

The background of the cover features a faded, low-angle photograph of a windmill. Overlaid on this are several abstract geometric elements: a large white square outline in the upper left, a smaller dark blue square in the top right, and a large dark blue square in the center-right. A white 'L' shape is positioned over the dark blue square, with a large white letter 'S' inside its vertical bar.

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# Aboriginal Archaeology and Cultural Heritage Impact Assessment



# Bylong Coal Project

## Aboriginal Archaeology and Cultural Heritage Impact Assessment

### Bylong Coal Project AACHIA - Mid Western Local Government Area

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## Executive Summary

RPS Australia East Pty Ltd (RPS) has been engaged by Hansen Bailey to prepare an Aboriginal Archaeology and Cultural Heritage Impact Assessment (AACHIA) as part of the *Environmental Impact Statement* (EIS) for the Bylong Coal Project (the Project).

The area the subject of this AACHIA is shown and delineated on **Figure 4**.

This AACHIA has been prepared in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011), the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010a) the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC 2005) and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010b).

Consultation with the Aboriginal community has been undertaken in accordance with the relevant Office of Environment and Heritage (OEH) guidelines. Registered Aboriginal Parties (RAPs) have been consulted for all aspects of the Project including the survey methodology and Aboriginal site recording and cultural feature recording and impact assessments as outlined below.

The archaeological site recording has been undertaken on Aboriginal objects which meet the Aboriginal Heritage Information Management System (AHIMS) site card criteria. Additionally, the RAPs have requested during the consultation process that areas be recorded if the RAPs considered the area had cultural significance. This request has been complied with and the areas considered by the RAPs to have cultural significance have been recorded and reported in this AACHIA. These areas have been labelled as cultural features. As they do not have tangible traces of Aboriginal use or occupation; AHIMS site cards are not being submitted for these cultural features. As a result of the survey and further discussions, 32 cultural features were identified by the RAPs (Section 6.0 and **Appendix 4**).

The Survey Area was investigated using archaeological pedestrian survey methods over a period of five weeks with representatives of the RAPs. At the commencement of the survey, there were 21 registered AHIMS sites within the Survey Area. As a result of the fieldwork, 218 previously unrecorded sites were identified in the Survey Area. Thus the total number of archaeological sites in the Survey Area is 239 when the 21 previously registered AHIMS sites are added.

It is noted that the total number of sites in the Survey Area differs from the number of sites in the Project Impact Boundary (which includes the area covered by the Project Disturbance Boundary and the Subsidence Study Area). This is due to the survey area being slightly larger than the Project Impact Boundary. As such there is a total of 216 Archaeological sites within the Project Impact Boundary. This includes 195 sites identified during the survey and 21 previously recorded AHIMS sites. Twenty-three previously unrecorded sites were located outside the Project Impact Boundary. These sites are reported on as part of the Survey Area results and AHIMS site cards have been prepared in accordance with OEH guidelines.

Thirty-two cultural features (32) were identified within the Project Impact Boundary and thus the total archaeological Aboriginal sites and cultural features combined in the Project Impact Boundary is 248 including 102 in the Project Disturbance Boundary and 146 in the Subsidence Study Area (note site RPS RS003 is outside the Project Impact Boundary, but requires management and mitigation measures to be applied for potential blasting impacts). The majority (90%) of the archaeological Aboriginal sites comprised surface artefacts (artefact scatters and isolated finds), while approximately 5% were rockshelters and the remainder were Potential Archaeological Deposits (some with artefacts), grinding grooves, modified trees and an ochre quarry.



Archaeological Aboriginal sites assessed to have high regional archaeological significance included the ochre quarry, three grinding groove sites and three rockshelters. The RAPs also indicated that these sites were of high cultural significance. Significance assessment of cultural features was a task undertaken by the RAPs. Cultural features of high significance included natural rock formations "Bird Head" and "Face," the other rock formations and rock cavities are of moderate significance (while this was the consensus, some RAPs did not agree on the validity or significance of some of the cultural features) (**Appendix 4**).

An impact assessment has been undertaken on the Aboriginal archaeological sites and cultural features. It has identified that 41 sites/features are at risk of impact from underground mining (11 archaeological sites and 30 cultural features) and 102 sites are at risk of impact in the Project Disturbance Boundary (100 archaeological sites and 2 cultural features). A significance assessment has been undertaken on all sites and features; and the results have been considered in the impact assessment. Approximately 42% of the sites/features are not anticipated to be impacted at all and approximately 40% of the sites/features with predicted impacts are of low regional archaeological significance. Thus approximately 83% of sites/features will either not be impacted, or are of low regional archaeological significance.

Mitigation and management measures have been devised for the sites/features which are proposed to be impacted. As the staging of impacts, as well as the nature of impact differs between the underground mining and the surface disturbance areas; the management strategy has been divided between mitigation measures for subsidence impacts and those for surface impacts.

It is recommended that 148 Aboriginal sites and cultural features be subject to management/recording measures prior to and during the proposed mining operations. Of these 144 archaeological Aboriginal sites and cultural features are to be mitigated due to potential impact (41 in the Subsidence Study Area, 102 in the Project Disturbance Boundary and one outside (but potentially affected by blasting)). Another 4 sites outside the Project Impact Boundary are to be subject to archival recording prior to the commencement of mining operations within the vicinity of these sites.

The ochre quarry (RPS Bylong OQ001) has been assessed as being of high regional significance. It is recommended that all reasonable and feasible actions be taken to avoid impacts to this site. If impacts cannot be avoided then engineering solutions to prevent rockfall and cracking are to be considered, in addition to the proposed full archival recording.

For underground mining, pre-mining mitigation is recommended for 45 sites (including archival recording of four sites not to be impacted). Ongoing monitoring of 32 sites/cultural features will need to be undertaken during and post-mining and the mitigation measures to be applied for 9 rockshelter sites will be dependent upon the results of the test excavations.

In relation to the Project Disturbance Boundary 102 sites/features will require management. This includes: excavation of two PADs, archival recording of two cultural features, controlled removal of three modified trees and 95 surface artefact sites will require collection. In addition, one rockshelter immediately adjacent to the Project Disturbance Boundary will require archival recording to develop a pre-mining condition to enable the impacts of blasting to be appropriately managed.

KEPCO is seeking State Significant Development Consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the development and operation of the Project and a sequential reinstatement/rehabilitation of the site to enable re-activation of agricultural uses. The State Significant Development Application will be supported by an Environmental Impact Statement (EIS) which is being prepared by Hansen Bailey.

The conclusions of the AACHIA are that it has:

- been carried out in accordance with the relevant statutory, regulatory requirements and policy Guidelines;

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- detailed the location, nature and extent of the survey and its findings in respect of the Aboriginal heritage already registered under the AHIMS criteria and those archaeological sites and cultural features identified in the survey;
- identified and assessed the significance of the archaeological sites and cultural features and identified; and
- assessed the possible nature and extent of the impacts, if any, on the archaeological sites and cultural features.

The AACHIA recommends the following actions to conserve, and mitigate impacts to, archaeological sites and cultural features:

- The ochre quarry (RPS Bylong OQ01) has been assessed as being of high regional significance. All reasonable and feasible action is to be taken to avoid impacts to this site. Where impacts cannot be avoided then engineering solutions to prevent rockfall and cracking are to be considered. Prior to the commencement of underground coal extraction with the potential to cause mine subsidence impacts, there is to be a full archival recording of the site.
- In the Subsidence Study Area, 45 sites/features will require pre-mining mitigation. Archival recording will be required prior to underground coal extraction for six sites (one ochre quarry, one rockshelter and four grinding grooves) and test excavation of 9 rockshelters. For the cultural features, 3 rock formations will need to be subject to an archival recording, plus inspection and subsequent recording of the 27 rock cavities. Monitoring of 32 sites/cultural features will need to be undertaken post-mining.
- One rockshelter (RPS RS003) will require archival recording to provide a baseline for the management of potential blasting impacts.
- In the Project Disturbance Boundary, 102 sites/features will require mitigation which includes: excavation of two PAD areas, archival recording of two cultural features, controlled removal of three modified trees and 95 surface artefact sites will require collection.
- An Aboriginal and Archaeological Cultural Heritage Management Plan (AACHMP) should be prepared in consultation with OEH and all RAPs and approved by the Department of Planning and Environment (DP&E). Section 9 sets out the key components and mitigation management measures recommended to be included in the AACHMP.
- The proponent should liaise with the RAPs regarding the provision of a Keeping Place for the storage of Aboriginal artefacts collected as part of the proposed Aboriginal archaeological salvage works. The location of the Keeping Place will be decided in consultation with the RAPs.
- Once mining operations and rehabilitation actions have been completed, the ongoing storage of the artefacts will be discussed with the RAPs; this conversation should include the option of returning artefacts back to their original locations, where feasible.
- Where practicable and consistent with safety arrangements, RAPs will be offered the opportunity to access areas of cultural value with protocols to be detailed in the AACHMP.

## Terms, Definitions and Abbreviations

Abbreviation/Term	Meaning
Aboriginal Culturally Modified Tree/ Scarred Tree	<p>"Means a tree that, before or concurrent with (or both) the occupation of the area in which the tree is located by persons of non-Aboriginal extraction, has been scarred, carved or modified by an Aboriginal person by:</p> <p>(a) the deliberate removal, by traditional methods, of bark or wood from the tree, or</p> <p>(b) the deliberate modification, by traditional methods, of the wood of the tree"</p> <p>NPW Regulation 80B (3). Culturally Modified trees are sometimes referred to as scarred trees.</p>
Aboriginal Object	<p>"Any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains" (DECCW 2010:18).</p>
Aboriginal Place	<p>"A place declared under s.84 of the NPW Act that, in the opinion of the Minister, is or was of special significance to Aboriginal culture" (DECCW 2010:18). Aboriginal places are gazetted by the minister.</p>
ACHCR	Aboriginal Cultural Heritage Consultation Requirements for Proponents.
AACHIA	Aboriginal Archaeological Cultural Heritage Impact Assessment.
AACHMP	Aboriginal and Archaeological Cultural Heritage Management Plan.
Activity	A project, development, or work (this term is used in its ordinary meaning and is not restricted to an activity as defined by Part 5 EP&A Act 1979).
AHIMS	Aboriginal Heritage Information Management System.
AHIP	Aboriginal Heritage Impact Permit.
ASIR	Aboriginal Site Impact Recording form
BP	Years before present as determined by radiocarbon dating. Sometimes these dates are calibrated (cal. years BP) this indicates a radiocarbon date has been calibrated using the dendrochronology curves, making the date more accurate than an uncalibrated date.
CHL	Commonwealth Heritage List
CHPP	Coal Handling and Preparation Plant.
DECCW	Department of Environment, Climate Change and Water (is now the Office of Environment and Heritage – OEH).
Disturbed Land	<p>"Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable." (DECCW 2010:18).</p>
DP&E	Department of Planning and Environment
Due Diligence	<p>"Taking reasonable and practical steps to determine whether a person's actions will harm an Aboriginal object and, if so, what measures can be taken to avoid that harm" (DECCW 2010:18).</p>
EIS	Environmental Impact Statement.
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i> .
EPRG	Environment Protection Regulation Group
Eol	Expression of Interest
GDA	Geodetic Datum Australia.
GIS	Geographic Information System.
GSE	Ground Surface Exposure.
GSV	Ground Surface Visibility.
Harm	<p>"Destroy, deface, damage an object, move an object from the land on which it is situated, cause or permit an object to be harmed." (DECCW 2010:18).</p>
LALC	Local Aboriginal Land Council.

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Abbreviation/Term	Meaning
LEP	Local Environmental Plan.
LGA	Local Government Area
MCoAs	Ministers Conditions of Approval
Mine Infrastructure Area	Boundary within which the surface infrastructure area will be located
ML	Mining Lease
Mtpa	Million tonnes per annum
MWRC	Mid-Western Regional Council
NES	National Environmental Significance
NHL	National Heritage List
NPW Act	NSW <i>National Parks and Wildlife Act 1974</i> (administered by OEH)
NPW Regulation	NSW <i>National Parks and Wildlife Regulation 2009</i> (administered by OEH)
NPWS	National Parks and Wildlife Service
OEH	Office of Environment and Heritage (formerly DECCW)
OEAs	Overburden Emplacement Areas
PAD	Potential Archaeological Deposit
Project Boundary	Encompasses all land which the Development Consent will apply to.
Project Disturbance Boundary	Actual area of disturbance within the Project Boundary which is comprised by the Open Cut Mining Area and Mine Infrastructure Areas
Project Impact Boundary	Refers to land within the Project Disturbance Boundary and the Subsidence Study Area
RAPs	Registered Aboriginal Parties
ROM	Run of Mine
SEARs	Secretary's Environmental Assessment Requirements
SSD	State Significant Development
Study Area	Study Area is the project study area
Survey Area	Survey Area is the land subject to archaeological survey
Subsidence Study Area	The area which may be affected by subsidence as a result of proposed underground mining operations.

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## 1.0 Introduction

RPS Australia East Pty Ltd (RPS) has been engaged by Hansen Bailey to prepare an Aboriginal Archaeology and Cultural Heritage Impact Assessment (AACHIA) as part of the *Environmental Impact Statement* (EIS) for the Bylong Coal Project (the Project).

The AACHIA comprises the Aboriginal heritage component. An historic heritage impact assessment has been completed by AECOM and will also be included within the EIS.

The AACHIA has been prepared in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011; Pearson 1981) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010a).

The key components of this report are:

- To identify what Aboriginal sites are at risk from subsidence effects;
- To identify what Aboriginal sites are at risk from surface works;
- To provide an impact assessment based on those findings;
- To provide recommendations to manage the predicted impacts;
- To outline key components, as well as mitigation and management measures to be considered in the Aboriginal and Archaeological Cultural Heritage Management Plan (AACHMP).

The purpose of this AACHIA report is to identify, assess and make recommendations on mitigation and management measures in respect to Aboriginal archaeological and cultural heritage values within the Project Disturbance Boundary and the Subsidence Study Area. The Project Disturbance Boundary includes the actual area of disturbance within the Project Boundary which comprises the Open Cut Mining Area and Mine Infrastructure Area. The Subsidence Study Area is the extent of coal to be extracted by underground mining methods and the area of resulting subsidence effects. For ease of reference this AACHIA will use Project Impact Boundary to refer to land within the Project Disturbance Boundary and the Subsidence Study Area. For purposes of the AACHIA, 'Survey Area' will refer to the area assessed for Aboriginal heritage, this includes primarily the Project Impact Boundary (Project Disturbance Boundary and Subsidence Study Area) as well as small portions of land which were surveyed immediately adjacent to these boundaries.

### 1.1 Background

In December 2010 KEPCO Bylong Australia Pty Ltd (KEPCO) acquired Authorisations (A) 287 and 342. Since that time, extensive exploration and mine planning work has been undertaken to determine the most socially responsible and economically viable mine plan to recover the known coal resources within the two Authorisations and to reinstate/rehabilitate the Project Area for a return to an agricultural land use.

In August 2014 KEPCO commissioned WorleyParsons Services Pty Ltd (WorleyParsons) to manage the Project exploration activities, mine feasibility study planning, environmental approvals and ongoing environmental monitoring for the Bylong Coal Project (the Project).

The Project is located wholly within A287 and A342 which are located within the Mid-Western Regional Council (MWRC) Local Government Area (LGA). The closest regional centre is Mudgee, located approximately 55 km south-west of the Project Boundary. The Project is approximately 230 km by rail from the Port of Newcastle. **Figure 1** illustrates the locality of the Project within New South Wales (NSW). **Figure 2** shows the regional locality of the Project in relation to the neighbouring town centres, mining authorities, major transport routes and reserves.

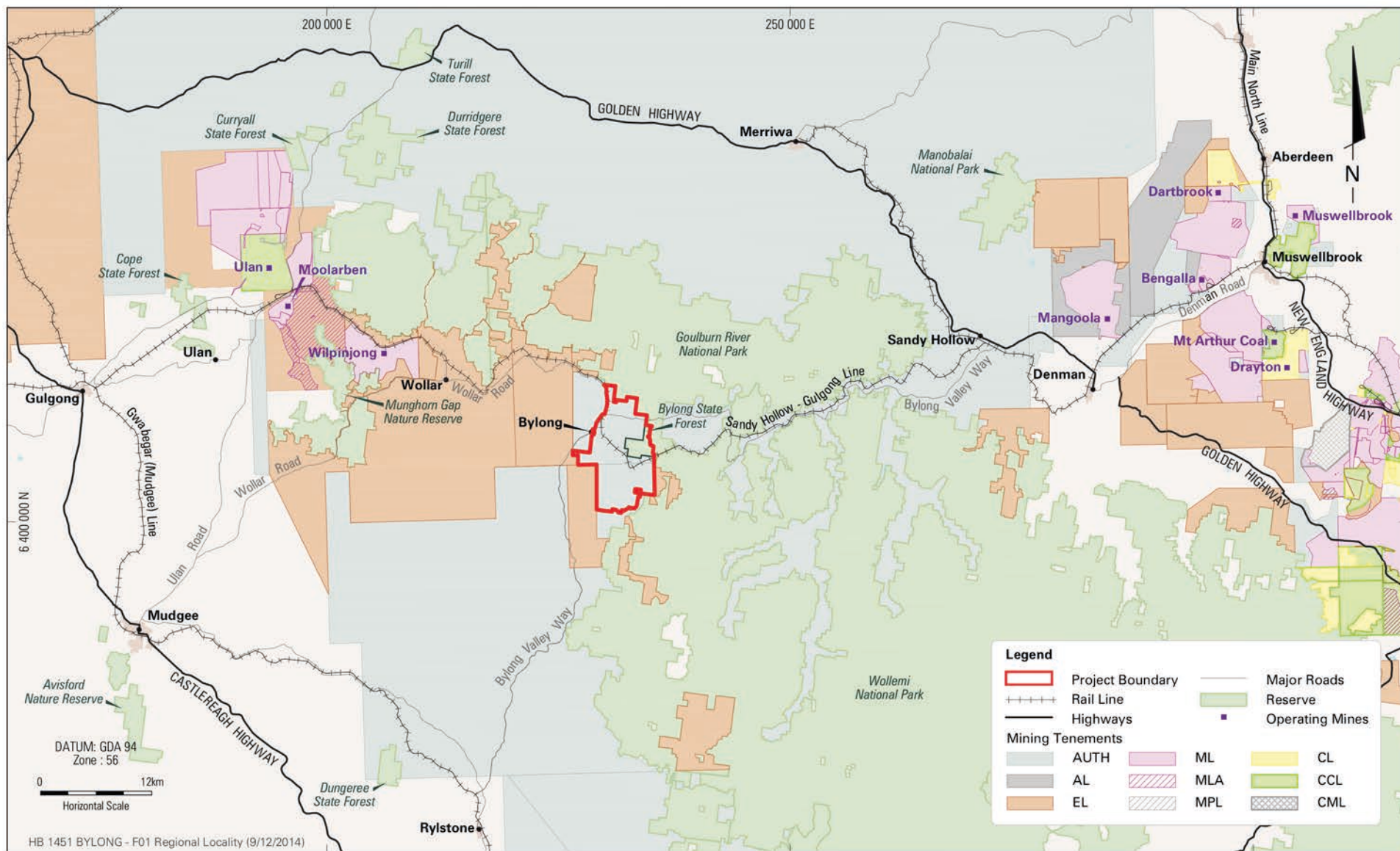


KEPCO is seeking State Significant Development Consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the development and operation of the Project. The State Significant Development Application will be supported by an Environmental Impact Statement (EIS) which is being prepared by Hansen Bailey.



BYLONG COAL PROJECT





BYLONG COAL PROJECT

## 1.2 Project Description

The Project life is anticipated to be approximately 25 years, comprising a two year construction period and a 23 year operational period, with underground mining operations commencing in Year 7. Various rehabilitation and decommissioning activities will be undertaken during both the course of, and following the 25 years of the Project. It is noted that further mineable coal resources exist within both A287 and A342.

The Project is to be developed on land within the Project Boundary as illustrated on **Figure 3**. Key features of the Project are conceptually shown on **Figure 3** and include:

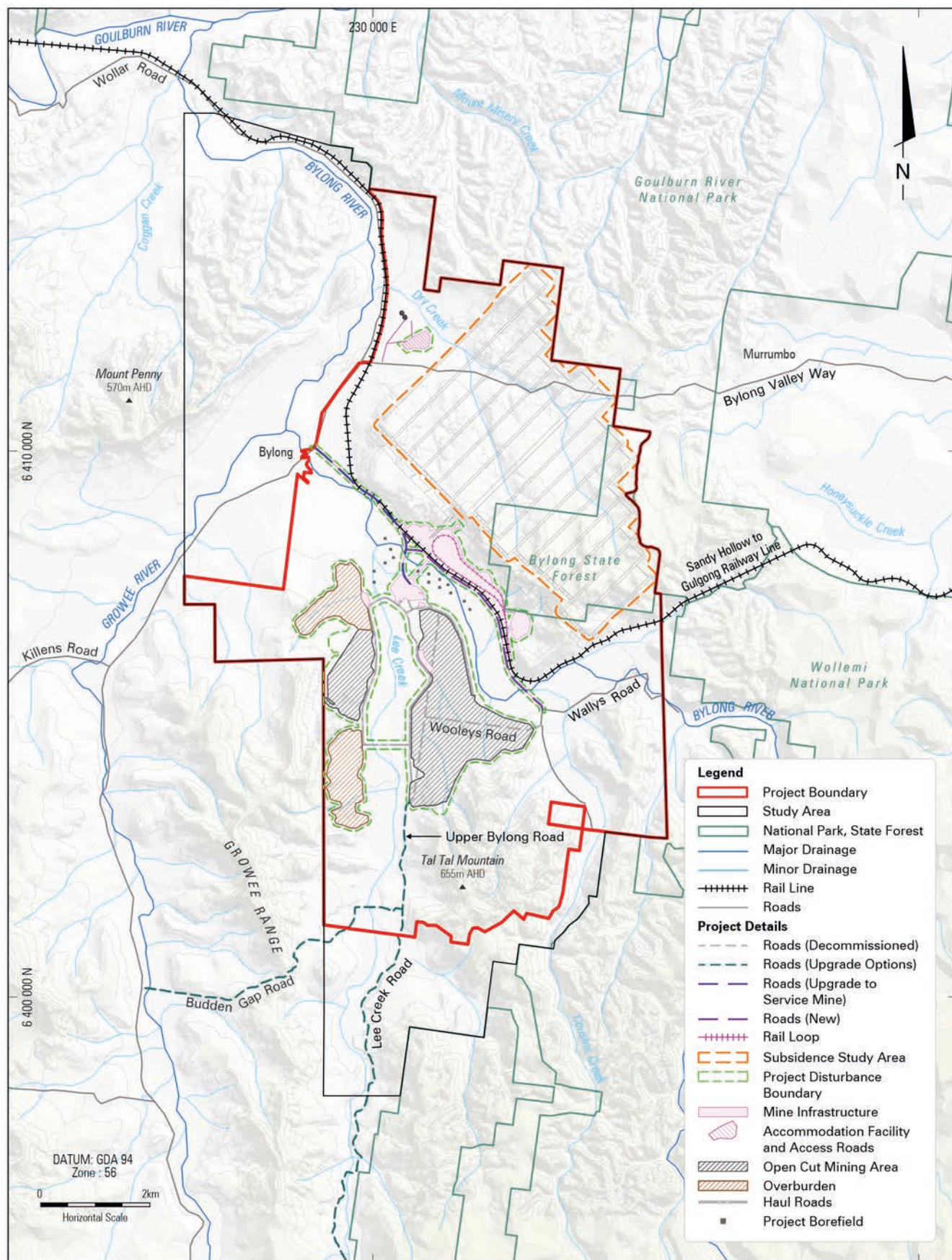
- The initial development of two open cut mining areas with associated haul roads and Overburden Emplacement Areas (OEAs), utilising a mining fleet of excavators and trucks and supporting ancillary equipment;
- The two open cut mining areas will be developed and operated 24 hours a day, 7 days a week over an approximate 10 year period and will ultimately provide for the storage of coal processing reject materials from the longer term underground mining activities;
- Construction and operation of administration, workshop, bathhouse, explosives magazine and other open cut mining related facilities;
- Construction and operation of an underground coal mine operating 24 hours a day, 7 days a week for a 20 year period, commencing mining in around year 7 of the Project;
- A combined maximum extraction rate of up to 6.5 Million tonnes per annum (Mtpa) Run of Mine (ROM) coal;
- A workforce of up to approximately 800 during the initial construction phase and a peak of 470 full-time equivalent operations employees at full production;
- Underground mining operations utilising longwall mining techniques with primary access provided via drifts constructed adjacent to the rail loop and Coal Handling and Preparation Plant (CHPP);
- The construction and operation of facilities to support underground mining operations including personnel and materials access to the underground mining area, ventilation shafts, workshop, offices and employee amenities, fuel and gas management facilities;
- Construction and operation of a CHPP with a designed throughput of approximately 6 Mtpa of ROM coal, with capacity for peak fluctuations beyond this;
- The dewatering of fine reject materials through belt press filters within the CHPP and the co-disposal of dewatered fine and coarse reject materials within OEAs and final open cut voids (avoiding the need for a tailings dam);
- Construction and operation of a rail loop and associated rail load out facility and connection to the Sandy Hollow to Gulgong Railway Line to facilitate the transport of product coal;
- The construction and operation of surface and groundwater management and water reticulation infrastructure including diversion drains, dams (clean, dirty and raw water), pipelines and pumping stations;
- The installation of communications and electricity reticulation infrastructure;
- Construction and operation of a Workforce Accommodation Facility (WAF) and associated access road from the Bylong Valley Way;
- The upgrade of Upper Bylong Road and the construction and operation of a Mine Access Road to provide access to the site facilities;
- Relocation of sections of some existing public roads to enable alternate access routes for private landholders surrounding the Project; and
- Infilling of mining voids, progressive rehabilitation of disturbed areas, decommissioning of Project



infrastructure and rehabilitation of the land progressively following mining operations.

**Figure 3** illustrates the Conceptual Project Layout.





BYLONG COAL PROJECT

Conceptual Project Layout

**FIGURE 3**

### 1.3 Compliance with the Heritage Components of the Secretary's Environmental Assessment Requirements (SEARs)

The SEARs for the Project were issued on 23 June 2014 (SSD14\_6367). An amendment to the SEARs was issued on 11 November 2014 in light of some minor amendments to the Project. This AACHIA has been prepared in accordance with the SEARs, as well as the agency requests from the Office of Environment and Heritage (OEH) during a meeting on 11 February 2015. **Table 1** below summarises the SEARs and agency requests relevant to Aboriginal heritage, as well as outlining the relevant section of this report where they have been addressed.

**Table 1 Compliance with Heritage Components of the SEARS**

SEARs	Addressed in this Report
<b>General Requirements</b>	
<b>Heritage</b> – including an assessment of the likely Aboriginal and Historic heritage (cultural and archaeological) impacts of the development having regard to OEH's and the Heritage Council of NSW's requirements (see Attachment 2);	This AACHIA addresses the Aboriginal component
<b>Agency Request – Heritage Council A/1906985 28/2/2014</b>	
The heritage significance of the Project area and any impacts the development may have upon this significance should be assessed. This assessment should include natural areas and places of Aboriginal, historic or archaeological significance. It should also include a consideration of wider heritage impacts in the area surrounding the site.	Sections 7 and 8
The proposal should have regard to any impacts on places, items or relics of significance to Aboriginal people. Where it is likely that the Project will impact on Aboriginal heritage, adequate community consultation should take place regarding the assessment of significance, likely impacts and management/mitigation measures.	Section 3 and Appendix 1
<b>Office of Environment and Heritage - DOC14/10656 18/2/2014</b>	
While OEH has no specific Aboriginal cultural heritage issues concerning the proposed Bylong project at this stage, the EIS will need to consider the detailed results of the Mt Penny assessments which established areas of high Aboriginal cultural heritage value.	Sections 7 and 8.8
1. A description of the Aboriginal objects and declared Aboriginal places located within the area of the proposed development.	Section 6
2. A description of the sensitivity (in relation to cultural heritage) of different landforms present in the landscape affected by the Project.	Sections 6 and 7
3. A description of the cultural heritage values, including the significance of the Aboriginal objects and declared Aboriginal places, that exist across the whole area that will be affected by the proposed development, and the significance of these values for the Aboriginal people who have a cultural association with the land.	Sections 2 and Section 7 and Appendix 1
4. A description of how the requirements for consultation with Aboriginal people as specified in clause 80C of the <i>National Parks and Wildlife Regulation 2009</i> have been met.	Section 3 and Appendix 1
5. The views of those Aboriginal people regarding the likely impact of the proposed development on their cultural heritage. If any submissions have been received as a part of the consultation requirements, then the report must include a copy of each submission and your response.	Section 3 and Appendix 1
6. A description of the actual or likely harm posed to the Aboriginal objects or declared Aboriginal places from the proposed activity, with reference to the cultural heritage values identified.	Section 8
7. A description of any practical measures that may be taken to protect and conserve those Aboriginal objects or declared Aboriginal places.	Section 10
8. A description of any practical measures that may be taken to avoid or mitigate any actual or likely harm, alternatives to harm or, if this is not possible, to manage (minimise) harm.	Section 10
9. Documentation of discussions with the Aboriginal stakeholders regarding commitments from the proponent related to social, economic and/or conservation gains to offset any loss of cultural heritage.	Section 3 and Appendix 1



SEARs	Addressed in this Report
10. A specific Statement of Commitment that the proponent will complete an Aboriginal Site Impact Recording Form and submit it to the Aboriginal Heritage Information Management System (AHIMS) Registrar, for each AHIMS site that is harmed through the proposed development.	Section 9

## 1.4 Project Team and Authorship

### 1.4.1 Authorship

This report has been prepared by suitably qualified heritage professionals in accordance with Section 1.6 and requirement 1 of the *Code of Practice for Archaeological Investigation* (DECCW 2010a:4,20). This report was prepared by RPS Cultural Heritage Consultants Tessa Boer-Mah, Gillian Goode and Kerrie Grant. The report was reviewed by Darrell Rigby, Cultural Heritage Technical Director.

## 1.5 Structure of this Report

Section 1.0 has outlined the purposes of this AACHIA and its compliance with the SEARs. The below provides a summary of the contents of the remaining sections of the report:

- Section 2.0 – Outlines the legislation and guidelines that apply to the protection and reporting of Aboriginal heritage sites.
- Section 3.0 – Outlines the Aboriginal consultation undertaken in accordance with the relevant OEH guideline, the *Aboriginal Cultural Heritage Consultation Requirements* (ACHCRs) (DECCW 2010).
- Section 4.0 – Outlines the environmental context of the Survey Area and its relevance to the assessment of Aboriginal heritage.
- Section 5.0 – Provides a summary of the relevant historic records of Aboriginal occupation, previous archaeological and heritage assessments, as well as the predictive model.
- Section 6.0 – Presents the survey methodology, the survey results and interpretation of survey results.
- Section 7.0 – Provides an assessment of archaeological significance and cultural significance of the Aboriginal heritage in the Survey Area.
- Section 8.0 – Incorporates the relevant sections of the subsidence report for the assessment of potential impacts from underground mining to the Aboriginal heritage sites identified, as well as providing an impact assessment for sites in the direct impact areas (open cut, stockpile and infrastructure areas).
- Section 9.0 – Outlines the management strategies for the Aboriginal sites.
- Section 10.0 – Provides conclusions arising from the archaeological investigation and outlines the salient points in the management strategy which are presented as recommendations.
- Section 11.0 – Contains the reference list for reports referred to in this report.
- Appendix 1 – Contains the documentation of the Aboriginal consultation.
- Appendix 2 – Contains the survey coverage and plates relating to the landform descriptions.
- Appendix 3 – Presents the individual Aboriginal archaeological site descriptions.
- Appendix 4 – Provides descriptions of the cultural features identified during the survey and discussed at the cultural values workshop.
- Appendix 5 – Provides copies of the site cards submitted to the AHIMS.
- Appendix 6 – Provides a copy of the Arborist report completed for the modified trees by UTMA.



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- Appendix 7 – Provides additional information on archaeological significance assessment
  - Appendix 8 - Contains the documentation of the subsidence report which was used as a basis for the impact assessment.

## 2.0 Legislative Context

This Project is being assessed primarily in accordance with the EP&A Act and it is under this process that the SEARs have been issued and, where relevant, addressed in this report. The legislation and regulations that protect Aboriginal heritage and historic heritage have also been outlined.

### 2.1 Commonwealth Legislation

#### 2.1.1 Environmental Protection and Biodiversity Act 1999

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (MNES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the MNES without approval from the Australian Government Environment Minister or the Minister's delegate. The definition of the environment under this act incorporates both natural and cultural elements. Under the EPBC Act heritage items can be listed on the National Heritage List (NHL) (for items of national significance) or the Commonwealth Heritage List (CHL) (for items owned by the Commonwealth). A search of the NHL and CHL confirmed that there are no heritage items in the Survey Area registered on these databases.

### 2.2 State Legislation

#### 2.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act regulates a system of environmental planning and assessment for NSW. Land use planning requires that environmental impacts are considered, including the impact on cultural heritage and specifically Aboriginal heritage. Within the EP&A Act, Parts 3, 4 and 5 relate to Aboriginal heritage.

Part 3 regulates the preparation of planning policies and plans. Part 4 governs the manner in which consent authorities determine development applications and outlines those that require an environmental impact statement. Part 5 regulates government agencies that act as determining authorities for activities conducted by that agency or by authority from the agency. The National Parks & Wildlife Service is a Part 5 authority under the EP&A Act.

Under Division 4.1 of Part 4 of the EP&A Act, a development may be declared a SSD if it meets specific criteria. The consent authority for a SSD is the Minister. Although under Section 23 of the EP&A Act, the Minister may delegate the consent authority function to the Planning Assessment Commission, the Director-General or to any other public authority.

An Aboriginal Heritage Impact Permit (AHIP) under section 90 of the National Parks and Wildlife Act 1974 (NPW Act) is not required for SSD in accordance with Section 89J (1) (d) of the EP&A Act. However, an EIS is still required for an SSD and SEARs issued will include provisions for the assessment and management of Aboriginal heritage, as well as consultation with the Aboriginal community.

The EP&A Act ensures that Aboriginal and historic heritage is properly assessed in land use planning and development.

### Aboriginal Cultural Heritage

Although there are a number of Acts and regulations protecting and managing Aboriginal archaeological and cultural heritage in NSW; the primary ones which apply to this Assessment include:

- *National Parks and Wildlife Act 1974* (NPW Act) (as amended);
- *National Parks and Wildlife Regulation 2009* (NPW Regulation); and
- EP&A Act.

In brief, the NPW Act (as amended) protects Aboriginal heritage (places, sites and objects) within NSW; the NPW Regulation provides a framework for undertaking activities and exercising due diligence.

### 2.2.2 National Parks & Wildlife Act 1974 (as amended)

The NPW Act (as amended) protects Aboriginal heritage (places, sites and objects) within NSW. Protection of Aboriginal heritage is outlined in Section 86 of the NPW Act, as follows:

- "A person must not harm or desecrate an object that the person knows is an Aboriginal object" – Section 86(1);
- "A person must not harm an Aboriginal object" Section 86(2); and
- "A person must not harm or desecrate an Aboriginal place" Section 86(4).

Penalties apply for harming an Aboriginal object or place. The penalty for knowingly harming an Aboriginal object (Section 86[1]) and/or an Aboriginal place (Section 86[4]) is up to \$550,000 for an individual and/or imprisonment for 2 years; and in the case of a corporation the penalty is up to \$1.1 million. The penalty for a strict liability offence (Section 86[2]) is up to \$110,000 for an individual and \$220,000 for a corporation.

**Harm** under the NPW Act is defined as any act that: destroys defaces or damages the object; moves the object from the land on which it has been situated; or causes or permits the object to be harmed. However, it is a defence from prosecution if the proponent can demonstrate 1) that harm was authorised under an AHIP (and the permit was properly followed), or 2) that the proponent exercised due diligence in respect to Aboriginal heritage. The '**due diligence**' defence (**Section 87(2)**), states that if a person or company has exercised due diligence to ascertain that no Aboriginal object was likely to be harmed as a result of the activities proposed for the Project Boundary; then liability from prosecution under the NPW Act will be removed or mitigated if it later transpires that an Aboriginal object was harmed. If any Aboriginal objects are identified during the activity, then works should cease in that area and OEH should be notified (DECCW 2010c:13). The due diligence defence does not authorise the continuation of harmful activities.

#### Notification of Aboriginal Objects

Under section 89A of the NPW Act, an Aboriginal object (or site) must be reported to the Director-General of OEH within a reasonable time (unless it has previously been recorded and submitted to AHIMS). Penalties of \$11,000 for an individual and \$22,000 for a corporation may apply for each object not reported.

### 2.2.3 National Parks and Wildlife Regulation 2009

The NPW Regulation provides a framework for undertaking activities and exercising due diligence with respect to Aboriginal heritage. The NPW Regulation outlines the recognised due diligence codes of practice which are relevant to this report, but it also outlines procedures for AHIP applications and ACHCRs (DECCW 2010b); amongst other regulatory processes.

### 2.2.4 Aboriginal Land Rights Act 1983

The purpose of this legislation is to provide land rights for Aboriginal people within NSW and to establish Local Aboriginal Land Councils (LALCs). The land able to be claimed by LALCs, on behalf of Aboriginal people, includes Crown Land that (according to Section 36):

- (1) Is able to be lawfully sold, leased, reserved or dedicated;
- (2) Is not lawfully used or occupied;
- (3) Does not comprise lands which, in the opinion of the Crown Lands Minister, are needed or are likely to be needed for residential purposes;
- (4) Are not needed, nor likely to be needed for an essential public purpose;
- (5) Does not comprise land under determination by a claim for Native Title; and
- (6) Is not the subject of an approved determination under Native Title.

Claims for land are by application by LALCs to the Office of the Registrar under the Aboriginal Land Rights Act (1983).

## 2.3 Local Government

### 2.3.1 Mid-Western Regional Local Environmental Plan 2012

The Project is within the Mid-Western Regional Council Local Government Area (LGA) and therefore falls within the provisions of the Mid-Western Regional Council Local Environmental Plan (LEP) 2012. This LEP includes provisions for the management and conservation of places and buildings of heritage significance and includes a schedule of local heritage items and places. Under Clause 5.10 (8) the council must: (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. These conditions have been met in the documentation contained in this report and through the ongoing process of Aboriginal consultation. No Aboriginal heritage items are listed in Schedule 5 Environmental Heritage to the LEP and no Aboriginal heritage items appear in the LEP heritage mapping for the Bylong area.

## 2.4 Heritage Best Practice Guidelines

The best practice guidelines most relevant to the heritage components of this Project are the ICOMOS Burra Charter and the Ask First guidelines.

### ICOMOS Burra Charter

The ICOMOS Burra Charter (Australia ICOMOS 2013) defines the basic principles and procedures to be followed in the conservation of cultural heritage in Australia. Article 2 declares “‘The aim of conservation is to retain the cultural significance of a place’ and must include provision for its security, its maintenance and its future.” The principles that are set out in the Burra Charter guide and inform the assessment of cultural significance of a place. Cultural Significance means aesthetic, historic, scientific, or social value for past, present or future generations. Significance assessments are a key tool in the management of cultural heritage resources through allowing managers to make informed decisions, especially in land use issues. Definitions of these concepts of significance are:

- Aesthetic value (visual aspects of site);
- Scientific value or research potential (rarity, quality and representativeness of site);
- Social value (spiritual, political and cultural aspects of site); and
- Historic value (aesthetic, scientific and social values combined).



Aesthetic value encompasses aspects of sensory perception including form, scale, colour, texture and material of the fabric. Scientific value is the importance of the item in relation into its rarity, quality or representativeness. Social value encompasses the spiritual, political, national or other associations to a majority or minority group. Historic value is the history of the place, its association with historic figure and/or its role in a historical event.

#### Ask First: A guide to respecting Indigenous heritage places and values

Ask First (2002) was commissioned by the Australian Heritage Commission to help Australians protect different aspects of their natural and cultural heritage places, and is intended to be complementary to the Australia ICOMOS Burra Charter and the Australian Natural Heritage Charter. Ask First is a practical guide for land developers, land users and managers, cultural heritage professionals and others who may have an impact on Indigenous heritage. The main focus of the guidelines is to emphasise that consultation and negotiation with Indigenous stakeholders is the best means of addressing Indigenous heritage issues. The guidelines also emphasise the need to comply with relevant Territory and Commonwealth Indigenous cultural heritage legislation and statutory authorities.

Ask First states that in recognising the rights and interests of Indigenous peoples in their heritage, all parties concerned with identifying, conserving and managing this heritage should acknowledge, accept and act on the principles that Indigenous people:

- Are the primary source of information on the value of their heritage and how it is best conserved;
- Must have an active role in any Indigenous heritage planning process;
- Must have input into primary decision-making in relation to Indigenous heritage so that they can continue to fulfil their obligations towards this heritage; and
- Must control intellectual property and other information relating specifically to their heritage, as this may be an integral aspect of its heritage value.



### 3.0 Aboriginal Community Consultation

OEH acknowledges that Aboriginal people are the primary determinants of the significance of their heritage and that Aboriginal people are to be involved in the Aboriginal cultural heritage planning process. Aboriginal people are the primary source of information regarding the value of their heritage and how this is best protected and conserved, and must be afforded control in the way cultural information (particularly sensitive information) is used. Aboriginal consultation is regarded as an integral part of the process of investigating and assessing Aboriginal cultural heritage (OEH 2011:2).

