methodology

# Appendix F Draft Assessment Methodology

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

28 February 2018

## Dartbrook – Modification 6: Aboriginal Heritage Impact Assessment Draft Methodology

### 1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was commissioned by Hansen Bailey to prepare an Aboriginal Archaeological and Cultural Heritage Impact Assessment (AACHIA) for a proposed modification to DA 231-7-2000 to facilitate further mining operations at Dartbrook Mine located approximately 5 km north of the town of Muswellbrook in the Upper Hunter Valley of NSW.

The objectives of the AACHIA are to identify the Aboriginal heritage values, both archaeological and cultural, of the Study Area and to determine appropriate mitigation and/or management measures. The assessment will involve background research, Aboriginal community consultation and archaeological field survey.

In accordance with the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a), AECOM is providing for your review a draft assessment methodology for the Modification.

***Aboriginal stakeholders are invited to comment on this draft methodology and to provide comments regarding the Aboriginal heritage cultural values of the Study Area.***

### 2.0 Modification Overview

Australian Pacific Coal Limited (AQC) is the proprietor of the Dartbrook Mine, located in the Upper Hunter Valley of NSW. Dartbrook Mine is managed in accordance with Development Consent DA 231-7-2000 granted under the *Environmental Planning and Assessment Act 1979* (EP&A Act). DA 231-7-2000 allows for longwall mining operations to be carried out. However, Dartbrook Mine has been under care and maintenance since late 2006.

AQC is seeking to modify DA 231-7-2000 to facilitate further mining operations at Dartbrook Mine. This modification application will be made under Section 75W of the EP&A Act.

The Modification includes the following changes to the approved operations at Dartbrook Mine:

- Mining of the Kayuga seam using bord and pillar mining methods as an alternative to the approved longwall panels;
- Altering the method of transferring Run of Mine (ROM) coal to the Coal Handling and Preparation Plant (CHPP); and
- Extending the period of approval by 5 years.

### 3.0 The Study Area

The construction of a new mine shaft for transferring coal represents the only potential source of physical impacts to Aboriginal objects associated with the Modification. The location of the new mine shaft is within the Study Area for this assessment (as shown on Figures 1 & 2).

The Study Area is a roughly square-shaped *c.* 3.2 ha parcel of land located approximately 300 m west of the existing Dartbrook CHPP and 10 km north of the town of Muswellbrook in the Upper Hunter Valley of NSW. It lies on the Hunter River floodplain, approximately 900 m east of the Hunter River, and is currently utilised for cropping.

### 4.0 Background

A search of the AHIMS database was undertaken on 22 May 2017 for a 10 x 10 km area surrounding the Study Area and resulted in the identification of 121 Aboriginal sites comprising 116 open artefact sites (i.e., isolated artefacts and artefact scatters) and five scarred trees (Table 1). A review of data associated with the listing indicates that one open artefact site and one scarred tree are listed as 'Destroyed' suggesting a total of 119 'Valid' AHIMS sites are located within search area.

Consideration of the location of previously recorded sites indicates that none are located in the Study Area, with the closest site – open artefact site 'Brouns Mountain 6 7' (AHIMS ID#37-2-0536) – located 280 m to the east and

AECOM

recorded by Pam Dean-Jones in 1990 for the Dartbrook Mine surface infrastructure assessment (Dean-Jones 1990).

**Table 1 Site search results**

| Site Type | Count | % |
|---|---|---|
| Open artefact site (i.e., isolated artefacts and artefact scatters) | 115 | 97 |
| Scarred trees | 4 | 3 |
| **Total** | **119** | **100** |

## 5.0 Methodology

In accordance with the Office of Environment and Heritage's (OEH) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a), AECOM is providing for your review a draft assessment methodology for the Modification, and allowing 28 days from the date of this letter for comment.

AECOM proposes the following assessment methodology:

A. Desktop assessment;

B. Archaeological survey of the Study Area with Registered Aboriginal Parties (RAPs);

C. Consultation with RAPs in order to identify the Aboriginal cultural heritage values of the Study Area; and

D. Preparation of an AACHIA for the Study Area detailing the results of the above. Appropriate management/mitigation measures for the identified Aboriginal heritage values of the Study Area will be provided in these reports.

*A. Desktop Assessment*

The desktop assessment will comprise:

- A search of OEH's AHIMS database prior to archaeological survey;
- A review of the landscape context of the Study Area;
- A review of relevant archaeological and ethnohistoric information for the Study Area; and
- Preparation of a predictive model for Aboriginal archaeological site type and distribution within the Study Area.