Aboriginal consultation is mandatory for the preparation of an AHIP application (clause 80C of the NP&W Regulation), for undertaking a test excavation (DECCW 2010a) and is usually required as part of the SEARs issued by the Department of Planning and Environment (DP&E). In cases when Aboriginal consultation is mandatory, the consultation process is stipulated in clause 80C of the NPW Regulation and is further specified in the ACHCRs (DECCW 2010b). As a general principal, OEH encourages consultation with Aboriginal people whenever there is uncertainty that a proposed activity could potentially harm Aboriginal objects or places.

Aboriginal consultation was undertaken as part of heritage best practice and is documented in **Appendix 1**.

#### 3.1 Aboriginal Cultural Heritage Consultation Requirements

The ACHCRs include a four stage Aboriginal consultation process that stipulates specific timeframes for components of each stage.

**Stage 1** requires that Aboriginal people who hold cultural information are identified, notified and invited to register an expression of interest in the assessment. This identification process should draw on reasonable sources of information including: the Registrar (*Aboriginal Land Rights Act*, 1983), the relevant OEH Environment Protection Regulation Group (EPRG) Regional Office, the Local Aboriginal Land Council(s), the National Native Title Tribunal, the Native Title Services Corporation Limited, the relevant Local Land Services branch and the relevant local council(s). The identification process should also include an advertisement placed in a local newspaper circulating in the general location of the Project. Aboriginal organisations and/or individuals identified should be notified of the Project and invited to register an expression of interest (Eol) for Aboriginal consultation. Once a list of registered Aboriginal parties (RAPs) has been compiled from the expression of interest process, they need to be consulted in accordance with Stages 2, 3 and 4 of the ACHCRs.

**Stage 2** requires that project information is provided to the RAPs by the proponent. Relevant project information may include an outline of the Project activities, proposed impact areas and environmental assessment process. The presentation of the Project information should be documented and include any agreed outcomes with the RAPs. In some instances, depending on the nature, scale and complexity of the Project, the proponent may create the opportunity for RAPs to visit the Project site and/or may conduct additional project information sessions.

**Stage 3** is concerned with the gathering of information regarding cultural significance. The aim is to facilitate a process by which RAPs can have input into the heritage assessment methodology and management options, and provide information on the cultural significance of Aboriginal objects or places. The proponent must provide a proposed methodology for the cultural heritage assessment and allow a minimum of 28 days to respond. If needed, protocols for the appropriate handling of culturally sensitive information may need to be developed with the RAPs. The proponent must also seek the views of the RAPs on potential management options for Aboriginal objects or places.

**Stage 4** requires that the proponent prepare a draft cultural heritage assessment report and provide a copy to the RAPs for comment. A minimum of 28 days must be provided for the RAPs to comment on the draft report. To finalise the report the proponent must consider the submissions made by the RAPs and include the proponent's response to each submission. The finalised report must be provided to the RAPs and the relevant Local Aboriginal Land Council.

### 3.1.1 Stage 1 Notification and Registered Aboriginal Parties (RAPs)

In accordance with Stage 1 of the ACHCRs, public notices were placed in the local print media (Hunter Valley News and the Mudgee Guardian (15 January 2014) **Appendix 1**. Letters were also sent to the Western Branch OEH regional office, the Mudgee and Wanaruah Local Aboriginal Land Councils, MWRC, Central Tablelands Local Land Services, the Native Title Tribunal and the Native Title Services Corporation Limited requesting the identification of interested Aboriginal groups. Letters were sent out inviting expressions of interest and as a result of conducting Stage 1 of the ACHCR process the following organisations have been identified as RAPs (**Table 2**).

**Table 2 List of RAPs compiled from the Stage 1 Aboriginal consultation process**

Organisation	Name of Representative	Date of Registration
AGA Services	Adam Sampson	4/02/2014
Aliera French Trading	Aliera French	Prelim via phone
Buddang	Larry Foley	13/02/2014 via phone
Cacatua General Services	Donna Sampson	4/02/2014
Culturally Aware	Tracey Skene	17/02/2014
Divine Diggers Aboriginal Cultural Consultants	Gary Perkins	17/01/2014
Gomery	David Horton	19/02/2014 via phone
Hecmo Consultants	Kerren Boyd	19/02/2014
JLC Cultural Services	Jenny-Lee Chambers	17/01/2014
Katrina McKinnon	Katrina McKinnon	14/02/14 via phone
Lower Hunter Wonnarua Cultural Services	Thomas Miller	25/02/2014
Mingaan Aboriginal Corporation	Helen Riley	20/02/2014
Mudgee Local Aboriginal Land Council	Tony Lonsdale	10/02/2014
Murong Gialinga	Debbie Foley	13/02/2014 via phone
North East Wiradjuri Company Ltd	Lyn Syme	6/02/2014
Paul Brydon	Paul Brydon	14/02/14 via phone
Ungooroo Aboriginal Corporation	Taasha Layer	7/02/2014
Wallangan Cultural Services	Maree Waugh	2/02/2014
Wanaruah Local Aboriginal Land Council	Noel Downs	6/02/2014
Warrabinga Native Title Claimants Aboriginal Corporation	Kristen Kerr	20/02/2014
Wellington Valley Wiradjuri Aboriginal Corporation	Bradley Bliss	14/02/2014
Kauwul Wonn1 Contracting	Arthur Fletcher	5/02/2014
Tocomwall (Yarrowalk)	Scott Franks	12/02/2014

### 3.1.2 Stage 2 and 3 Presentation of Information, Gathering Information and Assessment Methodology

A very robust and inclusive consultation strategy was taken for the presentation of information, gathering information and incorporating feedback on the assessment methodology. Feedback was sought throughout the consultation process and in addition the following opportunities were afforded to the RAPs:

- Feedback for the archaeological survey methodology on the basis of mailed information;
- A planning meeting was held prior to the survey; and
- A site visit was held prior to the survey to allow RAP representatives (including individuals who were not able to attend the survey) to gain an understanding of the Survey Area and identify areas of cultural sensitivity.

#### Archaeological Survey Methodology

Information regarding the proposed heritage assessment methodology and the strategy for collecting information on cultural heritage significance was provided in writing to the RAPs on 18 March 2014. Fourteen RAPs returned their comments on the methodology, 8 of which were received by the closing date and 6 afterwards (**Table 3**).

**Table 3 RAPs who responded to the methodology**

Organisation	Name of Representative	Date of Reply for Methodology due 15/04/2014
Paul Brydon	Paul Brydon	31/03/2014
Kauwul Wonn 1 Contracting	Suzie Worth	31/03/2014
AGA Services	Adam Sampson	5/04/2014
Cacatua General Services	George Sampson	5/04/2014
Wellington Valley Wiradjuri Aboriginal Corporation	Bradley R. Bliss	4/04/2014
Hecmo	Kerren Boyd	14/04/2014
Aliera French Trading	Wayne French	15/04/2014
Lower Hunter Wonnarua Cultural Services	Tom Miller	15/04/2014
Katrina McKinon	Katrina McKinon	14/04/2014
Buddang	Larry Foley	14/04/2014
Murong Gialinga	Debbie Foley	14/04/2014
Culturally Aware	Tracey Skene	17/04/2014
Divine Diggers Aboriginal Cultural Consultants	Gary Perkins	17/04/2014
Wallangan Cultural Services	Maree Waugh	17/04/2014

#### Planning Meeting

In addition, a pre-field work information session was conducted on 11 April 2014 and was attended by the RAPs listed in **Table 4**. The planning meeting outlined the assessment methodology, provided an overview of the Survey Area, outlined the logistics for the proposed survey and offered an opportunity for RAPs to provide input and feedback. Outcomes of the meeting included the requests by the RAPs to provide a weekly field report, to undertake a pre-survey site visit, to postpone the start date of the survey, to extend the time allocated to the survey and to record cultural features identified by RAP representatives.

All of these requests were complied with. Weekly field reports were prepared and distributed to the RAPs. The weekly reports provided a summary of the areas surveyed and types of sites identified during the course of the weekly survey.

The pre-site visit was arranged and undertaken on 2 May 2014. The survey start date was moved back 3 weeks and the field survey time was doubled from 2 weeks to 4 weeks. An additional week was added after the survey commenced because of the difficulty of terrain and to satisfy RAP concerns regarding coverage. The recording of cultural features was undertaken at areas identified by the RAPs to have cultural significance which did not necessarily involve material traces of Aboriginal occupation or land use practices.

**Table 4 RAPs who participated in the pre-fieldwork information session**

Organisation	Name of Representative
Cacatua Cultural Consultants	George Sampson
Gomerioi-Namoi Traditional Owners*	Narelle Miller on behalf of Stephen Talbot
Mudgee LALC	David Maynard, Chris Maynard, Shirley Maynard
Murong Gialinga	Debbie Foley
Buddang	Larry Foley
Wellington Valley Wiradjuri Aboriginal Corporation	Brendan Doherty
Wonn1 Contracting	Arthur Fletcher
Lower Hunter Wonnarua Cultural Services	Tom Miller
Wanaruah LALC	Suzie Worth
Wellington Valley Wiradjuri Aboriginal Corporation	Joyce Williams, Violet Carr, Brad Bliss, Brendan Doherty
Yarrawalk (Tocomwall)	Malcolm Franks
Katrina McKinnon	Katrina McKinnon, Robert Reid
Wallangan	Maree Waugh
JLC Cultural Services	Jenny Chambers, Lisa Whakin
AGA Services	Adam Sampson, Ashley Sampson
Divine Diggers	Deidre Perkins
North East Wiradjuri Company Ltd	Lyn Syme
Warrabinga Native Title Claimants Aboriginal Corporation	Robyn F. Williams
Culturally Aware	Tracey Skene
Ungooroo	Allen Paget
Dhuuluu Yala*	Brian Grant
HECMO Consultants	Kerren Boyd, Mitchum Neave

\*Note: Gomerioi-Namoi Traditional Owners and Dhuuluu Yala are not in the RAP list for fieldwork as part of the Project; however, they chose to attend the information session.

## Site Visit

As a result of discussions during the planning meeting, the opportunity for Aboriginal Elders and other RAP representatives to familiarise themselves with the Survey Area was provided. The invitation for this site visit was sent out on 17 April 2014 and the site visit of the Survey Area was undertaken on 2 May 2014.

A bus was provided to transport the RAP representatives around the Authorisations on the surfaced roads, stopping at convenient lookout points to discuss and view the survey areas in question. The first stop was on the south west boundary of the Authorisations where views across Bylong Valley to Mt. Penny could be observed. The next was in an open paddock at Gate 19 on Bylong Valley Way where the proposed underground mining operations were discussed. This area allowed views of the rolling hills and ridgelines to the north and the paddocks to the south of Bylong Valley Way could be viewed. Comment was made about the density of the pasture grasses across the Survey Area in relation to the process of surveying for the identification of Aboriginal objects. It was considered that such dense vegetation would inhibit full coverage of ground surface areas and therefore limit the identification of sites.

The bus then travelled past other areas of interest such as the proposed rail loop area, the proposed construction camp areas and various roads. The bus stopped near the proposed rail infrastructure area, close to the rail crossing on the corner of Upper Bylong Road. The next stop was along the road to the west of Tal Tal Mountain, from which good views across the paddocks and the cliffines of Tal Tal Mountain were afforded. The final stop was at the western end of Wooleys Road, where views were available to the north across the foothills elevated from the alluvial plains, which is the location of the proposed eastern open cut mining area.

**Table 5 RAPs who participated in the pre-fieldwork site visit**

Organisation	Name of Representative
Cacatua Cultural Consultants	George Sampson
Gomeri-Namoi Traditional Owners	Dean Miller
Mudgee LALC	David Maynard, Christine Maynard, Shirley Maynard
Wellington Valley Wiradjuri Aboriginal Corporation	Brendan Doherty
Wonn1 Contracting	Arthur Fletcher
Lower Hunter Wonnarua Cultural Services	Tom Miller
Wanaruah LALC	Suzie Worth

### Survey (5 weeks)

The original survey time allocated by RPS was 2 weeks. RAP representatives indicated, however, that they would like cultural features recorded. While the features did not necessarily involve or include material traces of Aboriginal occupation or land use practices; they were considered by the RAPs to be of Aboriginal cultural significance. RAP representatives also indicated they would like greater survey coverage of the area. Consequently, the survey was extended to 4 weeks and then by another additional week to address these RAP concerns. In total, 5 weeks was spent in the field and all potential impact areas were covered including the proposed underground area and the direct impact area including the open cut, stockpile and infrastructure areas. A list of RAP representatives who participated in the survey is provided in Table 6 and further documentation of the areas surveyed is provided in Section 6.0 and **Appendix 2**.

**Table 6 RAPs who participated in the investigation of the Survey Area**

Week	Dates of Survey	RAP Organisation	RAP representative
1	19 May – 23 May 2014	AGA Services	Adam Sampson
		Cacatua Cultural Consultants	George Sampson
		Wellington Valley Wiradjuri	Robert Stuart
		Yarrowalk/Tocomwall	Ricky Fields
		Wonn 1 Contracting	Arthur Fletcher
2	26 May – 30 May 2014	Wallangan Cultural Services	Maree Waugh
		Mudgee LALC	Christine Maynard

Week	Dates of Survey	RAP Organisation	RAP representative
		Culturally Aware	Tracey Skene
		HECMO Consultants	Martin Salvador
		Gomery	David Horton
3	2 June – 6 June 2014	Divine Diggers	Deidre Perkins
		JLC Cultural Services	Leigh Chambers
		North East Wiradjuri	Coral Williams
		Buddang	Larry Foley
		Murong Gialinga	Steve Flick
		Katrina McKinnon	Rob Reid
4	10, 11, 12 June & 16-17 June 2014	Wanaruah LALC	Luke Hickey
		Ungooroo Aboriginal Corp	Allen Paget
		Warrabinga NTCA	Coral Williams
		Aliera French Trading	Wayne French
5	23 June – 27 June 2014	AGA Services	Adam Sampson
		Cacatua Cultural Consultants	George Sampson
		Ungooroo Aboriginal Corp	Allen Paget
		Divine Diggers	Deidre Perkins
		Murong Gialinga	Larry Foley

### Cultural Values Assessment and Discussion Sessions

An opportunity was provided in writing (26 June 2014) for RAPs to comment on the cultural values associated with the Project and the Aboriginal sites/features identified. RAPs were invited to provide information on cultural values by phone, in writing or via a meeting.

In order to streamline the process a number of meetings were held on 3 and 4 of July 2014. These sessions were run as small workshops to ensure that RAP representatives had ample opportunity to comment on cultural values. Some RAPs, however, provided information by phone, as detailed in the Aboriginal Consultation Log (**Appendix 1**).

At the beginning of each session, the outline of the topics to be discussed was presented by the RPS Cultural Heritage Manager, Tessa Boer-Mah. The topics discussed were: the cultural features identified during the survey, the cultural value of archaeological sites, any information about cultural values and preliminary discussions around potential offset for the proposed impact to cultural values.

This was followed by a review of the individual cultural features that had been recorded during the survey. These were features that did not have any archaeological evidence of Aboriginal occupation or activity. This was led by the archaeologist that had managed the teams throughout the entire survey program, RPS Archaeologist Kerrie Grant. Each cultural feature was discussed with all session attendees and comments were made on the validity of these cultural sites.

Archaeological sites such as the ochre quarry, modified trees, rockshelters and grinding grooves that were recorded on the survey were communicated by some of the RAPs to be of high cultural significance and further details are provided in Section 7.

The final topic was a preliminary discussion on potential offsets for impacts to cultural values. Some of the proposals included salvage of surface artefacts, subsurface testing of PADs, full recording of rockshelters and



cultural sites, a Keeping Place to be constructed within the Project Boundary, seed collecting opportunities for future rehabilitation phases, contributions to the Cultural Centre in Wellington, employment for Aboriginal people at the mine site, access for all RAPs to biological offset lands and education about Aboriginal culture in the area. Further information is provided in **Appendix 1**. **Table 7** lists the RAPs who participated in the cultural values discussion sessions.

**Table 7 RAPs who participated in the Cultural Values Discussion Sessions**

Organisation	Name of Representative	Dates
Wellington Valley Wiradjuri	Brad Bliss	3 July 2014 Session 1
Wellington Valley Wiradjuri	Brendon Doherty	3 July 2014 Session 1
Wellington Valley Wiradjuri	Violet Carr	3 July 2014 Session 1
Wellington Valley Wiradjuri	Joyce Williams	3 July 2014 Session 1
JLC Cultural Services	Jenny Chambers	3 July 2014 Session 3
JLC Cultural Services	Leigh Chambers	3 July 2014 Session 3
North West Wiradjuri	Lyn Syme	3 July 2014 Session 3
North West Wiradjuri	Kevin Williams	3 July 2014 Session 3
North West Wiradjuri	Coral Williams	3 July 2014 Session 3
WONN 1 Contracting	Arthur Fletcher	3 July 2014 Session 4
Mudgee LALC	Tony Lonsdale	3 July 2014 Session 4
Mudgee LALC	Alicia Lonsdale	3 July 2014 Session 44
Murong Gailinga	Larry Foley	4 July 2014 Session 5

### 3.1.3 Stage 4 Review of Draft Report

The draft report was distributed to the RAPs on 19 December 2014 for review and comment. The RAPs were allocated a period of 6 weeks to provide any feedback and comments before 30 January 2015. In addition to contact details being provided for the purposes of discussing the report on the phone, a meeting opportunity was provided at the Project on 20 January 2015 to discuss the contents and outcomes of the report and any comments from the RAPs. The outcomes of these meetings were minuted. All RAP responses are provided in **Appendix 1** and summarised below.

Ten RAP responses were received in writing and four RAP responses documented as part of the draft report meetings (two of these RAPs also provided feedback in writing). Seven RAPs provided feedback over the phone of which four agreed with the report and three explained that they did not have any comments on the report.

Sixteen RAPs provided comment on the draft AACHIA and three indicated they had no comments on the report. Nine RAPs did not provide comments. Of the 16 RAPs who provided comments 11 indicated they were satisfied with recommendations and contents of the draft report, subject to additional feedback (**Appendix 1**). All feedback was considered and incorporated into the report, where possible.

**Table 8 Feedback on the Draft Report**

Date	Organisation	Feedback
4/1/2015	Buddang	Raised an issue with the extent of survey coverage, further discussed in meeting on 22/1/2015 and compromise reached in relation to additional site inspections to occur during the preparation and implementation of the AACHMP.
6/1/2015	Murong	Raised an issue with the extent of survey coverage, further discussed in meeting on 22/1/2015 and compromise reached in relation to additional site inspections to occur during the preparation

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Date	Organisation	Feedback
		and implementation of the AACHMP.
8/1/2015	Yarrowalk	No comment
15/1/2015	Gomery	No comment
15/1/2015	Paul Brydon	No comment
20/1/2015	Buddang, Cacatua, (Group 1)	Meeting: Agrees with recommendations of draft report, have added more suggestions as per meeting minutes
20/1/2015	Group 2 – no attendees	
20/1/2015	Mudgee LALC (Group 3)	Meeting: Agrees with recommendations of draft report, have added more suggestions as per meeting minutes
23/1/2015	Wellington Valley Wiradjuri Aboriginal corporation	Had additional suggestions for draft report, incorporated where practicable and in accordance with the OEH guidelines
30/1/2015	Northeast Wiradjuri	Had additional suggestions for draft report, incorporated where possible
30/1/2015	JLC	Agrees with the report in general, does not agree with the project, raised issue of survey coverage, addressed in further work for AACHMP
30/1/2015	Divine Digger Aboriginal Cultural Heritage Consultants	Agrees with report, but would like artefacts and sites to be salvaged
30/1/2015	Wanaruah LALC	Agrees with recommendations of the draft report, subject to additional suggestions, incorporated where possible
30/1/2015	Wonn1	Agrees with recommendations of the draft report, subject to additional suggestions, incorporated where possible
2/2/2015	Mudgee LALC	Agrees with draft report, subject to additional feedback
2/2/2015	Warrabinga NTCAC	Had additional suggestions for draft report, incorporated where possible



## 4.0 Environmental Context

An understanding of environmental context is important for the predictive modelling and the archaeological interpretation of Aboriginal sites. It can provide insight into why Aboriginal people occupied certain areas of the landscape. The local environment provided natural resources for Aboriginal people, such as stone (for manufacturing stone tools), food and medicines, wood and bark (for implements including shields, spears, canoes, bowls and shelters), as well as areas for camping and other activities. The nature of Aboriginal occupation and resource procurement is inextricably linked to the local environment and, therefore, needs to be considered as part of the cultural heritage assessment process. This section of the report must be included, in compliance with the relevant OEH guidelines (DECCW 2010a:8&9; OEH 2011:5).

### 4.1 Geology

Aboriginal people often made stone tools using siliceous, metamorphic or igneous rocks and as such, an understanding the local geology can provide important information regarding resources in a local area. The nature of stone exploitation by Aboriginal people depends on the characteristics of the source, for example whether it outcrops on the surface (a primary source), or whether it occurs as gravels (a secondary source) (Doelman, Torrence et al. 2008).

There are five geological groups within the Survey Area, including: Narrabeen group, Singleton Supergroup, Widden Brook Conglomerate, Quaternary Alluvium, and Tertiary Volcanic Flows.

The geology of the Bylong Valley area (Department of Mines 1969) is typified by:

- The sandstone, quartz and mudstone clastic sediments of the Triassic Narrabeen Group in the steep escarpment area to the north east;
- The Permian Singleton Coal Measures and Shoalhaven Coal Measures (tuff, shale, mudstone conglomerate, sandstone and coal seams that occur across the Survey Area;
- The interbedded sandstones and siltstones, conglomerate and claystones of the Widden Brook conglomerate that generally occur in the mid slope and lower slope areas particularly to the north east and south east;
- Quaternary alluvial sand, silt, clay and gravel, together with colluvial and residual sediments that occur along the creek lines in the Bylong Valley; and
- Tertiary olivine and tholeiitic basalt flows, porphyritic ankaramite basalt, trachyte, teschenite, dolerite and microsyenite with occasional interbedded sediments are generally found in the central and eastern part of the Survey Area.

The presence of sandstone in the Survey Area is particularly important for Aboriginal occupation, as sandstone was commonly used for grinding stone artefacts, or for crushing substances such as ochre and seeds. Grinding groove sites only occur on high quality sandstone which does not have pebble inclusions and is not friable, they generally occur near water sources such as creeks. Sandstone often weathers forming rockshelters, locations which were often occupied by Aboriginal people. Rock engravings and paintings are sometimes associated with rockshelters, however, they only occur on suitable rock faces, namely those which are not friable and do not have pebble inclusions. The surrounding geology suggests that there were stone raw materials available which may have been used by Aboriginal people for the manufacture of tools, these include: quartz, mudstone, tuff and volcanic rocks.

## 4.2 Soils

The Bylong Valley comprises a number of soil landscapes:

- The alluvial flats, terraces and channel benches of the Bylong River, Growee River, Dry Creek and Lee Creek are characterised by the Bylong soil landscape, with topsoils to 30 centimetres (Kovac and Lawrie 1991:129);
- The undulating rises and low hills with broad shallow valleys are covered by the Growee soil landscape with red, yellow and brown solodic soils on the upper slope, mid slope and lower slope respectively. Topsoils range from 10 centimetres to 45 centimetres in depth (Kovac and Lawrie 1991:197);
- The Ogilvie soil landscape occurs on the steep hills and escarpments. Sandstone and conglomerate outcrops form cliffs. Shallow loams and sands are the main soils to 15 centimetres in depth, with brown solodic soils to 35 centimetres in depth on the lower parts of slopes (Kovac and Lawrie 1991:304);
- The Lees Pinch soil landscape covers rolling to steep hills in the mountains in the south of the Survey Area. The soils include yellow and grey soloths with topsoils to depths of 20 centimetres; brown and yellow earths to depths of 60 centimetres; yellow podzolic soils to 35 centimetres; and earthy sands to 60 centimetres (Kovac and Lawrie 1991:243);
- The Benjang soil landscape occupies much of the Survey Area, predominantly on the mid and upper slope areas. Red, yellow and brown solodic soils occur on the steeper benched country with topsoils to a maximum depth of 45 centimetres, while brown podzolic soils 22-70 centimetres deep occur on upper slopes, with non-calcic brown soils on the lower portions of longer flat slopes to a depth of 12 centimetres. Siliceous sands are found on quartz sandstone bedrock (Kovac and Lawrie 1991:91);
- At high elevations, the crests and upper slopes are covered by the Bald Hill soil landscape, found in the east of the Survey Area. Euchrozem-chocolate soil intergrades with shallow stony loams to 25 centimetres are the main soils on crests and very shallow chocolate soils occur on the lower slopes to only 3 centimetres in depth (Kovac and Lawrie 1991:70); and,
- The Sandy Hollow soil landscape also occurs in the south of the Survey Area, and consists of red and yellow solodic soils to depths of 54 centimetres on the upper and mid slopes and yellow and brown solodic soils in the lower slopes 25 centimetres to 54 centimetres. Alluvial soils occur along major drainage lines (Kovac and Lawrie 1991:356).

The Survey Area is characterised by duplex soils with clear to sharp horizon boundaries. The A horizon soils are generally shallow and therefore have low potential to contain stratified archaeological material. The clay and stony B horizon soils are often severely eroded from the effects of water runoff and sheet wash erosion; the A horizon soils may be redeposited in the lower slope areas on a previously eroded B horizon (Kovac and Lawrie 1991:449). It is expected that any artefacts present in the area would be atop the exposed B horizon or in the shallow A horizon soils. A horizon soils generally occur close to creek lines, with exposed B<sub>1</sub> soils dominating the areas where trees have previously been cleared.

## 4.3 Topography and Hydrology

The purpose of the following summary is to provide an indication of the water sources which may have been available to Aboriginal people in the past based on the topography and hydrology of the landscape. It does not replace more detailed surface water and groundwater studies.

The Survey Area is located in the Bylong Valley in the Central Goulburn Valley Topographic Zone (Kovac and Lawrie 1991:9). The topography of the region is characterised by high ridges and sandstone escarpments (Mount Penny in the northwest, the Bylong State forest in the east, and Tal Tal Mountain in the south). The Bylong River running north-south is the main watercourse and is fed by major tributaries including Growee River and Lee Creek in the south west and to a lesser extent Dry Creek in the north east. The high

ridges/sandstone escarpments and the river form the Bylong Valley which has a north-south orientation. It is wider in some areas, with undulating lowlands on less resistant Permian rocks fringed by steep escarpments (Kovac and Lawrie 1991:7). High order watercourses or areas where water is permanently available are present in the general locality of the Survey Area and would have been important areas for obtaining drinkable water; therefore the regional and local area would have been suitable for occupation.

#### 4.4 Flora and Fauna

The purpose of the following summary is to provide an indication of the types of flora and fauna which may have been available to Aboriginal people as sustenance and raw material resources in the past and does not replace more detailed ecological studies which have been completed as part of the EIS.

The Survey Area is within the Western Slopes Dry Sclerophyll Forests vegetation community in the east (Keith 2006: 166-167) and the North-West Slopes Dry Sclerophyll Woodlands vegetation community in the west (Keith 2006: 136-137). In addition to this there is also Sydney Hinterland Dry Sclerophyll Forest present in a small area to the south (Keith 2006: 148-149). These vegetation communities are likely to have been similar when Aboriginal people occupied the landscape in the past; the landscape would have been characterised by a number of eucalypts and cypress pines which range in height from 10 to 25 metres tall, as well as sclerophyll shrubs and native grasses.

The Dry Sclerophyll Forests and associated landforms, such as rocky outcrops, cliffs and gorges, provide an important habitat for animals that specialise in using these environments, including some rare species. Populations of honey and nectar-eating birds and mammals are commonly present including parrots, possums, gliders and the Brown Antechinus. Snakes, lizards and larger mammals such as kangaroos and wallabies are also present within these vegetation communities (Keith 2006:120-121). The bones of such animals have been recovered from excavations of Aboriginal sites suggesting that they were sources of food (Attenbrow 2003:70-76), although the hides, bones and teeth of some of the larger mammals may have been used for Aboriginal clothing, ornamentation, or other implements.

#### 4.5 Land Use and Disturbance

The alluvial plains of the Bylong Valley are predominately used for agricultural purposes. Land use disturbance includes cropping, tracks, fencing and farm buildings, as well as more major land modifications in some areas, including the construction of dams and contour banks. In the northern portion of the Survey Area, land has been cleared to be used for pasture and cattle grazing. In addition, a rock quarry has been excavated in the north eastern parts of the Survey Area to the south of Bylong Valley Way. With the exception of steep areas, the majority of the Survey Area has been subject to land clearing since initial 1820s occupation of the area by Europeans. This has led to the erosion of topsoils (A horizons) which consequently limits the potential for archaeological deposits in the open areas.

#### 4.6 Climate

The Bylong Valley typically experiences higher rainfall during the summer months, as well as warmer temperatures (**Table 9**). By contrast winter experiences lower rainfall and lower temperatures. This pattern is similar to those experienced throughout this part of NSW and other adjacent areas. Taking into account the hydrology of the area Bylong River and Lee Creek are more likely to experience flooding during the summer months due to increased rainfall. Water is also more likely to pool in sandstone depressions along the ephemeral drainage lines during the summer rains.

Table 9 Climate Data for Bylong Area Monthly Averages

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Rainfall (mm) <sup>1</sup>	85.3	75.2	53.8	35.0	43.0	36.9	38.3	43.7	39.5	57.0	60.3	70.0
Mean Temperature (degrees Celsius) <sup>2</sup>	23.9	22.5	19.9	16.7	12.8	9.6	9.1	10.9	14.1	17.0	19.7	21.9

<sup>1</sup> Kerrabee (Murrumbo) Weather station

<sup>2</sup> Nullo Mountain Weather Station

Maximum in red and minimum values in blue

#### 4.7 Synthesis of Environmental Context

There is ample water and natural resources in the Bylong Valley area which may have been used by Aboriginal people as drinking water and thus was a suitable locality for Aboriginal occupation. Basalts, tuffs and mudstone present in the geological landscape may have been used for the production of Aboriginal stone tools. Given the wide valley with sufficient drinking water, it would be expected that Aboriginal habitation would be common on the valley floor, and more detail on this is provided in Section 5.6. Due to the flatness of the terrain, in particular between the Bylong River and Lee Creek, the area is likely to have been used as a transit route between the Goulburn River Valley to the north and the uplands associated with the Wollemi area. Rockshelters may be present on ridgelines where there is suitable outcropping sandstone.

## 5.0 Aboriginal Heritage Context

The Aboriginal heritage assessment process requires the review of previous archaeological and heritage reports. It is also important that Aboriginal sites are contextualised within the local and regional landscape as part of the assessment of significance. The Aboriginal heritage context is also needed in order to develop a predictive model of Aboriginal sites in the Survey Area. Historical information provides further information for the interpretation of archaeological sites, evaluations of their significance and formulation of practical management considerations as appropriate.

### 5.1 Historic Records of Aboriginal Occupation

#### 5.1.1 Ethnography

Ethnographic information, especially early post settlement records, used to interpret the archaeological record needs to be viewed with some caution because they can be biased and may be deeply prejudiced, particularly in relation to lifestyle, social practices, community interactions, religion and other facets of Aboriginal life (L'Oste-Brown, Godwin et al. 1998). It is important to recognise the possible bias when using early European accounts that describe the lifestyles of Aboriginal people, particularly the interpretation of their daily life and beliefs. Nonetheless, some of these ethnographic records can provide important information and insight on local Aboriginal customs and cultural materials evidenced during the early years of European settlement. Seeking a clearer understanding of cultural significance is imperative to achieving practical and realisable outcomes for the conservation of significance. As the abovementioned authors note in a similar paper "*Given that cultural heritage management is at one level a question of land management, there was a need to link it more effectively to broader land management principles and processes*" (Godwin, Morwood et al. 1999:29).

#### The Traditional Owners

Historic records suggest that the general area of Bylong is within Wiradjuri country, but is also closely aligned with Wanaruah country. Thus a summary of traditional practices of both these groups of traditional owners is provided below.

#### Wiradjuri Culture Traditional Implements, Food Gathering and Practices

The Wiradjuri group is the largest Aboriginal language group in NSW, the meaning of which is 'people of the three rivers,' referring to the Macquarie (Wiradjuri name: *Wambool*), Lachlan (Wiradjuri name: *Kalari*) and the Murrumbidgee rivers (National Parks and Wildlife Service NSW 2003).

Research into the Wiradjuri occupation practices suggests that seasonal movements were more limited than some other areas of Australia and that family groups had a territory spanning 40-60 kilometres in which they hunted and procured food resources (Pearson 1981). People caught fish, yabbies and freshwater mussels in the rivers, creeks and waterholes in the region; as well as hunting ducks, snakes, lizards, kangaroos, emus and echidnas. Plant foods included berries, seeds, roots, pods, bulbs and greens and evidence for processing such food is commonly found in the form of grindstones and grinding surfaces (Clayton 1985).

Camps along rivers and watercourses, occupied by groups of 50 to 60 people, were common and huts were constructed for shelter using grass-thatch. Huts would be waterproofed with clay or skins for occupation during the winter months. Wooden implements described in historical accounts include "boomerangs, nullanullas, bundies, heilamans" (Mathews 1896). Nullanullas (also Nulla Nulla) are Aboriginal hunting sticks/clubs with an enlarged end. Heilamans are small wooden shields usually made of hardwood.

## Wiradjuri History After European Contact

First European contact with the Wiradjuri is documented from 1817 when the surveyor General John Oxley conducted an expedition along the Lachlan River. George Cox and William Lawson between 1821 and 1822 surveyed the Cudgegong River district. As early as 1819 pastoralists began entering the Wellington Valley area and a convict stock station was established in 1823 (Pearson 1981). In 1822 the colonial administrators presented the chiefs of the five Bathurst tribes with 'King Plates' in an attempt to gain co-operation. Such gestures, however, were short lived and conflict between the Wiradjuri and pastoralists became serious enough for Governor Brisbane to declare a state of martial law in August 1824 (Read 1981).

Reverend William Watson established a Christian mission and school for the Wiradjuri at Wellington in 1832. In 1837 Reverend Jakob Gunter and his wife Lydia arrived in Wellington and in 1840 they took over running the mission from William Watson until it was disbanded in 1843. During his years in Wellington, Reverend William Watson compiled a Wiradjuri grammar which was published in 1892 by J. Fraser (Gunter Journal [1838] 1990).

By the end of the 1840s, many Wiradjuri people were living and working on European-run stations. In the early 1900s further encroachment into Wiradjuri country occurred as a result of the gold rush.

## Wonnarua Traditional Implements, Food Gathering and Practices

Fawcett (1898:152) provided a detailed description of the Wonnarua (also spelled as Wanaruah) weapons and implements including the spear, woomera or throwing stick, shield, boomerang (both returning and non-returning), tomahawk or hatchet, flint knife, chip of flint or shell for skinning animals, club, yam stick for digging, bags of plaited swamp grass, wooden bowls, nets for catching fish and bark canoes.

Miller (1886:352) recorded that kangaroos, emus and reptiles were used as sources of protein and described how a variety of roots, most importantly that of the water lily, were roasted and eaten. Fawcett (1898:152) stated that wallabies, bandicoots, kangaroo rats, opossums [sic], rats, snakes, lizards, fish, shellfish, caterpillars, grubs, larvae of wasps, other insects and birds were used by the Aboriginal people as food resources.

W.J. Needham (1981) conducted interviews and research which resulted in a comprehensive study of Aboriginal sites in the Cessnock - Wollombi area. He describes *Xanthorrhoea australis* (grass tree), which is found in the Singleton area, as being an important resource (Needham 1981). Various parts of the grass tree were useful to make spear shafts, for sealing cracks in canoes and for securing stone tips in hunting spears (Needham 1981). It was also used to produce fire when two pieces of the dried flower stem were rubbed together (Needham 1981).

J.W. Fawcett (1898:152) described the preferred campsites of the "Wonnah-ruah [sic]" tribal district in the Hunter River catchment area as being located close to fresh water and food resources. A vantage ground was also favourable as a precaution against attacks on the camp.

The materials used to construct the campsites and shelters were made from organic matter which is highly unlikely to have been preserved in the archaeological record.

Fawcett (1898:153) also provided a description of the huts constructed for shelter. These huts were generally erected using forked sticks planted in the ground with straight sticks laid in the forks and covered over with sheets of bark sourced from local trees.



Summer weather and the milder days of autumn and spring required little in the way of protective clothing; winter however, saw the use of animal skins for both clothing and as blankets (Heath n.d.:43). Miller (1886:352) describes Aboriginal people using possum skin cloaks with an ornamental nautilus shell suspended around the neck on a string.

### **Wonnarua History After European Contact**

In the late nineteenth century a number of writers described the Aboriginal peoples of the Hunter Valley. J W Fawcett (1898:152) described the "Wonnah-ruah [*sic*]" tribal district as that area drained by the Hunter River and its tributaries which covered some 2,000 square miles. He estimated the population in 1848 to have numbered between 500-600 peoples and provides details of some of their customs and dialect. This estimate of the population is similar to that reported by Robert Miller (1886:352) who quotes an informant from the Hunter River district as estimating the Wonnarua population in 1841 as being around 500 individuals. Miller also noted that by 1886 the population was almost extinct [*sic*] (1886:353).

According to Moore (1970:28) the Wonnarua territory was bounded by the Worimi who occupied the estuarine Hunter River and coastal land in the south, the Gamilaroi to the north and the Gewegal to the north east. Although not mentioned by Moore (1970), Mathews (1896) places the Wiradjuri to the west of the Wonnarua.

## **5.2 Regional Archaeological Heritage Context**

Archaeological evidence suggests that Aboriginal occupation of the Goulburn River / Hunter Valley region began at least 35,000 years ago (Koettig 1987). Additional chronological evidence was recovered from the Hunter Valley's north-east mountains for which the following dates were assigned 34,580±650 (Beta-17009), >20,000 (Beta-20056) and 13,020±360 years before present (BP) (Beta-17271) (Koettig 1987, as cited in Attenbrow 2006). Kuskie (2000:215) identified artefacts in clay horizons at Wollombi Brook and these have been dated to between 18,000 and 30,000 years BP. At Glennies Creek, Koettig and Hughes (1983) excavated a hearth on an alluvial terrace where the radiocarbon-dated charcoal and geomorphological evidence provided a date of between 10,000 to 13,000 years BP. These archaeological sites show that the region was occupied during the Pleistocene, dated up to 11,000 years ago; Pleistocene sites are generally rare and therefore contain significant archaeological/scientific information as well as demonstrating the long occupation of Aboriginal people in the region (Lambeck, Yokoyama et al. 2002).

The majority of Aboriginal sites in the region, however, are dated to the more recent Holocene (<11,000 years ago). This may reflect Aboriginal occupation patterns, but may also be influenced by the inaccessibility of potential coastal Pleistocene sites which were inundated when sea levels rose and reached present levels approximately 6,000 years ago (Mulvaney and Kamminga 1999:223). Evidence for Holocene Aboriginal occupation has been recovered from Bobadeen (7,760 calibrated years before present [cal. years BP]), as well as Milbrodale (1,420 cal. years BP) and Sandy Hollow (1,310 cal. years BP) (Moore 1970:58).

## **5.3 Archaeological Context and Interpretative Frameworks**

In order to interpret Aboriginal habitation patterns the Attenbrow model (2006:217-247) of base camps and activity locations/transit camps has been a useful framework that is applicable to the landscape archaeological analysis. Base camps are similar to residential bases in that they are locations which hunter-gatherers occupy for longer periods, from which hunting and other activities can be undertaken (Attenbrow 2006:220-221). At locations which have been inhabited for these longer periods, a range of activities would be undertaken including food preparation, skin working, tool manufacture and/or maintenance, as well as other campsite activities. Activity locations/transit camps by contrast are occupied short term (day/s), as part a mobile hunter-gatherer strategy and may be used when moving between base camps or resource areas, activities undertaken are less varied and may be specific to the exploitation of a particular resource.

The archaeological evidence which distinguishes base camps from transit camps may include size (area in square metres) as well as the diversity, richness and nature of artefact types and faunal remains. Meehan (1988:179-80) identified that base camps had wider range of food species, but may not have the remains of whole animals since these may have partially been consumed at dinner-time (transit) camps. Nelson (1991:79-81,85) has asserted that base camps are likely to have evidence for particular activities and potentially a greater diversity and richness of artefacts.

## 5.4 Local Archaeological Heritage Context

The local Aboriginal heritage context provides a review of previous archaeological work conducted in the local landscape, determines whether Aboriginal sites have been previously identified (AHIMS search) in the Survey Area and informs the predictive model of Aboriginal sites for the area. The review of previous archaeological work includes relevant local research publications and archaeological consultancy reports. Two types of archaeological investigations are generally undertaken: excavations and surveys. Archaeological excavations can provide high resolution data regarding specific sites, such as the dates or chronology of Aboriginal occupation and information on stone tool technology (for example reduction sequences, raw material use, tool production and use-wear). Archaeological surveys generally cover wider areas than excavations and can provide important information on the spatial distribution of sites. The detection of sites during survey can be influenced by the degree of disturbance or erosion present. As such, sensitivity mapping is sometimes required to interpret survey results. The local Aboriginal heritage context also provides a context for assessing archaeological significance of sites.