*B. Archaeological Survey*

Full archaeological survey of the Study Area will be undertaken over one day by a combined field team of two AECOM archaeologists and an appropriate number of RAP representatives. Any new sites identified during survey will be recorded to the standard required by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b). For each site located, individual artefact locations will be captured by differential GPS with associated technological attributes entered into the same device. Photographic records of each site will also be taken.

*C. Consultation with RAPs*

RAP representatives are in the best position to provide information on the Aboriginal social/cultural heritage values of a given area. During the assessment process, AECOM archaeologists will consult with RAPs regarding the cultural heritage values of the Study Area. This will include:

- A request (with this draft methodology) for any initial comments regarding the Aboriginal cultural heritage values of the Study Area;
- The provision of this information package, including draft assessment methodology to all RAPs for comment prior to fieldwork;
- RAP participation in field survey;
- Discussion of cultural heritage values with RAPs during field survey; and
- Provision of draft AACHIA to all RAPs for comment prior to finalisation.

AECOM

*D Preparation of an AACHIA*

AECOM will prepare an AACHIA for the Modification detailing the results of the above archaeological survey and consultation with RAPs. The AACHIA will provide appropriate management and mitigation measures for the Study Area's Aboriginal heritage values such as conservation, archaeological test excavation and salvage. Should these be required, details would be included in an updated Aboriginal Cultural Heritage Management Plan (ACHMP) for the Dartbrook Mine.


AECOM
Figure 1 Study Area Region
Study Area
AECOM
Key
Study Area
Track
Contours (10m)
Railway
AHIMS Sites
Open artefact site
Scarred tree (destroyed)
Disclaimer
Methodology
Dartbrook Modification 6
Aboriginal Archaeological
and Cultural Heritage
Impact Assessment
Figure 1
PROJECT ID 60543103
CREATED BY G.Oakes
CREATED 21-02-2018
VERSION 1

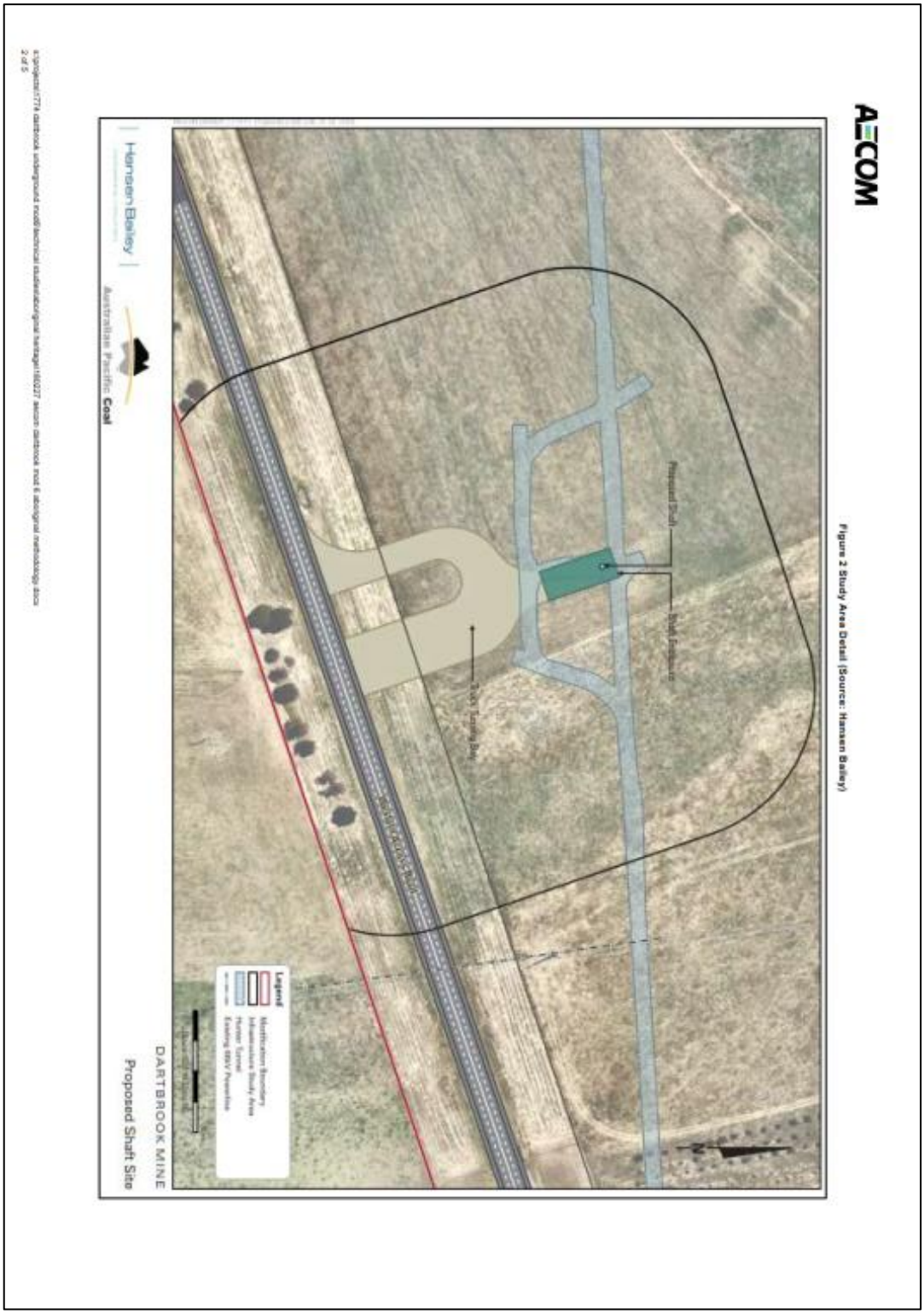
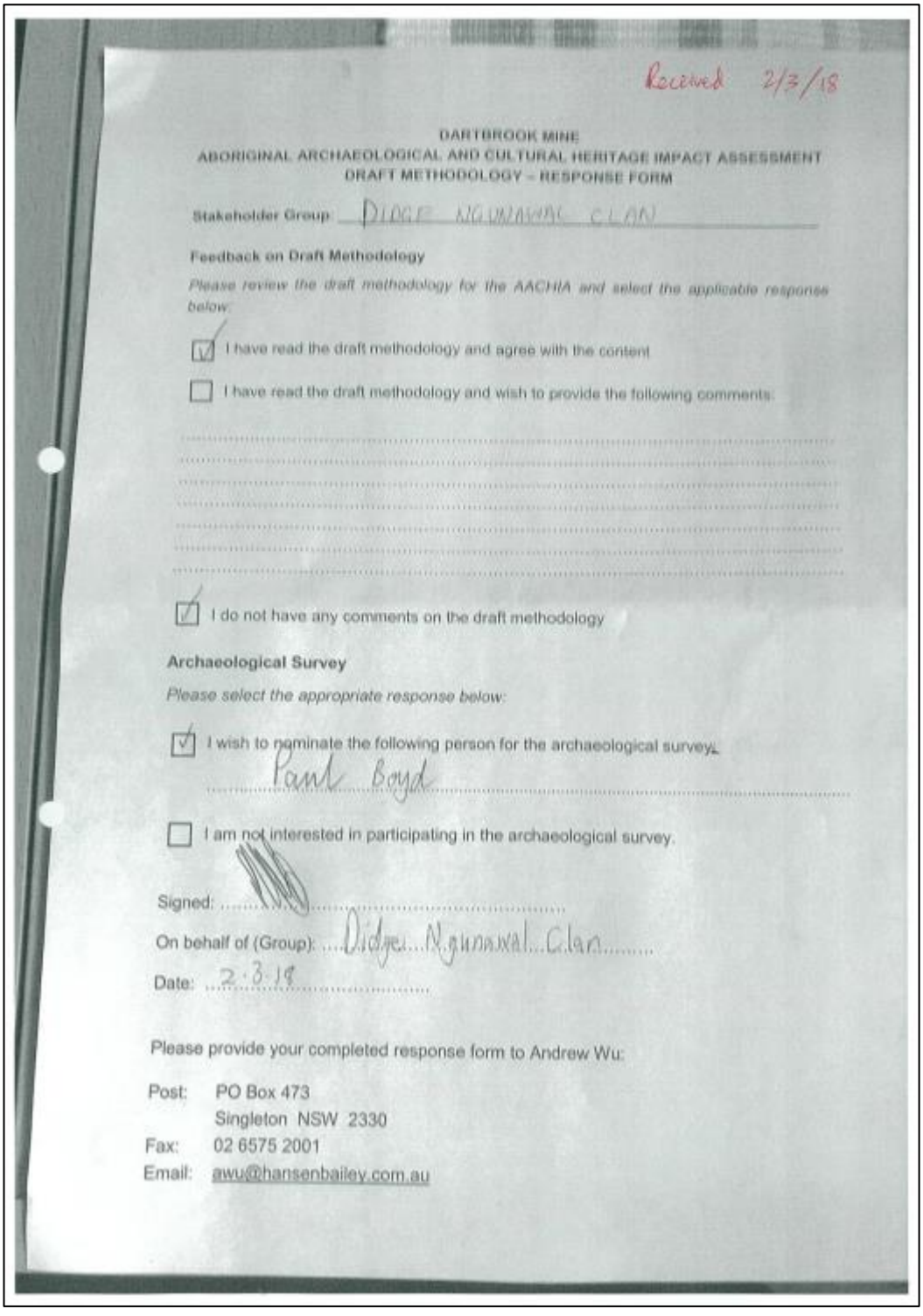