### 5.4.1 Aboriginal Heritage Information Management System (AHIMS)

A search was undertaken of the Aboriginal Heritage Information Management System (AHIMS) database on the 10 March 2014. The co-ordinates searched for the Survey Area and surrounds were GDA Zone 56, Eastings 225916 to 235916 and Northings 6397277 to 6417277. A total of 118 previously recorded Aboriginal sites have been identified within these co-ordinates (Figure 4, Table 10).

Table 10 Summary of AHIMS Sites within the searched co-ordinates

Sites	Frequency	Percent
Artefact Scatter with PAD	25	21.19%
Artefacts(s) Unspecified	24	20.34%
Artefact Scatter	23	19.49%
Isolated Find	15	12.71%
Artefact(s) Unspecified with PAD	11	9.32%
Potential Archaeological Deposit (PAD)	7	5.93%
Hearth; Artefact Scatter with PAD	3	2.54%
Shelter with Deposit	3	2.54%
Isolated find with PAD	2	1.69%
Modified Tree	2	1.69%
Art	1	0.85%
Grinding Groove	1	0.85%
Modified Tree; Artefact Scatter with PAD	1	0.85%
<b>TOTAL</b>	<b>118</b>	<b>100%</b>

Source: AHIMS Report – 10 March 2014

The majority of sites (88%) contain stone artefacts and are situated in close proximity to a reliable water source. Modified trees such as those with cultural scarring are relatively rare; this is most likely a result of the clearing of native bush for farming in the early years of settlement, but may also be reflective of the limited

amount of archaeological survey which has been undertaken in the area. Grinding grooves and rockshelters are dependent on the presence of suitable stone boulders or stone outcrops. Grinding grooves are usually found in close association with water courses, while rockshelters are dependent on stone outcrops large enough to contain cavities of a suitable size for occupation.

Previous archaeological surveys have identified that there is low potential for sandstone suitable for grinding stone tools in the shallow drainage lines of the first and second order streams that predominate in the lower slopes and alluvial plain of the Bylong Valley.

Twenty-one (21) AHIMS sites have been previously registered in the Survey Area (**Table 11, Figure 4**). Isolated finds are the most common site type, followed by artefact scatters. Artefact sites account for 95% of all sites identified. One Potential Archaeological Deposit (PAD) has also been identified. The high frequency of surface artefacts is broadly consistent with the AHIMS results from the wider region (compare **Table 10**). Although, a higher proportion of artefact sites have been identified in association with PAD in the broader region.

**Table 11 Summary of AHIMS Sites within the Survey Area**

Site Type	Frequency	Percent
Isolated Find	12	55%
Artefact Scatter	8	40%
PAD	1	5%
<b>TOTAL</b>	<b>21</b>	<b>100%</b>

#### 5.4.2 Aboriginal Places and Cultural Features

AHIMS incorporates archaeological sites which meet the scientific criteria for archaeological sites. Intangible heritage and cultural areas of high significance may be gazetted by the Minister as Aboriginal Places. These cultural areas and intangible heritage may be associated with songlines, oral history and/or ceremonial activities. No Aboriginal Places have been identified in the Survey Area.

Cultural features are location identified by the RAPs as having cultural significance, but do not have an established and demonstrated association with songlines, oral history and/or ceremonial activities. Cultural features may be tangible or intangible and do not necessarily involve material traces of Aboriginal occupation or land use practices. Cultural features will be recorded where identified during the survey and managed appropriately. Cultural features include areas/features which do not meet the AHIMS criteria for archaeological sites. The presence of cultural features are related to cultural activities and practices and generally do not conform predictive models based on environmental factors such as landforms and drainage.



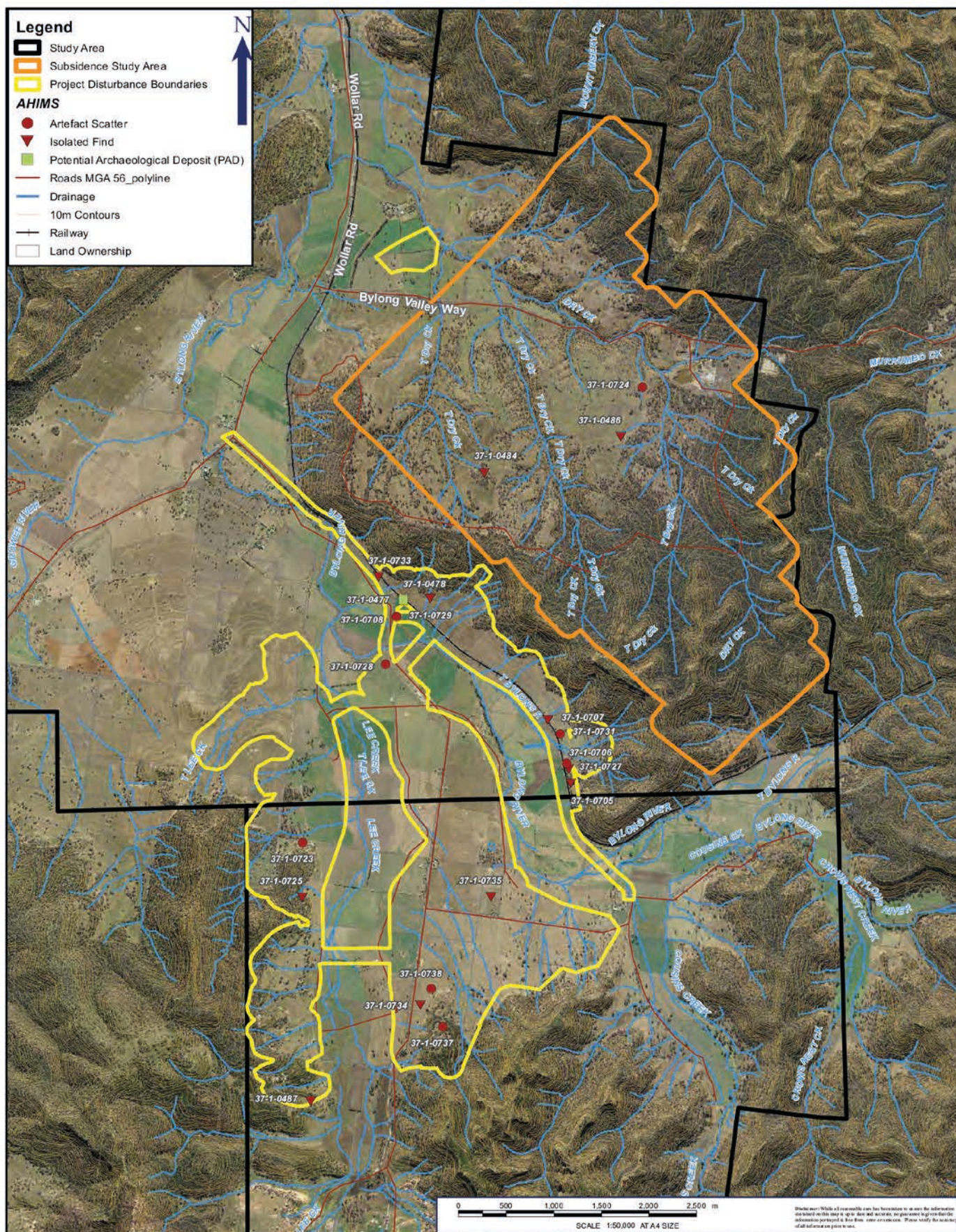
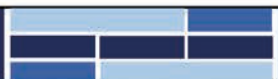


Figure 4 : AHIMS and Study Area

CLIENT: KEPSCO C/O: HANSEN BAILEY

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### 5.4.3 Local Archaeological and Heritage Studies

The following reports have been selected and summarised because of their relevance to the Bylong area and have been used to contextualise the predictive model and assist in the assessment of significance. For ease of reference the location of these studies has been mapped in **Figure 5**.

#### **RPS (2011; 2012; 2013). Borehole Due Diligence Inspection of Proposed Borehole Locations, Bylong.**

A series of archaeological due diligence assessments for a number of boreholes were conducted by RPS in the Bylong Project Boundary. Due diligence for boreholes required a visual inspection to be undertaken to determine the suitability of potential borehole locations. Proposed borehole locations are generally located in areas which exhibit high levels of prior disturbance from activities such as logging, farming or clearing for easements and/or access tracks. In general, the proposed borehole locations were determined to have limited to no potential for Aboriginal cultural or archaeological significance. Drilling was not undertaken in any location where there are any Aboriginal artefacts or objects. If artefacts or objects are identified near to the access routes then protective barrier fencing is placed around the artefact site in order to prevent inadvertent impact to the cultural heritage site. Several Aboriginal sites have been recorded by RPS and site cards have been registered with the AHIMS database.

#### **ARAS (2012). Aboriginal Cultural Heritage Assessment for Mt Penny Coal Project EL7406<sup>1</sup>**

This study was undertaken for a proposed open cut mine and associated infrastructure including rail loop and power line easement, the application has since been withdrawn. The study area was 1960 hectares with potential mine impact over 1400 hectares. The study area encompassed the Coggan Creek catchment which drains into the Goulburn River. During the survey, 215 Aboriginal sites were identified, the majority were surface artefacts (**Table 12**). Of these, 24 sites were identified as being of high significance, which was defined as an "Aboriginal site or Aboriginal object that is rare or unique....contains archaeological data that is of high quality and can provide information that will contribute to new knowledge. High conservation value and is important in educating the general public about cultural heritage values" (ARAS 2012:184). Sites identified with high significance included sites containing the following feature/s: hearth, modified tree, grinding groove, PAD and selected surface artefact/s. The remaining 191 sites were assessed to be of medium or low significance.

While the Mt Penny Coal Project site is located immediately north-west of the KEPCO Project site, it should be noted that it has a different representation of landforms. In particular: it has terrace, low slope and mid slope landforms associated with the Coggan Creek catchment; it contains few higher cliffline and sandstone areas, it has a higher proportion of area surveyed directly along the Bylong River for the proposed electricity easement (along Wollar Road) (**Figure 5**). The study identified one specific Aboriginal cultural landscape (T06-MPC 138 / MPC 163) which was assessed as being of high significance on the basis of input from RAPs, and the PAD (MPC 138) and isolated find (MPC 163) identified in the vicinity. The study also suggested that the Coggan Creek, Bylong River and Goulburn Valleys have cultural landscape values (ARAS 2012:183); these appear not to have been mapped in the context of the study area and there is little specific

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<sup>1</sup> Obtaining information on the Mt Penny area was difficult, the documents are not publically available, attempts were made by RPS on the 4/2/2014, 1/05/2014, 19/6/2014, as well as multiple attempts by Hansen Bailey. The Mt Penny report summarised here was finally received on the 28/7/2014. It is the only document which has been able to be accessed for the purposes of completing this section of this Report.

information in the report which supports the assessment. Further, it is unclear whether they have been determined on the basis of specific site types such as hearths; their significance appears to derive from a more regional statement of significance.

**Table 12 Mt Penny Aboriginal Sites (extracted from executive summary of ARAS 2012)**

Site Type	Frequency	Percent
Artefact Scatter with PAD	90	41.86%
Artefact Scatter	40	18.60%
Isolated Find	64	29.77%
Hearth, PAD and Artefact Scatter	5	2.33%
Scarred Tree, Artefact Scatter and PAD	1	0.47%
PAD and isolated find	5	2.33%
PAD	6	2.79%
Rockshelter	1	0.47%
Rockshelter and PAD	1	0.47%
Grinding Groove	1	0.47%
Scarred Tree	1	0.47%
<b>TOTAL</b>	<b>215</b>	<b>100%</b>

#### **Archaeological Surveys and Reports. 2011. Archaeological Assessment for Lots 53, 55 and 56 DP755420, Bylong Valley Way, Bylong**

Approximately 64 ha were surveyed for archaeological sites ahead of a proposed quarry extension. Four Aboriginal sites were identified comprising surface artefacts. Aboriginal site Bylong Q OS2 contained 29 artefacts, Bylong Q OS3 contained four artefacts, Bylong Q OS1 comprised two artefacts and a single artefact was identified at Bylong Q IS04. These surface artefacts were identified on exposures in close proximity to first order tributaries, with the largest site occurring at the confluence of two tributaries. These sites appear not to have been registered with AHIMS at these locations. The sites, according to the report were not going to be impacted by the proposed development, but fencing was recommended for Bylong Q OS2 and Bylong Q IS04 (Archaeological Surveys and Reports 2011).

#### **RPS (2011) Lithic Report for S87 and S90 Salvage and Excavation, Widden Creek Bridge.**

RPS conducted a salvage and excavation of an archaeological site at Widden Creek Bridge approximately 40 kilometres east of the current Survey Area. The site, uncovered during excavation works for a new bridge, comprised almost 3,000 artefacts consisting mainly of mudstone (81%). The analysis of artefacts demonstrated a variety of lithic technologies including formal tools with evidence of retouch and usewear, but only a limited number of raw materials had been used. This indicated that this was likely a procurement site with no evidence of the trading of artefacts or raw materials (RPS 2011a).

#### **Sinclair Knight Mertz (2008). Cultural Heritage Assessment, Bylong Crossing Loop, Central Tablelands, NSW, Australian Rail Track Corporation Limited.**

The Australian Rail Track Corporation (ARTC) prepared a Review of Environmental Factors (REF) to obtain planning approval for proposed improvement works to the Bylong crossing loop, along the Muswellbrook to Ulan rail line. The study area encompassed: a 200 metre wide corridor along the proposed length of the passing loop; an area measuring 400 metres by 100 metres for use as a temporary construction lay down area for associated infrastructure and stockpiled materials; and a previously quarried area approximately 100 metres by 100 metres located on the north side of the track near the western end of the proposed crossing loop (Sinclair Knight Mertz 2008:3-4). The survey was conducted on foot.



One Aboriginal archaeological site was detected, Bylong River 1 (AHIMS Site #37-1-0477); a moderate density scatter (> 50 artefacts) over 150m x 100m in area. The artefacts were predominantly indurated mudstone. The site, adjacent the Bylong River, was directly above the flood level with direct access to river resources. A potential archaeological deposit site, Bylong River PAD 1 (AHIMS Site #37-1-0478), was recorded in the same location.

Effective coverage of the survey area was moderate to high as a result of heavy disturbance caused by construction and maintenance of the rail line with the presence of road base and imported gravels limiting the probability of locating artefacts (Sinclair Knight Merz 2008:27). No other sites were located in the proposed crossing loop area despite high exposure and only moderate vegetation cover, probably due to the high level of disturbance in the area. It was considered that there was low potential for subsurface archaeological deposit in these areas. No non-Indigenous sites were identified within the study area during the archaeological assessment (Sinclair Knight Merz 2008:29-30).

### **HLA. 2003. Draft Indigenous Heritage Assessment Exploration Boreholes, Bylong.**

This draft heritage assessment was undertaken by HLA (2003) for Anglo Coal Australia Pty Ltd. The eight borehole exploration sites were in the Bylong Valley within the exploration licence A287. The survey identified two isolated artefact sites; Bylong #1 (retouched fine-grained siliceous flake) and Dry Creek #1 (silcrete flake). Bylong #1 was located close to a stock access track, on a lower slope approximately 100m from Bylong River which is a high order stream. Dry Creek #1 was identified in an alluvial context, approximately 40m from Dry Creek (also a high order stream) and close to a vehicle access track. It was considered by HLA that the borehole works would not impact on either Bylong #1 (AMG Zone 56 228307/6415086) or Dry Creek #1 (AMG Zone 56 230684/6412398), but to mitigate any potential impact at Dry Creek #1 temporary fencing was to be erected around the artefact site during exploration drilling. The isolated finds had been exposed through erosion of the topsoils.

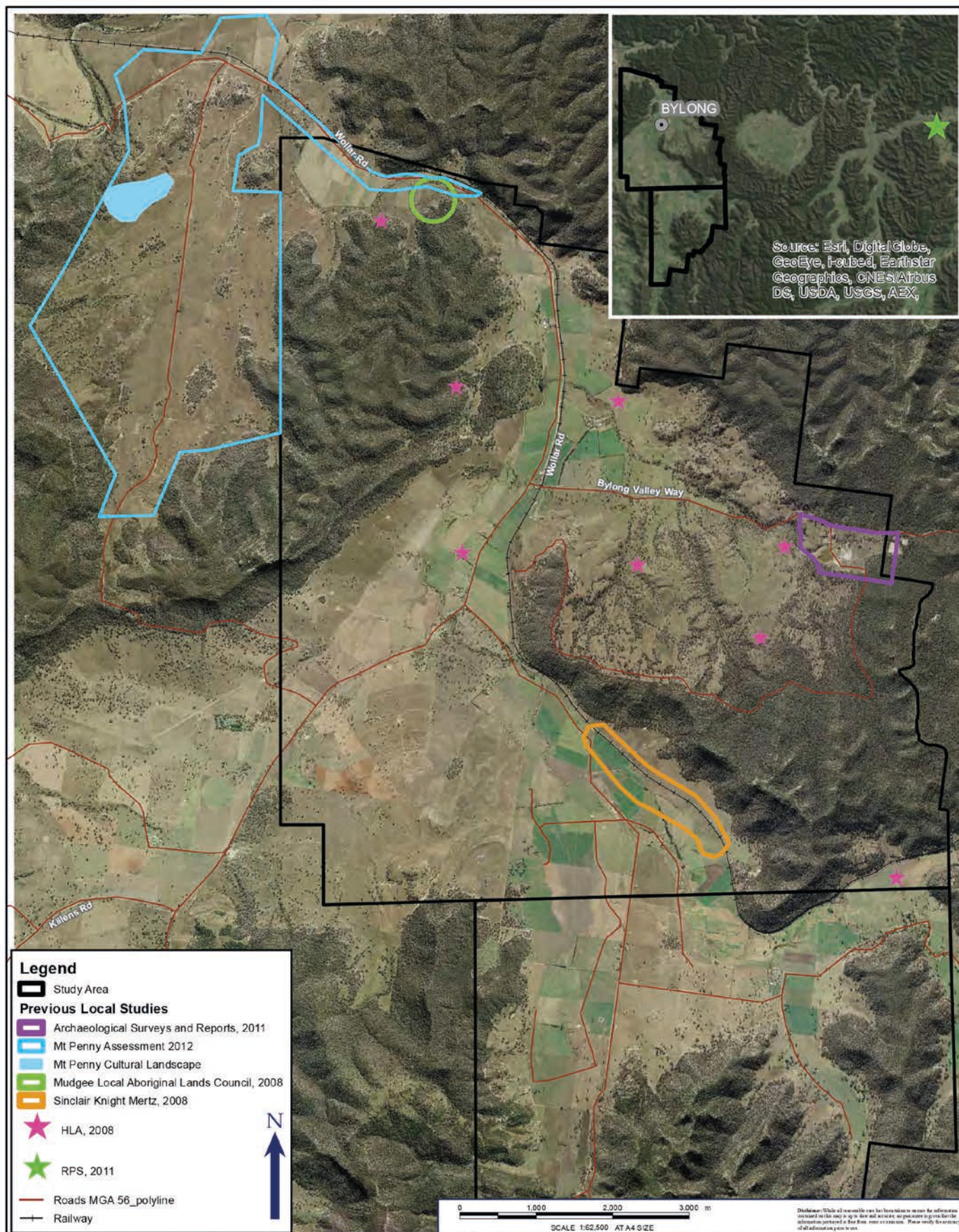
### **Mudgee Local Aboriginal Land Council. 2008. Aboriginal Cultural Heritage Site Assessment for Telstra's Impact to Aboriginal Heritage along Installed Optical Fibre Cable Route at "Baringa" Bylong.**

This report related to the laying of an optical fibre cable nine kilometres from Bylong to Coggan Creek. Several flakes and a core were identified within the optical fibre cable route in an area that was close to a previously recorded site Bylong #1 (HLA Envirosciences Pty Ltd 2003). There is no information as to the exact location of these objects and no site co-ordinates were recorded in the report for the location of these flakes and core, although a map was included. There is no evidence whether the site/s were registered with the DECCW (now OEH). However, the general location of the site area is on the southern bank of the Bylong River to the north east of the Bylong #1 site recorded previously by HLA (2003) (Mudgee Local Aboriginal Land Council 2008).

## **5.5 Summary of the Aboriginal Heritage Context**

Surface artefacts are the most commonly identified Aboriginal site type in the Bylong Valley area and have tended to be located on footslopes and within 200m of watercourses.







## 5.6 Predictive Model

The following predictive model aims to provide testable statements about the nature and distribution of evidence of Aboriginal occupation on the basis of environmental information, AHIMS data, as well as the review of relevant archaeological and heritage reports. The predictive model is necessary for the formulation of appropriate field methodologies and to provide information for the assessment of archaeological significance.

There are a number of factors that influence Aboriginal occupation of an area some of which are discussed in Section 4.0. These include essential subsistence resources such as food (flora and fauna) and fresh water. However, other resources such as stone raw materials, wood and bark, animal skins, reeds and string, were also utilised. Landscape features such as ridges, flat elevated areas and rockshelters, may have also influenced Aboriginal occupation of an area. In addition, cultural activities, such as corroborees and initiations may have taken place at certain locations in the landscape, while other locations were considered to be mythological places.

### 5.6.1 Site Type and Locations Predictions

The results of the AHIMS search, environmental background overview and the review of previous archaeological work identified three major site types within the Survey Area: artefact sites (artefact scatters and isolated finds), modified trees and PADs. It is considered that artefact sites generally occur along footslopes and flat areas between water courses, making these landforms highly sensitive. There is some weaker patterning of artefact sites at the headwaters of creeks, and as such these landforms are considered to be moderately sensitive. Artefact sites have infrequently been identified on the alluvial plain between Lee Creek and Bylong River, despite good exposure of topsoils due to agriculture, although such practices may have also disturbed such sites.

The summary of the soil types has identified that the land within the Survey Area has topsoil depths of no more than 60cm and may be substantially eroded in many areas. It is likely that PADs will be present within the Survey Area where the soils have been least disturbed. The locations likely to contain PADs include terraces near higher order tributaries of rivers and creeks. While not listed on AHIMS and not identified during previous works, rock shelters are predicted to be present in areas where suitable sandstone cliffs occur, such as the Bylong State Forest. Modified trees, on the basis of the AHIMS, are predicted to be located on footslopes and mid slopes, but only where mature trees are still present and located within 200 m of a watercourse.

### 5.6.2 Site Content Predictions

The environmental background has identified that mudstone, tuff and basalt occur in the area. It is highly likely that artefact sites will contain Aboriginal objects of those raw materials. Previous archaeological works and excavations at Widden Creek (RPS 2011a) have shown that mudstone is the most dominant raw material in the area, followed closely by silcrete and that artefact sites will consist mainly of flakes and cores.

The vegetation background has identified that several eucalypt species occur in the Survey Area and as such, modified trees will be present in areas where vegetation clearing is limited and mature trees remain.

## 6.0 Aboriginal Heritage Survey and Field Results

### 6.1 Survey Methodology

The Survey Area was subject to a pedestrian survey in accordance with the requirements set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010) and the *Guide for Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). In addition, the survey methodology was tailored to meet RAP feedback during Stage 2 of the consultation process (**Appendix 1**). This included a methodology for recording of Aboriginal cultural features, more detailed transecting options and more thorough survey coverage across the Survey Area.

#### 6.1.1 Survey Aims

The purpose of the survey was to inspect visible ground surfaces, observe exposed soil profiles, sample all landform types in the Survey Area and record any material evidence of Aboriginal occupation. The survey also aimed to record any cultural sites or Aboriginal landscapes, if identified by the Aboriginal stakeholders.

#### 6.1.2 Sampling Strategy

The purpose of a sampling strategy is to provide a framework for conducting archaeological surveys in a manner which can be quantified and thus can be compared to other survey reports in the local landscape and for regional comparison (Burke and Smith 2004). The sampling strategy for this assessment has considered the nature of impact and the archaeological sensitivity of landforms.

The Project has two types of impact; direct and indirect. Direct impacts will include the development of two open cut areas (east and west), as well as the construction of roads, overburden emplacement areas, dams, rail loop, surface facilities and other supporting infrastructure. Indirect impacts may include effects from subsidence as a result of underground mining.

Direct impact areas were surveyed primarily using transects, where terrain was flat and even, but targeting of landforms was undertaken for areas which were more difficult to traverse. Transect survey methods were used on the indirect impact areas on the flat and rolling hill landforms. However, outcrops of sandstone with the potential to contain grinding grooves or rockshelters were surveyed using targeted methods which identified outcrops of sufficient size and/or sandstone quality.

#### 6.1.3 Field Methods

The survey was conducted on foot (pedestrian) and targeted the sample areas as described above.

The area surveyed was recorded in survey units based on landforms. Original landform units proposed in the survey methodology were refined for the interpretation of the archaeological record and the cultural features record and on the basis of ground conditions. The mapping of survey units was undertaken on the basis of GPS recorded data, with reference to aerial and topographic information. The recording of survey units was undertaken using representative digital photographs and field notes which included observations of soils, ground surface exposure and visibility, vegetation cover, rock outcrops, levels of ground surface disturbance, erosion and any other relevant information. The field notes provided a basis for the reporting of survey coverage and calculating survey effectiveness, presented in **Appendix 2**.

Arising from the Aboriginal consultation as documented in Section 3.0 and **Appendix 1**, it was decided that two levels of site recording would be undertaken; archaeological site recording and Aboriginal cultural feature recording.

### Archaeological Site Recording of Aboriginal Objects

It was agreed that the archaeological site recording would be undertaken on tangible evidence which meets the AHIMS site card criteria for Aboriginal objects and would document sites with material evidence for occupation or land use practices by Aboriginal people.

### Aboriginal Cultural Features

It was agreed that the Aboriginal cultural features would include areas identified by the RAPs which have cultural significance and may not necessarily involve material traces of Aboriginal occupation or land use practices. Areas identified may include rock formations, rock overhangs, special locales such as men's or women's areas and other landforms associated with mythology or cultural practices.

Both types of site recording included photographs, field notes and GPS locations. The archaeological Aboriginal sites were recorded according to the AHIMS guidelines.

## **6.2 Survey Units and Landforms**

The Survey Area was investigated using pedestrian survey methods and was undertaken over a period of 5 weeks with participation from the RAP representatives listed in Section 3.0 in **Table 6**. The survey was undertaken according survey units based on 11 landforms described below and in **Figure 6**. Survey coverage and plates for these landforms are provided in **Appendix 2**.

### **6.2.1 Cliff Lines (Landform Unit 1)**

The cliff lines landform unit generally contained outcropping sandstone and very steep slopes. In most areas, where the cliff lines are located, the lower slopes are littered with large talus boulders and rock fall. The area is wooded with mostly immature eucalyptus and mature black cypress pines. Areas can also be densely populated by medium sized shrubs such as acacias. Some native grasses are present in the more open areas. As a result of the vegetation, steep slopes, scree, sandstone outcropping and rock fall, the terrain was difficult to traverse. Sandstone in these areas is very friable, poorly sorted, and with small angular pebble inclusions. There appears to be little evidence of rockshelters at these high levels due to the dynamic nature of the outcrops in these areas.

Due to water runoff, extensive fracturing, large rock fall and poor quality sandstone, this landform is not conducive to the development of shelters in the sandstone. This sandstone is also not suitable for grinding grooves or rock art, due to its friable nature and bands of pebble inclusions. Although there are very small rock cavities in the sandstone along these cliff lines, all are unsuitable for sustained Aboriginal occupation, due to the erosion, water flow runoff and the instability of the sandstone outcrops.

### **6.2.2 Mid to Upper Slopes - Jointed Sandstone (Landform Unit 2)**

This landform unit comprises mid to upper slopes under the cliff lines and contains outcropping sandstone with large talus boulders and rock fall. Rock cavities are found mid slope especially where the creek lines have cut through the sandstone outcrops. A number of these cavities were considered to be suitable for sustained Aboriginal occupation and were recorded as rockshelters. The rockshelters recorded with archaeological features had flat floors, PAD material, stable walls and ceilings, and no evidence of water runoff through the cavity. The sandstone walls within these shelters generally had small angular pebble inclusions and were poorly sorted, making it unsuitable for grinding grooves or rock art. In some instances, open artefact sites occurred in the general area. However, they were mostly identified on the exposed access tracks running through these areas.

This landform is characterised by active erosion caused by collapse, landslide, sheet flow, creep and channelled stream flow. The area is wooded with mostly immature eucalyptus and mature black cypress pines, due to the poor soils in the steeper terrain, although accessible areas are likely to have been cleared in the past. Access to these areas is also hindered by densely packed medium sized shrubs, such as acacias. Some native grasses are present in the more open areas. As a result of the vegetation, slopes, sandstone outcropping and rock fall, the terrain is difficult to traverse, but is more accessible than the cliff line areas.

### **6.2.3 Stepped Creeks and Terraces (Landform Unit 3)**

The creek lines that were formed with outcropping sandstone along the banks were located in the mid to low sloped areas in the cliff lined areas. In the cleared and farmed areas to the north and south of Bylong Valley Way, the large drainage systems had basalt stepped platforms at the upper entry points of these systems. No rockshelters or cavities were recorded in these areas.

Sandstone outcrops were observed in the creek lines, but none were of high enough quality to be used for the grinding of tools and no grinding grooves were present. The sandstone lined creek lines are wooded with mostly immature eucalyptus and black cypress pines with some acacia within the waterway. The drainage channels are located in areas cleared for farming purposes. Some areas are also densely populated by medium sized shrubs such as acacias. Some native grasses are present in basalt stepped platform areas.

### **6.2.4 Interlocking Spurs and Creek Lines (Landform Unit 4)**

This landform unit comprised interlocking spurs and creek lines along the middle catchment area of Dry Creek. Interlocking spurs, where promontories jut out into the creek lines in staggered formation, are formed in V-shaped valleys with lateral erosion undercutting the concave banks of river bends and depositing the load downstream. The creek banks are generally fairly steep and the promontories are usually rounded due to the effects of erosion. The areas in this landform unit were cleared grazing land. The surrounding hills were covered in dense grassy vegetation. A large number of open artefact scatters were identified where soil profiles had been exposed from sheet wash associated with vehicle movements and tracks.

### **6.2.5 Steep Slopes and Rolling Hills (Landform Unit 5)**

The rolling hill landform unit was associated with the western tributaries of Dry Creek. This landform unit is characterised by gentle and moderate slopes. These fixed, shallow erosional drainage channels were moderately spaced and formed a convergent integrated tributary network. Vegetation was predominantly characterised by cleared grassy paddocks and open woodland on some of the slopes. These hills have been eroded by sheet wash, creep and channelled creek flow. Open artefact sites occur infrequently in this landform and grinding grooves were identified in the upper catchment at in one location. Open artefact sites occurred to the west of these groove sites, creating a complex of associated occupation areas.

### **6.2.6 Cobbled Creeks and Flat Terraces (Landform Unit 6)**

This landform unit comprised flat creek terraces adjacent to the main channel of Dry Creek which was cobble lined. This creek line and terracing ran parallel to the Bylong Valley Way. The terracing has been formed by previous erosion and aggradation by overbank flooding. Flood events have subsequently become less frequent due to the deepening and enlargement of the creek.

Vegetation was predominantly composed of densely grassed paddocks. There are some scattered eucalyptus trees on the top of the hill slopes up towards the boundary of the Goulburn River National Park. No sandstone outcrops or platforms occur in this area. Flat basalt sheeting and eroded columns were identified in the upper catchment of some tributaries. Artefact sites were identified infrequently in this landform, most likely due to lack of exposures, but may have also been removed during flooding events.



### **6.2.7 Alluvial Plain (Landform Unit 7)**

The alluvial plain is located on the Bylong valley floor between Lee Creek and Bylong River. Landform Unit 7 does not include the footslopes extending up from the alluvial plain (Landform Unit 9), or the area immediately adjacent to the Lee Creek and Bylong River channels (Landform Unit 11).

The alluvial plain was a relatively level landform with extremely low relief, and aggradation by channelled and over-bank stream flow. There is little change in elevation across the area. The alluvial creek channels that have formed this plain are Bylong Creek and Lee Creek. In the past, this plain, with its water courses, would have provided Aboriginal people with an abundance of food sources, such as edible plants and the presence of animals to hunt. This flat alluvial plain has been extensively pasture improved and/or cultivated since European settlers came to the Bylong Valley. Highly disturbed artefact scatters and/or isolated finds were present and observed across the plain. These sites were identified mostly in areas of high ground exposure such as farm dam banks, contour banks and graded vehicle access tracks. Towards the southern end of this landform, a number of possible modified trees were present in one paddock where the clearance of large old mature eucalyptus had not occurred.

### **6.2.8 Volcanic Capped Hills (Landform Unit 8)**

The volcanic capped hill landform unit comprised undulating hill slopes which correspond to the proposed North Western Overburden Emplacement Area. The slopes were made up of a number of hills, saddled at the northern end of a long steep ridgeline. These low gradient slopes, once traversed, offer an outlook across most of the Bylong Valley area and into both surrounding plains. At the end of this spur was a bald hill which offered unparalleled views. This rare outlook in the overall region had some potential for Aboriginal use. These slopes have been cleared of native vegetation and been used in more recent times for the grazing of cattle. The slopes were covered in very tall and dense pasture grasses. A small number of isolated artefacts were identified on the exposed vehicle access tracks in the area.

### **6.2.9 Footslopes (Landform Unit 9)**

This landform is the transition between the ridgelines and alluvial plain in the south, and the interlocking spurs and steep rolling hills in the north of the survey areas. This transition is between the upslope sites of erosion and transportation, such as the shoulders and back slopes, and the down slope sites of deposition, such as the toe slopes. These moderate inclines are the result of aggradation or erosion by sheet flow, earth flow or creep. Vegetation was mainly dense pasture grasses, with scatterings of open woodland on entering the mid slopes that were more forested. Open artefact sites occurred infrequently in this landform, and where present were again only identified in exposures.

### **6.2.10 Incised V-Shaped Creek lines and Slopes (Landform Unit 10)**

This steep sloped landform unit was encountered in association with deeply incised V-shaped creek lines. In some areas, these creek lines became small gorges. Ground surfaces were sloped and unsuitable for occupation and no Aboriginal sites were identified in these areas. Vegetation ranged from sparsely wooded (near Dry Creek tributaries) to thickly wooded in the north and eastern areas.

### **6.2.11 Flats and Slopes Adjacent to Major Channels (Landform Unit 11)**

This landform unit encapsulates the Bylong Valley floor. The major channels are defined as the main course of the Bylong River and Lee Creek. This landform unit comprises the flats and slopes adjacent to the major channels (approximately 300m from centre of the channel).



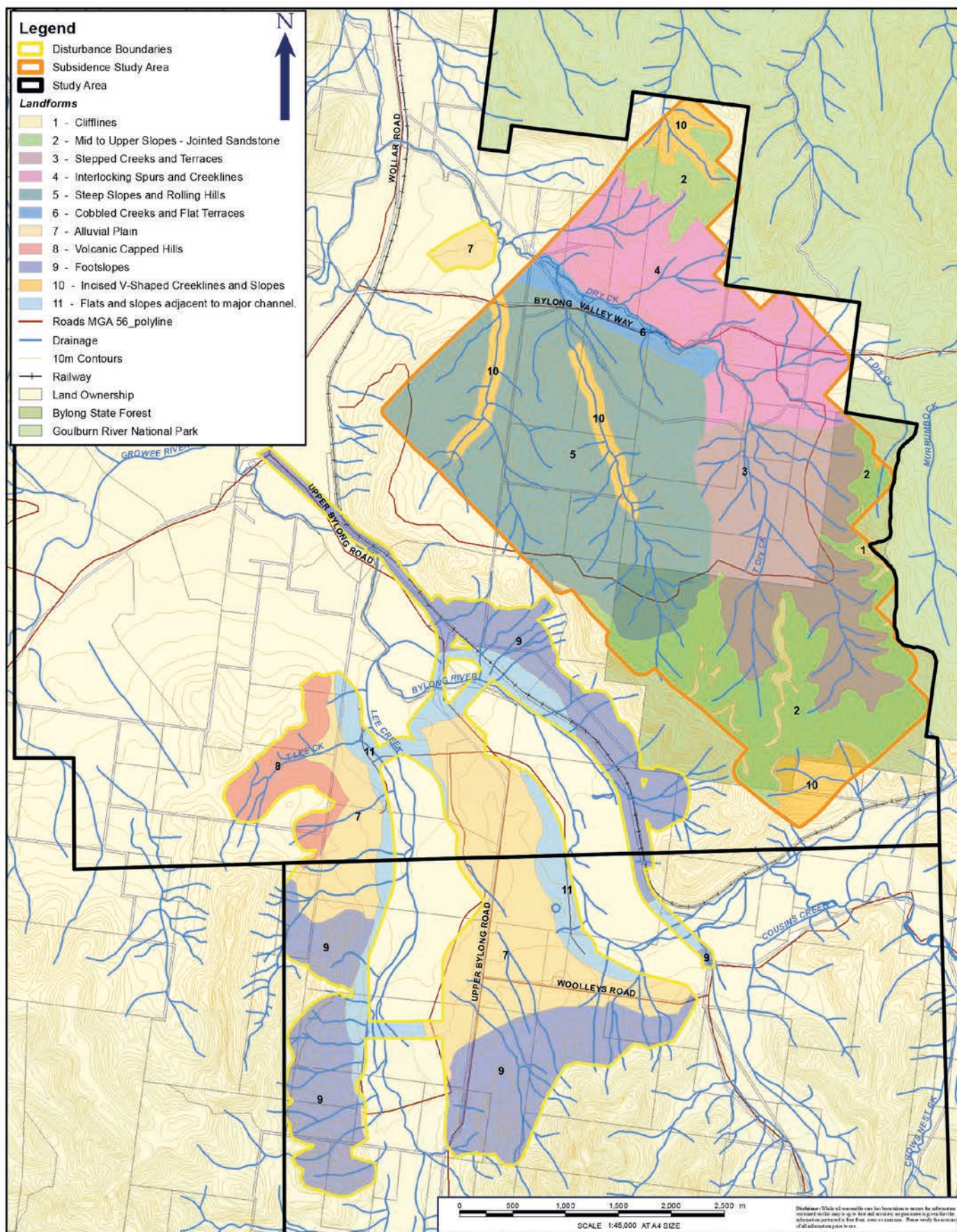


Figure 6: Landform Map



## 6.3 Survey Results

Over the five week survey, 218 archaeological Aboriginal sites and 32 cultural features were identified (**Figure 7**). Individual archaeological Aboriginal site descriptions are provided in **Appendix 3** and the descriptions of cultural features in **Appendix 4**. AHIMS site cards are provided in **Appendix 5**.

### 6.3.1 Summary of Archaeological Aboriginal Sites Identified During the Survey

There have been a total of 239 archaeological Aboriginal sites identified within the Survey Area which includes 218 identified during the survey and the 21 previously registered AHIMS sites. A summary of the sites identified during the survey that were not previously registered on AHIMS is provided in **Table 13**. Surface artefacts (isolated finds and artefact scatters) were the most common site type, accounting for almost 90% of sites identified. Rockshelters occurred less frequently, while modified trees and grinding groove sites occurred infrequently. A single ochre quarry was also identified.

**Table 13 Summary of Archaeological Aboriginal Sites Identified during the Survey**

Site Type	Number	Percent
Isolated Find	104	47.71%
Artefact Scatter	91	41.74%
Rockshelter	13	5.96%
Grinding Groove	4	1.83%
Modified Tree	3	1.38%
Artefact Scatter + PAD	2	0.92%
Ochre Quarry	1	0.46%
<b>Total</b>	<b>218</b>	<b>100.00%</b>

Surface artefacts comprised flakes, broken flakes, cores, tools and grindstones. Raw materials included tuff, silcrete, mudstone, quartz and volcanic rock; grindstones were sandstone or other sedimentary rocks. Surface artefacts occurred throughout the survey area and more predominantly within 200m of watercourses.

Some 23 of the archaeological Aboriginal sites that did not wholly comprise loose surface artefacts included: rockshelters, grinding grooves, a modified tree, an ochre quarry and PADs (**Table 14**). These sites comprise intact material evidence for repeated occupation or activity locations such as tree scarring, hatchet grinding or quarrying of ochre.

The rockshelters identified had an accumulation of sediment, forming PADs, which suggests they contain evidence for Aboriginal occupation. The modified tree site types contain evidence of bark removal; bark was often used for coolamons (containers), shields, or canoes. The grinding grooves were generally elongated in shape and are likely to have been used for sharpening stone hatchets. The grinding groove sites are located in creek beds. It appears that ochre was being procured from the ochre quarry and it is notable that red, yellow and purple pigments were present at this location.

Two PADs are associated with artefact scatters and are up to 30cm in depth, located in areas where there is likely to be intact evidence of repeated occupation by Aboriginal people. In addition, there is one previously registered PAD in the Survey Area. The PADs are associated with areas of archaeological sensitivity and are the only areas identified which are assessed as being likely to contain subsurface archaeological deposit (**Figure 8**). These areas occur on the foot hills which have not been subject to extensive cropping. The areas of archaeological sensitivity are indicative only and will require further definition under a subsurface archaeological testing program (Section 9.3).

The modified trees were verified by a professional arborist, Danny Draper of Urban Tree Management Australia (UTMA) with RAP and RPS representatives. The report is available in **Appendix 6**.