Figure 2 Study Area Detail (Source: Hansen Bailey)

# Appendix G

## RAP Responses to Draft Methodology

# Appendix G RAP Responses to Draft Methodology



Received 2/3/18

DARTBROOK MINE
ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT
DRAFT METHODOLOGY – RESPONSE FORM

Stakeholder Group: DIDGE NGUNAWAL CLAN

**Feedback on Draft Methodology**

*Please review the draft methodology for the AACHIA and select the applicable response below:*

☑ I have read the draft methodology and agree with the content

☐ I have read the draft methodology and wish to provide the following comments:

.....

.....

.....

.....

.....

.....

.....

☑ I do not have any comments on the draft methodology

**Archaeological Survey**

*Please select the appropriate response below:*

☑ I wish to nominate the following person for the archaeological survey:
Paul Boyd

☐ I am not interested in participating in the archaeological survey.

Signed: .....

On behalf of (Group): Didge Ngunawal Clan

Date: 2.3.18

Please provide your completed response form to Andrew Wu:

Post: PO Box 473
Singleton NSW 2330
Fax: 02 6575 2001
Email: awu@hansenbailey.com.au

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**DRAFT METHODOLOGY – RESPONSE FORM**

**Stakeholder Group:** Muwa Bidgee Mullangari

**Feedback on Draft Methodology**

*Please review the draft methodology for the AACHIA and select the applicable response below:*

☒ I have read the draft methodology and agree with the content

☐ I have read the draft methodology and wish to provide the following comments:

.....
.....
.....
.....
.....
.....
.....

☐ I do not have any comments on the draft methodology

**Archaeological Survey**

*Please select the appropriate response below:*

☒ I wish to nominate the following person for the archaeological survey:

Ryan Johnson

☐ I am not interested in participating in the archaeological survey.

Signed: .....

On behalf of (Group): Muwa Bidgee Mullangari

Date: 2.3.18

Please provide your completed response form to Andrew Wu:

Post: PO Box 473
Singleton NSW 2330
Fax: 02 6575 2001
Email: awu@hansenbailey.com.au

MURAGADI HERITAGE INDIGENOUS CORPORATION
ICN NO: 8284

06/03/2018

Attention: Andrew Wu
Hansen Bailey Environmental Consultants
PO Box 473,
Singleton NSW 2330

Dear Andrew,

Re: Aboriginal Archaeological & Cultural Heritage Impact, Draft Assessment Methodology Dartbrook Mine

I have read the Aboriginal archaeological cultural heritage impact assessment & draft assessment methodology for the Dartbrook Mine. Our organisation endorses the recommendations made by Aecom Australia. I agree to the approach to the protocols for the management of sensitive cultural information for the above project. I look forward to hearing from you shortly.

Kind regards

Jesse Carroll Johnson
0418970389

5 Hession Road, Nelson NSW 2765
Email: muragadi@yahoo.com.au

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**DRAFT METHODOLOGY – RESPONSE FORM**

**Stakeholder Group**: _____

**Feedback on Draft Methodology**

*Please review the draft methodology for the AACHIA and select the applicable response below:*

☑ I have read the draft methodology and agree with the content

☐ I have read the draft methodology and wish to provide the following comments:

.....
.....
.....
.....
.....
.....
.....

☐ I do not have any comments on the draft methodology

**Archaeological Survey**

*Please select the appropriate response below:*

☑ I wish to nominate the following person for the archaeological survey:
LES ATKINSON

☐ I am not interested in participating in the archaeological survey.

Signed: .....

On behalf of (Group): WABIN + Plegrebee

Date: 7/03/18

Please provide your completed response form to Andrew Wu:

Post: PO Box 473
Singleton NSW 2330
Fax: 02 6575 2001
Email: awu@hansenbailey.com.au

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**DRAFT METHODOLOGY – RESPONSE FORM**

**Stakeholder Group:** UNGOOROO ABORIGINAL CORPORATION

**Feedback on Draft Methodology**

*Please review the draft methodology for the AACHIA and select the applicable response below:*

☑ I have read the draft methodology and agree with the content

☐ I have read the draft methodology and wish to provide the following comments:

.....
.....
.....
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.....

☐ I do not have any comments on the draft methodology

**Archaeological Survey**

*Please select the appropriate response below:*

☑ I wish to nominate the following person for the archaeological survey:

ALLEN PAGET

☐ I am not interested in participating in the archaeological survey.

Signed: .....

On behalf of (Group): UNGOOROO ABORIGINAL CORPORATION

Date: 7/3/2018

Please provide your completed response form to Andrew Wu:

Post: PO Box 473
Singleton NSW 2330
Fax: 02 6575 2001
Email: awu@hansenbailey.com.au

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**DRAFT METHODOLOGY – RESPONSE FORM**

**Stakeholder Group:** Culturally Aware

**Feedback on Draft Methodology**

*Please review the draft methodology for the AACHIA and select the applicable response below:*

☑ I have read the draft methodology and agree with the content

☐ I have read the draft methodology and wish to provide the following comments:

.....
.....
.....
.....
.....
.....
.....

☑ I do not have any comments on the draft methodology

**Archaeological Survey**

*Please select the appropriate response below:*

☑ I wish to nominate the following person for the archaeological survey:

Tracey Skene - Georgina Berry.

☐ I am not interested in participating in the archaeological survey.

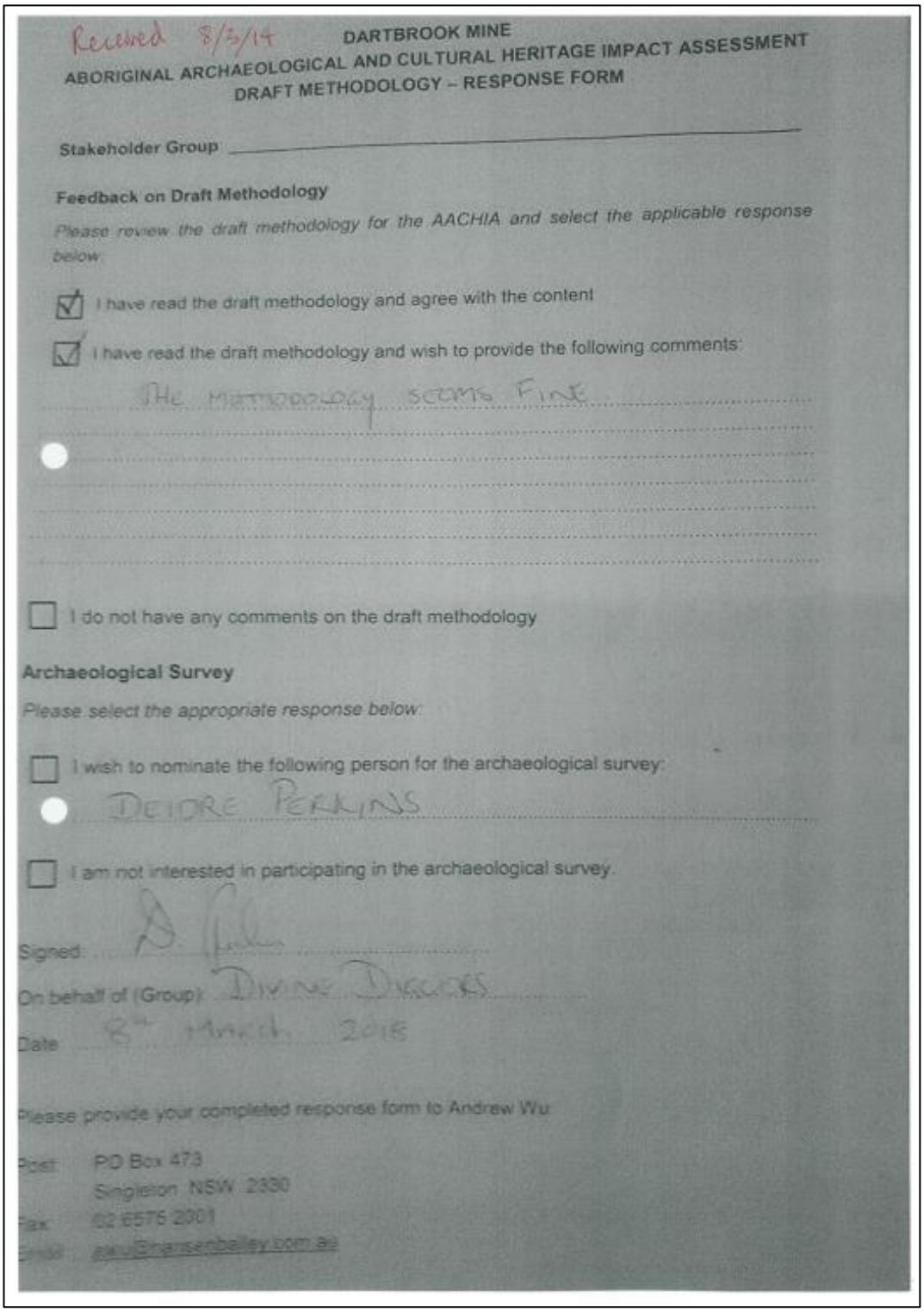
Signed: Tracey Skene

On behalf of (Group): Culturally Aware

Date: 8.7.18

Please provide your completed response form to Andrew Wu:

Post: PO Box 473
Singleton NSW 2330
Fax: 02 6575 2001
Email: awu@hansenbailey.com.au



Received 8/3/14

DARTBROOK MINE
ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT
DRAFT METHODOLOGY – RESPONSE FORM

Stakeholder Group _____

**Feedback on Draft Methodology**

*Please review the draft methodology for the AACHIA and select the applicable response below:*

☑ I have read the draft methodology and agree with the content

☑ I have read the draft methodology and wish to provide the following comments:

The methodology seems fine

☐ I do not have any comments on the draft methodology

**Archaeological Survey**

*Please select the appropriate response below:*

☐ I wish to nominate the following person for the archaeological survey:

Deidre Perkins

☐ I am not interested in participating in the archaeological survey.

Signed: D. Parkes

On behalf of (Group): Divine Diggers

Date: 8th March 2014

Please provide your completed response form to Andrew Wu

Post: PO Box 473
Singleton NSW 2330
Fax: 02 6576 2301
Email: aww@hansenbailey.com.au

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**DRAFT METHODOLOGY – RESPONSE FORM**

**Stakeholder Group:** Hunter Valley Aboriginal Corporation

**Feedback on Draft Methodology**

*Please review the draft methodology for the AACHIA and select the applicable response below:*

☐ I have read the draft methodology and agree with the content

☑ I have read the draft methodology and wish to provide the following comments:

HVAC would expect the following:
- 100% salvage of any artifacts
- reinterment after project ends

☐ I do not have any comments on the draft methodology

**Archaeological Survey**

*Please select the appropriate response below:*

☑ I wish to nominate the following person for the archaeological survey:

Cliff Johnson - HVAC

☐ I am not interested in participating in the archaeological survey.

Signed: [signature]

On behalf of (Group): Hunter Valley Aboriginal Corporation.

Date: 14/3/18

Please provide your completed response form to Andrew Wu:

Post: PO Box 473
Singleton NSW 2330
Fax: 02 6575 2001
Email: awu@hansenbailey.com.au

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**DRAFT METHODOLOGY – RESPONSE FORM**

**Stakeholder Group:** Lower Hunter Aboriginal Incorporated.

**Feedback on Draft Methodology**

*Please review the draft methodology for the AACHIA and select the applicable response below:*

☑ I have read the draft methodology and agree with the content

☐ I have read the draft methodology and wish to provide the following comments:

.....
.....
.....
.....
.....
.....
.....

☑ I do not have any comments on the draft methodology

**Archaeological Survey**

*Please select the appropriate response below:*

☑ I wish to nominate the following person for the archaeological survey:

Davey Allen

☐ I am not interested in participating in the archaeological survey.

Signed: .....

On behalf of (Group): LHAI

Date: 28/3/18

Please provide your completed response form to Andrew Wu:

Post: PO Box 473
Singleton NSW 2330
Fax: 02 6575 2001
Email: awu@hansenbailey.com.au

**DARTBROOK MINE**
**ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**
**DRAFT METHODOLOGY – RESPONSE FORM**

**Stakeholder Group**: YINARR CULTURAL SERVICES

**Feedback on Draft Methodology**

*Please review the draft methodology for the AACHIA and select the applicable response below:*

☑ I have read the draft methodology and agree with the content

☐ I have read the draft methodology and wish to provide the following comments:

.....
.....
.....
.....
.....
.....
.....

☑ I do not have any comments on the draft methodology

**Archaeological Survey**

*Please select the appropriate response below:*

☑ I wish to nominate the following person for the archaeological survey:

KATHIE STEWARD KINCHELA

☐ I am not interested in participating in the archaeological survey.

Signed: .....