**Table 14 Summary of Archaeological Aboriginal Sites (excluding surface artefact sites)**

Site Type	Site Name
Rockshelter	RPS Bylong RS001
	RPS Bylong RS002
	RPS Bylong RS003
	RPS Bylong RS004
	RPS Bylong RS005
	RPS Bylong RS006
	RPS Bylong RS007
	RPS Bylong RS008
	RPS Bylong RS009
	RPS Bylong RS010
	RPS Bylong RS011
	RPS Bylong RS012
	RPS Bylong RS013
Modified Tree	RPS Bylong MT005
	RPS Bylong MT007
	RPS Bylong MT008
Grinding Groove	RPS Bylong GG001
	RPS Bylong GG002
	RPS Bylong GG003
	RPS Bylong GG004
Artefact Scatter + PAD	RPS Bylong AS040
	RPS Bylong AS077
Ochre Quarry	RPS Bylong OQ001

### 6.3.2 Summary of Aboriginal Cultural Features identified during the Survey

During the field surveys, Aboriginal cultural features identified by RAP representatives were recorded. These were then further evaluated during the cultural values discussion sessions in order to reach a consensus confirming the value of these important features to the RAPs (**Section 3.0** and **Appendix 1**). Thirty-two cultural features were identified as part of this process (**Table 15** and **Table 16**). While a consensus was reached on their identification, not all RAPs were in agreement on whether these features were of cultural significance. Of these cultural features, the most common were sandstone cavities. These cavities were too small or too inaccessible for regular occupation by Aboriginal people; but, RAPs have suggested that they may have been used for caching tools. Two sandstone cavities were identified as being the type of locations which may contain burials; however, there was no material evidence of this present at these locations. Sandstone formations identified as cultural features included a natural rock which resembled a bird's head and natural weathering of a rock which resembled a face and flat sandstone formation both of which are in the upper catchment of a tributary of Dry Creek.

The sandstone platform is a natural outcrop of sandstone that is positioned in a location that may have overlooked Lee Creek, although it may have been partially interrupted by tree canopy. The possible occupation area was located near the confluence of two drainage channels. No artefacts were identified in this area and it was not recorded as a PAD because sediment was less than 5cm in depth.

**Table 15 Summary of Cultural Features**

Feature Type	Number	Percent
Sandstone Cavity	27	84.38%
Sandstone Formation	3	9.38%
Sandstone Platform	1	3.13%
Possible occupation area	1	3.13%
<b>Total</b>	<b>32</b>	<b>100%</b>

**Table 16 Cultural Features Types and Feature Names and possible uses/functions**

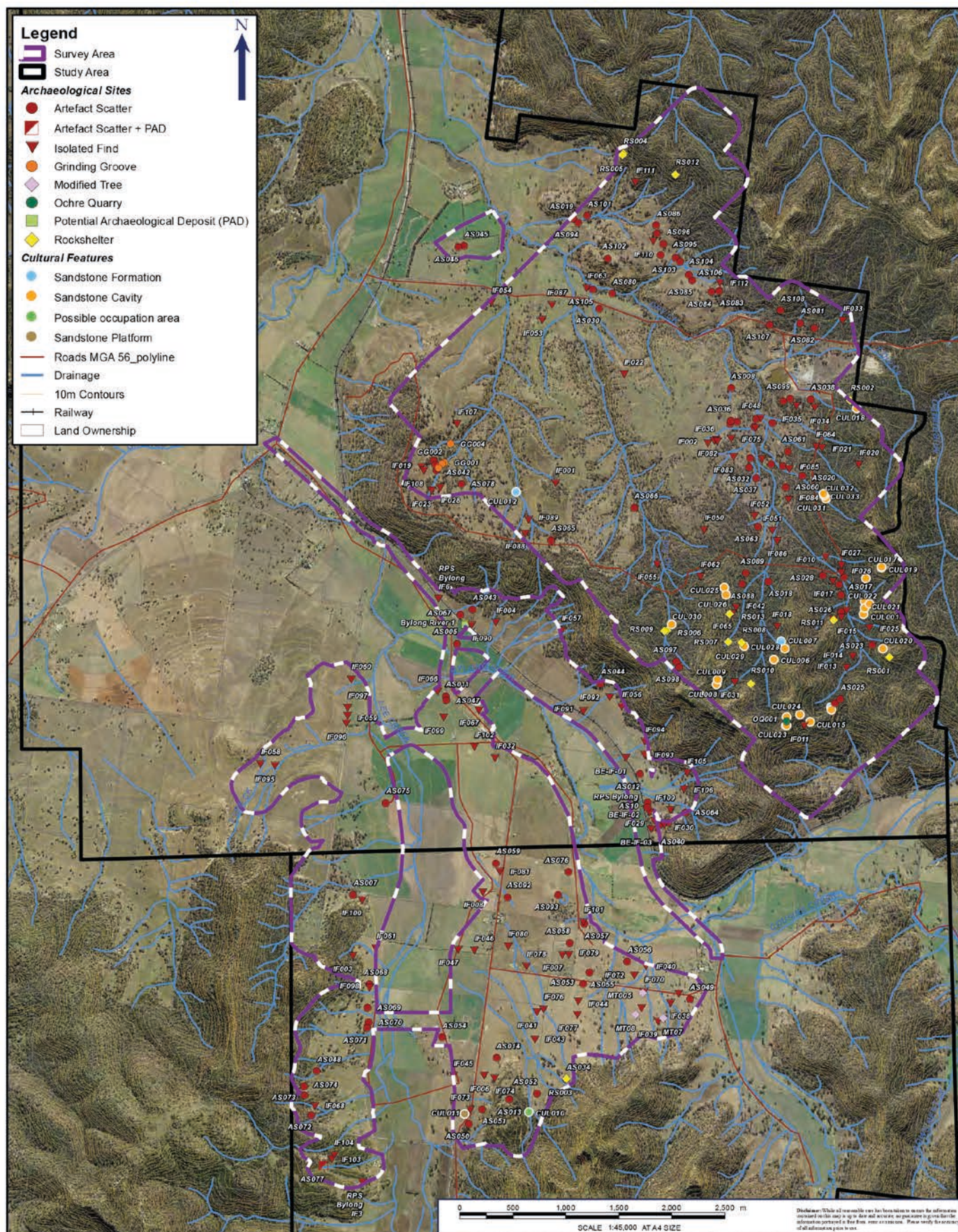
Feature Type	Feature Name	Comment
Sandstone Cavity	CUL001	Caching
	CUL002	This type of location may have been used for the interment of human remains 'burial,' but there was no evidence for this observed.
	CUL003	Caching
	CUL005	Caching
	CUL006	Caching
	CUL008	Caching
	CUL009	This type of location may have been used for the interment of human remains 'burial,' but there was no evidence for this observed.
	CUL013	Caching
	CUL015	Caching
	CUL016	Caching
	CUL017	Caching
	CUL018	Caching
	CUL019	Caching
	CUL020	Caching
	CUL021	Caching
	CUL022	Caching
	CUL023	Caching
	CUL024	Caching
	CUL025	Caching
	CUL026	Caching
	CUL027	Caching
	CUL028	Caching
	CUL029	Caching
	CUL030	Caching
	CUL031	Caching
	CUL032	Caching
	CUL033	Caching
Sandstone Formation	CUL004	'Birds Head'
	CUL007	'Face'
	CUL012	Flat sandstone
Possible occupation area	CUL010	Possible occupation area



Bylong Coal Project  
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Feature Type	Feature Name	Comment
Natural Sandstone Platform	CUL011	'Lookout'





**Figure 7: All Archaeological Aboriginal Sites and Cultural Features Identified During the Survey**



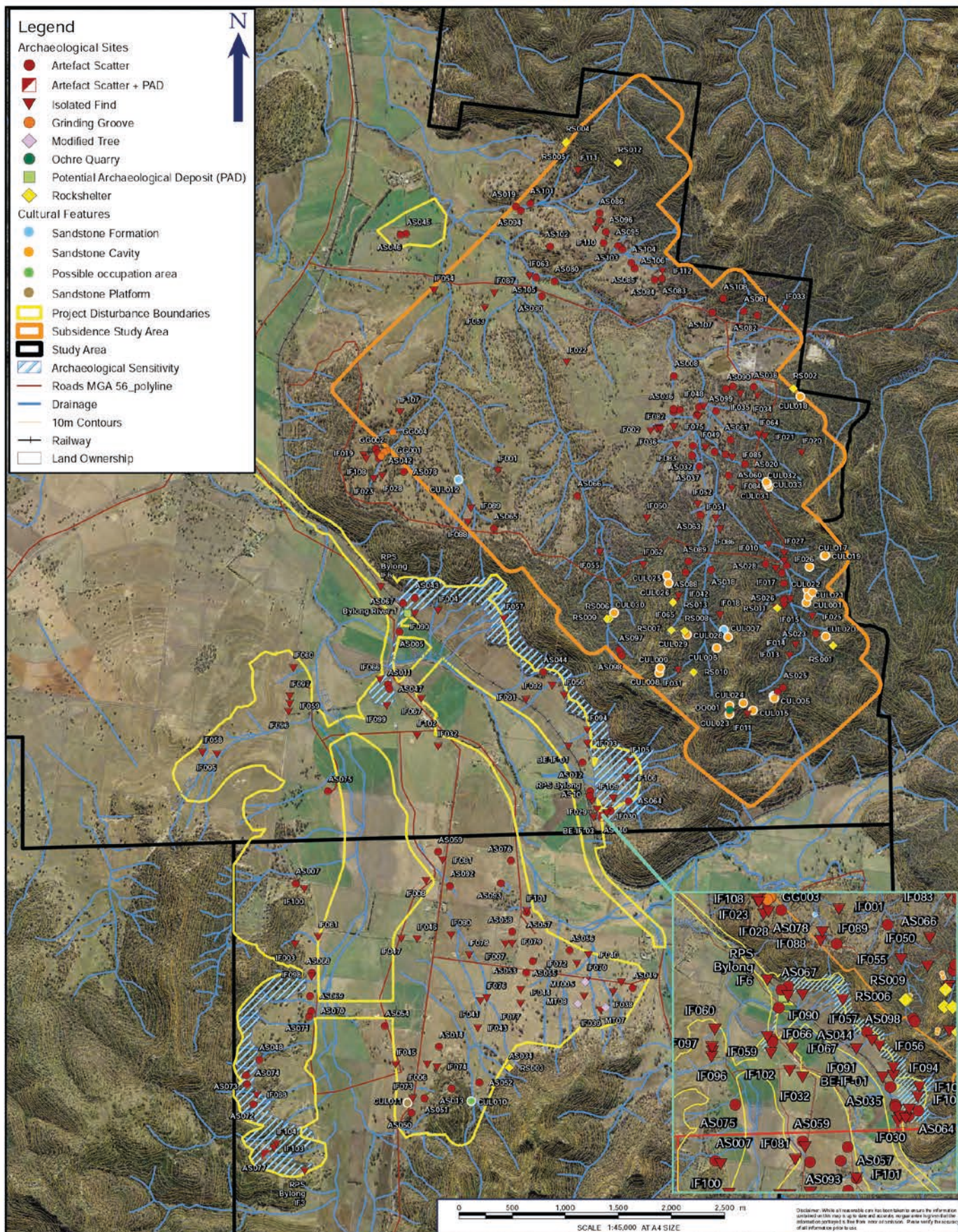


Figure 8: Archaeological Sites and Areas of Archaeological Sensitivity associated with PADs

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## 6.4 Interpretation of Survey Results

This section analyses Aboriginal site data (from the survey results and AHIMS search) with reference to elements of the predictive model: landform and site contents, so that survey results can be interpreted.

### 6.4.1 Landform and Site Type Analysis

The landforms surveyed have been described in Section 4.6. Steep rolling hills, footslopes and alluvial plain landforms covered the highest proportion of the Survey Area in terms of area (hectares) (**Table 17, Figure 9**). While archaeological Aboriginal sites were common in these landforms in terms of raw numbers of sites; footslopes had the highest numbers of sites per 100 hectares. For the purposes of discussion these landforms will be grouped into the Dry Creek catchment (proposed Subsidence Study Area) and the Bylong River Valley (Project Disturbance Boundary), as there is distinct site patterning associated with these two catchment areas.

#### Dry Creek Catchment (Subsidence Study Area)

The Dry Creek area contained Landform Units 1-6 and 10. The western portion of the Dry Creek area is underlain by basalt geology; whereas the east is underlain by sandstone.

Archaeological Aboriginal site distribution in this area was not equal between east and west. The highest concentration of sites was in the eastern area which contained Landform Units 1, 2 and 3. Landform Unit 1 was characterised by clifflines and was difficult to traverse. It contained an ochre quarry and a rockshelter. The remaining 12 rockshelters were contained in Landform Unit 2 which was easier to traverse and the sandstone formations more conducive to rockshelter formation, therefore influencing the frequency of rockshelters in this area. Landform Unit 3 was characterised by ephemeral drainage courses with flat to moderately sloped terrain, which is easier to traverse and has multiple vehicle tracks. Landform Unit 3 had the highest concentration of surface artefact sites compared with any other landform unit in the Survey Area.

In contrast, surface artefact sites were sparsely distributed throughout the western portion of the Dry Creek area (primary Landform Units include 4, 5, 6 and 10). This may partly be due to a reduced number of vehicle tracks in this area, although it is noteworthy that Landform Unit 5 has rolling hills and is difficult to traverse by vehicle and on foot. The steep drainage gullies in Landform Unit 10 also inhibit access to the western portion of the Dry Creek Area. Access through Landform Units 4 and 6 was better and proportionally, the frequency of sites almost doubled. Although, Landform Unit 5 does not contain a high frequency of sites, it is notable that the only grinding groove sites in the Survey Area were identified in this landform unit. The southern margin of Landform Unit 5 had suitable outcropping sandstone for grinding grooves and such sandstone formations were not noted elsewhere in the Survey Area. The grinding grooves are evidence that specialised activities took place at this location, including the sharpening of hatchets, and possibly also seed processing (although the circular depressions noted would need to be investigated further).

The differences in the frequency of site identification between the eastern and western portions of the Dry Creek area may have been partly influenced by the percentage of ground surface exposure created by vehicle tracks. However, there are also noteworthy differences in topography and landforms between the eastern and western portions of the area which are likely to have influenced the site patterning; with the east being easier to traverse. The nature of the ephemeral drainage courses in the east and the adjacent flat to gently sloping areas are suitable for campsite occupation and it appears that portion of Dry Creek was more frequently occupied.



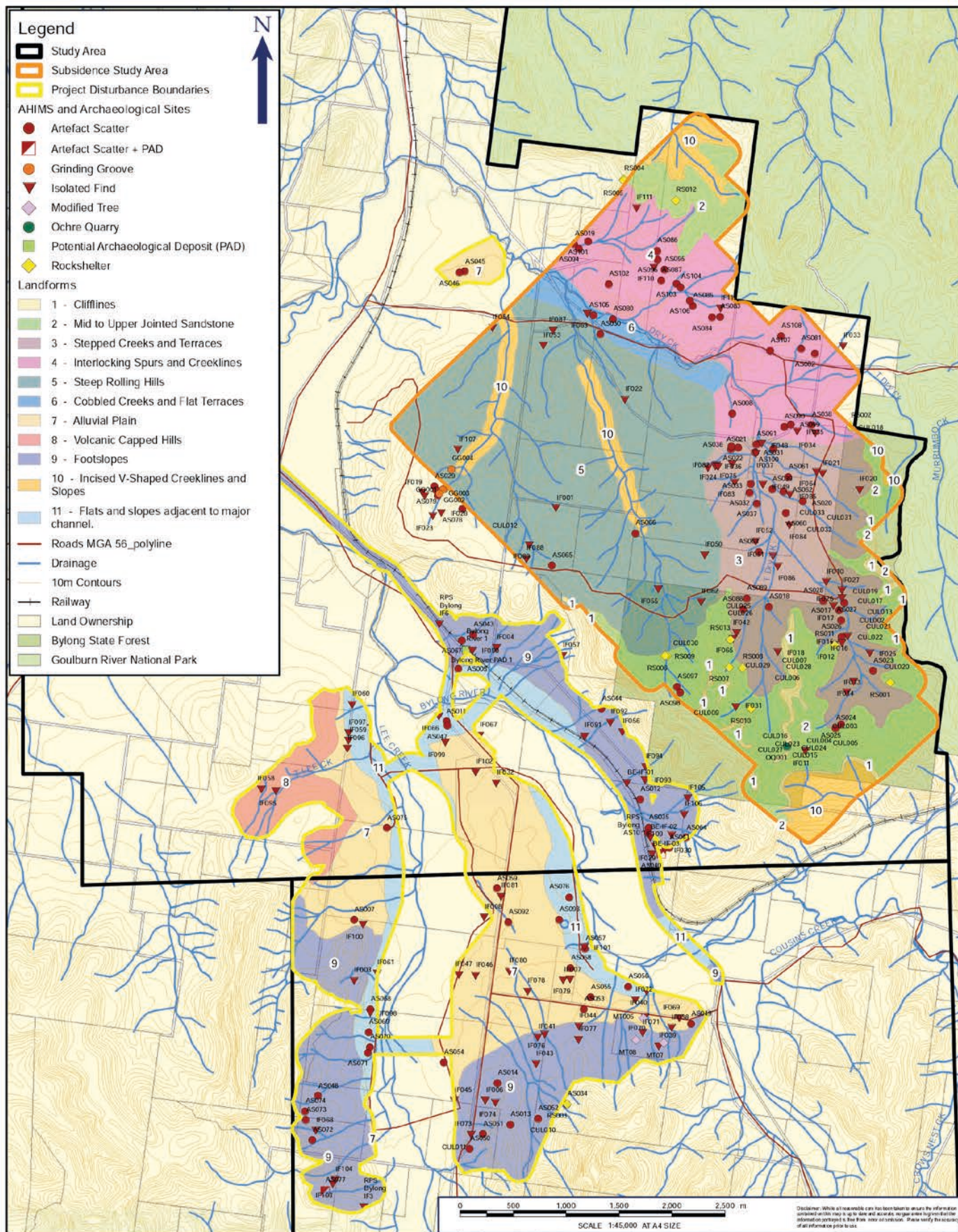


Figure 9: Archaeological Sites within Landforms

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### Bylong Valley (Project Disturbance Boundary)

Archaeological Aboriginal sites in the Bylong Valley (Landform Units 7-9 and 11) were characterised almost exclusively by surface artefacts. The Bylong Valley contained alluvial plain (Landform Unit 7), volcanic capped hills (Landform Unit 8), footslopes (Landform Unit 9) and flat and slopes adjacent to major channels of the Bylong River and Lee Creek (Landform Unit 11).

The alluvial plain and footslopes (Landform Unit 7 and 9) occupy the largest area. By contrast, the volcanic capped hills, major channel landforms (Landform Units 8 and 11) were less than half the size.

The alluvial plain (Landform Unit 7) had fewer surface artefact sites than the adjacent footslopes. This site patterning may be attributed to the extensive disturbance and cropping of the area, although, the extent of disturbance also created high visibility across this landform unit which assisted surface artefact identification. By contrast, the footslopes (Landform Unit 9) had almost twice the frequency of surface artefact sites than the alluvial plain (Landform Unit 7) and almost four times as many as the flats and slopes adjacent to the main channels (Landform Unit 11). During the survey the drainage courses along the footslopes were all observed to be dry. Generally, Aboriginal campsites are located near suitable drinking sources. The occupation of the footslopes therefore appears not to match this trend; however, it is notable that the higher rainfall in the area occurs during summer (Section 4.6) and thus suitable drinking water in these drainage courses may have been more readily available during this period. It is possible that the footslope areas may have been more regularly occupied during the summer months, although further investigation would be required to support this.

The scarcity of sites adjacent to the main Bylong River and Lee Creek channels (Landform Unit 11) is unexpected and does not conform to the predictive model that identified Aboriginal sites are more likely to be located near sources of drinking water. One possibility for this trend is that only small portions of this landform are contained within the Survey Area and thus the low frequency of sites may be related to sampling bias. Another possibility is that periodic flooding of these channels may have removed evidence of Aboriginal occupation.

The volcanic capped hills (Landform Unit 8) which encapsulates 'Bald Hill' contained the fewest artefacts in the entire Survey Area. This area is over 500m from the Lee Creek channel. There are ephemeral watercourses in the area, but, unlike the footslopes, there are no sandstone boulders where drinking water pools; as such the area is largely devoid of the characteristics for regular Aboriginal occupation. However, it may have been used occasionally as a vantage point as it has good views to the north, south east and south west of the Survey Area.

**Table 17 Landforms and Aboriginal sites (including data from survey and AHIMS)**

Landform Number	Landform ID #	Hectares	Number of Sites	Percent	Sites Per 100 Hectares
5	Steep Rolling Hills	587	25	10.46%	4.3
9	Footslopes	477	56	23.43%	11.7
7	Alluvial Plain	422	33	13.81%	7.8
2	Mid to Upper Jointed Sandstone	348	19	7.95%	5.5
3	Stepped Creeks and Terraces	324	53	22.18%	16.4
4	Interlocking Spurs and Creeklines	321	28	11.72%	8.7
11	Flats and slopes adjacent to major channel.	189	18	7.53%	9.5
8	Volcanic Capped Hills	165	2	0.84%	1.2
10	Incised V-Shaped Creeklines and Slopes	128	0	0	0.00

Landform Number	Landform ID #	Hectares	Number of Sites	Percent	Sites Per 100 Hectares
6	Cobbled Creeks and Flat Terraces	47	4	1.67%	3.1
1	Clifflines	34	1	0.42%	2.1

#### 6.4.2 Site Content Predictions

Surface artefact sites were predicted to contain mudstone, tuff and basalt raw materials. These raw materials were identified during the survey, in addition to quartz, sandstone, quartzite, chalcedony and silcrete raw materials. The wider variety of raw materials is likely due to the more extensive surface artefact sites identified during the survey than had previously been identified in the AHIMS and previous studies, which were used to construct the predictive model (Section 5.0).

### 6.5 Summary of Evidence for Aboriginal Occupation

The survey covered two distinct landform groupings, the Dry Creek catchment (Landform Units 1-6 and 10) and the Bylong Valley (Landform Units 7-9 and 11).

In the Dry Creek catchment, Aboriginal occupation appears to have been concentrated in the east, with several of the rockshelters, the Ochre Quarry and multiple surface artefact sites identified. Grinding grooves were only found in one locality in the headwaters of a tributary of Dry Creek. The use of this location is likely to be due to the suitability of the sandstone for grinding; although it does indicate that specialised activities such as ochre extraction also took place. It is likely that the surrounding artefact scatters are indicative of campsites used when obtaining specific resources and sharpening hatchet heads.

In the Bylong Valley, surface artefact sites are the most frequent, particularly in footslope landforms. The lower elevations, adjacent to the main channels and alluvial plain have less artefact sites, although this may be partly due to previous land disturbance. This area as a whole was likely to been used for camping, hunting and gathering as well as transit, but unlike the Dry Creek catchment, there was no evidence for specialised activities such as ochre quarrying or hatchet head sharpening.



## 7.0 Significance Assessment

It is necessary for the significance of Aboriginal sites, cultural features or areas of archaeological sensitivity to be assessed in order to develop appropriate practical and implementable conservation management outcomes which may then be adopted as part of the AACHMP. The overall impact of a proposed development will be measured according to the number of sites/features impacted, if any, and the significance of those sites/features. Aboriginal heritage can be of cultural and/or scientific and/or historic significance. Aboriginal community members are best placed to assess cultural significance and are therefore consulted in the Aboriginal heritage management process.

The Burra Charter (1999) and the OEH guidelines (2011) set out the value criteria and scales on which significance is to be assessed. The values include:

- (1) Social Values (spiritual, political and cultural aspects of the site);
- (2) Aesthetic Values (visual aspect of the site);
- (3) Historic Values (aesthetic and social value combined); and
- (4) Scientific Values.

The OEH guidelines (2011:10) set out scales on which Aboriginal cultural heritage significance is to be assessed. It identifies three levels: local, regional and state. The guidelines do not specify a geographic area for the assessment of local, regional and state significance. For the purposes of this assessment, the local scale is defined as the Survey Area and its immediate vicinity. The regional scale includes the Bylong River and Goulburn River catchment areas and is broadly aligned with the regional area discussed in the Cumulative Impact Assessment (Section 8.7). The State scale is defined as the land within the State of New South Wales.

### 7.1 Cultural (Aboriginal) Significance Criteria

The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (2011:3-7) recognises that Aboriginal cultural heritage significance is equal in importance to the context in which the object or place was found. The RAPs for the Project were invited to consider the identified sites using the following conservation values: social, aesthetic and historic. Scientific value was discussed with the RAPs, but they preferred to assess the sites/features in terms of the social, aesthetic and historic values as these were more relatable from their cultural perspective.

Social value encompasses the spiritual, political, national or other associations to a majority or minority group. Aesthetic value encompasses aspects of sensory perception including form, scale, colour, texture and material of the fabric. Historic value is the history of the place, its association with historic figure and/or its role in a historical event.

The methodology for assessing cultural significance was to consult with the RAPs through the cultural values assessment and discussion sessions, the draft report review process and informal consultation as requested. Further details are available in Section 3.0.

Feedback from the RAPs noted that all sites and features in the Survey Area were considered to have moderate to high significance in terms of social, aesthetic and historic values, some of this information was collected during the cultural values workshops, as well as feedback from the draft report and informal consultation (**Table 18**). It should be noted that not all RAP representatives agreed unanimously on the significance of the sites/features and thus **Table 18** should be read as a general consensus, rather than representative of individual RAP representatives' views. The RAPs chose not to rank archaeological sites



individually. The cultural features and their significance are mapped in **Figure 10**. The locations of significant archaeological sites are mapped in **Figure 11**.

**Table 18 Aboriginal Cultural Significance for Sites and Features**

Site Type	Classification	Label	Cultural Significance
Ochre Quarry	Archaeological	OQ001	High
Modified Trees	Archaeological	MT005, MT007, MT008	High
Grinding Grooves	Archaeological	GG001-GG004	High
Artefact Scatter + PAD	Archaeological	AS040, AS077	Moderate-High
Surface Artefact Sites	Archaeological	All, individually listed in <b>Table 22</b>	Moderate-High
Sandstone Formation	Cultural Feature	CUL004,CUL007	High
Sandstone Formation	Cultural Feature	CUL0012	Moderate
Sandstone Cavity	Cultural Feature	CUL001-003, CUL005, CUL006, CUL008, CUL009, CUL013, CUL015-CUL033	Moderate
Possible occupation area	Cultural Feature	CUL010	Moderate
Natural Sandstone Platform	Cultural Feature	CUL011	Moderate



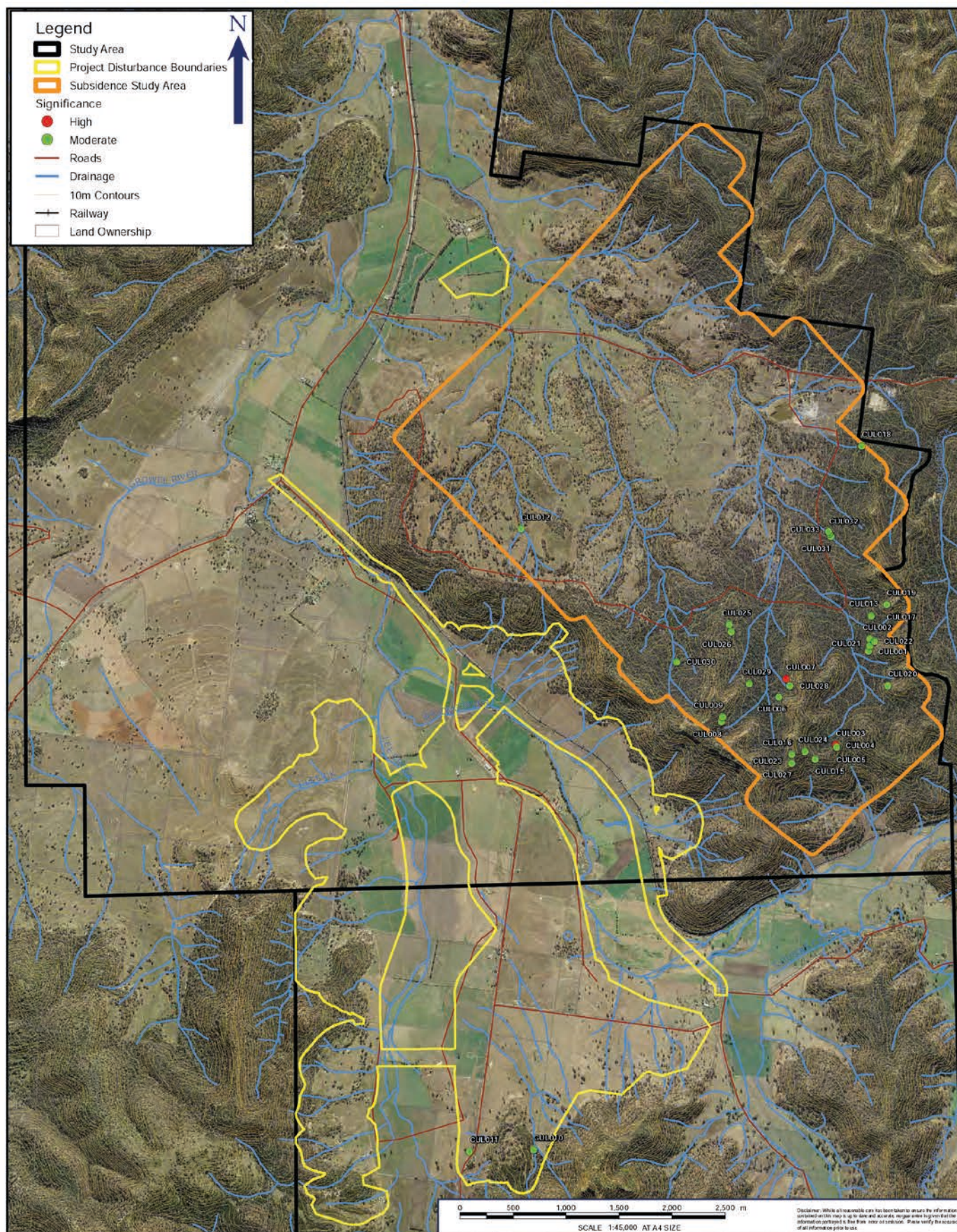


Figure 10: Significance of Cultural Sites

LOCATION: Bylong

DAIUM: GDA94

PROJECTION: MGA Zone 56

JOB NO.: PR113279

Data Sources:

PURPOSE: HERITAGE

RPS Recorded Data

Technician: Natalie Wood

Date: 20/02/2015

Client supplied Data

OE H

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## 7.2 Archaeological (Scientific) Significance Criteria

Archaeological value (also referred to as scientific value) is assessed according to the criteria outlined in the OEH guidelines (2011). In order to develop appropriate heritage management and impact mitigation strategies, archaeological value is determined by assessing an Aboriginal archaeological site or area according to the following criteria: research potential, rarity, representativeness and education potential. These criteria are defined in **Table 19** below.

**Table 19 Archaeological Significance Criteria**

Criteria	Description
Research Potential	This criterion is used to identify whether a site has the potential to contribute new information to the interpretation of Aboriginal occupation.
Rarity	This criterion examines the frequency of the identified site types with others previously recorded in the local or regional landscape.
Representativeness	All sites are representative of a site type, however, some sites may be in better condition, or demonstrate more clearly a particular site type. Representativeness is based on the understanding of extant sites in the local or regional landscape and the purpose of this criterion is to ensure a representative sample of sites is conserved for future generations.
Education Potential	This refers to whether the site has the potential to contribute to the public understanding of Aboriginal cultural heritage. These sites are often well preserved and have recognisable features which would assist in teaching.

The archaeological significance criteria are usually assessed on two scales: local and regional; in exceptional circumstances, however, state significance may also be identified. Local and regional level of significance will be assessed for all sites; however, state level significance assessment will only be undertaken on sites with high regional significance. This extra level of assessment will determine whether they have exceptional values which are applicable to state level significance.

Archaeological significance criteria is assessed in three levels to which scores are assigned; low (score=1), moderate (score=2) and high (score=3).

A combination of these scores then enables an overall significance ranking of the site to be determined.

- Low significance 4-6
- Moderate significance 7-9
- High significance 10-12

## 7.3 Assessment of Archaeological Significance

The significance of the archaeological Aboriginal sites has been assessed and the results are summarised in **Table 20**; 25 sites were assessed to be of high local significance, 8 were determined to be of moderate significance and 185 were determined to be of low significance. A more detailed description and significance scoring is available in **Appendix 7**. Of the 25 sites of high local significance, only 7 were of high regional significance equating to less than 4% of total number of sites (**Table 21**). Archaeological Aboriginal sites of high regional significance included an ochre quarry (OQ001), three grinding grooves (GG001-GG003) and three rockshelters with PAD (RS003, RS007 and RS013). Archaeological Aboriginal sites of high regional significance were relatively rare. Approximately 90% of the archaeological sites in the Survey Area were assessed to have low significance on a regional level.

**Table 20 Local Significance Assessment for Archaeological Aboriginal Sites Identified during the survey**

Local Significance	Site Type	Count	Total	Percent
High	Rockshelter	13	25	11.47%
	Artefact Scatter	4		
	Grinding Groove	4		
	Modified Tree	3		
	Ochre Quarry	1		
Moderate	Artefact Scatter	6	9	4.13%
	Artefact Scatter + PAD	2		
	Isolated Find	1		
Low	Artefact Scatter	81	184	84.40%
	Isolated Find	103		

**Table 21 Regional Significance Assessment for Archaeological Aboriginal Sites Identified during the survey**

Regional Significance	Site Type	Site Name	Total	Percent
High	Ochre Quarry	OQ001	7	3.21%
	Grinding Groove	GG001		
	Grinding Groove	GG002		
	Grinding Groove	GG003		
	Rockshelter	RS003		
	Rockshelter	RS007		
	Rockshelter	RS013		
Moderate	Grinding Groove	GG004	13	5.96%
	Rockshelter	RS008		
	Rockshelter	RS010		
	Rockshelter	RS012		
	Modified Tree	MT005		
	Modified Tree	MT007		
	Modified Tree	MT008		
	Artefact Scatter	AS029		
	Artefact Scatter	AS034		
	Artefact Scatter	AS042		
	Artefact Scatter	AS079		
	Artefact Scatter + PAD	AS040		
	Artefact Scatter + PAD	AS077		
Low	Individually listed in <b>Table 22</b>		198	90.83%

The above tables summarise the significance assessment for archaeological Aboriginal sites. A summary of all other archaeological sites identified in the Survey Area is provided below (**Table 22**). It lists the sites individually according to their local and regional significance. Archaeological sites of high local significance have been mapped in **Figure 11**. **Figure 12** shows sites of high regional significance.



Table 22 Archaeological Significance Assessment for all sites

Label	Site Type	Local Significance	Regional Significance
OQ001	Ochre Quarry	High	High
GG001	Grinding Groove	High	High
GG002	Grinding Groove	High	High
GG003	Grinding Groove	High	High
RS003	Rockshelter	High	High
RS007	Rockshelter	High	High
RS013	Rockshelter	High	High
AS029	Artefact Scatter	High	Moderate
AS034	Artefact Scatter	High	Moderate
AS042	Artefact Scatter	High	Moderate
AS079	Artefact Scatter	High	Moderate
GG004	Grinding Groove	High	Moderate
MT005	Modified Tree	High	Moderate
MT007	Modified Tree	High	Moderate
MT008	Modified Tree	High	Moderate
RS008	Rockshelter	High	Moderate
RS010	Rockshelter	High	Moderate
RS012	Rockshelter	High	Moderate
RS001	Rockshelter	High	Low
RS002	Rockshelter	High	Low
RS004	Rockshelter	High	Low
RS005	Rockshelter	High	Low
RS006	Rockshelter	High	Low
RS009	Rockshelter	High	Low
RS011	Rockshelter	High	Low
AS040	Artefact Scatter + PAD	Moderate	Moderate
AS077	Artefact Scatter + PAD	Moderate	Moderate
AS033	Artefact Scatter	Moderate	Low
AS039	Artefact Scatter	Moderate	Low
AS047	Artefact Scatter	Moderate	Low
AS060	Artefact Scatter	Moderate	Low
AS083	Artefact Scatter	Moderate	Low
IF012	Isolated Find	Moderate	Low
AS016	Artefact Scatter	Low	Low
AS017	Artefact Scatter	Low	Low
AS018	Artefact Scatter	Low	Low
AS019	Artefact Scatter	Low	Low
AS020	Artefact Scatter	Low	Low
AS021	Artefact Scatter	Low	Low
AS022	Artefact Scatter	Low	Low
AS023	Artefact Scatter	Low	Low

Label	Site Type	Local Significance	Regional Significance
AS024	Artefact Scatter	Low	Low
AS025	Artefact Scatter	Low	Low
AS026	Artefact Scatter	Low	Low
AS027	Artefact Scatter	Low	Low
AS028	Artefact Scatter	Low	Low
AS030	Artefact Scatter	Low	Low
AS031	Artefact Scatter	Low	Low
AS032	Artefact Scatter	Low	Low
AS035	Artefact Scatter	Low	Low
AS036	Artefact Scatter	Low	Low
AS037	Artefact Scatter	Low	Low
AS038	Artefact Scatter	Low	Low
AS041	Artefact Scatter	Low	Low
AS043	Artefact Scatter	Low	Low
AS044	Artefact Scatter	Low	Low
AS045	Artefact Scatter	Low	Low
AS046	Artefact Scatter	Low	Low
AS048	Artefact Scatter	Low	Low
AS049	Artefact Scatter	Low	Low
AS050	Artefact Scatter	Low	Low
AS051	Artefact Scatter	Low	Low
AS052	Artefact Scatter	Low	Low
AS053	Artefact Scatter	Low	Low
AS054	Artefact Scatter	Low	Low
AS055	Artefact Scatter	Low	Low
AS056	Artefact Scatter	Low	Low
AS057	Artefact Scatter	Low	Low
AS058	Artefact Scatter	Low	Low
AS059	Artefact Scatter	Low	Low
AS061	Artefact Scatter	Low	Low
AS062	Artefact Scatter	Low	Low
AS063	Artefact Scatter	Low	Low
AS064	Artefact Scatter	Low	Low
AS065	Artefact Scatter	Low	Low
AS066	Artefact Scatter	Low	Low
AS067	Artefact Scatter	Low	Low
AS068	Artefact Scatter	Low	Low
AS069	Artefact Scatter	Low	Low
AS070	Artefact Scatter	Low	Low
AS071	Artefact Scatter	Low	Low
AS072	Artefact Scatter	Low	Low
AS073	Artefact Scatter	Low	Low

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Label	Site Type	Local Significance	Regional Significance
AS074	Artefact Scatter	Low	Low
AS075	Artefact Scatter	Low	Low
AS076	Artefact Scatter	Low	Low
AS078	Artefact Scatter	Low	Low
AS080	Artefact Scatter	Low	Low
AS081	Artefact Scatter	Low	Low
AS082	Artefact Scatter	Low	Low
AS084	Artefact Scatter	Low	Low
AS085	Artefact Scatter	Low	Low
AS086	Artefact Scatter	Low	Low
AS087	Artefact Scatter	Low	Low
AS088	Artefact Scatter	Low	Low
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AS093	Artefact Scatter	Low	Low
AS094	Artefact Scatter	Low	Low
AS095	Artefact Scatter	Low	Low
AS096	Artefact Scatter	Low	Low
AS097	Artefact Scatter	Low	Low
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AS099	Artefact Scatter	Low	Low
AS107	Artefact Scatter	Low	Low
AS108	Artefact Scatter	Low	Low
AS100	Artefact Scatter	Low	Low
AS101	Artefact Scatter	Low	Low
AS102	Artefact Scatter	Low	Low
AS103	Artefact Scatter	Low	Low
AS104	Artefact Scatter	Low	Low
AS105	Artefact Scatter	Low	Low
AS106	Artefact Scatter	Low	Low
IF008	Isolated Find	Low	Low
IF010	Isolated Find	Low	Low
IF011	Isolated Find	Low	Low
IF013	Isolated Find	Low	Low
IF014	Isolated Find	Low	Low
IF015	Isolated Find	Low	Low
IF016	Isolated Find	Low	Low
IF017	Isolated Find	Low	Low
IF018	Isolated Find	Low	Low
IF019	Isolated Find	Low	Low

Label	Site Type	Local Significance	Regional Significance
IF020	Isolated Find	Low	Low
IF021	Isolated Find	Low	Low
IF022	Isolated Find	Low	Low
IF023	Isolated Find	Low	Low
IF024	Isolated Find	Low	Low
IF025	Isolated Find	Low	Low
IF026	Isolated Find	Low	Low
IF027	Isolated Find	Low	Low
IF028	Isolated Find	Low	Low
IF029	Isolated Find	Low	Low
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IF036	Isolated Find	Low	Low
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IF045	Isolated Find	Low	Low
IF046	Isolated Find	Low	Low
IF047	Isolated Find	Low	Low
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IF052	Isolated Find	Low	Low
IF053	Isolated Find	Low	Low
IF054	Isolated Find	Low	Low
IF055	Isolated Find	Low	Low
IF056	Isolated Find	Low	Low
IF057	Isolated Find	Low	Low
IF058	Isolated Find	Low	Low
IF059	Isolated Find	Low	Low
IF060	Isolated Find	Low	Low
IF061	Isolated Find	Low	Low