On behalf of (Group): YINARR CULTURAL SERVICES

Date: 28-3-2018

Please provide your completed response form to Andrew Wu:

Post: PO Box 473
Singleton NSW 2330
Fax: 02 6575 2001
Email: awu@hansenbailey.com.au

**From:** steve talbott
**To:** Andrew Wu
**Subject:** Fw: Dartbrook Mine Cultural Heritage Assessment Methodology
**Date:** Tuesday, 3 April 2018 1:36:47 PM
**Attachments:** steves insurances.pdf

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Hi Andrew

I agree with the draft methodology for Dartbrook Mine attached is my insurances

Regards

Steve Talbott

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**From:** steve talbott <talbo.minda@hotmail.com>
**Sent:** Tuesday, 3 April 2018 1:32 PM
**To:** steve talbott
**Subject:** Re: Dartbrook Mine Cultural Heritage Assessment Methodology

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**From:** steve talbott <talbo.minda@hotmail.com>
**Sent:** Thursday, 15 March 2018 9:58 PM
**To:** talbo.minda@hotmail.com
**Subject:** Fw: Dartbrook Mine Cultural Heritage Assessment Methodology

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From: Andrew Wu <AWu@hansenbailey.com.au>
Sent: Thursday, 15 March 2018 3:34:06 PM
To: steve talbott
Subject: FW: Dartbrook Mine Cultural Heritage Assessment Methodology

Please see documents attached

From: Andrew Wu
Sent: Thursday, 15 March 2018 3:26 PM
To: 'steve talbott'
Subject: RE: Dartbrook Mine Cultural Heritage Assessment Methodology

Hi Stephen,

I tried to mail a copy of the draft assessment methodology to 28A Kiah Road, Gillieston Heights

**From:** Scott Franks
**To:** Andrew Wu
**Subject:** Re: DartBrook Mine
**Date:** Thursday, 29 March 2018 11:19:53 AM
**Attachments:** image001.png
image002.png
**Importance:** High

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Andrew,

Thank you for the email,

**The registered Native title party Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People NSD1680/2013 dose not support this project**.

As stated PCWP do not support the Methodology, as it stands this project has not attempted to even bother whom can and is a proper Knowlage holder to assess the lands with in our registered Native title area Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People NSD1680/2013. I would also like to point out the following.
The PWCP Registered Native title party ) do not authorise or give permission or consent to any other parties, person, or organisation authority to speak for or assess or make representation for the interpretation of Wonnarua Heritage and the landscape in which it is held.

**3.3.1 Who can provide this information?**
Aboriginal people who can provide the information outlined in 3.3 above are, based on Aboriginal lore and custom, the traditional owners or custodians of the land that is the subject of the proposed project. Traditional owners or custodians with appropriate cultural heritage knowledge to inform decision making who seek to register their interest as an Aboriginal party are those people who:

- · continue to maintain a deep respect for their ancestral belief system, traditional lore and custom
- · recognise their responsibilities and obligations to protect and conserve their culture and heritage and care for their traditional lands or Country

· have the trust of their community, knowledge and understanding of their culture, and permission to speak about it.

In some cases, the information required for decision making will be held by Aboriginal people with statutory recognition for certain lands:

- · Aboriginal owners in accordance with the NSW ALR Act and/or
- · Native title holders or registered native title claimants in accordance with the *Native Title Act 1993* (Cth) and NSW *Native Title Act 1994*

It is acknowledged that Aboriginal people who, through a historical presence in a particular area, may have developed cultural knowledge relevant to the Aboriginal objects and/or places based on knowledge passed down to them by Aboriginal people with a traditional connection to Country. DECCW respects the rights of Aboriginal people with a historical connection to Country to, with their permission, act on behalf of Aboriginal people with a traditional connection to Country. DECCW acknowledges that in some cases it will only be Aboriginal people with a historical connection to an area who have the knowledge to inform the assessment of cultural significance of certain objects/places; e.g. on Aboriginal reserves and missions.

Some time ago I contacted OEH Newcastle and sort advise on how an archaeological firm could in fact make a decision on the identification of knowledge holders for a specific area the response I received in below.

Mr Peter Saad how could an archaeological firm form the view of who would should speak for country when an archaeologist was not trained to understand anthropology. The email below is Mr Saad Response, Page 5 makes the statement.

***Skills to investigate and assess Aboriginal cultural heritage***

*The investigation and assessment of Aboriginal cultural heritage should make use of all relevant disciplines. The assessment of cultural significance is*

*more than a component of an archaeological assessment or investigation. It cannot be assumed that any one practitioner will have the full range of skills required to investigate and assess cultural significance and harm. During this task it may be necessary to engage additional practitioners with special expertise.*

In all applications being sought and issued with the registered native title area of the PCWP no anthropological research is being considered or conducted and only archaeologists, who are not qualified in this field are making the decision and OEH Newcastle nor Coffs harbour are questioning this. I have first-hand experience of this being the case as I have personally questioned several projects recently about this directly with OEH as well as with the Archaeological firm managing the projects and have been totally ignored.