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Label	Site Type	Local Significance	Regional Significance
IF062	Isolated Find	Low	Low
IF063	Isolated Find	Low	Low
IF064	Isolated Find	Low	Low
IF065	Isolated Find	Low	Low
IF066	Isolated Find	Low	Low
IF067	Isolated Find	Low	Low
IF068	Isolated Find	Low	Low
IF069	Isolated Find	Low	Low
IF070	Isolated Find	Low	Low
IF071	Isolated Find	Low	Low
IF072	Isolated Find	Low	Low
IF073	Isolated Find	Low	Low
IF074	Isolated Find	Low	Low
IF075	Isolated Find	Low	Low
IF076	Isolated Find	Low	Low
IF077	Isolated Find	Low	Low
IF078	Isolated Find	Low	Low
IF079	Isolated Find	Low	Low
IF080	Isolated Find	Low	Low
IF081	Isolated Find	Low	Low
IF082	Isolated Find	Low	Low
IF083	Isolated Find	Low	Low
IF084	Isolated Find	Low	Low
IF085	Isolated Find	Low	Low
IF086	Isolated Find	Low	Low
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IF090	Isolated Find	Low	Low
IF091	Isolated Find	Low	Low
IF092	Isolated Find	Low	Low
IF093	Isolated Find	Low	Low
IF094	Isolated Find	Low	Low
IF095	Isolated Find	Low	Low
IF096	Isolated Find	Low	Low
IF097	Isolated Find	Low	Low
IF098	Isolated Find	Low	Low
IF099	Isolated Find	Low	Low
IF100	Isolated Find	Low	Low
IF101	Isolated Find	Low	Low
IF102	Isolated Find	Low	Low
IF103	Isolated Find	Low	Low



Label	Site Type	Local Significance	Regional Significance
IF104	Isolated Find	Low	Low
IF105	Isolated Find	Low	Low
IF106	Isolated Find	Low	Low
IF107	Isolated Find	Low	Low
IF108	Isolated Find	Low	Low
IF109	Isolated Find	Low	Low
IF110	Isolated Find	Low	Low
IF111	Isolated Find	Low	Low
IF112	Isolated Find	Low	Low



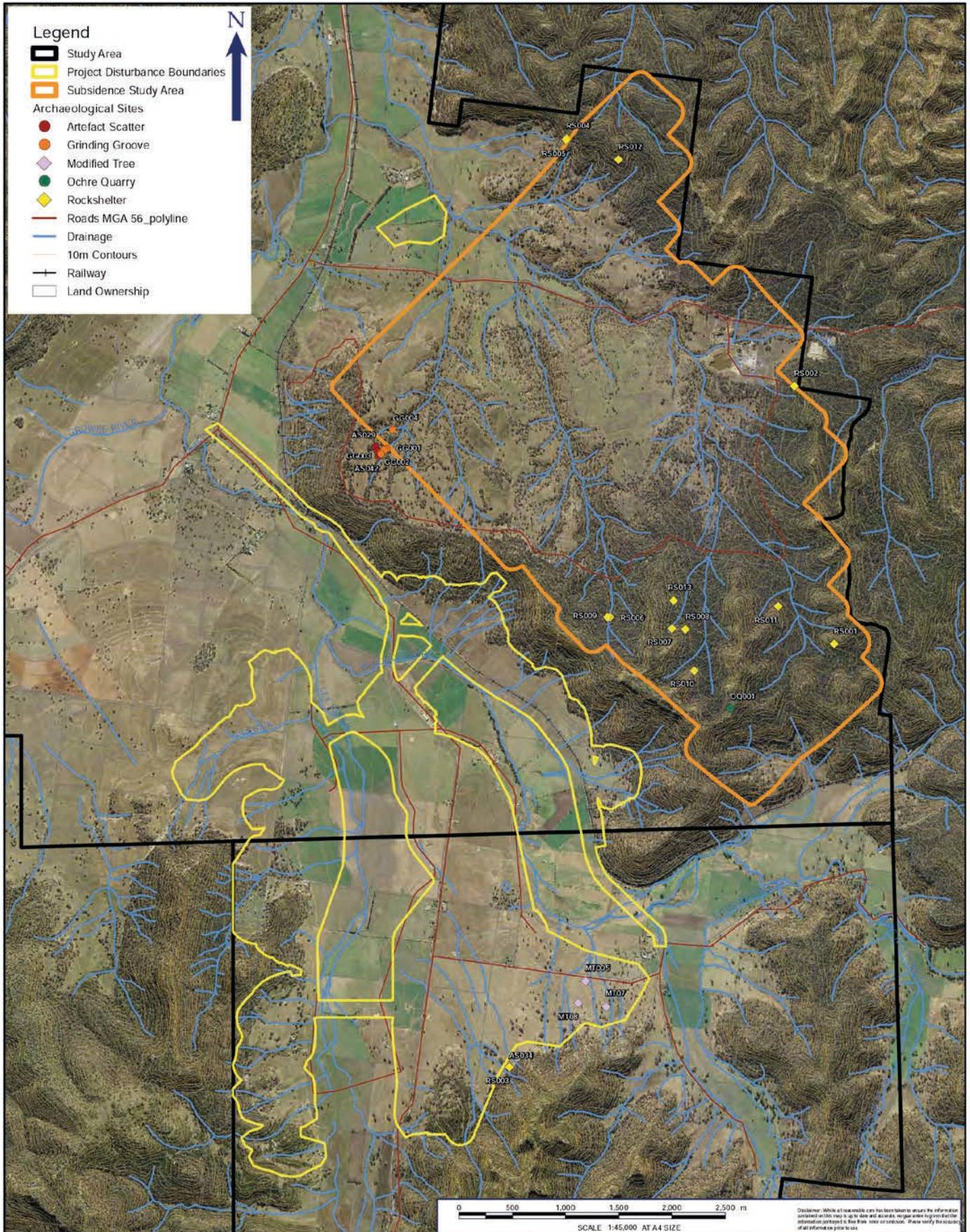


Figure 11: Aboriginal Archaeological Sites of Local Significance



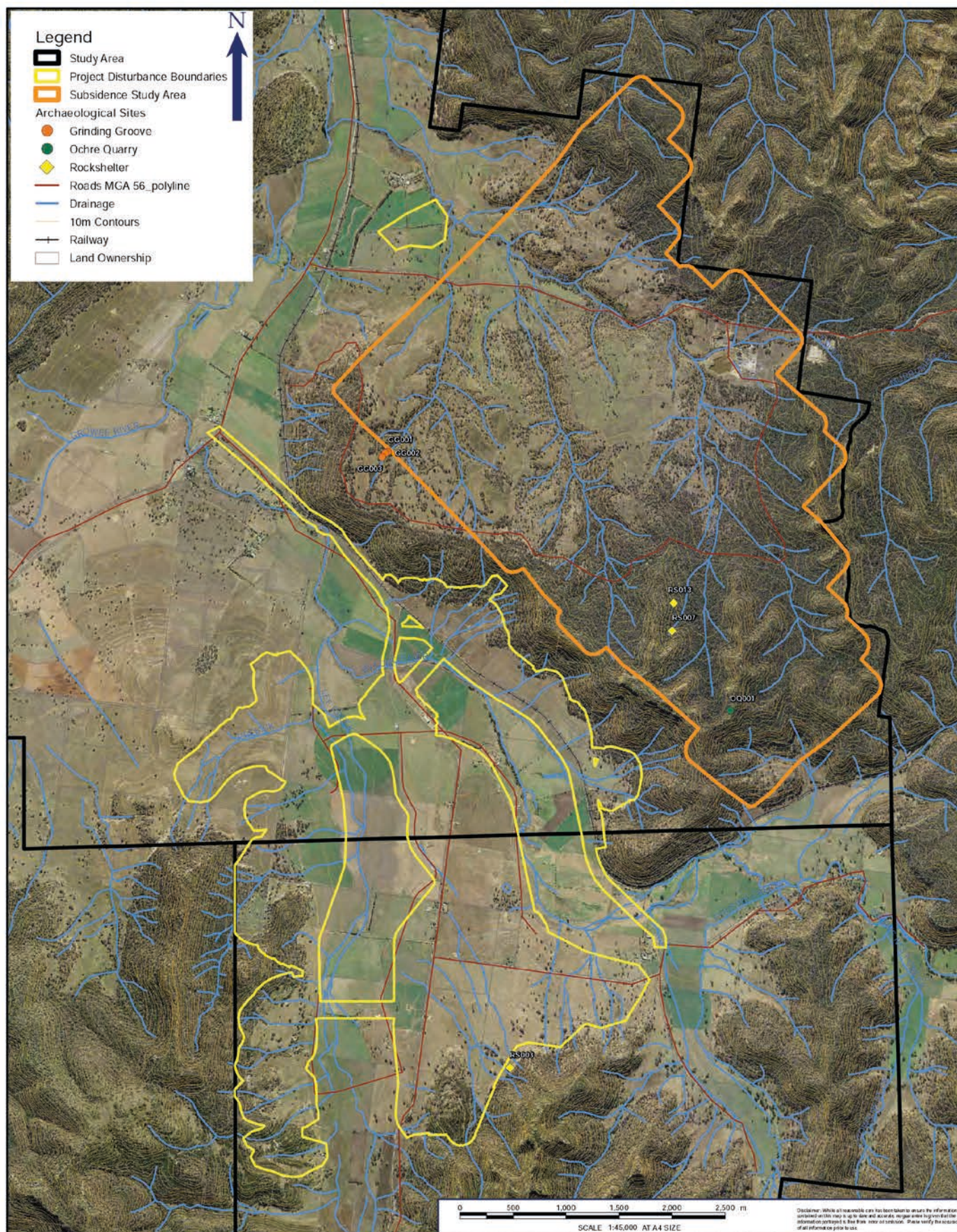


Figure 12: Aboriginal Archaeological Sites of High Regional Significance

LOCATION: Bylong

DATUM: GDA94

PROJECTION: MGA Zone 56

JOB NO.: PR113279

Data Sources:

PURPOSE: HERITAGE

RPS Recorded Data

Client supplied Data

OE H

Technician: Natalie Wood

Date: 20/02/2015

CLIENT: KEPCO C/O- HANSEN BAILEY

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### 7.3.2 Archaeological Aboriginal Sites of High Local and Regional Significance

The sites of high local and regional archaeological significance are summarised in this section in accordance with the definitions and criteria outlined at the beginning of Section 7.0. Full details on the significance ranking and assessment are outlined in **Appendix 7**.

#### RPS Bylong OQ001

Ochre Quarries are rare and as such are considered to have significant potential to contribute to research and education. Ochre is an iron oxide and deposits of ochre are found in a range of earthy colours. Two types of ochre occur in the regional area: red ochre (generally impure earthy haematite) and yellow ochre (earthy goethite, clay and iron hydroxides) both of which are used by Aboriginal people. Ochre pigments are used for artistic and ceremonial purposes and ochre residue has been found on implements manufactured from stone and wood (Paterson 1985). Ochre may be mixed with mediums such as water, blood, fat, etc. which act as a fixative. Sometimes dry ochre can be used for staining skins and hair and has been used as a trade item in some areas (NSW Department of Primary Industries 2007). The ochre may be extracted from the deposit by use of stone implements (Davidson 1952 in Paterson 1985:4).

The ochre quarry RPS Bylong OQ001 has significant potential to contribute knowledge not available from other site types identified in the area.

The site is on a north west facing upper slope of a ridge line on a mountainous landform. The ochre quarry is associated with the Widden Brook Conglomerate which is characterised by interbedded sediments including sandstone, conglomerate, siltstone and claystone. The ochre seam at this site is interbedded between massive sandstone, conglomerate and siltstone bedding planes. The results of the field survey showed that there were red, purple and yellow pigments represented at this site. The red ochre deposit at this site is probably associated with hematitic sandstone and the yellow ochre with the claystone. The yellow ochre deposit overlies a discontinuous red ochre deposit, which is underlain by siltstone.

The ochre would have been removed from the rock cavity and then probably transported to an area where it could be processed by grinding it and mixing it with water or another liquid substance.

As the rarity, representativeness, research and education potential of this site are high, the site has been rated as highly significant on both a local and regional scale. This site was rated of high archaeological significance for the region, but this site was not considered to be of State Significance for a number of reasons. There are a number of mineral ochre resource sites in NSW such as Manfred Ranges and at least 17 ochre quarry sites have been recorded in NSW (NSW Department of Primary Industries 2007) including an exceptional site at Cuddie Springs (Flood 1983:189) and thus this site is not unique. There is evidence for ochre extraction at this site, but the extraction at this site does not appear to have been as extensive as at other sites across the state and as such, while it is likely to have been used by those occupying the region, the level of extraction does not suggest it was traded more extensively.

#### RPS Bylong Grinding Groove Complex : RPS Bylong GG001, RPS Bylong GG002 and RPS Bylong GG003

Grinding groove sites are rare in the local area. The presence of sandstone is important for Aboriginal occupation as sandstone was commonly used for grinding stone artefacts. To produce a sharp edge the axe blank (or re-worked axe) was honed on a natural stone surface near a source of water. The water was required for lubricating the grinding process. Rock engravings and grinding grooves may be found in areas of exposed sandstone and sandstone outcrops, particularly on level sandstone outcrops situated along creek beds and creek banks. Grinding grooves may be u-shaped or v-shaped and the groove depth varies. Some grinding groove sites are associated with permanent waterholes or depressions in the sandstone. These

waterholes often have grinding surfaces near to the rim. Sites with larger numbers of grinding grooves are uncommon in this area and those in association with waterholes are rare, as are grinding groove sites with associated stone artefacts.

The grinding groove sites RPS Bylong GG001, RPS Bylong GG002 and RPS Bylong GG003 are considered to have high local significance and high regional significance as they are situated in close proximity to each other along a first order tributary of Dry Creek that flowed to the north east. Grinding groove sites are rare in the local area and in the region. The grinding grooves are located on flat lying or gently sloping sandstone that lined the bed of the creek. The sandstone bedrock in the creek line was stepped between the grinding groove site locations in line with the fall of the creek.

RPS Bylong GG001 is an excellent example of a grinding groove site, which covered an area that is 15 metres long by 5 metres wide. There are 12 grinding grooves identified at the site on a flat lying sandstone rock in the creek bed. The grinding grooves are v-shaped and the majority are similar in size, measuring between 22 to 25 centimetres in length and 5 centimetres in width. There are some shallow grooves and a number that are deeper, indicating likely repetitive use of the site.

RPS Bylong GG002 is also an excellent example of a grinding groove site, and extends over an area more than 10 metres long and 5 metres wide. There are several irregular shaped depressions in the sandstone bedrock and two roughly circular basin shaped depressions had grinding surfaces extending into the water. The basins are approximately 10 centimetres in depth and the diameter of the basins measured more than 50 centimetres. There are more than 10 v-shaped grooves at the site which varied in size between 15 to 25 centimetres in length and around 5 centimetres in width.

RPS Bylong GG003 is an exceptional example of a grinding groove site. There are more than 30 v-shaped and u-shaped grooves identified at this site although some were obscured by leaf litter at the time of survey. This site has the longest grooves of the three grinding groove sites identified during the survey, measuring 30 centimetres in length and approximately 8 to 10 centimetres in width. There are also shorter grooves, between 20 to 24 centimetres long and 6 to 8 centimetres wide and some are 15 to 18 centimetres long and 6 to 8 centimetres wide. Some of the depressions in the bedrock contained water, but no grinding surfaces were observed on the edge of these areas.

These three grinding groove sites form a complex and have been rated as highly significant on both a local and regional scale. Artefact scatters to the west of the creekline, RPS Bylong AS042, RPS Bylong AS079 and RPS Bylong AS029 are in close proximity with the grinding groove sites and are considered to be associated with them. These sites are considered to be representative and an outstanding example of a complex of grinding groove sites. As such they are rare and have high research and education potential. Although this complex of sites was rated as having high regional significance, there are other sites of this type in the region (**Figure 14**). As such, it was not considered to be of State Significance as they are not rare across the whole of NSW.

### **Rockshelters (RS003, RS007, RS013)**

All rockshelters identified in the Survey Area contained PADs. However, three rockshelters were identified as having high significance according to the four OEH criteria (research potential, representativeness, rarity and education potential).

RS003 is the only boulder rockshelter on the Bylong Valley floor and its association with nearby artefact scatters suggests habitation of the area by Aboriginal people. This shelter is rare and representative for the region and thus has high educational potential. The PAD in this instance is outside the shelter and is relatively shallow and it thus has moderate potential for further research. RS007 and RS013 are the largest rockshelters identified which had sizable PADs. They are rare and representative for the region and thus



were ranked as high for these criteria, as well as for educational purposes. The research potential of the PADs contributed to their high regional significance ranking.

#### **7.4 Summary of Significance**

Archaeological significance assessment has been undertaken on the 218 Aboriginal sites identified during the survey. In accordance with the OEH criteria, significance assessment has been undertaken on a local and regional level. The sites have been assessed according to the four archaeological criteria (research potential, rarity, representativeness and education potential).

Archaeological Aboriginal sites of high regional significance included an ochre quarry (OQ001), three grinding grooves (GG001-GG003) and three rockshelters with PAD (RS003, RS007 and RS013).

Archaeological Aboriginal sites of high regional significance were relatively rare and comprised less than 4% of the total archaeological sites in the Survey Area.

Approximately 90% of the archaeological sites in the Survey Area were assessed to have low significance on a regional level.

## 8.0 Impact Assessment

The potential impacts to Aboriginal heritage from the proposed Project include: subsidence (proposed underground longwall mining), blasting and surface disturbance. As such the impact assessment is divided into three sections according to these potential impacts. Subsidence and blasting are considered to be indirect impacts, while direct impacts relate to the surface disturbance proposed within the Project Disturbance Boundary.

As defined previously, the Subsidence Study Area is the extent of coal to be extracted by Underground methods; in making an assessment of subsidence effects MSEC has defined the Subsidence Study Area, this covers the area above the longwalls, as well as a horizontal buffer around the longwalls which equates to half the depth of cover (MSEC 2015). Extraction of coal via underground mining methods may result in indirect impacts to archaeological and cultural Aboriginal sites. The Project Disturbance Boundary comprises the area of potential surface disturbances associated with the Open Cut Mining Area and the Mine Infrastructure Area. The extraction of coal via open cut mining methods and construction of surface facilities and infrastructure will result in direct impacts to archaeological Aboriginal sites.

Archaeological Aboriginal site types within the Subsidence Study Area include an ochre quarry, a modified tree, a grinding groove, rockshelters and surface artefacts (artefact scatters and isolated finds). In addition, there are 30 cultural features which are within the Subsidence Study Area (MSEC 2015, **Appendix 8**).

Archaeological Aboriginal site types within the Project Disturbance Boundary include: surface artefacts (artefact scatters and isolated finds) and PADs (some with surface artefacts) and a modified tree. There are two cultural features within the surface disturbance area. One rockshelter has been recorded outside the Project Disturbance Boundary, but will potentially be affected by blasting activities (i.e. within 70 metres of the Project Disturbance Boundary). As such, it has been included in the impacted site count. An assessment of the potential impacts from blasting has been prepared by Pacific Environment Limited (2014).

Archaeological Aboriginal sites outside the disturbance boundaries include surface artefacts (artefact scatters and isolated finds), grinding grooves, rockshelters and a modified tree.

### 8.1 Subsidence Study Area - Subsidence Predictions for Longwall Mining

There are 146 Aboriginal sites and features in the Subsidence Study Area (**Figure 13**). MSEC (2015) has prepared subsidence predictions for all the Aboriginal sites (116) and features (30) within the Subsidence Study Area (**Table 23**). Of the sites in the Subsidence Study Area, 41 (11 sites, 30 features) are at risk of impacts from subsidence cracking and rockfall. The remaining 105 archaeological sites are not likely to be impacted from subsidence.

MSEC (2015) considered the morphology of the sites and features in making predictions regarding the potential impacts. In general, sandstone sites and features within the Subsidence Study Area are susceptible to rock fall and cracking, the modified tree sites within the Subsidence Study Area are susceptible to tree fall and surface artefacts within the Subsidence Study Area are susceptible to movement only if there are substantial changes in surface water drainage patterns and sheet wash. In general, rock falls are predicted to occur "in approximately 20% of the cliffs and visible mining subsidence movements in approximately 50% to 70% of the sandstone formations greater than approximately 3 metres high" (MSEC 2015).

One other potential impact which needs to be considered is the remediation of surface cracks by the use of fill or earthmoving equipment. The subsidence predictions and impact assessment has been organised according to site and feature type. Surface artefacts sites which have been recorded in tracks are at risk of impact from vehicles accessing the area for monitoring related activities.



There are five archaeological Aboriginal sites outside the subsidence zone, but in close proximity to the Subsidence Study Area, three of which are considered to be of high regional significance (**Table 25**). These have been included in the impact assessment in order to demonstrate that they will not be indirectly impacted by underground mining.



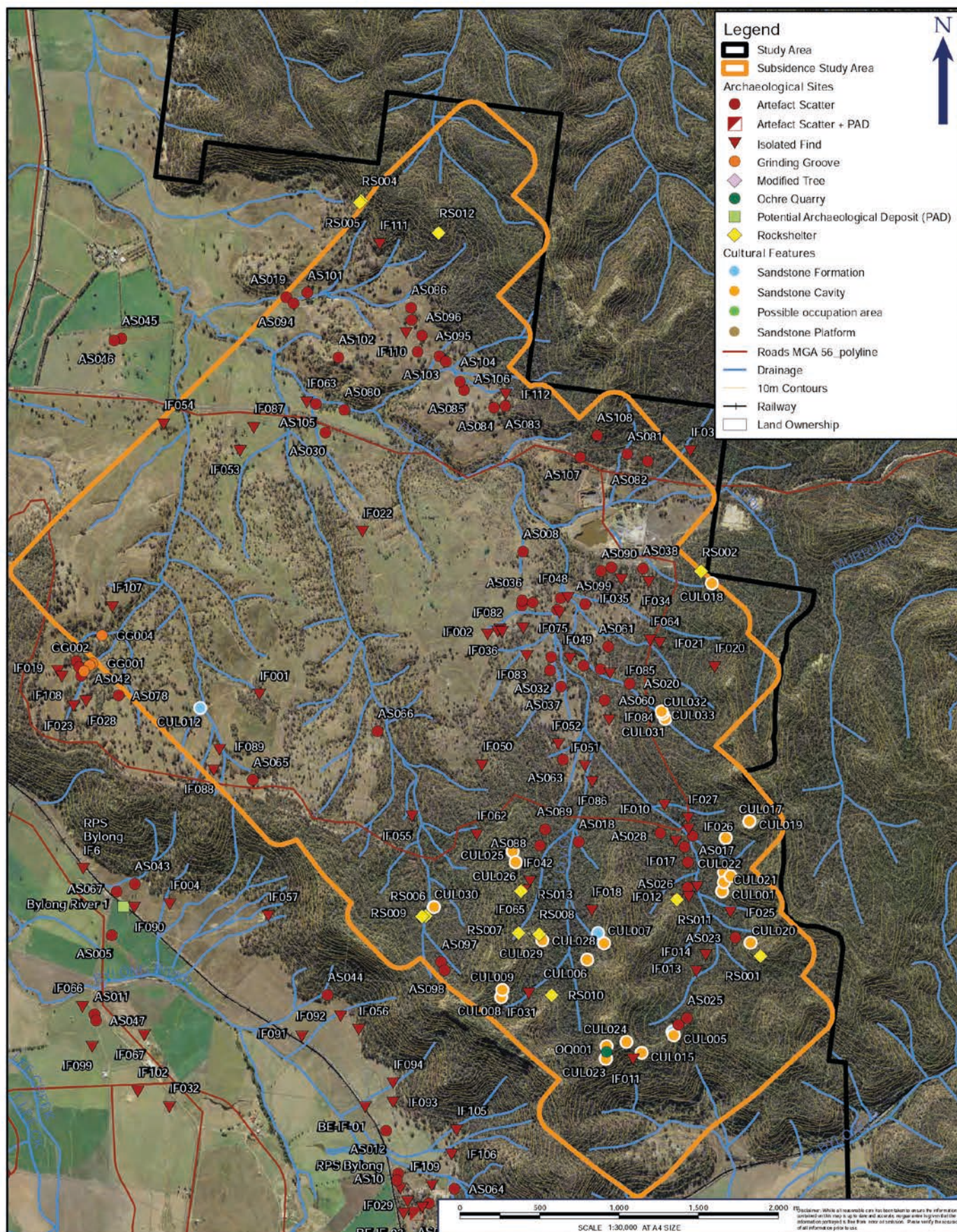


Figure 13: Subsidence Study Area with Archaeological Aboriginal Sites and Cultural Features

LOCATION: Bylong	DAIUM: GDA94
JOB NO.: PR113279	PROJECTION: MGA Zone 56
PURPOSE: HERITAGE	Data Sources: RPS Recorded Data Client supplied Data OE H
Technician: Natalie Wood	Date: 20/02/2015

CLIENT: KPCO C/O: HANSEN BAILEY

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**Table 23 Potential Indirect Impacts to Archaeological Sites within the Subsidence Study Area (MSEC 2015)**

Site Type	Site Name	Archaeological Regional Significance	Summary of Potential Impact from Subsidence
Ochre Quarry	OQ001	High	Cracking / Rockfall
Grinding Groove	GG004	Moderate	Cracking
Rockshelter	RS001	Low	Cracking
Rockshelter	RS002	Low	Negligible
Rockshelter	RS006	Low	Cracking
Rockshelter	RS007	High	Cracking
Rockshelter	RS008	Moderate	Cracking
Rockshelter	RS009	Low	Cracking
Rockshelter	RS010	Moderate	Cracking
Rockshelter	RS011	Low	Cracking
Rockshelter	RS012	Moderate	Cracking
Rockshelter	RS013	High	Cracking
Artefact Scatter	AS008	Low	Negligible
Artefact Scatter	AS016	Low	Negligible
Artefact Scatter	AS017	Low	Negligible
Artefact Scatter	AS018	Low	Negligible
Artefact Scatter	AS019	Low	Negligible
Artefact Scatter	AS020	Low	Negligible
Artefact Scatter	AS021	Low	Negligible
Artefact Scatter	AS022	Low	Negligible
Artefact Scatter	AS023	Low	Negligible
Artefact Scatter	AS024	Low	Negligible
Artefact Scatter	AS025	Low	Negligible
Artefact Scatter	AS026	Low	Negligible
Artefact Scatter	AS027	Low	Negligible
Artefact Scatter	AS028	Low	Negligible
Artefact Scatter	AS030	Low	Negligible
Artefact Scatter	AS031	Low	Negligible
Artefact Scatter	AS032	Low	Negligible
Artefact Scatter	AS033	Low	Negligible
Artefact Scatter	AS036	Low	Negligible
Artefact Scatter	AS037	Low	Negligible
Artefact Scatter	AS038	Low	Negligible
Artefact Scatter	AS039	Low	Negligible
Artefact Scatter	AS060	Low	Negligible
Artefact Scatter	AS061	Low	Negligible
Artefact Scatter	AS062	Low	Negligible
Artefact Scatter	AS063	Low	Negligible
Artefact Scatter	AS065	Low	Negligible
Artefact Scatter	AS066	Low	Negligible



Site Type	Site Name	Archaeological Regional Significance	Summary of Potential Impact from Subsidence
Artefact Scatter	AS080	Low	Negligible
Artefact Scatter	AS081	Low	Negligible
Artefact Scatter	AS082	Low	Negligible
Artefact Scatter	AS083	Low	Negligible
Artefact Scatter	AS084	Low	Negligible
Artefact Scatter	AS085	Low	Negligible
Artefact Scatter	AS086	Low	Negligible
Artefact Scatter	AS087	Low	Negligible
Artefact Scatter	AS088	Low	Negligible
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Artefact Scatter	AS102	Low	Negligible
Artefact Scatter	AS103	Low	Negligible
Artefact Scatter	AS104	Low	Negligible
Artefact Scatter	AS105	Low	Negligible
Artefact Scatter	AS106	Low	Negligible
Artefact Scatter	AS107	Low	Negligible
Artefact Scatter	AS108	Low	Negligible
Isolated Find	IF001	Low	Negligible
Isolated Find	IF002	Low	Negligible
Isolated Find	IF010	Low	Negligible
Isolated Find	IF011	Low	Negligible
Isolated Find	IF012	Low	Negligible
Isolated Find	IF013	Low	Negligible
Isolated Find	IF014	Low	Negligible
Isolated Find	IF015	Low	Negligible
Isolated Find	IF016	Low	Negligible
Isolated Find	IF017	Low	Negligible
Isolated Find	IF018	Low	Negligible
Isolated Find	IF020	Low	Negligible
Isolated Find	IF021	Low	Negligible
Isolated Find	IF022	Low	Negligible

Site Type	Site Name	Archaeological Regional Significance	Summary of Potential Impact from Subsidence
Isolated Find	IF024	Low	Negligible
Isolated Find	IF025	Low	Negligible
Isolated Find	IF026	Low	Negligible
Isolated Find	IF027	Low	Negligible
Isolated Find	IF031	Low	Negligible
Isolated Find	IF034	Low	Negligible
Isolated Find	IF035	Low	Negligible
Isolated Find	IF036	Low	Negligible
Isolated Find	IF037	Low	Negligible
Isolated Find	IF042	Low	Negligible
Isolated Find	IF048	Low	Negligible
Isolated Find	IF049	Low	Negligible
Isolated Find	IF050	Low	Negligible
Isolated Find	IF051	Low	Negligible
Isolated Find	IF052	Low	Negligible
Isolated Find	IF053	Low	Negligible
Isolated Find	IF054	Low	Negligible
Isolated Find	IF055	Low	Negligible
Isolated Find	IF062	Low	Negligible
Isolated Find	IF063	Low	Negligible
Isolated Find	IF064	Low	Negligible
Isolated Find	IF065	Low	Negligible
Isolated Find	IF075	Low	Negligible
Isolated Find	IF082	Low	Negligible
Isolated Find	IF083	Low	Negligible
Isolated Find	IF084	Low	Negligible
Isolated Find	IF085	Low	Negligible
Isolated Find	IF086	Low	Negligible
Isolated Find	IF087	Low	Negligible
Isolated Find	IF088	Low	Negligible
Isolated Find	IF089	Low	Negligible
Isolated Find	IF107	Low	Negligible
Isolated Find	IF110	Low	Negligible
Isolated Find	IF111	Low	Negligible
Isolated Find	IF112	Low	Negligible

Table 24 Potential Indirect Impacts to Cultural Sites within the Subsidence Study Area (MSEC 2015)

Site Type	Site Name	Cultural Significance	Summary of Potential Impact from Subsidence
Cultural Feature	CUL004	High	Cracking / Rockfall

Site Type	Site Name	Cultural Significance	Summary of Potential Impact from Subsidence
Cultural Feature	CUL007	High	Cracking / Rockfall
Cultural Feature	CUL001	Moderate	Cracking
Cultural Feature	CUL002	Moderate	Cracking
Cultural Feature	CUL003	Moderate	Cracking
Cultural Feature	CUL005	Moderate	Cracking
Cultural Feature	CUL006	Moderate	Cracking
Cultural Feature	CUL008	Moderate	Cracking
Cultural Feature	CUL009	Moderate	Cracking
Cultural Feature	CUL012	Moderate	Cracking
Cultural Feature	CUL013	Moderate	Cracking
Cultural Feature	CUL015	Moderate	Cracking
Cultural Feature	CUL016	Moderate	Cracking
Cultural Feature	CUL017	Moderate	Cracking
Cultural Feature	CUL018	Moderate	Cracking
Cultural Feature	CUL019	Moderate	Cracking
Cultural Feature	CUL020	Moderate	Cracking
Cultural Feature	CUL021	Moderate	Cracking
Cultural Feature	CUL022	Moderate	Cracking
Cultural Feature	CUL023	Moderate	Cracking
Cultural Feature	CUL024	Moderate	Cracking
Cultural Feature	CUL025	Moderate	Cracking
Cultural Feature	CUL026	Moderate	Cracking
Cultural Feature	CUL027	Moderate	Cracking
Cultural Feature	CUL028	Moderate	Cracking
Cultural Feature	CUL029	Moderate	Cracking
Cultural Feature	CUL030	Moderate	Cracking
Cultural Feature	CUL031	Moderate	Cracking
Cultural Feature	CUL032	Moderate	Cracking
Cultural Feature	CUL033	Moderate	Cracking

**Table 25 Potential Indirect Impacts to Archaeological Sites in close proximity to, but outside the Subsidence Study Area**

Site Type	Site Name	Archaeological Regional Significance	Summary of Potential Impact from Subsidence
Grinding Grooves	GG001	High	Negligible
Grinding Grooves	GG002	High	Negligible
Grinding Grooves	GG003	High	Negligible
Rockshelter	RS004	Low	Negligible
Rockshelter	RS005	Low	Negligible



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## 8.2 Subsidence Impact Assessment

This section considers the impacts that may occur from subsidence in relation to the Aboriginal site/feature type. It is important to consider site/feature type, as the degree and type of impacts may vary according to the morphology of the site type. For instance, subsidence impact will have a different effect on rockshelters compared to artefact scatters.

### 8.2.1 Ochre Quarry (RPS Bylong OQ001) Impact Assessment

This archaeological Aboriginal site is located at the base of a sandstone cliffline over 3 metres high and 20 metres in length. It has been assessed to have high archaeological significance and high cultural significance. Due to its geological morphology and size, it is probable that this site will experience cracking and rockfall under the current mine plan (MSEC 2015:124).

### 8.2.2 Grinding Groove Site Impact Assessment

RPS Bylong GG004 has been assessed to have moderate archaeological regional significance, but high Aboriginal cultural significance. The “predicted conventional strains for Site GG004 are large and would be expected to result in fracturing of the sandstone bedrock” (MSEC 2015:126).

The other three grinding groove sites (GG001-GG003) are located outside the Subsidence Study Area and over 100 metres from the nearest longwall panel. These sites are unlikely to experience any significant subsidence movements, but may experience upsidence and closure movements. The Subsidence Impact Assessment has confirmed “*the potential for impact on the three grinding groove sites that are located outside the Subsidence Study Area are considered to be very low*” (MSEC 2015:126).

### 8.2.3 Rockshelters Impact Assessment

Nine rockshelter sites are located above Longwalls 12 to 17 (RS001, RS006, RS007, RS008, RS009, RS010, RS011, RS012 and RS013). The maximum predicted tilt for these rockshelters is 30mm/m, that is 3% and thus MSEC has concluded that “*it is unlikely that these sites would experience any adverse impacts as a result of the mining induced tilt*” (MSEC 2015:125). However, on the basis of cliffline subsided in the Ulan Colliery area, rockfalls were observed “*in approximately 20% of the cliffs and visible mining subsidence movements in approximately 50% to 70% of the sandstone formations greater than approximately 3 metres high [however] the actual percentage of archaeological sites affected may be slightly higher or lower than the Ulan experience on account of the differences between the two sites*” (MSEC 2015:125). On the basis of previous experience and geological characteristics MSEC has concluded that “*some cracking may be experienced to [rockshelter] sites that are located within the Subsidence Study Area*” (MSEC 2015:125).

RS002 is on the edge of the Subsidence Study Area, but is not above a longwall panel, as such it is expected that impact to this site will be negligible. RS004 and RS005 are outside the Subsidence Study Area and therefore is not predicted to be impacted by subsidence.

### 8.2.4 Cultural Features Impact Assessment

Cultural features within the Subsidence Study Area are sandstone: either sandstone cavities or natural rock formations which resemble zoomorphic (CUL004) or anthropomorphic figures (CUL007). Not all RAPs agreed with the interpretation of these cultural features, although the consensus was that they should be considered as cultural features. The natural rock formations (CUL004 ‘Bird’ and CUL007 ‘Face’) could potentially be impacted by rock falls (MSEC 2015:124). The 28 rock cavities (CUL001, CUL002, CUL003, CUL005, CUL006, CUL008, CUL009, CUL012, CUL013, CUL015, CUL016, CUL017, CUL018, CUL019, CUL020,

CUL021, CUL022, CUL023, CUL024, CUL025, CUL026, CUL027, CUL028, CUL029, CUL030, CUL031, CUL032 and CUL033) have potential to be affected by subsidence induced cracking (MSEC 2015:124).

### 8.2.5 Surface Artefact Sites (Artefact Scatters and Isolated Finds) Impact Assessment

The surface artefacts comprise isolated finds or artefact scatters which contain up to 50 artefacts. These artefacts sit directly on the ground surface. MSEC has considered the nature of these sites and concluded that it is unlikely that these sites would be impacted directly by cracking (MSEC 2015:124). Risks from remediation of surface cracks are outlined below.

Additional to the above, surface artefacts sites which have been recorded in tracks are at risk of impact from vehicles accessing the area for monitoring related activities.

### 8.2.6 Remediation of Surface Cracks (All sites and features)

Surface cracking is expected as a result of Longwalls. Surface cracks are “*expected to be typically between 25 mm and 50 mm, with some isolated cracking around 100 mm or greater. The surface cracking along the steeper slopes are[sic] expected to be typically in the order of 50 mm to 100 mm, with isolated cracking around 200 mm or greater*” (MSEC 2015: 31). It is proposed that surface cracks will be monitored and where required remediation is undertaken. Remediation will involve the transport of fill, the filling in of the cracks and in some instances may require earthmoving equipment. These remediation activities have the potential to impact archaeological Aboriginal sites and Aboriginal cultural features. As such, these activities will need to be managed in accordance with Section 9.0 of this Assessment.

## 8.3 Blasting Predictions

A blasting assessment has been prepared for the Project by Pacific Environment Limited (2014) and has made predictions for overpressure and ground vibration in accordance with the relevant guidelines (ANZEC 1990). Pacific Environment Limited has taken into account the nature of the heritage items in the Survey Area and has adopted the overpressure limit of 133 dB(L)<sup>2</sup> for heritage items (under the ANZEC guideline this is a safe level to minimise the risk of structural or architectural damage from air blasts) (Pacific Environment Limited 2014:4). Pacific Environment Limited has adopted 15 PPV (mm/s)<sup>3</sup> as the limit for vibration in the vicinity of heritage items.

### 8.3.1 Blasting Impact Assessment

Pacific Environment Limited (2014) has assessed all Aboriginal sites and cultural features in the vicinity of the Survey Area, of which the majority are unaffected by the predicted effects of blasting (**Appendix 8**).

One site, RPS Bylong RS003 however, is 70 metres south of the proposed open cut pit and the overpressure prediction is upwards of 133 dB(L) and 15 PVV mm/s (Pacific Environment Limited 2014:11). These predictions indicate that this site may be impacted by blasting; as such management measures have been proposed and are outlined in Section 9.0.

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<sup>2</sup> dB (L) is Decibels (Lin Peak) is the standard measure for the relative magnitude of sound pressure level and other acoustical quantities

<sup>3</sup> PPV (mm/s) is peak particle velocity measured in millimetres per second and is the standard measure for vibration.

## 8.4 Project Disturbance Boundary and Proposed Surface Impacts

Two open cut mining areas are proposed, as well as two overburden emplacement areas and associated mine infrastructure which will result in direct surface disturbance.

The proposed surface disturbance areas associated with the Project will generally include:

- Mine infrastructure and associated support ancillary;
- Accommodation facility and access roads;
- Haul roads;
- Open cut mining areas; and
- Overburden emplacement areas.

The mine infrastructure will include the construction of a rail loop, open cut mine infrastructure area, overland conveyor and coal drift, as well as an employee and materials drift. Accommodation facilities will involve the construction of buildings and access roads. Haul roads will be built up on batter and surfaced for coal trucks. Open cut mining areas will involve topsoil removal and rock blasting to extract coal. Overburden emplacement areas will be used to store non-coal bearing soil and rock extracted from the open cut areas. Although there are different activities being undertaken in the above ground disturbance areas, all will involve the excavation of topsoils, cut and fill or covering of the ground surface and hence the surface disturbances associated with these activities will be addressed together.

## 8.5 Project Disturbance Boundary – Surface Impact Assessment

There are 100 archaeological Aboriginal sites in the Project Disturbance Boundary, 95 surface artefact sites, 2 PADs (one with surface artefacts) and three modified trees. In addition, there are two cultural features; thus the total of sites/features in the Project Disturbance Boundary is 102.

The surface artefacts are distributed throughout the Project Disturbance Boundary, including the mine infrastructure, accommodation facility, open cut areas and overburden emplacement areas. While the disturbance of surface artefacts will be avoided where possible, the majority will have to be collected and managed as outlined in Section 9.0.

The modified trees are located in the proposed eastern open cut mining area and therefore cannot be conserved in-situ; however, management and mitigation measures for these sites are outlined in Section 9.0.

The PADs occur on the footslopes north of the rail loop and the proposed dam locations, as well as footslopes on the western side of Lee Creek. These PADs are associated with archaeologically sensitive areas; further investigation through excavation will mitigate the impact to these areas and need to be managed in accordance with Section 9.0.

The cultural features identified are within the proposed eastern open cut mining area and cannot be avoided. Not all the RAPs agreed that CUL10 and CUL11 were cultural features, but the consensus was that they had some significance to some RAP representatives. Options for cultural mitigation have been discussed with the RAPs these have been summarised in Section 9.5.