Hi Scott,

Page 5 of OEH 2010 ***Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*** contains the reference that you referred to. Document is available at: http://www.environment.nsw.gov.au/resources/cultureheritage/20110263ACHguide.pdf

Regards
Scott Franks

Native Title & Environmental Services Consultant

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# Appendix H

# RAP Responses to the Draft Report

# Appendix H RAP Responses to the Draft Report

Received 20/4/18

**Return Fax:** (02) 6575 2001

**Attention:** Andrew Wu

**RE:** DARTBROOK MINE MODIFICATION 7 – DRAFT ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT

**Stakeholder Group:** DIDGE NGUNAWAL CLAN

I have read and have understood the Draft *Dartbrook Mine Modification 7: Aboriginal Archaeology and Cultural Heritage Impact Assessment* prepared by AECOM. With regard to the Report, I would like to confirm that our group:

☑ Agrees with the content ☐ Disagrees with the content

We would like to make the following comments on the Report:

DNC agrees with the draft for the Dartbrook mine through AECOM and wishes for the go ahead

Signed in support: Paul Boyd

On behalf of (Group): Didge Ngunawal Clan

Date: 20.4.18

**Return Fax:** (02) 6575 2001

**Attention: Andrew Wu**

**RE:** **DARTBROOK MINE MODIFICATION 7 – DRAFT ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**

**Stakeholder Group:** Murra Bidgee Mullangari

I have read and have understood the Draft *Dartbrook Mine Modification 7: Aboriginal Archaeology and Cultural Heritage Impact Assessment* prepared by AECOM. With regard to the Report, I would like to confirm that our group:

☒ Agrees with the content ☐ Disagrees with the content

We would like to make the following comments on the Report:

Signed in support: R Dalton.

On behalf of (Group): Murra Bidgee Mullangari

Date: 14-5-2018

**Return Fax:** (02) 6575 2001

**Attention: Andrew Wu**

**RE:** **DARTBROOK MINE MODIFICATION 7 – DRAFT ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**

**Stakeholder Group**: Muragadi Heritage

I have read and have understood the Draft *Dartbrook Mine Modification 7: Aboriginal Archaeology and Cultural Heritage Impact Assessment* prepared by AECOM. With regard to the Report, I would like to confirm that our group:

☒ Agrees with the content ☐ Disagrees with the content

We would like to make the following comments on the Report:

Signed in support: .....

On behalf of (Group): Muragadi Heritage

Date: 14-5-2018

**Return Fax:** (02) 6575 2001

**Attention: Andrew Wu**

**RE:** **DARTBROOK MINE MODIFICATION 7 – DRAFT ABORIGINAL ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT**

**Stakeholder Group:** Lower Hunter Aboriginal Inc.

I have read and have understood the Draft *Dartbrook Mine Modification 7: Aboriginal Archaeology and Cultural Heritage Impact Assessment* prepared by AECOM. With regard to the Report, I would like to confirm that our group:

☑ Agrees with the content ☐ Disagrees with the content

We would like to make the following comments on the Report:

No Further Comments to add.

Signed in support: ...

On behalf of (Group): LHAI

Date: 16/5/18

**From:** Deidre Perkins
**To:** Andrew Wu
**Subject:** Re: Dartbrook Mine Modification - draft Report
**Date:** Monday, 14 May 2018 2:56:14 PM

Hi Andrew, sorry I thought i had replied.
Wrong person. I am happy with the project .
Thanks Deidre

Get Outlook for Android

From: Andrew Wu
Sent: Monday, 14 May, 2:25 pm
Subject: FW: Dartbrook Mine Modification - draft Report
To: Deidre Perkins

Hi Deidre,

Just a reminder that if you wish to provide comments on the draft cultural heritage report for the Dartbrook Mine Modification, comments need to be provided by the end of the week. A feedback form is provided for your convenience.

Feel free to contact me if you have any questions.

Regards,

**Andrew Wu**
*Senior Environmental Engineer*

**HANSEN BAILEY**
Tel: (02) 6575 2017
Fax: (02) 6575 2001
Email : awu@hansenbailey.com.au

**From:** Andrew Wu
**Sent:** Thursday, 19 April 2018 6:23 PM
**To:** 'Deidre Perkins'
**Subject:** Dartbrook Mine Modification - draft Report

Hi Deidre,

Please find attached, the draft Aboriginal Archaeological and Cultural Heritage Impact