**Table 26 Summary Archaeological Sites and Cultural Features in the Project Disturbance Boundary**

Site/Feature Type	Site Code	Significance Archaeological (Regional) / Cultural
PAD	Bylong River PAD 1	Moderate
PAD + Artefacts	AS077	Moderate

Site/Feature Type	Site Code	Significance Archaeological (Regional) / Cultural
Modified Tree	MT005	Moderate
Modified Tree	MT007	Moderate
Modified Tree	MT008	Moderate
Cultural Feature – Possible Occupation Area	CUL010	Moderate
Cultural Feature – Natural Sandstone Platform	CUL011	Moderate
Artefact Scatter	AS005	Low
Artefact Scatter	AS007	Low
Artefact Scatter	AS011	Low
Artefact Scatter	AS012	Low
Artefact Scatter	AS013	Low
Artefact Scatter	AS014	Low
Artefact Scatter	AS035	Low
Artefact Scatter	AS043	Low
Artefact Scatter	AS044	Low
Artefact Scatter	AS045	Low
Artefact Scatter	AS046	Low
Artefact Scatter	AS047	Low
Artefact Scatter	AS048	Low
Artefact Scatter	AS049	Low
Artefact Scatter	AS050	Low
Artefact Scatter	AS051	Low
Artefact Scatter	AS052	Low
Artefact Scatter	AS053	Low
Artefact Scatter	AS055	Low
Artefact Scatter	AS056	Low
Artefact Scatter	AS057	Low
Artefact Scatter	AS058	Low
Artefact Scatter	AS059	Low
Artefact Scatter	AS067	Low
Artefact Scatter	AS068	Low
Artefact Scatter	AS069	Low
Artefact Scatter	AS070	Low
Artefact Scatter	AS071	Low
Artefact Scatter	AS072	Low
Artefact Scatter	AS073	Low
Artefact Scatter	AS074	Low
Artefact Scatter	AS075	Low
Artefact Scatter	AS076	Low
Artefact Scatter	AS092	Low
Artefact Scatter	AS093	Low



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Site/Feature Type	Site Code	Significance Archaeological (Regional) / Cultural
Artefact Scatter	RPS Bylong AS10	Low
Artefact Scatter	RPS Bylong IF3	Low
Artefact Scatter	RPS Bylong IF6	Low
Isolated Find	BE-IF-01	Low
Isolated Find	BE-IF-02	Low
Isolated Find	BE-IF-03	Low
Isolated Find	Bylong River 1	Low
Isolated Find	IF003	Low
Isolated Find	IF004	Low
Isolated Find	IF006	Low
Isolated Find	IF007	Low
Isolated Find	IF029	Low
Isolated Find	IF030	Low
Isolated Find	IF032	Low
Isolated Find	IF038	Low
Isolated Find	IF039	Low
Isolated Find	IF040	Low
Isolated Find	IF041	Low
Isolated Find	IF043	Low
Isolated Find	IF044	Low
Isolated Find	IF045	Low
Isolated Find	IF046	Low
Isolated Find	IF047	Low
Isolated Find	IF056	Low
Isolated Find	IF057	Low
Isolated Find	IF058	Low
Isolated Find	IF059	Low
Isolated Find	IF060	Low
Isolated Find	IF066	Low
Isolated Find	IF068	Low
Isolated Find	IF069	Low
Isolated Find	IF070	Low
Isolated Find	IF071	Low
Isolated Find	IF072	Low
Isolated Find	IF073	Low
Isolated Find	IF074	Low
Isolated Find	IF076	Low
Isolated Find	IF077	Low
Isolated Find	IF078	Low
Isolated Find	IF079	Low
Isolated Find	IF080	Low

Site/Feature Type	Site Code	Significance Archaeological (Regional) / Cultural
Isolated Find	IF081	Low
Isolated Find	IF090	Low
Isolated Find	IF091	Low
Isolated Find	IF092	Low
Isolated Find	IF093	Low
Isolated Find	IF094	Low
Isolated Find	IF095	Low
Isolated Find	IF096	Low
Isolated Find	IF097	Low
Isolated Find	IF098	Low
Isolated Find	IF099	Low
Isolated Find	IF100	Low
Isolated Find	IF101	Low
Isolated Find	IF102	Low
Isolated Find	IF103	Low
Isolated Find	IF104	Low
Isolated Find	IF105	Low
Isolated Find	IF106	Low
Isolated Find	IF109	Low

## 8.6 Summary of Impact Assessment

There are 146 Aboriginal sites and features in the Subsidence Study Area (**Figure 13**). MSEC (2015) has prepared subsidence predictions for all the Aboriginal sites (116) and features (30) within the Subsidence Study Area (**Table 23**). Of the sites in the Subsidence Study Area, 41 (11 archaeological, 30 cultural) are at risk of impacts from subsidence cracking and rockfall. The remaining 105 archaeological sites will not be directly impacted from subsidence. If cracks occur that need to be rehabilitated, then rehabilitation activities should avoid the surface artefacts. If this cannot be achieved, then surface artefacts may need to be collected in accordance with the procedure described in Section 9.0.

In addition, there is one rockshelter (RS003), which outside the Project Disturbance Boundary, but which may be impacted by blasting. The total sites/features which may be subject to indirect impacts from subsidence and blasting is 42 (**Table 27**).

One archaeological site (ochre quarry) of high regional significance is at risk from cracking and rockfall (OQ001). Two rockshelters of high regional significance are at risk from cracking (RS007 and RS013). Seven rockshelters and one grinding groove of low-moderate regional significance are at risk from cracking (RS001, RS006, RS008, RS009, RS010, RS011, RS012 and GG004).

Two cultural features of high significance are at risk from cracking and rockfall (CUL004 and CUL007). Twenty-eight rock cavities of moderate significance are at risk from cracking (CUL001, CUL002, CUL003, CUL005, CUL006, CUL008, CUL009, CUL012, CUL013, CUL015, CUL016, CUL017, CUL018, CUL019, CUL020, CUL021, CUL022, CUL023, CUL024, CUL025, CUL026, CUL027, CUL028, CUL029, CUL030, CUL031, CUL032 and CUL033).

**Table 27 Summary of Aboriginal Sites and Cultural Features which may be Subject to Indirect Impacts from Subsidence or Blasting**

Indirect Impact Type	Regional Archaeological Significance / Cultural Significance	Site Type	Number
Subsidence	High (5)	Ochre Quarry	1
		Rockshelter	2
		Cultural Feature	2
	Moderate (32)	Grinding Groove	1
		Rockshelter	3
		Cultural Feature	28
	Low (4)	Rockshelter	4
<i>Subtotal</i>			<b>41</b>
Blasting	Rockshelter	High	1
<b>Total</b>			<b>42</b>

There are 102 archaeological Aboriginal sites and cultural features in the Project Disturbance Boundary with potential to be impacted (Table 28). These include two cultural features and 100 archaeological Aboriginal sites comprising 95 surface artefact sites, two PADs (one with surface artefacts) and three modified trees.

**Table 28 Summary of Aboriginal Sites and Cultural Features which may be Subject to Direct Impacts**

Regional Archaeological Significance / Cultural Significance	Site Type	Number
Moderate (7)	Artefact Scatter + PAD	1
	PAD	1
	Modified Tree	3
	Cultural Feature	2
Low (95)	Surface Artefacts	95
<b>Total</b>		<b>102</b>

In summary, there is potential for 144 sites/features to be impacted by the Project, 112 of these are archaeological sites and 32 are cultural features. Approximately 47% of the sites/features will not be impacted at all and approximately 37% of the sites/features with potential impacts are of low regional archaeological significance. Thus 83% of sites/features will either not be impacted, or are of low regional archaeological significance (**Table 29**).

**Table 29 Summary of Significance and Impact for all Archaeological Aboriginal Sites and Cultural Features**

Impact Type	Significance	Number	Percent	Sites/Features with No Impact or Low Significance
Impact	High	6	2.21%	83.39%
	Moderate	39	14.39%	
	Low	99	36.53%	
Not Impacted / Negligible Impact	Variable	123	46.86%	

## 8.7 Cumulative Impact Assessment

The previous section has assessed the impacts on Aboriginal sites/features in the Project Area. The purpose of cumulative impact assessment is to identify how a project's impacts compare with overall impacts in an area. The cumulative impact assessment process aims to *"take the longer broader view to identify the possible total effect of decisions about a number of seemingly isolated projects"* (Thomas 2001:246).

The cumulative impact should consider the *"nature and extent of the Aboriginal object or place proposed to be harmed in relation to other identified sites in the region"* (OEH 2011:13). The OEH guidelines do not specify a methodology for conducting cumulative impact assessments. As a consequence, the below methodology has been tailored specifically to take in regional/landform factors relevant to the Project.

### 8.7.1 Methodology and Background for Cumulative Impact Assessment

Aboriginal site patterning and distribution is often correlated to landforms (and their associated geology/hydrology) and therefore understanding this relationship can be useful for predictive modelling of Aboriginal site locations in areas which have not been subject to systematic archaeological survey. For the purposes of a cumulative impact assessment, it is important to understand the relationship between landform characteristics and Aboriginal site patterning within the Project Impact Boundary (Bylong Aboriginal site distribution model). For this cumulative impact assessment a comparative sample of the surrounding area was selected for consideration, called the cumulative impact assessment sample area (CIA sample area). The AHIMS site patterning was then modelled in the CIA sample area in order to understand the extant AHIMS patterning and the projected site patterning (predictive modelling). All of the above were considered in order to make an assessment of the impacts in the Project Impact Boundary as compared with those Aboriginal sites extant/impacted in the CIA sample area.

In summary, the following information and methodology has been used for this cumulative impact assessment:

- (1) Bylong Aboriginal site distribution model;
- (2) Selection of a CIA sample area;
- (3) Understanding of Aboriginal site patterning (extant and predictive) within the CIA sample area; and
- (4) Make assessment of impacts in the Project Impact Boundary as compared with the CIA sample area.

Ultimately, the cumulative impact assessment will consider the sites to be impacted by the Project, the known sites in the region and the likelihood of unknown sites in the CIA sample area, as well as previous impacts to AHIMS sites in the CIA sample area.

### 8.7.2 Bylong Aboriginal Site Distribution Model

The Bylong Aboriginal site distribution model considers all Aboriginal sites identified in the Survey Area (n=239). This has been done to ensure an adequate sample size on which to produce the modelling. However, of the sites in the Survey Area some 144 sites are to be impacted by the project (i.e. are within the Project Impact Boundary, plus an additional site potentially affected by blasting). This data will be used for the cumulative impact assessment.

In order to make meaningful comparisons between the (Bylong) Survey Area and the CIA sample area landform definitions have been simplified to two regional landform groupings: Alluvial Valleys and Ridgelines.

Alluvial valleys are defined as flat, sloping and undulating hills associated with watercourses and their tributaries. For the purposes of the cumulative impact assessment which is based on a regional scale, local landforms discussed in Section 6.2 have been grouped. Alluvial valleys for the cumulative impact assessment



are made up of survey/landform units (3-11). Ridgelines are defined by steeply sloping terrain and ridges, which often have outcropping sandstone (survey landform units 1 and 2, Section 6.2). As a proportion of the Survey Area Alluvial Valleys were almost double the area of the Ridgelines. The majority of Aboriginal sites in the Survey Area were in the Alluvial Valleys, whereas sites were far less common in the Ridgelines (**Table 30**). This is reflected in the raw site numbers as well as the sites per 100 ha (**Table 30**). However, the most important site types in the Survey Area (rockshelters, grinding grooves, ochre quarry) tended to be located in the Ridgeline landforms (**Table 31**). Aboriginal sites in the Alluvial Valleys mainly comprised surface artefacts which had been previously disturbed by agricultural practices and also tended to be of low archaeological significance.

**Table 30 Bylong Aboriginal Sites by Regional Landform**

Regional Landform Type	Site Type	Number	Percent
Alluvial Valley (1945 ha; 9.6 sites/100ha)	Isolated Find	98	41.00%
	Artefact Scatter	89	37.24%
	Modified Tree	3	1.26%
	Artefact Scatter + PAD	2	0.84%
	Rockshelter	1	0.42%
	Potential Archaeological Deposit (PAD)	1	0.42%
<b>Subtotal</b>		<b>194</b>	<b>81.17%</b>
Ridgelines (969 ha; 4.8 sites/100ha)	Isolated Find	18	7.53%
	Rockshelter	12	5.02%
	Artefact Scatter	10	4.18%
	Grinding Groove	4	1.67%
	Ochre Quarry	1	0.42%
<b>Subtotal</b>		<b>45</b>	<b>18.83%</b>
<b>Total</b>		<b>239</b>	<b>100%</b>

**Table 31 Bylong Aboriginal Site Types and Significance by Regional Landform**

Regional Landform Type in the Survey Area	Site Type	High Regional Significance	Moderate Regional Significance	Low Regional Significance	Count
Alluvial Valley (1945 ha; 9.6 sites/100ha)	Isolated Find			98	98
	Artefact Scatter		1	88	89
	Modified Tree		3		3
	Artefact Scatter + PAD		2		2
	Rockshelter	1			1
	Potential Archaeological Deposit (PAD)		1		1
<b>Subtotal</b>		<b>1</b>	<b>7</b>	<b>186</b>	<b>194</b>
Ridgelines (969 ha; 4.8 sites/100ha)	Grinding Groove	3	1		4
	Rockshelter	2	3	7	12
	Ochre Quarry	1			1
	Artefact Scatter		3	7	10
	Isolated Find			18	18

<i>Subtotal</i>	<b>6</b>	<b>7</b>	<b>32</b>	<b>45</b>
<b>Total</b>	<b>7</b>	<b>14</b>	<b>218</b>	<b>239</b>

### 8.7.3 Selection of CIA Sample Area

For the purposes of the cumulative impact assessment, the Project Impact Area has been defined as 3,000 hectares and includes land in the Project Disturbance Boundary and the Subsidence Study Area. In order to make a comparison with the surrounding regional landforms a multiple of 25 has been applied to generate a sample, that is, 75,000 hectares of land surrounding the Project Impact Area has been selected as the CIA sample area. This area has been selected because it includes the major river catchments of the region including the Bylong River (which runs through the Project Area) and the Goulburn River in the north (**Figure 14**). Importantly, this sample also provides a good representation of the Alluvial Valleys and high sandstone ridges (**Table 32**) which are also present in the Project Impact Area (**Table 30**) and therefore allows for meaningful comparisons to be made.

**Table 32 Regional Landforms**

<b>Regional Landform</b>	<b>Hectares</b>	<b>Percent of Whole Region</b>
Alluvial Valley (In region, outside Survey Area)	21,594	28.79%
Ridgelines (In Region, outside Survey Area)	53,406	71.21%
<b>Total</b>	<b>75,000</b>	

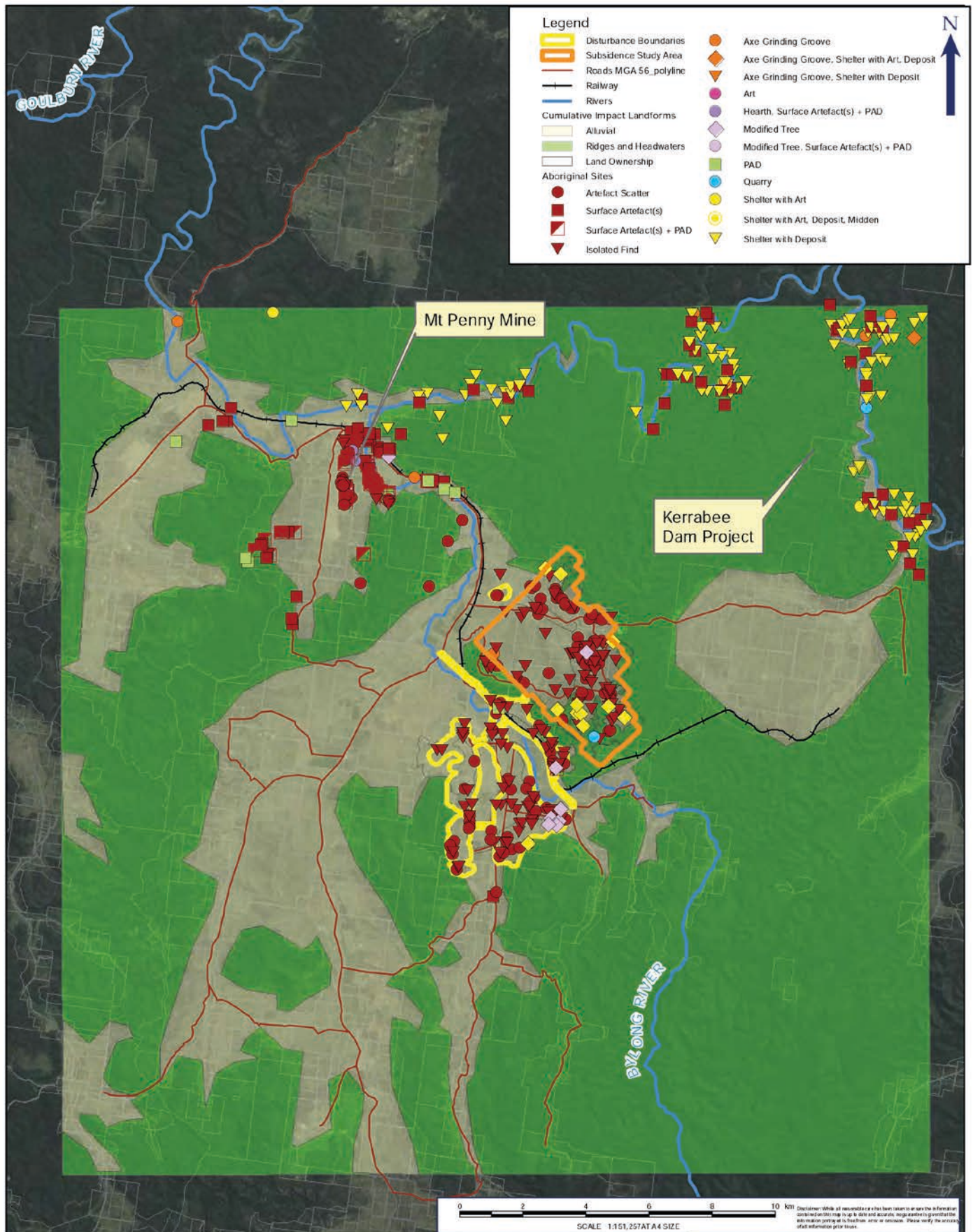


Figure 14: Regional Landforms in Cumulative Impact Assessment Area

LOCATION: Bylong

DATUM: GDA94  
PROJECTION: MGA Zone 56

JOB NO.: PR113279

PURPOSE: HERITAGE

Technician: tessa.boer-mah Date: 2/03/2015

Data Sources:  
RPS Recorded Data  
Client supplied Data  
OEH

CLIENT: KPCO C/O: HANSEN BAILEY

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#### 8.7.4 Aboriginal Site Patterning in the CIA Sample Area

This section will examine the extant site patterning, that is, analyse the AHIMS sites which have been recorded in the CIA sample area. It will also provide a projection for the numbers of Aboriginal sites which may occur in the CIA sample area, but, have not been surveyed and therefore, have not been identified.

##### Extant Site Patterning

AHIMS sites recorded in the CIA sample area have largely been identified as a result of two major studies: Kerrabee Dam (Haglund 1980) and the former Mt Penny Project (ARAS 2012) (**Figure 14**). Thus approximately only 15% of the CIA sample area has been subject to systematic archaeological survey, totalling 168 Aboriginal sites as reported in the various studies. However, the results of the previous studies give an indication of Aboriginal site patterning with respect to landform (**Table 33**) across the region.

**Table 33 Total Aboriginal Sites in CIA sample area and Bylong Project**

Regional Landform	Count	Percent
Alluvial Valley	117	69.64%
Ridgelines	51	30.36%
<b>Total</b>	<b>168</b>	<b>100.00%</b>

From a regional perspective, Ridgelines tend to have more rockshelters, whereas the Alluvial Valleys have more surface artefacts (**Table 34**). Generally, PADs in rockshelters have greater potential to contain datable archaeological deposits and often are more intact than PADs in open contexts. Thus, in general, the Ridgelines are likely to contain archaeologically significant rockshelter sites and to contain more of this site type than the Alluvial Valleys. In addition, the Alluvial Valleys have historically been highly disturbed by past and ongoing land-use practices including agriculture from the early 1820s when the area was settled by Europeans. The high proportion of surface artefact sites (artefact scatters and isolated finds) identified is partially the result of this disturbance. Due to their disturbed context, surface artefacts tend to be of lower significance than rockshelters with PADs. Therefore, as a general overview, the Ridgelines are more likely to contain higher quantities of sites with higher levels of significance than the Alluvial Valleys. There are sites of high significance in the Alluvial Valleys, but these are less frequently encountered. Sites of high significance in the Alluvial Valley include grinding groove, hearth, art and modified tree site types, as well as PAD and occasionally surface artefact sites.

In summary, Ridgelines tend to contain sites of higher significance than the Alluvial Valleys. The ridgelines are well represented in the CIA sample area.

**Table 34 Regional Landforms and Site Types (n=168)**

Site Type	Alluvial Valley Count	Ridgelines Count	Alluvial Valley Percent	Ridgelines Percent
Surface Artefact(s)	62	17	52.99%	33.33%
Surface Artefact(s) + PAD	36	8	30.77%	15.69%
Grinding Groove	1	1	0.85%	1.96%
PAD	10	3	8.55%	5.88%
Rockshelters	8	22	6.84%	43.14%
<b>Total</b>	<b>117</b>	<b>51</b>	<b>100.00%</b>	<b>100.00%</b>



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### **8.7.5 Projected Site Patterning**

Approximately 6,000 hectares have been surveyed in the CIA sample area (8% of the total 75,000 ha) in which 168 sites have been identified. Thus if 100% of the area had been surveyed we would expect 2,100 sites to be present across the CIA sample area. The CIA sample area also has a high proportion of Ridgeline area and is therefore likely to contain sites of moderate-high significance.

### **8.7.6 Conclusion for Cumulative Impact Assessment**

In order to gauge the previous impacts to Aboriginal sites in the CIA sample area, the AHIMS data for the region has been used. Impact has been defined as sites which have been issued with an AHIP or equivalent and subsequently have had their status changed to invalid. Only one site, an artefact scatter, has been issued with an AHIP (AHIMS# 33-1-0064); the remaining are still listed as valid with AHIMS. Thus less than one percent of Aboriginal sites have been impacted in the region.

The projected number of Aboriginal sites in the CIA sample area is 2,100. There are 144 archaeological sites proposed to be impacted by the Project. This produces a cumulative impact of less than 7%. Of those sites to be impacted, less than 4.9% are of high significance as the majority of sites to be impacted by the Project are surface artefacts with low significance. Thus, based on the projected total number of Aboriginal sites in the CIA sample area (2,100), the cumulative impact of the Project to sites of high significance is less than 0.3%. The assessment results show that the Project has a low cumulative impact on Aboriginal sites.

## 9.0 Management Strategy

KEPCO is seeking a State Significant Development Consent for the Project under Division 4.1, Part 4 of the EP&A Act. An Aboriginal Archaeological and Cultural Heritage Management Plan (AACHMP) will be developed with the approval of the Department of Planning and Environment (DP&E) and in consultation with the OEH and all RAPs. As part of the implementation of the AACHMP, Aboriginal Site Impact Recording Forms (ASIR Forms) will be completed.

This section will outline the key components of the AACHMP and the key mitigation and management measures.

The impacts to Aboriginal Archaeology and cultural features assessed in Section 8.0 will occur according to the progression of the mine development schedule. Therefore, it is proposed that the following mitigation and management measures will be put in place in response to and in accordance with the mine development schedule and staging. As the occurrence of impacts, as well as the nature of impact differs between the Subsidence Study Area and the Project Disturbance Boundary, the mitigation management strategy has been divided between mitigation measures for subsidence impacts and for surface impacts.

In addition, the Due Diligence Code is to be applied if there are changes in the nature of expected impacts, or if any uncertainties arise in the extent or nature of impacts.

Aboriginal cultural offsets will be included in the AACHMP. Offset commitments are set out in Section 9.5. They have been informed from consultations with the RAPs (Section 3.0 and **Appendix 1**).

### 9.1 Mitigation and Management Measures for Indirect Impacts (Subsidence)

Mitigation measures for Aboriginal sites and cultural features in the Subsidence Study Area are proposed to be implemented in two phases:

- **Phase 1: Pre-Undermining Mitigation Measures** (prior to undermining or potential for subsidence impacts); and
- **Phase 2: Post Undermining Mitigation Measures** – ([2a] Firstly - immediately after undermining and [2b] secondly - within 12 months of undermining.

The mitigation measures to be undertaken in the Subsidence Study Area are summarised in **Table 35** and further outlined in the sections below.

In summary,

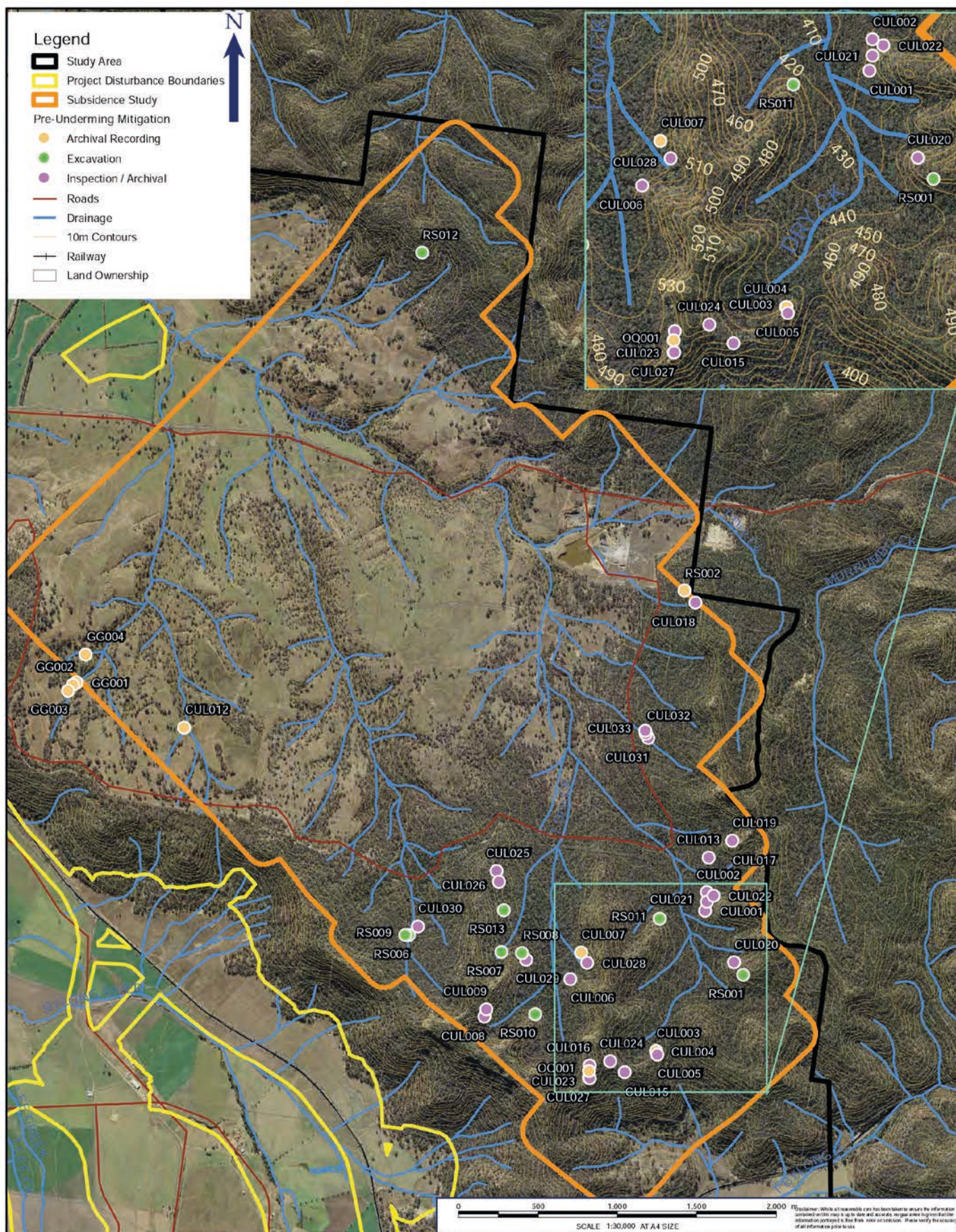
- 45 sites/features will **require pre-mining mitigation measures**, including the 41 identified within the Subsidence Study Area and a further 4 outside the Project Impact Boundary which are to be subject to archival recording prior to the commencement of mining (**Figure 15**).
- Archival recording will be required **prior to mining** for six sites (one ochre quarry, one rockshelter and four grinding grooves), and test excavation will be required at 9 rockshelters.
- For the cultural features, 3 rock formations will need to be subject to an archival recording, plus inspection of the 27 rock cavities and recording as relevant.
- Monitoring of 32 sites/cultural features will need to be undertaken post-mining and the mitigation for 9 rockshelters post-mining will be determined on the basis of pre-undermining test excavations (**Figure 16**).

**Table 35 Mitigation Measures for all Archaeological Sites and Cultural Features in and immediately adjacent to the Subsidence Study Area**

Site Type	Site Name	Summary of Potential Subsidence Impact	Pre-Mining Phase 1 Mitigation	Post- Mining Phase 2 Mitigation
Ochre Quarry	OQ001	Cracking / Rockfall	Archival Recording	Monitoring
Grinding Groove	GG001	None – offset impact to GG004	Archival Recording	None Required
Grinding Groove	GG002		Archival Recording	None Required
Grinding Groove	GG003		Archival Recording	None Required
Grinding Groove	GG004	Cracking	Archival Recording	Monitoring
Rockshelter	RS001	Cracking	Test Excavation	Mitigation post mining dependent on results of pre-mining test excavation
Rockshelter	RS002	Negligible	Archival Recording	None
Rockshelter	RS006	Cracking	Test Excavation	Mitigation post mining dependent on results of pre-mining test excavation
Rockshelter	RS007	Cracking	Test Excavation	Mitigation post mining dependent on results of pre-mining test excavation
Rockshelter	RS008	Cracking	Test Excavation	Mitigation post mining dependent on results of pre-mining test excavation
Rockshelter	RS009	Cracking	Test Excavation	Mitigation post mining dependent on results of pre-mining test excavation
Rockshelter	RS010	Cracking	Test Excavation	Mitigation post mining dependent on results of pre-mining test excavation
Rockshelter	RS011	Cracking	Test Excavation	Mitigation post mining dependent on results of pre-mining test excavation
Rockshelter	RS012	Cracking	Test Excavation	Mitigation post mining dependent on results of pre-mining test excavation
Rockshelter	RS013	Cracking	Test Excavation	Mitigation post mining dependent on results of pre-mining test excavation
Cultural Feature	CUL004	Cracking / Rockfall	Archival Recording	Monitoring
Cultural Feature	CUL007	Cracking / Rockfall	Archival Recording	Monitoring
Cultural Feature	CUL001	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL002	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL003	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL005	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL006	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL008	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL009	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL012	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL013	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL015	Cracking	Inspection and Archival	Monitoring

Site Type	Site Name	Summary of Potential Subsidence Impact	Pre-Mining Phase 1 Mitigation	Post- Mining Phase 2 Mitigation
			Recording	
Cultural Feature	CUL016	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL017	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL018	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL019	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL020	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL021	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL022	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL023	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL024	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL025	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL026	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL027	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL028	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL029	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL030	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL031	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL032	Cracking	Inspection and Archival Recording	Monitoring
Cultural Feature	CUL033	Cracking	Inspection and Archival Recording	Monitoring
Surface Artefacts	Various	Vehicle Impacts	Collection of artefacts in tracks	Monitoring







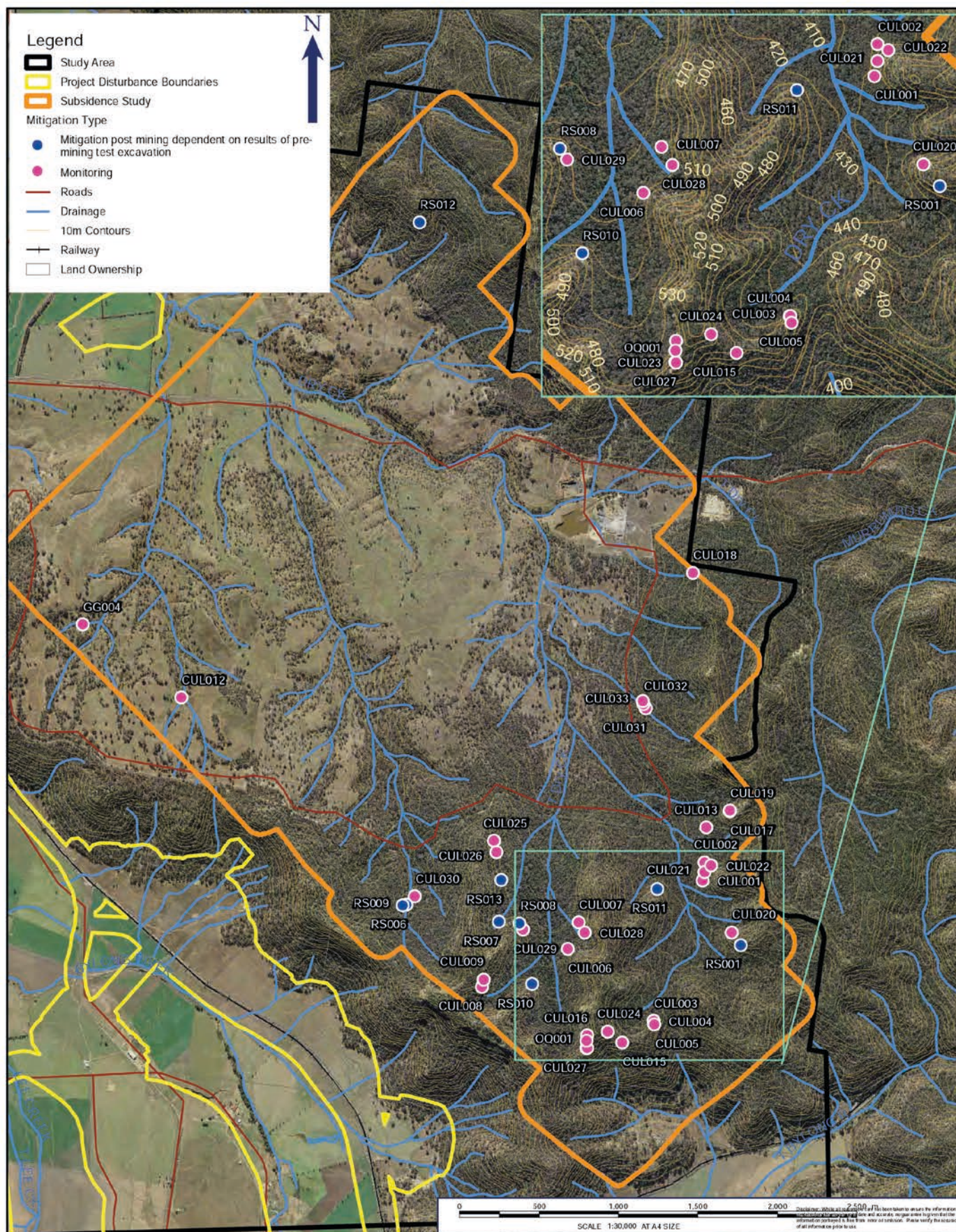


Figure 16: Aboriginal Sites and Features requiring Post-Mining Mitigation Measures

LOCATION: Bylong	DATUM: GDA94 PROJECTION: MGA Zone 56
JOB NO.: PRT13279	Data Sources: RPS Recorded Data Client supplied Data OEH
PURPOSE: HERITAGE Technician: Natalia Wood	Drawn: 20/03/2015

**CLIENT: KEPCO C/O- HANSEN BAILEY**

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)  
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### 9.1.2 Phase I: Pre-Undermining Mitigation Measures

The mitigation measures to be undertaken prior to undermining have been divided by the nature of impact and site/feature type.

#### Ochre Quarry (RPS Bylong OQ001)

The ochre quarry (RPS Bylong OQ001) is of high regional significance. It is recommended that all “*reasonable and practical steps*” be taken to avoid/minimise impacts to this site; this may involve modification to the mine plan. If impacts cannot be avoided then engineering/mine design solutions to prevent rockfall and cracking are to be explored, for instance shoring and artificial stabilisation. This is in addition to the full archaeological and archival recording referred to below.

Prior to underground coal extraction with the potential to cause mine subsidence to this site, a full archaeological recording should be completed; including archival quality photographs, full measurements, scaled plan and notes, in accordance with the NSW Heritage Council’s Guidelines for Archival Recording (NSW Heritage Office 1998). Due to the significance of this feature, 3D scan recording may be considered along with sampling of the ochre for further analysis. Some RAP representatives have requested to extract samples of the ochre for cultural use.

#### Grinding Grooves (RPS Bylong GG001, GG002, GG003 and GG004)

Prior to underground coal extraction a full archaeological recording of RPS Bylong GG001, 002, 003 and 004 should be completed. This should include archival quality photographs, full measurements, scaled plan and notes. Due to the significance of this feature, 3D scan recording may be considered as a recording strategy. An assessment by a structural geologist and subsidence specialist should be undertaken to identify if there are any ways of preventing fracturing of RPS Bylong GG004 (such an assessment is not required for GG001, GG002 and GG003 since they are outside the Subsidence Study Area).

#### Rockshelters

The rockshelters that were identified as archaeological Aboriginal sites were classified as such because of the identified potential for subsurface archaeological material to be present. Prior to underground coal extraction with the potential to cause mine subsidence on these sites, an investigation of the potential archaeological deposit should be undertaken. This would involve the sub-surface archaeological investigation of the sediment to identify if Aboriginal objects are present and the nature of such objects. If sub-surface Aboriginal objects are identified, then further salvage, if warranted, should be undertaken as well as a full recording of the rockshelter.

#### Cultural Features

Prior to underground coal extraction, the rock cavities that were identified by the RAPs as having potential for cached objects or burials should be thoroughly checked for evidence of such uses and practices. A full recording of the cavity should be undertaken if such material is identified. The recording is to include archival quality photographs, full measurements, scaled plan and notes; 3D scan recording may be considered as an option for the rock cavities. The natural rock formations are important because of their shape, thus full recording of these should involve a 3D scan and photographic render.

Provisions for the discovery of human remains should be included in the AACHMP and include the following actions.

In the event that skeletal remains are identified, work must cease immediately in the vicinity of the remains, the area must be cordoned off and a GPS reading for the location must be taken. The proponent must

contact the local NSW Police who will make an initial assessment as to whether the remains are part of a crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, OEH must be contacted by ringing the Enviroline 131 555. An OEH officer will determine if the remains are Aboriginal or not; and a management plan must be developed in consultation with the RAPs.

### Surface Artefacts

There are no predicted impacts to surface artefacts resulting from subsidence effects. However, the artefact sites which have been recorded along vehicle tracks are at risk of impact from vehicles. These surface artefacts should be collected, prior to the use of these tracks. Surface salvage will involve the recording of GPS coordinates, photographs, field notes and collection of artefacts in labelled bags for storage. The artefacts will then be stored in the Keeping Place as described in Section 9.5 for the duration of mining activity. Once mining and rehabilitation of the surfaces have been completed, the ongoing management of the artefacts is to be discussed with RAPs. The ongoing management may involve returning artefacts, where feasible, to their original recorded locations, or in the vicinity of their original recorded locations.

### **9.1.3 Phase 2: Post-Undermining Mitigation Measures**

Monitoring of all sites/features in **Table 35** should be undertaken immediately after undermining and within 12 months of mining below the Aboriginal archaeological sites and cultural features.

**Phase 1** will have provided the baseline recording for the ochre quarry, grinding grooves, rockshelters and cultural features.

The purpose of **Phase 2** is to monitor these sites and features to: **a)** identify if any changes have taken place, for instance the development of cracks or tilting; and **b)** to implement stabilisation measures, where possible. For instance, where cracking develops within a rockshelter, then structural supports may need to be considered to stabilise the rockshelter.

**Phase 2a** is to be implemented immediately after undermining. **Phase 2b** is to be implemented within 12 months of undermining to ensure ground surfaces have stabilised.

Once mine subsidence has taken place and the ground surfaces have stabilised, no further monitoring will be required.

## **9.2 Mitigation and Management Measures for Indirect Impacts (Blasting)**

One rockshelter is predicted to be potentially impacted from blasting (**Table 36**). Prior to potential impact, this rockshelter should be subject to full archival recording. Ongoing monitoring will be undertaken during and following blasting activities to ensure that impacts are appropriately managed.

**Table 36 Summary of Mitigation Measures for Blasting**

Site Type	Site Code	Impact	Mitigation
Rockshelter	RS003	Blasting	Archival Recording

### **9.3 Mitigation and Management Measures for Surface Impacts**

Recommended mitigation measures for surface impacts have been divided according to the nature of the site or cultural feature type. All of these measures should be implemented before surface disturbance takes place and may be implemented in stages in accordance with the development schedule. The mitigation measures have been summarised in **Table 37** and are further described in the sections below. Two PAD areas will require excavation, three modified trees will require conservation by controlled removal and storage and 95 surface artefact sites will require collection (**Figure 8**).



**Table 37 Summary of Mitigation Measures for Archaeological Sites and Cultural Features in the Project Disturbance Boundary**

Site Type	Site Code	Impact	Mitigation
PAD	Bylong River PAD 1	Surface Impact	Excavation
PAD + Artefacts	AS077	Surface Impact	Excavation
Modified Tree	MT005	Surface Impact	Conservation by controlled removal
Modified Tree	MT007	Surface Impact	Conservation by controlled removal
Modified Tree	MT008	Surface Impact	Conservation by controlled removal
Cultural Feature	CUL010	Surface Impact	Archival Recording
Cultural Feature	CUL011	Surface Impact	Archival Recording
Artefact Scatter	AS005	Surface Impact	Collection
Artefact Scatter	AS007	Surface Impact	Collection
Artefact Scatter	AS011	Surface Impact	Collection
Artefact Scatter	AS012	Surface Impact	Collection
Artefact Scatter	AS013	Surface Impact	Collection
Artefact Scatter	AS014	Surface Impact	Collection
Artefact Scatter	AS035	Surface Impact	Collection
Artefact Scatter	AS043	Surface Impact	Collection
Artefact Scatter	AS044	Surface Impact	Collection
Artefact Scatter	AS045	Surface Impact	Collection
Artefact Scatter	AS046	Surface Impact	Collection
Artefact Scatter	AS047	Surface Impact	Collection
Artefact Scatter	AS048	Surface Impact	Collection
Artefact Scatter	AS049	Surface Impact	Collection
Artefact Scatter	AS050	Surface Impact	Collection
Artefact Scatter	AS051	Surface Impact	Collection
Artefact Scatter	AS052	Surface Impact	Collection
Artefact Scatter	AS053	Surface Impact	Collection
Artefact Scatter	AS055	Surface Impact	Collection
Artefact Scatter	AS056	Surface Impact	Collection
Artefact Scatter	AS057	Surface Impact	Collection
Artefact Scatter	AS058	Surface Impact	Collection
Artefact Scatter	AS059	Surface Impact	Collection
Artefact Scatter	AS067	Surface Impact	Collection
Artefact Scatter	AS068	Surface Impact	Collection
Artefact Scatter	AS069	Surface Impact	Collection
Artefact Scatter	AS070	Surface Impact	Collection
Artefact Scatter	AS071	Surface Impact	Collection
Artefact Scatter	AS072	Surface Impact	Collection
Artefact Scatter	AS073	Surface Impact	Collection
Artefact Scatter	AS074	Surface Impact	Collection
Artefact Scatter	AS075	Surface Impact	Collection

Site Type	Site Code	Impact	Mitigation
Artefact Scatter	AS076	Surface Impact	Collection
Artefact Scatter	AS092	Surface Impact	Collection
Artefact Scatter	AS093	Surface Impact	Collection
Isolated Find	BE-IF-01	Surface Impact	Collection
Isolated Find	BE-IF-02	Surface Impact	Collection
Isolated Find	BE-IF-03	Surface Impact	Collection
Isolated Find	Bylong River 1	Surface Impact	Collection
Artefact Scatter	RPS Bylong AS10	Surface Impact	Collection
Isolated Find	RPS Bylong IF3	Surface Impact	Collection
Isolated Find	RPS Bylong IF6	Surface Impact	Collection
Isolated Find	IF003	Surface Impact	Collection
Isolated Find	IF004	Surface Impact	Collection
Isolated Find	IF006	Surface Impact	Collection
Isolated Find	IF007	Surface Impact	Collection
Isolated Find	IF029	Surface Impact	Collection
Isolated Find	IF030	Surface Impact	Collection
Isolated Find	IF032	Surface Impact	Collection
Isolated Find	IF038	Surface Impact	Collection
Isolated Find	IF039	Surface Impact	Collection
Isolated Find	IF040	Surface Impact	Collection
Isolated Find	IF041	Surface Impact	Collection
Isolated Find	IF043	Surface Impact	Collection
Isolated Find	IF044	Surface Impact	Collection
Isolated Find	IF045	Surface Impact	Collection
Isolated Find	IF046	Surface Impact	Collection
Isolated Find	IF047	Surface Impact	Collection
Isolated Find	IF056	Surface Impact	Collection
Isolated Find	IF057	Surface Impact	Collection
Isolated Find	IF058	Surface Impact	Collection
Isolated Find	IF059	Surface Impact	Collection
Isolated Find	IF060	Surface Impact	Collection
Isolated Find	IF066	Surface Impact	Collection
Isolated Find	IF068	Surface Impact	Collection
Isolated Find	IF069	Surface Impact	Collection
Isolated Find	IF070	Surface Impact	Collection
Isolated Find	IF071	Surface Impact	Collection
Isolated Find	IF072	Surface Impact	Collection
Isolated Find	IF073	Surface Impact	Collection
Isolated Find	IF074	Surface Impact	Collection
Isolated Find	IF076	Surface Impact	Collection
Isolated Find	IF077	Surface Impact	Collection
Isolated Find	IF078	Surface Impact	Collection

Site Type	Site Code	Impact	Mitigation
Isolated Find	IF079	Surface Impact	Collection
Isolated Find	IF080	Surface Impact	Collection
Isolated Find	IF081	Surface Impact	Collection
Isolated Find	IF090	Surface Impact	Collection
Isolated Find	IF091	Surface Impact	Collection
Isolated Find	IF092	Surface Impact	Collection
Isolated Find	IF093	Surface Impact	Collection
Isolated Find	IF094	Surface Impact	Collection
Isolated Find	IF095	Surface Impact	Collection
Isolated Find	IF096	Surface Impact	Collection
Isolated Find	IF097	Surface Impact	Collection
Isolated Find	IF098	Surface Impact	Collection
Isolated Find	IF099	Surface Impact	Collection
Isolated Find	IF100	Surface Impact	Collection
Isolated Find	IF101	Surface Impact	Collection
Isolated Find	IF102	Surface Impact	Collection
Isolated Find	IF103	Surface Impact	Collection
Isolated Find	IF104	Surface Impact	Collection
Isolated Find	IF105	Surface Impact	Collection
Isolated Find	IF106	Surface Impact	Collection
Isolated Find	IF109	Surface Impact	Collection

### Surface Artefacts

There are 95 surface artefact sites within the Project Disturbance Boundary. Before impact commences in each area the identified sites should be subject to surface salvage and any additional artefacts identified will also be salvaged. Surface salvage will involve the recording of GPS coordinates, photographs, field notes and collection of artefacts in labelled bags for storage. The artefacts will then be stored in the Keeping Place as committed to in Section 9.5 for the duration of mining activity. Once mining and rehabilitation of the surfaces have been completed, the ongoing storage is to be discussed with RAPs; it may involve returning artefacts, where feasible, to their original recorded locations, or in the vicinity of their original recorded locations.

### Modified Trees (MT005, MT007, MT008)

The modified trees should be removed prior to impact. Eucalyptus species are not suitable for transplanting and therefore the modified trees would need to be cut to ensure their conservation. RAPs have indicated that cultural practices, such as a smoking ceremony, should be held prior to the removal of the trees. The tree will need to be crowned (removal of upper branches) and a suitable portion of trunk above the scar retained, to ensure structural stability of the tree; it should also be cut as close to its base as possible. The tree removal should be undertaken with a qualified arborist and the process documented. The cut tree may be temporarily stored in a ventilated container (to prevent moisture build-up and to allow the tree portion to dry out slowly), until such time as it is ready to be installed in the keeping place or other agreed location (Section 9.5).

### PADs and Areas of Archaeological Sensitivity

The PADs are associated with areas of archaeological sensitivity and are the only areas identified which are likely to contain subsurface archaeological deposit. These areas occur on the foot hills which have not been subject to extensive cropping (**Figure 8**). The two PADs and associated areas of archaeological sensitivity should be subject to subsurface investigation. The first phase aims to identify the extent and depth of subsurface artefacts and identify if artefact concentrations and/or other notable archaeological features are present and also determine if further subsurface salvage is required. The interpretative aim of the subsurface excavation is to recover archaeological material which can assist in understanding Aboriginal occupation of the area.

### Cultural Features

The cultural features should be archivally recorded. The recording should include archival quality photographs, full measurements, scaled plan and notes. The application of 3D scan recording may be considered as an option for recording.

## **9.4 Due Diligence Assessment under the Code**

The proposed impact areas have been assessed for the Project in accordance with the proposed activities. At all times, the Project is to comply with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010c). The due diligence code should be included as a protocol in the AACHMP.

Outside the nominated Project Disturbance Boundary and Subsidence Impact Limit, other minor disturbances associated with ancillary works for the Project may also be required. For example, disturbances associated with firebreaks, water diversion structures, minor contour banks, pipelines and associated tracks, power supply infrastructure, fences, sediment and erosion control structures, remediation of surface subsidence cracks, and monitoring equipment. This disturbance will be the subject of a prior assessment in accordance with a Land Disturbance Protocol for the Project which will be developed in accordance with DECCW (2010c).

The Due Diligence Code is still applicable, prior to the approval of the Application and will be applied to any activities which will cause ground disturbance. It should also be applied if there are any changes in the proposed development so as to gauge the nature and degree of impacts, if any.

Assessment of proposed impacts is to be undertaken by a suitably qualified heritage consultant and carried out in accordance with the Due Diligence Code. This will involve a desktop assessment, but may also involve a visual inspection of the area.

## **9.5 Aboriginal Cultural Offsets**

Determining the Aboriginal cultural offsets has included suggestions raised in consultations on the Cultural Values Assessment (**Appendix 1**). Where practicable these suggestions have been adopted. The following Aboriginal cultural offsets are proposed:

- (1) The mitigation of the 148 Aboriginal archaeological sites and cultural features should be implemented. This should include archival recording, excavation, monitoring, controlled removal and surface salvage (collection) and is to be undertaken in consultation with the RAPs and detailed in the AACHMP.
- (2) The proponent should liaise with the RAPs regarding the provision of a Keeping Place for the storage of Aboriginal artefacts during the life of the mine, the location of which will be decided in consultation with the RAPs. Depending on its location, if necessary, RAPs will be able to arrange access to the Keeping Place during business hours and consistent with mine protocols to be detailed in the AACHMP



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- (3) Once mining and rehabilitation has been completed, the ongoing storage of the artefacts will be discussed with the RAPs; and should include the option of returning artefacts back to their original locations, where feasible.
- (4) Where practicable, and consistent with safety arrangements, RAPs will be offered the opportunity to access areas of cultural values with protocols to be detailed in the AACHMP. The procedures for RAP site visits to areas of interest within the Project Impact Boundary will be provided as part of the consultation in the development of the AACHMP.
- (5) The AACHMP will provide provisions for cultural ceremonies to be undertaken as relevant and consistent with safety arrangements.
- (6) Oral history recording, where appropriate, may be undertaken as part of the AACHMP.
- (7) Where physically practicable within the Project Disturbance Boundary, topsoils should be returned to their original locations as part of the mining remediation process.

In addition to these offsets, social impacts relevant to the local Aboriginal community have been assessed and mitigated, as appropriate, in the Social Impact Assessment completed for the Project (Hansen Bailey - EIS 2015).

## 10.0 Conclusions and Recommendations

The Project is a State Significant Development for which a Development Consent is being sought under Division 4.1, Part 4 of the EP&A Act.

### 10.1 Summary of Impacts

There are 146 Aboriginal sites and features in the Subsidence Study Area (**Figure 13**). MSEC (2015) has prepared subsidence predictions for all the Aboriginal sites (116) and features (30) within the Subsidence Study Area (**Table 23**). Of the sites in the Subsidence Study Area, 41 (11 archaeological, 30 cultural) are at risk of impacts from subsidence cracking and rockfall. The remaining 105 archaeological sites will not be directly impacted from subsidence. If mitigation action to any cracks/fractures is needed, then these sites are to be avoided.

There are 100 archaeological Aboriginal sites in the Project Disturbance Boundary, 95 surface artefact sites, three modified trees, 2 PADs (one with surface artefacts). In addition, there are two cultural features; thus the total of sites/features in the Project Disturbance Boundary is 102.

In addition, there is one rockshelter (RS003) outside the Project Disturbance Boundary, which may be impacted by blasting.

In total, 144 Aboriginal sites will potentially be impacted by the Project; with a further 4 sites outside the Project Impact Boundary requiring archival recording.

### 10.2 Conclusions

The conclusions of the AACHIA are that it has:

- been carried out in accordance with the relevant statutory, regulatory requirements and policy Guidelines;
- detailed the location, nature and extent of the survey and its findings in respect of the Aboriginal heritage already registered under the AHIMS criteria and those archaeological sites and cultural features identified in the survey;
- identified and assessed the significance of the archaeological sites and cultural features and identified;
- assessed the possible nature and extent of the impacts, if any, on the archaeological sites and cultural features; and
- proposed appropriate management and mitigation measures and protocols in the AACHMP .

### 10.3 Summary of Management and Mitigation Measures

The AACHIA recommends the following actions to conserve, and mitigate impacts to, archaeological sites and cultural features:

- The ochre quarry (RPS Bylong OQ01) has been assessed as being of high regional significance. All reasonable and feasible action is to be taken to avoid impacts to this site. Where impacts cannot be avoided then engineering solutions to prevent rockfall and cracking are to be considered. Prior to the commencement of any works or actions, there is to be a full archival recording of the site.
- In the Subsidence Study Area, 45 sites/features will require pre-mining mitigation. Archival recording will be required prior to mining for six sites (one ochre quarry, one rockshelter and four grinding grooves) and test excavation of 9 rockshelters. For the cultural features, 3 rock formations will need to be subject to an archival recording, plus inspection and subsequent recording of the 27 rock cavities. Monitoring of 32

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sites/cultural features will need to be undertaken post-mining.

- One rockshelter (RPS RS003) will require archival recording to provide a baseline for the management of potential blasting impacts.
- In the Project Disturbance Boundary, 102 sites/features will require mitigation and includes: excavation of two PAD areas, archival recording of two cultural features, controlled removal of three modified trees and 95 surface artefact sites will require collection.
- The proponent should liaise with the RAPs regarding the provision of a Keeping Place for the storage of Aboriginal artefacts collected as part of the proposed Aboriginal archaeological salvage works. The location of the Keeping Place will be decided in consultation with the RAPs.
- Once mining and rehabilitation has been completed, the ongoing storage of the artefacts will be discussed with the RAPs; this conversation should include the option of returning artefacts back to their original locations, where feasible.
- Where practicable and consistent with safety arrangements, RAPs will be offered the opportunity to access areas of cultural value with protocols to be detailed in the AACHMP.

## 11.0 References

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## Appendix I

### Aboriginal Consultation - Aboriginal Consultation Log & Documentation

NOT FOR PUBLIC DISTRIBUTION



## Appendix 2

### Survey Coverage Data and Plates



## Survey Coverage Data

The reporting of survey coverage is required under the *Guide for Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*. The purpose of reporting survey coverage is to evaluate the effective coverage area, as well as analysing the survey results in respect to the survey unit/landform. Analysis of Aboriginal site distribution with relation to landform is important for interpreting the survey results, as well as for predictive modelling.

The eleven major survey units/landform within the Project Area have been identified as:

- (1) Cliff Lines
- (2) Mid to Upper Slopes Jointed Sandstone
- (3) Stepped Creeks and Terraces
- (4) Interlocking Spurs and Creek lines
- (5) Steep Rolling Hills
- (6) Cobbled Creeks and Flat Terraces
- (7) Alluvial Plain
- (8) Volcanic Capped Hills
- (9) Footslopes
- (10) Incised V-shaped creek lines and slopes
- (11) Main River Channel

### Cliff Lines (Landform Unit 1)

The cliff lines landform unit generally contained outcropping sandstone and very steep slopes. In most areas, where the cliff lines are located, the lower slopes are littered with large talus boulders and rock fall (**Plate 1 – Plate 3**). The area is wooded with mostly immature eucalyptus and mature black cypress pines. Some areas are densely populated by medium sized shrubs such as acacias. Some native grasses are present in the more open areas. The terrain was difficult to traverse due to the dense vegetation, steep slopes, scree, sandstone outcrops and rock fall (**Plate 4**). Sandstone in these areas is very friable, poorly sorted, and with small angular pebble inclusions.

This landform is not conducive to the development of shelters in the sandstone due to water runoff, extensive fracturing, large rock fall and poor quality sandstone. This sandstone is also not suitable for grinding grooves or rock art, due to its friable nature and bands of pebble inclusions. Although there are very small rock cavities in the sandstone along these cliff lines, all were considered unsuitable for sustained Aboriginal occupation, due to the dynamic erosion, water flow runoff and the instability of the sandstone outcrops (**Plate 5**).



**Plate 1 Landform Unit 1 view showing sandstone outcrop in cliff line area and steep slope**



**Plate 2 Landform Unit 1 view showing steep slope and talus slope**



Plate 3 Landform Unit 1 view showing steep cliffs and scree slope



Plate 4 Landform Unit 1 view showing sandstone cliffs and rock fall





**Plate 5 Landform Unit 1 view showing sandstone boulders on scree slope**



### Mid to Upper Slopes - Jointed Sandstone (Landform Unit 2)

This landform unit comprises mid to upper slopes under the cliff lines, it contains outcropping sandstone with large talus boulders and rock fall. Rock cavities are found mid slope especially where the creek lines have cut through the sandstone outcrops (**Plate 6 and Plate 7**). A number of these cavities were suitable for sustained Aboriginal occupation and were recorded as rockshelters. The rockshelters recorded with archaeological features had level or generally flat lying floors, accumulated sediment on the floor of the rockshelter with sufficient depth to contain potential archaeological material, stable walls and ceilings, and no evidence of water runoff through the cavity. The sandstone walls within these shelters generally had small angular pebble inclusions and were poorly sorted, making it unsuitable for grinding grooves or rock art (**Plate 8**). In some instances, open artefact sites occurred in the general area, although they were commonly found in areas of sustained erosion or on the exposed access roads.

This landform is characterised by active erosion caused by collapse, landslide, sheet flow, creep and channelled stream flow and poor soils in the steeper terrain (**Plate 9**). The area is wooded with mostly immature eucalyptus and mature black cypress pines. There was evidence of previous land clearing in some areas relating to previous farming activities in the area. Access to these areas is also hindered by dense vegetation particularly with an understory of medium sized shrubs, such as acacias. Some native grasses are present in the more open areas. The terrain is difficult to traverse, but is more accessible than the cliff line areas due to the dense vegetation, slopes, sandstone outcropping and rock fall.



Plate 6 Landform Unit 2 - view showing creek line cutting through outcropping sandstone



**Plate 7 Landform Unit 2 view showing rock cavity**



**Plate 8 Landform Unit 2– view showing conglomerate sandstone**



Plate 9 Landform Unit 2 – view showing steep terrain



### Stepped Creeks and Terraces (Landform Unit 3)

The creek lines with outcropping sandstone along the banks are located in the mid to low sloped areas below the cliff lines (**Plate 10**). The large drainage systems had stepped platforms at the upper entry points of these systems (**Plate 11**) that flowed down to the cleared and farmed areas to the north and south of Bylong Valley Way. In the cleared and farmed areas to the north and south of Bylong Valley Way, the large drainage systems had basalt stepped platforms at the upper entry points of these systems. No rockshelters or cavities were recorded in these areas.

There are sandstone outcrops along the creek lines and in the creek beds in this area, but the sandstone is not fine grained and not suitable to be used for grinding stone tools. The sandstone lined creeks are wooded with immature eucalyptus and black cypress pines with an understory of acacia populating the creek bed (**Plate 12**). The drainages channels are located in farm cleared areas. Areas can also be densely populated by medium sized shrubs such as acacias. Some native grasses are present in basalt stepped platform areas.

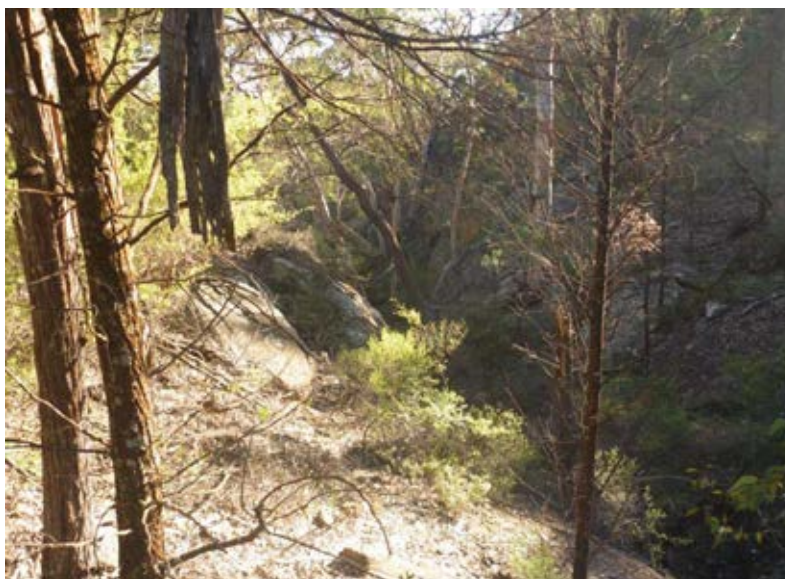


Plate 10 Landform Unit 3– view showing stepped creek line with sandstone rocks and terraces



Plate 11 Landform Unit 3 – view showing stepped rocks in the creek bed



Plate 12 Landform Unit 3 – view showing vegetation in creek bed and along creek banks

### Interlocking Spurs and Creek Lines (Landform Unit 4)

This landform unit comprises interlocking spurs and creek lines along the middle catchment area of Dry Creek. Interlocking spurs are formed in v-shaped valleys with lateral erosion undercutting the concave banks of river bends and depositing the load downstream (**Plate 13**). The creek banks are generally fairly steep and the promontories are usually rounded due to the effects of erosion (**Plate 14**). The promontories jut out into the creek lines in staggered formation throughout the landscape and are described as interlocking spurs. Some of the creek beds were lined by basalt rocks (**Plate 13**) and there was evidence of weathering of these rocks to form white clays along the creek banks (**Plate 14**). The areas in this landform unit were cleared grazing land at the base of the Goulburn River State Forest. The surrounding hills densely grassed. A large number of open artefact scatters were identified where soil profiles had been exposed from sheet wash and areas associated with vehicle movements and tracks.



Plate 13 Landform Unit 4 – view showing interlocking spurs and basalt rocks lining the creek bed



Plate 14 Landform Unit 4 25 June 14 Week 5 – view showing weathering of basalt along creek banks





### Steep Slopes and Rolling Hills (Landform Unit 5)

The rolling hill landform unit was associated with the eastern tributaries of Dry Creek (**Plate 15 – Plate 17**). This landform unit is characterised by steep to moderate slopes. The crests of the hills are rounded. The eroded drainage channels are moderately spaced and formed a convergent integrated tributary network. Vegetation was predominantly characterised by cleared grassy paddocks and open woodland on some of the slopes. These hills have been eroded by sheet wash, creep and channelled creek flow. Open artefact sites occur infrequently in this landform and grinding grooves were identified in the upper catchment at in one locality. Open artefact sites occurred to the west of these groove sites, creating a complex of associated occupation areas.



Plate 15 Landform Unit 5 – view showing steep sided rolling hills with rounded crests



Plate 16 Landform Unit 5 05 June 14 Week 3





**Plate 17 Landform Unit 5 05 June 14 Week 3**



### **Cobbled Creeks and Flat Terraces (Landform Unit 6)**

This landform unit comprises flat creek terraces, many of which are lined with cobbles, adjacent to the main channel of Dry Creek (**Plate 18** and **19**). These cobbles are predominantly derived from basalt and are likely to have been eroded from the extensive columnar basalt and basalt flows in the area to the south west characterised by steep rolling hills. Flat basalt sheeting and eroded columns were identified in the upper catchment of some of these tributaries. This creek line and terracing pattern runs parallel to the Bylong Valley Way on the northern side of the mining lease. The terraces have been formed by erosion and aggradation by overbank flooding. The deepening and enlargement of the creek has then lowered the likelihood of flooding events occurring. The red brown soils lining the creek bed are the result of the weathering of basalt rocks.

Vegetation is characterised by densely grassed paddocks with some scattered eucalyptus woodland on the top of the hill slopes adjacent to the boundary of the Goulburn River National Forest. No sandstone outcrops or platforms occur in this area. Artefact sites were identified infrequently in this landform, likely due to lack of exposures, but may have also been removed during flooding events.



**Plate 18 Landform Unit 6— view showing terraces and cobbles in creek bed**



**Plate 19 Landform Unit 6– view showing banks cut by fast flowing water and cobbles in creek bed**



### Alluvial Plain (Landform Unit 7)

The alluvial plain was located on Bylong valley floor below the footslopes. This plain was a level landform with extremely low relief (**Plate 20**), and aggradation of alluvium by channelled and overbank stream flow. There is very gradual change in elevation across the area. The alluvial creek channels that have formed this plain are Bylong Creek and Lee Creek and thus drinking water would have been available for Aboriginal occupation and is likely to have supported edible plants and is likely to have been a location for hunting animals. This flat alluvial plain has been extensively pastured and/or cultivated since European settlers came to the Bylong Valley, due to the water resources and alluvial soils present. Highly disturbed artefact scatters and/or isolated finds were present and observed across the plain. These sites were identified mostly in areas of high ground exposure such as farm dam banks, contour banks and graded vehicle access tracks (**Plate 21** and **Plate 22**). Towards the southern end of this landform, a number of possible scarred trees were present in one paddock where the clearance of large old mature eucalyptus had not occurred (**Plate 23**).



Plate 20 Landform Unit 7– view showing alluvial plain





**Plate 21 Landform Unit 7 alluvial plain showing disturbance from pastoral activities**



**Plate 22 Landform Unit 7 alluvial plain showing erosion and landform modification**



Plate 23 Landform Unit 7 alluvial plain

### Volcanic Capped Hills (Landform Unit 8)

The volcanic capped hill landform unit comprised undulating hill slopes which correspond to the proposed North Western Overburden Emplacement Area. The slopes were made up of a number of hills, saddled at the northern end of a long steep ridgeline (**Plate 24**). These low gradient slopes, once traversed, offer an outlook across most of the Bylong Valley area and into both surrounding plains. At the end of this spur was a bald hill which offered unparallel views. This rare outlook in the overall region had some potential for Aboriginal use. These slopes have been cleared of native vegetation and been used in more recent times for the grazing of cattle (**Plate 25**). The slopes were covered in very tall and dense pasture grasses. A small number of isolated artefacts were identified on the exposed vehicle access tracks in the area.



Plate 24 Landform Unit 8 Volcanic capped hills



Plate 25 Landform Unit 8 volcanic capped hills





### Footslopes (Landform Unit 9)

This landform is the transition between the ridgelines and alluvial plain in the south, and the interlocking spurs and steep rolling hills in the north of the survey areas (**Plate 26-Plate 29**). This transition is between the upslope sites of erosion and transportation, such as the shoulders and back slopes, and the down slope sites of deposition, such as the toe slopes. These moderate inclines are the result of aggradation or erosion by sheet flow, earth flow or creep. Vegetation was mainly dense pasture grasses, with scatterings of open woodland on entering the mid slopes that were more forested. Open artefact sites occurred infrequently in this landform, and where present were again only identified in exposures.



Plate 26 Landform Unit 9, footslopes in mid-background



Plate 27 Landform Unit 9 footslopes





**Plate 28 Landform Unit 9 footslopes**



**Plate 29 Landform Unit 9 footslopes – mid/background**



### Incised V-Shaped Creek lines and Slopes (Landform Unit 10)

This steep sloped landform unit was encountered in association with deeply incised V-shaped creek lines. In some areas, these creek lines became small gorges. Ground surfaces were sloped and unsuitable for occupation and no Aboriginal sites were identified in these areas (**Plate 30** and **Plate 31**). Vegetation ranged from sparsely wooded (near Dry Creek tributaries) to thickly wooded in the north and eastern areas.



Plate 30 Landform Unit 10



Plate 31 Landform Unit 10

**Flats and Slopes Adjacent to Major Channels (Landform Unit 11)**

This landform unit encapsulates the Bylong Valley floor. The major channels are defined as the main course of the Bylong River and Lee Creek. This landform unit comprises the flats and slopes adjacent to the major channels (approximately 300m from centre of the channel).



Plate 32 Landform Unit 11





The exposure and visibility was recorded for each survey unit/landform is summarised in **Table 2** and **Table 3**.

**Table 2 Summary of Ground Surface Visibility (GSV) and Ground Surface Exposure (GSE)**

GSE and GSV average percentage	Ranking
0-29%	Low
30-69%	Moderate
70-100%	High

**Table 3 Survey Coverage Data**

Survey Unit (SU)	Landform	Survey Unit Area (Square metres)	Exposure (%)	Visibility (%)	Effective Coverage Area (square metres)	Sample Fraction of Survey Unit
1	Cliffines	340000	90	80	244800	72
2	Mid to Upper Jointed Sandstone	3480000	35	35	426300	12.25
3	Stepped Creeks and Terraces	3240000	75	70	1701000	52.5
4	Interlocking Spurs and Creeklines	3210000	80	70	1797600	56
5	Steep Rolling Hills	5870000	80	75	3522000	60
6	Cobbled Creeks and Flat Terraces	470000	60	30	84600	18
7	Alluvial Plain	4220000	80	80	2700800	64
8	Volcanic Capped Hills	1650000	80	50	660000	40
9	Footslopes	4770000	80	80	3052800	64
10	Incised V-Shaped Creeklines and Slopes	1280000	80	70	716800	56
11	Flats and slopes adjacent to major channel.	1890000	90	80	1360800	72



## Appendix 3

### Archaeological Site Descriptions



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## Rockshelter Site Descriptions

**RPS Bylong RS001 (Field points KG002)**

RPS Bylong RS001 was accessed from Road 04, a graded access track for the drilling rigs. This rockshelter was identified on the 19<sup>th</sup> May 2014 in Week 1 of the survey. The rockshelter is 2.82 m in height, 7.21 m in width and 6.79 m in depth (**Plate 33**). It was estimated that the sediment covering the floor of the shelter had a depth of at least 30 cm. There were no artefacts associated with this site. This site has westerly aspect (**Plate 34**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

**PHOTOS**

**Plate 33 RS001 (KG002) Rockshelter**



**Plate 34 West aspect from the rockshelter**



### RPS Bylong RS002 (Field points KG025)

RPS Bylong RS002 was accessed from Road 01, a graded access track for the drilling rigs. This site was identified on the 22<sup>nd</sup> May 2014 in Week 1 of the survey. The rockshelter is 1.8 m in height, 3.4 m in width and 3.13 m in depth (**Plate 35**). It was estimated that the sediment covering the floor of the shelter had a depth of at least 15 cm, however there were no surface artefacts associated with this site. The rockshelter has westerly aspect (**Plate 36**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

### PHOTOS

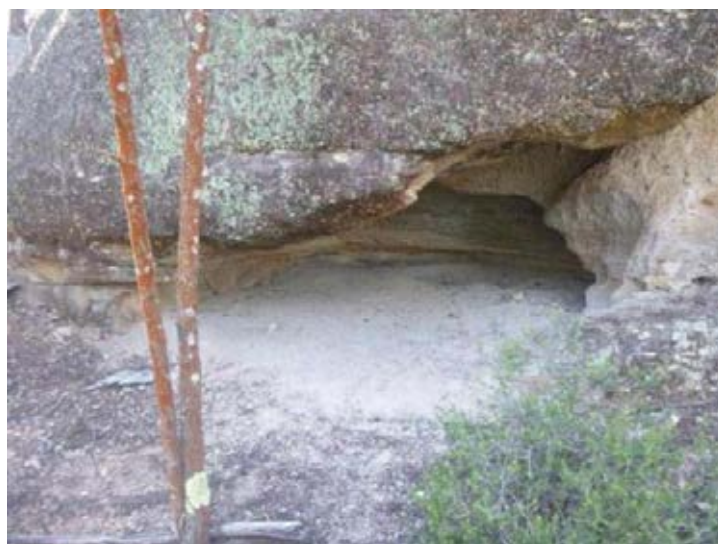


Plate 35 RPS Bylong RS002 (KG025) Rockshelter



Plate 36 West aspect from the shelter



**RPS Bylong RS003 (Field points KG049)**

RPS Bylong RS003 was located to the south of the proposed open cut. This rockshelter and its associated artefact scatter (RPS Bylong AS034) were identified on the 28<sup>th</sup> May 2014. The rockshelter is 2.1 m in height, 2.5 m in width and 2.2 m in depth (**Plate 37**). There was no PAD identified inside the rock shelter, but there was an area of PAD measuring 6 m by 6 m, and considered to be approximately 20 cm in depth, in front of and adjacent to the shelter. This site has north westerly aspect (**Plate 38**). The associated artefact scatter (RPS Bylong AS034) was located to the south east, directly behind the shelter (**Plate 39**) and the artefacts are on the surface of sandy soils **Plate 40**. The GSV and GSE were low in the general area due to the density of the surrounding pasture grasses. The area has eucalypts, black cypress pines and acacia understory along the tree line on the footslopes to the south. There are also native grasses and small shrubs present.

**PHOTOS**

**Plate 37 RPS Bylong RS003 (KG049) Rockshelter**



**Plate 38 Northwest aspect from the shelter**



Plate 39 RPS Bylong RS003 (KG049) Rockshelter with Artefact Scatter RPS Bylong AS034 to the south east



Plate 40 Artefact from associated artefact scatter RPS Bylong AS034



**RPS Bylong RS004 (Field points KG128)**

RPS Bylong RS004 was accessed via a graded access track used for the drilling rigs, which followed the western boundary in the northwest corner of the State Forest. This site was identified on the 26<sup>th</sup> June 2014 in Week 5 of the survey. The rockshelter is 1.3 m in height, 5.1 m in width and 4.2 m in depth (**Plate 41**) and has a north westerly aspect (**Plate 42**). It was estimated that the sediment that formed the floor of the shelter had a depth of at least 10 cm. There were no artefacts associated with this site. The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey. This shelter was situated in close proximity to RS005.

**PHOTOS**

**Plate 41 RPS Bylong RS004 (KG128) Rockshelter**



**Plate 42 Northwest aspect from the shelter**



### RPS Bylong RS005 (Field points KG129)

RPS Bylong RS005 was accessed via a graded access track used for the drilling rigs, which followed the western boundary in the northwest corner of the State Forest. This site was identified on the 26<sup>th</sup> June 2014 in Week 5 of the survey. The rockshelter is 1.5 m in height, 5.8 m in width and 3.1 m in depth (**Plate 43**) and has a north westerly aspect (**Plate 44**). It was estimated that the sediment covering the floor of the shelter had a depth of at least 10 cm. There were no artefacts associated with this site. The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey. This shelter was situated in close proximity to RS004.

### PHOTOS



Plate 43 RPS Bylong RS005 (KG129) Rockshelter



Plate 44 Northwest aspect from the shelter



**RPS Bylong RS006 (Field points KG135)**

RPS Bylong RS006 (KG135) was located in a creek line running between Roads 09 and 10 and was accessed using Road 10, a graded access track for the drilling rigs. This site was identified on the 27<sup>th</sup> May 2014 in Week 5 of the survey. The rockshelter is 1.61 m in height, 6.58 m in width and 4.67 m in depth (**Plate 45**) and has a westerly aspect (**Plate 46**). It was estimated that the sediment forming the floor of the shelter had a depth of at least 15 cm. There were no artefacts associated with this site. The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

**PHOTOS**

**Plate 45 RPS Bylong RS006 (KG135) Rockshelter**



**Plate 46 West aspect from the shelter**



### RPS Bylong RS007 (Field points KG136)

RPS Bylong RS007 (KG136) was accessed from Road 07, a graded access track for the drilling rigs. This site was identified on the 27<sup>th</sup> May 2014 in Week 1 of the survey. The rockshelter is 1.83 m in height, 8.84 m in width and 4.82 m in depth (**Plate 47 Plate 50**) and has a northerly aspect (**Plate 48 Plate 49**). The area of sediment that was considered to be a PAD was between 10 and 20 cm throughout the site. There were no artefacts associated with this site. The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

### PHOTOS



Plate 47 RPS Bylong RS007 (KG136) Rockshelter



Plate 48 North aspect from the shelter





**Plate 49 RPS Bylong RS007 (KG136) Rockshelter**



**Plate 50 RPS Bylong RS007 (KG136) Rockshelter**



### RPS Bylong RS008 (Field points RPS020JH)

RPS Bylong RS008 was accessed from Road 06, a graded access track for the drilling rigs. This site was identified on the 21<sup>st</sup> May 2014 in Week 1 of the survey. The rockshelter is 2.1 m in height, 3.6 m in width and 3.7 m in depth (**Plate 51**) and has a north easterly aspect (**Plate 52**). There was an area of PAD measuring 3 m by 3 m in front of the shelter. Sediment inside the shelter was less than 5 cm in depth. There were no artefacts associated with this site. The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

### PHOTOS



Plate 51 RPS Bylong RS008 (RPS020) Rockshelter

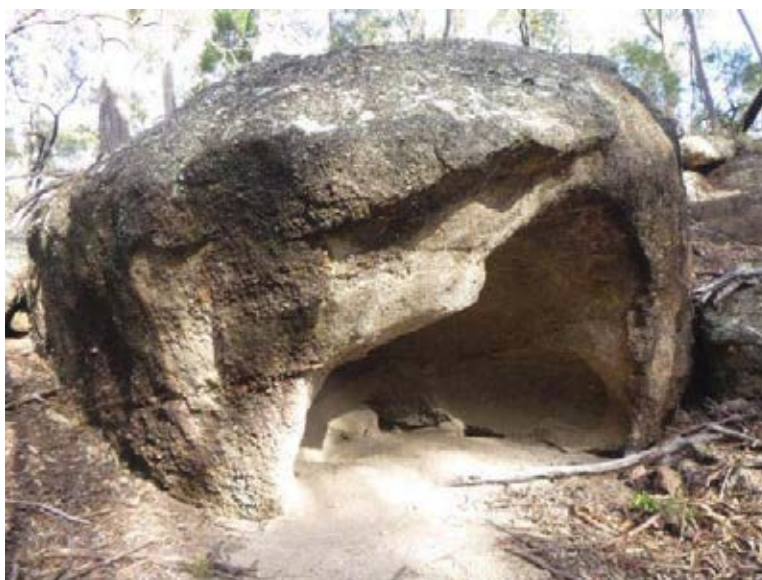


Plate 52 West aspect from the shelter



**RPS Bylong RS009 (Field points JH010)**

RPS Bylong RS009 was accessed from Road 10, a graded access track for the drilling rigs. This rockshelter was identified on the 27<sup>th</sup> June 2014 in Week 5 of the survey. The site was located in a creek line carved between two steeply sloping sheets of outcropping sandstone. The rockshelter is 1.55 m in height, 2.34 m in width and 3.4 m in depth (**Plate 53**) and has a south easterly aspect (**Plate 54**). There was no PAD sediment in the cavity. There were no artefacts associated with this site. The GSV and GSE were low throughout the creek line due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

**PHOTOS**

**Plate 53 RPS Bylong RS009 Rockshelter**



**Plate 54 South east aspect from the shelter**



### RPS Bylong RS010 (Field points JH021)

RPS Bylong RS010 was accessed from Road 06, a graded access track for the drilling rigs. This site was identified on the 21<sup>st</sup> May 2014 in Week 1 of the survey. The rockshelter is 1.6 m in height, 2.45 m in width and 9.88 m in depth (**Plate 55**) and has a westerly aspect (**Plate 56**). It was estimated that the sediment forming the floor of the shelter had a minimum depth of 10 cm. There were no artefacts associated with this site. The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

### PHOTOS



Plate 55 RPS Bylong RS010 (JH021) Rockshelter



Plate 56 View to south into the shelter



**RPS Bylong RS011 (Field points JH095)**

RPS Bylong RPS011 was accessed from Road 05, a graded access track for the drilling rigs. This site was identified on the 20<sup>th</sup> May 2014 in Week 1 of the survey. The rockshelter is 1.6 m in height, 2.1 m in depth and 7.6 m in width (**Plate 57**) and has a northerly aspect (**Plate 58**). It was estimated that the sediment covering the floor of the shelter had a depth of approximately 5 cm. An isolated artefact (IF012) was associated with this site (RPS Bylong IF012). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

**PHOTOS**

**Plate 57 RPS Bylong RS011 (JH095) Rockshelter**



**Plate 58 North aspect from the shelter showing isolated artefact amongst leaf litter in the foreground**



### RPS Bylong RS012 (Field points PS122)

RPS Bylong RS012 was accessed via the graded access track for the drilling rigs, located near the northern boundary in the northwest corner of the State Forest. This site was identified on the 26<sup>th</sup> June 2014 in Week 5 of the survey. The rockshelter is 3.09 m in height, 11.18 m in width and 9.11 m in depth (**Plate 59 Plate 61**) and has a westerly aspect (**Plate 60 Plate 62**). The sediment considered to be a PAD was between 15 and 20 cm throughout the site. The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

### PHOTOS



Plate 59 RPS Bylong RS012 (PS122) Rockshelter view to east (Steve Flick & Deidre Perkins in entrance)

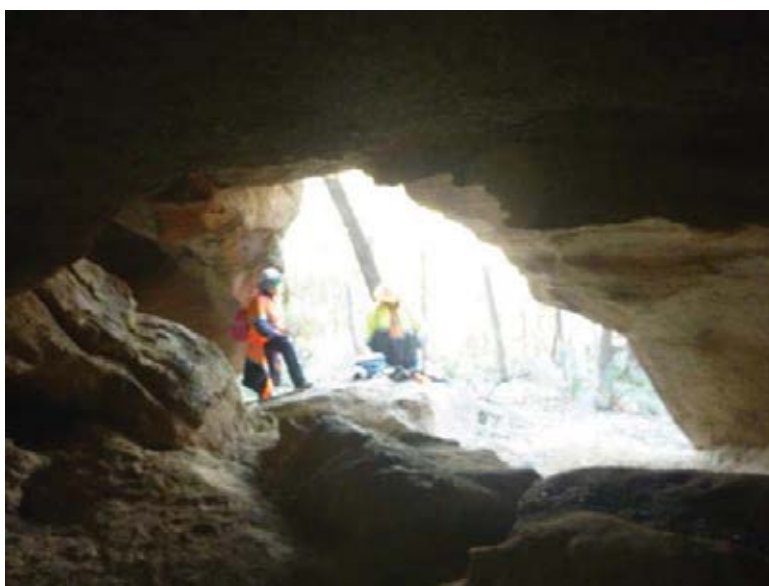


Plate 60 West aspect from inside the shelter





**Plate 61 View to the south east towards the shelter**



**Plate 62 View of PAD to the west of the shelter entrance**



### RPS Bylong RS013 (Field points RPS126)

RPS Bylong RS013 was accessed from Road 07, a graded access track for the drilling rigs. This site was identified on the 27<sup>th</sup> May 2014 in Week 5 of the survey. The rockshelter is 1.14 m in height, 4.66 m in width and 5.15 m in depth (**Plate 63**) and has a north easterly aspect (**Plate 64**). The sediment forming the PAD was between 5 and 10 cm throughout the site. There were two quartz artefacts located in this rockshelter. The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation community in the area is characterised by new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses and small shrubs are present in the understorey.

### PHOTOS



Plate 63 RPS Bylong RS013 (PS126) Rockshelter



Plate 64 Two quartz artefacts in rockshelter

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## Grinding Groove Site Descriptions



### RPS Bylong GG001 (Field points KG073)

RPS Bylong GG001 was accessed via densely grassed paddocks entered from Road 19, a graded access track. These grinding grooves were identified on the 05<sup>th</sup> June 2014 in Week 3 of the survey. The area of this site is approximately 15 m in length and 5 m in width. There were over 12 grinding grooves observed at this time. The majority of grooves at this site measured between 22 and 25cm in length, and approximately 5cm in width. There were two other grinding groove sites identified in the area (RPS Bylong GG002 and RPS Bylong GG003). There were also three artefact scatters: RPS Bylong AS042, RPS Bylong AS079 and RPS Bylong AS029, to the west of the creek line and grinding groove sites, which were probably associated with these groove sites. The drainage channel associated with the site ran in a north east to south west direction. The GSV and GSE were low between the site and the graded track due to the dense pasture grasses throughout the area leading to the drainage channel system. The vegetation community in the area is characterised by very large, mature eucalypts, however no cultural scars were identified. Some native grasses and small shrubs are present along the banks of the drainage channel.

### PHOTOS



Plate 65 RPS Bylong GG001 (KG073) Grinding Grooves





**Plate 66 Landscape in which the grooves were located (facing southwest)**



### RPS Bylong GG002 (Field points KG074)

RPS Bylong GG002 was accessed via densely grassed paddocks entered from Road 19, a graded access track. These grinding grooves were identified on the 05<sup>th</sup> June 2014 in Week 3 of the survey. The area of this site is approximately 10 m in length and 5 m in width. There were a number of irregular shaped depressions in the sandstone bedrock that were filled with water and were adjacent to the grooves. Two of these 'basins' had grinding surfaces visible on the edge. Nine grooves were observed on the flat lying sandstone surface. Five of the grooves were approximately 25 cm in length and 5-7 cm in width. Four were 15-18 cm in length and 4 cm in width. The basins were over 50 cm in length and over 30 cm in width. The depth of the basins, which were in natural depressions that had not been modified, was approximately 10 cm. There were two other grinding groove sites identified in the area (RPS Bylong GG001 and RPS Bylong GG03). There were also three artefact scatters: RPS Bylong AS042, RPS Bylong AS079 and RPS Bylong AS029, to the west of the creek line and grinding groove sites, which were probably associated with these groove sites. The drainage channel associated with this site ran in a north easterly direction. The GSV and GSE were low between the site and the graded track due to the dense pasture grasses throughout the area. The vegetation in the area also includes very large mature eucalypts, however no cultural scars were identified upon inspection. Some native grasses and small shrubs are present along the banks of the drainage channel.

### PHOTOS



Plate 67 RPS Bylong GG002 (KG074) Grinding grooves and ground basins



**Plate 68 Northwest view of grooves and basins**



### RPS Bylong GG003 (Field points PS072)

RPS Bylong GG003 was accessed via densely grassed paddocks entered from Road 19, a graded access track. These grinding grooves were identified on the 05<sup>th</sup> June 2014 in Week 3 of the survey (**Plate 69**). The area of this site is approximately 40 m in length and 10 m in width. There were around 30 grooves observed. The largest grooves from all three sites were found at this location, over 30cm in length and approximately 8 to 10 cm in width. There were also shorter grooves, measuring 20-24 cm in length and 6-8 cm in width, as well as some that were 15-18 cm by 6-8 cm. There were two other grinding groove sites identified in the area (RPS Bylong GG001 and RPS Bylong GG002). There were also three artefact scatters: RPS Bylong AS042, RPS Bylong AS079 and RPS Bylong AS029 to the west of the creek line and grinding groove sites, which were probably associated with these groove sites. The drainage channel associated with this site ran in a north easterly direction. The GSV and GSE were low between the site and the graded track due to the dense pasture grasses throughout the area. The vegetation in this area also includes very large mature eucalypts, however no cultural scars were identified upon inspection. Some native grasses and small shrubs are present along the banks of the drainage channel.

### PHOTOS



Plate 69 RPS Bylong GG003 (PS072) Grinding Grooves





**Plate 70 View of grinding grooves**



### RPS Bylong GG004 (Field points PS109)

RPS Bylong GG004 was accessed via densely grassed paddocks entered from Road 19, a graded access track. These grinding grooves were identified on the 24<sup>th</sup> June 2014 in Week 5 of the survey (**Plate 71**). The area of this site was approximately 15 m in length and 5 m in width. There were approximately 10 grooves observed. The grooves at this location were shorter and wider than previously recorded sites in the area, measuring between 12-20 cm in length and approximately 10 cm in width. There were three other grinding groove sites identified in the area (RPS Bylong GG001, RPS Bylong GG002 and RPS Bylong GG003). There were also artefact scatters to the north (RPS Bylong AS042) and to the east (RPS Bylong AS029) that were associated with these groove sites. The drainage channel in which this site was located ran in an easterly direction. The GSV and GSE were low between the site and the graded track due to the dense pasture grasses throughout the area. The vegetation also included very large mature eucalypts, however no cultural scars were identified upon inspection. Some native grasses and small shrubs are present along the banks of the drainage channel.

### PHOTOS



Plate 71 RPS Bylong GG004 (PS109) Grinding grooves

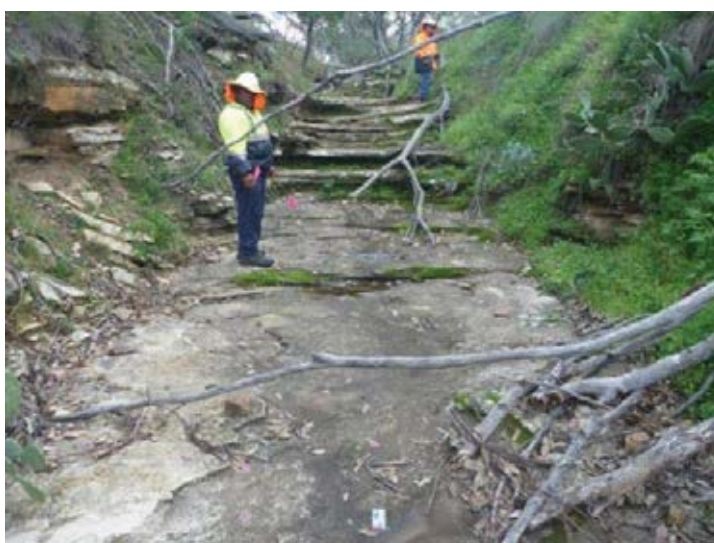


Plate 72 Looking to the west over the grinding groove area



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# Scarred Tree Site Descriptions



### RPS Bylong MT005 (Field point KG039)

RPS Bylong MT005 was a scarred tree recorded on the 26<sup>th</sup> of May 2014. The tree was located in the large open paddock on the east boundary, south of Woolley's Rd. This tree has one cultural scar and is 1.86 m in height, 33 cm in width, 15 cm in thickness and is located 4 cm from the base of the tree (**Plate 73**). This scar faces west. Another scar was observed, but is likely a result of damage and not from cultural practices (**Plate 74**).

### PHOTOS



Plate 73 RPS Bylong MT005 Scarred Tree (Cultural Scar)



Plate 74 RPS Bylong MT005 Scarred Tree, showing scar resulting from damage (not culturally modified)



**RPS Bylong MT07 (Field point KG042)**

RPS Bylong MT07 is a scarred tree located in a large open paddock on the east boundary, south of Woolley's Rd. The scar is 1.11 metres in height, 23 cms in width, 12 cms in thickness and 22 cms from the base (**Plate 75** and **Plate 76**). The scar has a westerly aspect. The GSV and GSE were low in the general area due to dense pasture grasses. The only exposures in the area were the vehicle access tracks, contour bans and farm dams.

This tree was verified by aborist Danny Draper (25 June 2014), Urban Tree Management Australia.

**PHOTOS**

**Plate 75 Scarred Tree MT07 (with Christine Maynard – Mudgee LALC)**



**Plate 76 Scarred Tree MT07 (facing northwest)**



### RPS Bylong MT08 (Field points KG043)

RPS Bylong MT08 was a scarred tree located in a large open paddock on the east boundary, south of Woolley's Rd. The scar is 1.54 metres in height, 38 cms in width, 10 cms in thickness and 42 cms from the base (**Plate 77** and **Plate 78**). The scar has a westerly aspect. The GSV and GSE were low in the general area due to dense pasture grasses. The only exposures in the area were the vehicle access tracks, contour bans and farm dams. On the 25<sup>th</sup> of June 2014, Danny Draper, an arborist with UTMA (Urban Tree Management Australia) confirmed that this is a culturally modified scar.

### PHOTOS



**Plate 77 MT08 Scarred Tree**



**Plate 78 MT08 Scarred Tree (facing south)**

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## Ochre Quarry Site Description



### RPS Bylong OQ001 (Field points KG019)

RPS Bylong OQ001 was accessed via Road 06, a graded access track, across a moderate slope and up onto the ridgeline (**Plate 79**). This site was identified on the 21<sup>st</sup> May 2014 in Week 1 of the survey. The area covered by this site is over 80 m in length and 2 m in width. There were small niches observed where ochre collection had occurred. A number of different coloured ochres occur in this one location, which indicates that this is a site of high significance. There are coloured ochres that have significance to both male and female ceremonial events, such as red ochre for men, and yellow and purple ochre for women. Variations of orange, white and black ochre were also present. The vegetation community in the area is characterised by new growth eucalypts and black cypress pines. Some native grasses and small shrubs are also present on the slope leading up to the ridge where the quarry is located.

### PHOTOS



Plate 79 RPS Bylong OQ001 (KG019) in the background of the surrounding landscape



Plate 80 RPS Bylong OQ001 Ochre Quarry (facing east)





**Plate 81 Close up of ochre**



**Plate 82 View of ochre quarry along ridge line**



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## Archaeological Artefact Site Descriptions

**RPS Bylong AS016 (Field points JH005, JH006)**

RPS Bylong AS016 is a small artefact scatter, located on Road 04 (**Plate 83**), adjacent to an ephemeral creek. It consists of two mudstone flakes that conjoin, with one fragment measuring 2.5 cm by 2 cm and the other 2 cm by 2 cm (**Plate 84 and Plate 85**). This site has an area of 10 m by 5 m and has a north westerly aspect. The artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high along the road due to grading for drill rig access. Leaf litter in the vegetated areas surrounding the site severely reduced the GSV and GSE. The vegetation community in the area is characterised by eucalypts, black cypress pines and acacia shrubs. All mature trees were inspected for cultural scarring, however no scarred trees were identified. Water runoff was noted on the track, demonstrating the erosion and movement of A horizon soils. Disturbances in the area include the use of the access track and erosion by water.



**Plate 83 Site location photo of RPS Bylong AS016 (JH 005), view to the north west**



**Plate 84 Artefact identified at RPS Bylong AS016 (JH 005)**



**Plate 85 Artefact identified at RPS Bylong AS016 (JH 005)**



### RPS Bylong IF010 (Field point JH007)

RPS Bylong IF010 is an isolated find, located on Road 05 (**Plate 86**), which consists of one mudstone flake, measuring 2.5 cm by 2 cm (**Plate 87**). The site has an extent of 1 m by 1 m. This site has a southerly aspect and the artefact was situated on redeposited A horizon soils. The GSV and GSE were high along the road due to grading for drill rig access. Leaf litter in the vegetated areas surrounding the site severely reduced the GSV and GSE. The vegetation in the area is characterised by by eucalypts, black cypress pines and acacia shrubs. All mature trees were inspected for cultural scarring, however no scarred trees were identified. Water runoff was noted on the track, demonstrating the erosion and movement of A horizon soils. Disturbances include the use of the access track and erosion by water.



Plate 86 Site locationphoto of RPS Bylong IF010  
(JH 007), view to the south



Plate 87 Artefact identified at RPS Bylong IF010  
(JH 007)



**RPS Bylong IF011 (Field point JH008)**

RPS Bylong IF011 is an isolated find, located on a mid slope below a ridgeline across from Road 05 (**Plate 88**). It consists of one basalt distal flake, measuring 2.5 cm by 2.5 cm (**Plate 89**). The site has an extent of 1 m by 1 m. The site has a southerly aspect and the artefact was situated on the surface of A Horizon soils. The GSV and GSE were moderate due to trees and shrubs with leaf and branch litter. The vegetation in the area is characterised by eucalypts and a shrubby understorey. No mature trees were present and therefore no culturally scarred trees were identified. The site is situated on a naturally sloping landform with no modifications or disturbance.



**Plate 88 Site location photo of RPS Bylong IF011 (JH 008), view to the south**



**Plate 89 Artefact identified at RPS Bylong IF011 (JH008)**



### RPS Bylong IF012 (Field point JH017)

RPS Bylong IF012 is an isolated find, located on a mid slope (**Plate 90**), which consists of one quartz distal flake, measuring 4 cm by 2.5 cm (**Plate 91**). The site has a 1 m by 1 m extent. This site is associated with Rockshelter RPS Bylong RS011. The site has a northern aspect and the artefact was situated approximately 3 m to a rock shelter. The GSV and the GSE were moderate due to new growth trees, with some leaf and branch litter. The vegetation community in the area is characterised by eucalypts, acacias and pines. No mature trees were present and therefore no culturally scarred trees were identified. Water erosion is evident within the rock cavity of RPS Bylong RS011 with possible run off down the slope toward the location of RPS Bylong AS012. Disturbances include sheet wash erosion.



Plate 90 Site location photo of RPS Bylong IF012 (JH017), view to the north; RS011 in background



Plate 91 Artefact identified at RPS Bylong IF012 (JH017)

**RPS Bylong IF013 (Field point JH011)**

RPS Bylong IF013 is an isolated find, located on Road 05 (**Plate 92**), which consists of one mudstone flake, measuring 3 cm by 3 cm (**Plate 93**). The site has an area of 1 m by 1 m and faces north east. The artefact was situated on redeposited A horizon soils. The GSV and GSE were high along the road due to grading for drill rig access. The leaf litter in the vegetated areas surrounding the site severely reduced the GSV and GSE. The vegetation community in the area is characterised by eucalypts, black cypress pines and acacia shrubs. All mature trees were inspected for cultural scarring, however no scarred trees were identified. Water runoff was noted on the track, demonstrating the erosion and movement of A horizon soils. Disturbances include use of the access track and erosion by water.



**Plate 92 Site location photo of RPS Bylong IF013 (JH011), view to the north-east**



**Plate 93 Artefact identified at RPS Bylong IF013 (JH011)**



### RPS Bylong IF014 (Field point JH012)

RPS Bylong IF014 is an isolated find, located on Road 05 (**Plate 94**), which consists of one basalt flake, measuring 3cm in length by 2.5cm in width (**Plate 95**). The site has an extent of 1 m by 1 m and has a northerly aspect. The artefact was situated on clay B Horizon soils. The GSV and GSE were high along the road due to grading for drill rig access. The leaf litter in the vegetated areas surrounding the site severely reduced the GSV and GSE. The vegetation community in the area is characterised by eucalypts, black cypress pines and acacia shrubs. All mature trees were inspected for cultural scarring; however no scarred trees were identified. Water runoff was noted on the track, demonstrating the erosion and movement of A horizon soils. Disturbances include use of the access track and erosion by water.



Plate 94 Site location photo of RPS Bylong IF014 (JH012) , view to the north



Plate 95 Artefact identified at RPS Bylong IF014 JH012



**RPS Bylong IF015 (Field point JH013)**

RPS Bylong IF015 is an isolated find consisting of one mudstone flake located on Road 05 (**Plate 96** and **Plate 97**). The site has an extent of 1 m by 1 m., with a northerly aspect, and the artefact was situated on redeposited A horizon soils. The GSV and GSE were high along the road due to grading for drill rig access. Broken branches and leaf litter in the area surrounding this site had severely reduced the GSV and GSE. The vegetation community in the area is characterised by eucalyptus, black cypress pines and acacia shrubs. No mature trees were found to bear signs of cultural scarring or modification. Water run-off was noted along the track, demonstrating the erosion and movement of A horizon soils. Disturbances include access use of the track and erosion by water.



**Plate 96 Site location photo of RPS Bylong IF015 (JH013) view to the north**



**Plate 97 Artefact identified at RPS Bylong IF015 (JH013)**



### RPS Bylong IF016 (Field point JH014)

RPS Bylong IF016 is an isolated find, located on a bank adjacent to an ephemeral creek line (**Plate 98**), consisting of one mudstone flake, measuring 4 cm by 5 cm (**Plate 99**). The site has an extent of 1 m by 1 m, with a northerly aspect, and the artefact was situated on redeposited A horizon soils. The GSV and the GSE were moderate due to trees and leaf litter. The vegetation community in the area is characterised by eucalyptus, black cypress pines and acacia shrubs. No mature trees were found to bear signs of cultural scarring or modification. Water run-off was noted along the track, demonstrating the erosion and movement of A horizon soils. Disturbances include use of the access track and erosion by water.



Plate 98 Site location photo of RPS Bylong IF016 (JH014), view to the north



Plate 99 Artefact identified at RPS Bylong IF016 (JH014)

**RPS Bylong IF017 (Field point JH015)**

RPS Bylong IF017 is an isolated find, located on Road 05 (**Plate 100**), consisting of one mudstone flake, measuring 4 cm by 3 cm (**Plate 101**). The site has an extent of 1 m by 1 m, with a westerly aspect, and the artefact was situated on redeposited A horizon soils. The GSV and GSE were high along the road due to grading for drill rig access but broken branches and leaf litter in the area surrounding the site had severely reduced the GSV and GSE. The vegetation community in the area is characterised by eucalyptus, black cypress pines and acacia shrubs. No mature trees were found to bear signs of cultural scarring or modification. Water run-off was noted along the track, demonstrating the erosion and movement of A horizon soils. Disturbances include use of the access track and erosion by water.



**Plate 100 Site location photo of RPS Bylong IF017 (JH015), view to the west**



**Plate 101 Artefact identified at RPS Bylong IF017 (JH015)**



### RPS Bylong AS017 (Field points JH016)

RPS Bylong AS017 was located on Road 05 (**Plate 102**), consisting of one mudstone core measuring 7 cm by 5 cm, two mudstone blades measuring 4 cm by 2 cm and 4.5 cm by 2 cm and four mudstone flakes, two measuring 6 cm by 4 cm and two measuring 2 cm by 2 cm (**Plate 103**). The site has an area of 20 m by 5 m, with a westerly aspect, and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high along the road due to grading for drill rig access but broken branches and leaf litter in the area surrounding the site had severely reduced the GSV and GSE. The vegetation community in the area is characterised by eucalyptus, black cypress pines and acacia shrubs. No mature trees were found to bear evidence of cultural scarring or modification. Water run-off was noted along the track, demonstrating the erosion and movement of A horizon soils. Disturbances include use of the access track and water erosion.



**Plate 102 Site location photo of RPS Bylong AS017 (JH016) view to the west.**



**Plate 103 Artefacts identified at RPS Bylong AS017 (JH016)**



**RPS Bylong IF018 (Field point JH034)**

RPS Bylong IF018 was an isolated find, located parallel to Road 05 (**Plate 104**), consisting of one quartz flake measuring 3.5 cm by 2.5 cm (**Plate 105**). The site has an area of 1 m by 1 m, with a northerly aspect, and the artefact was situated on redeposited A horizon soils. Broken branches, tree and rock fall and leaf litter in the area surrounding this site severely reduced the GSV and GSE. The vegetation community in the area is characterised by eucalyptus, black cypress pines and acacia shrubs. No mature trees were found to bear evidence of cultural scarring or modification. Water run-off was noted along the track, demonstrating the erosion and movement of A horizon soils. Disturbances include use of the access track and water erosion, as well as modifications such as the grading of a nearby road.



**Plate 104 Site location photo of RPS Bylong IF018 (JH034), view to the north.**



**Plate 105 Artefact identified at RPS Bylong IF018 (JH034)**



### RPS Bylong AS018 (Field point JH018, JH019)

RPS Bylong AS018 is an isolated find, located on Road 06 (**Plate 106**), which consists of one mudstone flake measuring 3.5 cm by 2 cm and one mudstone flake blade 4.5 cm by 2 cm (**Plate 107**). The site has an extent of 5 m by 5 m, with a northerly aspect, and the artefacts were situated on redeposited A horizon soils. The GSV and GSE were high along the road due to grading for drill rig access. Broken branches and leaf litter in the area surrounding this site had severely reduced the GSV and GSE. The vegetation community in the area is characterised by eucalyptus, black cypress pines and acacia shrubs. No mature trees were found to bear evidence of cultural scarring or modification. Water run-off was noted along the track, demonstrating the erosion and movement of A horizon soils. Disturbances include use of the access track and water erosion.



Plate 106 Site location photo of RPS Bylong AS018 (JH018), view to the north.



Plate 107 Example of artefacts identified at RPS Bylong AS018 (JH018)

**RPS Bylong IF019 (Field point KG116)**

RPS Bylong IF019 is an isolated find located on a vehicle access track in the southwest corner of the possible subsidence longwall area (**Plate 108**). This site consists of one mudstone flake, measuring 4 cm in length and 3 cm in width (**Plate 109**). The site has an extent of 1 m by 1 m, with a south-easterly aspect. The artefact was situated on redeposited A horizon soils atop exposed clay B horizon soils. The GSV and GSE were moderate due the exposed B horizon soils on the access track. The GSV and GSE surrounding the site were low, due to the dense pasture grass. Disturbances in the area included land clearance, cattle grazing and access track usage.



**Plate 108 Site location photo of RPS Bylong IF019 (KG116) view to the south-east.**



**Plate 109 Artefact identified at RPS Bylong IF019 (KG116)**



### RPS Bylong AS019 (Field point KG117)

RPS Bylong AS019 is a small artefact scatter, located on the slope of a dam north of Bylong Valley Way (**Plate 110**). The scatter consists of three mudstone artefacts, including one mudstone core, measuring 4.5 cm in length and 4 cm in width (**Plate 111**). The site has an extent of 1 m by 1 m, with a westerly aspect. The artefacts were situated on exposed clay 'B' horizon soils and the GSV and GSE surrounding the site were moderate, due to the exposed farm dam banks. Disturbances in the area included the modification of the landscape to create the dam and cattle grazing.



**Plate 110 Site location photo of RPS Bylong AS019 (KG117), view to the west.**



**Plate 111 Example of artefacts identified at RPS Bylong AS019 (KG117)**



**RPS Bylong IF020 (Field point JH024)**

RPS Bylong IF020 is an isolated find, located on Road 02 (**Plate 112**), consisting of one siltstone broken blade measuring 6 cm by 3 cm (**Plate 113**). The site has an extent of 1 m by 1 m, with a westerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high along the Road due to grading for drill rig access. Broken branches and leaf litter in the area surrounding this site had severely reduced the GSV and GSE. This area is populated with eucalyptus, black cypress pines and acacia shrubs. No mature trees were identified as culturally scarred. Water run-off was noted along the track, demonstrating the erosion and movement of A horizon soils. Disturbance includes access track use and water erosion.



**Plate 112 Site location photo of RPS Bylong IF020 (JH024), view to the west.**



**Plate 113 Artefact identified at RPS Bylong IF020 (JH024)**



### RPS Bylong IF021 (Field point JH025)

RPS Bylong IF021 is an isolated find, located on Road 02 (**Plate 114**), consisting of one siltstone flake measuring 2 cm by 2 cm (**Plate 115**). The site has an extent of 1 m by 1 m, with a westerly aspect, and the artefact was situated on redeposited exposed B horizon soils. The GSV and GSE were high along the road due to grading for drill rig access. Broken branches and leaf litter in the area surrounding this site had severely reduced the GSV and GSE. The vegetation in the area is characterised by eucalyptus, black cypress pines and acacia shrubs. No mature trees were found to bear evidence of cultural scarring or modification. Water run-off was noted along the track, demonstrating the erosion and movement of A horizon soils. Disturbances include use of the access track and water erosion.



**Plate 114 Site location photo of RPS Bylong IF021 (JH025), view to the west.**



**Plate 115 Artefact identified at RPS Bylong IF021 (JH025)**

**RPS Bylong AS020 (Field points JH026)**

RPS Bylong AS020 is an artefact scatter, located on Road 03 (**Plate 116**), consisting of one mudstone flake, one mudstone core measuring 6.5 cm by 5 cm, and one pair of conjoining pieces measuring 4.5 cm by 4 cm and 4 cm by 2 cm (**Plate 117**). The site has an extent of 20 m by 3 m, with a southerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high along the road due to grading for drill rig access. Broken branches and leaf litter in the area surrounding this site had severely reduced the GSV and GSE. The vegetation in the area is characterised by eucalyptus, black cypress pines and acacia shrubs. No mature trees were found to bear evidence of cultural scarring or modification. Water run-off was noted along the track, demonstrating the erosion and movement of A horizon soils. Disturbances include use of the access track and water erosion.



**Plate 116 Site location photo of RPS Bylong AS020 (JH026), view to the south.**



**Plate 117 Artefacts identified at RPS Bylong AS020 (JH026)**



### RPS Bylong IF022 (Field point JH029)

RPS Bylong IF022 is an isolated find, located on Road 18 (**Plate 118**), consisting of one volcanic flake measuring 3 cm by 3 cm (**Plate 119**). The site has an extent 1 m by 1 m, with a southerly aspect and the artefact was situated on exposed B horizon soils. The GSV and GSE were high along the road due to grading for drill rig access. The GSV and GSE in the surrounding area were low due to the very dense pasture grasses on either side of the road. Disturbances include use of the access track and water erosion.



**Plate 118 Site location photo of RPS Bylong IF022 (JH029), view to the south.**



**Plate 119 Artefact identified at RPS Bylong IF022 (JH029)**



**RPS Bylong IF023 (Field point KG114)**

RPS Bylong IF023 is an isolated find located on a well used vehicle access track in the southwest corner of the possible subsidence longwall area (**Plate 120**). It consists of one broken mudstone flake (**Plate 121**). The artefact fragment is 4.5 cm in length and 3 cm in width. The site has an extent of 1 m by 1 m, with a westerly aspect and the artefact was situated on exposed clay 'B' horizon soils, due to use of the vehicle track. While the track was exposed, the GSV and GSE surrounding the site were low, due to dense pasture grasses. Disturbances include the use of the access track and water erosion.



**Plate 120 Site location photo of RPS Bylong IF023 (KG114), view to the west.**



**Plate 121 Artefact identified at RPS Bylong IF023 (KG114)**



### RPS Bylong IF024 (Field point JH031)

RPS Bylong IF024 is an isolated find located on a vehicle access track to the east of Road 18, at the water tanks (**Plate 122**). It consisted of one chert flake measuring 2.5 cm by 2.5 cm (**Plate 123**). The site has an extent of 1 m by 1 m, with a westerly aspect, and the artefact was situated on exposed B horizon soils. The GSV and GSE were moderate along the access track. The GSV and GSE in the surrounding area were low due to the very dense pasture grasses on either side of the track. Disturbances include use of the access track and water erosion.



Plate 122 Site location photo of RPS Bylong IF024 (JH031), view to the west.



Plate 123 Artefact identified at RPS Bylong IF024 (JH031)

**RPS Bylong AS021 (Field points JH032)**

RPS Bylong AS021 is a small artefact scatter, located on a vehicle access track to the east of road 18, at the water tanks (**Plate 124**). It consists of one mudstone core measuring 6 cm by 6 cm and one mudstone flake measuring 3 cm by 2.5 cm (**Plate 125**). The site has an extent of 5 m by 5 m, with a westerly aspect, and the artefacts were situated on exposed B horizon soils. The GSV and GSE were moderate along the track with low GSV and GSE either side of track due to tall, dense pasture grasses. A small number of mature eucalyptus trees were observed in the area but none were observed to possess cultural scarring. Disturbances include use of the access track and water erosion.



**Plate 124 Site location photo of RPS Bylong AS021 (JH032), view to the west.**



**Plate 125 Example of artefacts identified at RPS Bylong AS021 (JH032)**



### RPS Bylong AS022 (Field points JH033)

RPS Bylong AS022 is a small artefact scatter, located on a vehicle access track on a midslope (**Plate 126**). It consists of six flakes of mudstone and tuff. The tuff flakes measured 4 cm by 3 cm and 3 cm by 2.5 cm (**Plate 127**). The site has an extent of 5 m by 5 m, with an easterly aspect, and the scatter was situated on exposed B horizon soils exposed by use of the vehicle track. The GSV and GSE were high along the access track, but were low off the track, due to the high density of leaf litter, fallen branches and rock tumble. There was evidence of water run-off along the track in the more recent past. Disturbances include sheet wash and track usage.



Plate 126 Site location photo of RPS Bylong AS022 (JH033), view to the east.

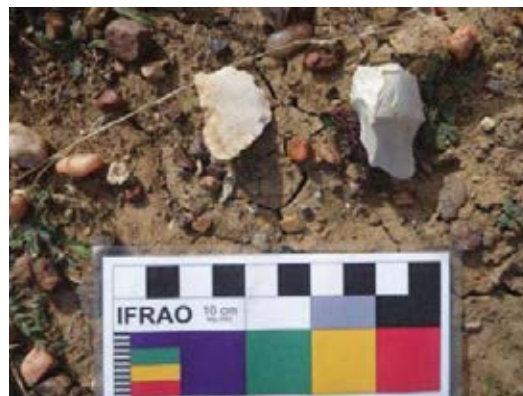


Plate 127 Artefact sample identified at RPS Bylong AS022 (JH033)



**RPS Bylong AS023 (Field points KG003, KG004)**

RPS Bylong AS023 is a small artefact scatter, located on Road 04 (**Plate 128**), consisting of two mudstone flakes.. One flake had a length and width of 2.5cm (**Plate 129**), while the other had a length of 5.5 cm and a width of 3.5 cm. The site has an extent of 30 m by 5 m, with a northerly aspect and the scatter was situated on exposed B horizon soils. The GSV and GSE were high along the access track but were low off the track, due to the high density of leaf litter, fallen branches and rock tumble. No mature trees were found to bear evidence of cultural scarring or modification. There was evidence of water run-off along the track in the more recent past. Disturbances in the area included the grading of the drill rig access road on which the scatter was observed.



**Plate 128 Site location photo of RPS Bylong AS023 (KG003), view to the north.**



**Plate 129 Example of artefacts identified at RPS Bylong AS023 (KG003)**



### RPS Bylong IF025 (Field point KG005)

RPS Bylong IF025 was an isolated find located on Road 04 (**Plate 130**), consisting of one mudstone flake that measured 3 cm in length and 2.5 cm in width (**Plate 131**). This site has an extent of 1 m by 1 m, with a northerly aspect, and was situated on exposed B horizon soils. The GSV and GSE were high along the road where vegetation had been cleared. In the area near the site, the GSV and GSE were severely reduced, due to dense leaf litter. Water run-off was noted on the track, demonstrating the erosion and movement of A horizon soils. Disturbances in the area included the grading of the drill rig access road on which the scatter was observed.



**Plate 130 Site location photo of RPS Bylong IF025 (KG005), view to the north.**



**Plate 131 Artefact identified at RPS Bylong IF025 (KG005)**

**RPS Bylong IF026 (Field point KG006)**

RPS Bylong IF026 is an isolated find located on Road 04 (**Plate 132**), consisting of one mudstone flake (**Plate 133**). The artefact measured 3.5 cm in length and 2 cm in width. This site has an extent of 1 m by 1 m, with a northerly aspect, and the artefact was situated on exposed B horizon soils. The GSV and GSE were high along the graded road but the surrounding GSV and GSE were severely reduced due to dense leaf litter and tree fall debris. Water run-off was noted on the track, demonstrating the erosion and movement of A horizon soils. Disturbances were predominantly associated with the graded road, as well as sheet wash erosion.



**Plate 132 Site location photo of RPS Bylong IF026 (KG006), view to the east.**



**Plate 133 Artefact identified at RPS Bylong IF026 (KG006)**



### RPS Bylong IF027 (Field point KG007)

RPS Bylong IF026 is an isolated find located on Road 04 (**Plate 134**), consisting of one broken proximal flake (**Plate 135**). The artefact fragment measured 2 cm in length and 2 cm in width. This site has an extent of 1 m by 1 m, with a northerly aspect, and the artefact was situated on exposed B horizon soils. The GSV and GSE were high along the graded road but the surrounding GSV and GSE were severely reduced due to dense leaf litter and tree fall debris. Water run-off was noted on the track, demonstrating the erosion and movement of A horizon soils. Disturbances were predominantly associated with the graded road, as well sheet wash erosion.



**Plate 134 Site location photo of RPS Bylong IF027 (KG007), view to the north.**



**Plate 135 Artefact identified at RPS Bylong IF027 (KG007)**



**RPS Bylong AS024 (Field points KG008, KG009, KG010)**

RPS Bylong AS024 is an artefact scatter located on Road 05 (**Plate 136**), consisting of two mudstone flakes (measuring respectively 2.5 cm by 1.5 cm, and 3 cm by 3 cm) and one rose quartz flake, measuring 2 cm by 1.5 cm (**Plate 137**). This site has an extent of 50 m by 15 m, with an easterly aspect, and the artefacts were situated on exposed B horizon soils. The GSV and GSE were high along the graded drill rig access road, however the GSV and GSE at the location of the site were severely reduced due to dense leaf litter and fallen tree debris. Water run-off was noted on the track demonstrating the erosion and movement of A horizon soils. Disturbances were predominantly associated with the graded road, as well as sheet wash erosion.



**Plate 137 Example of artefacts identified at RPS Bylong AS024 (KG008)**



**Plate 136 Site location photo of RPS Bylong AS024 (KG008), view to the east.**



### RPS Bylong AS025 (Field points KG011)

RPS Bylong AS025 is a small artefact scatter located on Road 05 (**Plate 138**), consisting of three broken mudstone flakes (measuring respectively 2.5 cm by 2 cm, 3 cm by 1.5 cm and 1.5 cm by 2 cm) (**Plate 139**). This site has an extent of 15 m by 15 m, with a northerly aspect, and the artefacts are situated on exposed B horizon soils. The GSV and GSE were high along the graded road, however the GSV and GSE for the location of the site were reduced due to dense leaf litter and fallen tree debris. Water run-off was noted on the track demonstrating the erosion and movement of A horizon soils. Disturbances were predominantly associated with the graded access road for the drilling rigs, as well as sheet wash erosion.



**Plate 138 Site location photo of RPS Bylong AS025 (KG011), view to the north.**



**Plate 139 Example of artefacts identified at RPS Bylong AS025 (KG011)**

**RPS Bylong AS026 (Field point KG012)**

RPS Bylong AS026 is a small artefact scatter located on Road 05 (**Plate 140**), consisting of three broken mudstone flakes (measuring length by width respectively 4.5 cm by 2.5 cm, 5 cm by 3 cm and 1.5 cm by 1.5 cm), one quartz flake (1.5 cm by 1 cm) and one mudstone core (measuring 2.5 cm by 4 cm) (**Plate 141**). This site has an extent of 20 m by 5 m, with a north-westerly aspect, and the artefacts were situated on exposed B horizon soils. The GSV and GSE were high along the graded road, however the GSV and GSE in the surrounding area were low, due to leaf litter and fallen tree debris. Water run-off was noted on the track, demonstrating the erosion and movement of A horizon soils. Disturbances include the graded access road for the drilling rig and sheet wash erosion.



**Plate 140 Site location photo of RPS Bylong AS026 (KG012), view to the north-west.**



**Plate 141 Example of artefacts identified at RPS Bylong AS026 (KG012)**



### RPS Bylong AS027 (Field points KG013, KG014, KG015)

RPS027 is located on 'Bylong Station' which was purchased by KEPCO in April 2011 for mining and other related purposes. The property is currently managed by Cockatoo Coal (on behalf of KEPCO) as an agricultural enterprise. The site is located along a formed track to the south of a quarry within Coal Mining Authorisation Number 287 owned and operated by KEPCO. The formed track is used for ongoing agricultural land management, Bylong Coal Project Exploration purposes and Environmental Impact Statement investigation access.

Aboriginal objects were situated on the exposed B horizon soils (**Plate 142**) with pebble laterite and imported road base. Previous disturbances included track construction, vegetation clearing, farming, fencing and the importation of road base. The site was identified to extend 305 metres on a north east to south west axis and is 25 metres wide. Artefact types include flakes, flake tools and cores from several different material types which include: tuff, mudstone and silcrete (**Plate 143**).

This site has a south westerly aspect and extends along the track to an ephemeral drainage line. The surrounding area was populated with grasses, sparse eucalypts and casuarinas. There were no mature trees in the area; however, trees were inspected for cultural scarring. No cultural scarring was identified on these trees. The ground surface visibility and exposure was high along the track and low in the grassed areas. No Aboriginal objects were identified in the grassed areas. Some sheet wash was noted in the area, particularly in the south close to the ephemeral drainage line.

Approximately 50 artefacts were located at this site in approximately 3284 square metres. At the time of recording it, the road on which this site was located was closed.



Plate 142 Site location photo of RPS Bylong AS270 (KG013), view to the north-west.



Plate 143 Example of artefacts identified at RPS Bylong AS027 (KG013)



**RPS Bylong AS028 (Field points KG016, KG017, KG018)**

RPS Bylong AS028 is a small artefact scatter located on Road 05 (**Plate 144**), consisting of one mudstone flake (measuring 3.5 cm in length and, 2.5 cm in width), one mudstone manuport (7 cm by 5 cm) and one silcrete flake (6 cm by 4 cm) (**Plate 145**). This site has an extent of 80 m by 15 m with a north-west aspect, and the artefacts were situated on exposed B horizon soils. The GSV and GSE were high along the graded track but were reduced in the area of the site due to the presence of leaf litter. Water run-off was noted on the track demonstrating the erosion and movement of A horizon soils. Disturbances include the graded road for the drilling rig and sheet wash erosion.



**Plate 144 Site location photo of RPS Bylong AS028 (KG016), view to the north.**



**Plate 145 Example of artefacts identified at RPS Bylong AS028 (KG016)**



### RPS Bylong IF028 (Field point KG113)

RPS Bylong IF028 is an isolated find located on a vehicle access track in the southwest corner of the possible subsidence longwall area (**Plate 146**). It consists of one mudstone core (**Plate 147**). The site has an extent of 1 m by 1 m, with a westerly aspect, and the artefact was situated on exposed clay B Horizon soils. The GSV and GSE were moderate along the track, but were greatly reduced off the track due to dense pasture grasses. Disturbances include vehicle use on the track and extensive cattle grazing.



**Plate 146 Site location photo of RPS Bylong IF028 (KG113), view to the north west.**



**Plate 147 Artefact identified at RPS Bylong IF028 (KG113)**

**RPS Bylong IF029 (Field point KG111)**

RPS Bylong IF029 is an isolated find located on the edge of a track that runs parallel to the current rail line (**Plate 148**). It consists of one mudstone flake, measuring 3cm in length and 2 cm in width (**Plate 149**). The site has an extent of 1 m by 1 m, with a southerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE where the artefact was located were moderate, with the eroded B horizon soils exposed on the vehicle track and along a number of cattle trails, but were low in the surrounding areas due to the presence of dense pasture grasses. Disturbances included the vehicle use on the track and extensive cattle grazing.



**Plate 148 Site location photo of RPS Bylong IF029 (KG111), view to the north.**



**Plate 149 Artefact identified at RPS Bylong IF029**



### RPS Bylong IF030 (Field point KG022)

RPS Bylong IF030 is an isolated find located on a vehicle track (**Plate 150**), consisting of one mudstone flake, measuring 3 cm by 1.5 cm (**Plate 151**). The site has an extent of 1 m by 1 m with a southerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE where the artefact was located were moderate, with eroded B horizon soils exposed by vehicle use of the access track, while the GSV and GSE in the area surrounding the site were low due to the dense pasture grasses and woodland regrowth. Disturbances included the use of the access track and extensive cattle grazing.



Plate 150 Site location photo of RPS Bylong IF030 (KG022), view to the north.



Plate 151 Artefact identified at RPS Bylong IF030 (KG022)



**RPS Bylong IF031 (Field point KG023)**

RPS Bylong IF031 is an isolated find located on Road 06 (**Plate 152**), consisting of one quartz flake, measuring 2.5 cm by 2 cm (**Plate 153**). The site has an extent of 1 m by 1 m, with a westerly aspect, and the artefact was situated on redeposited A horizon soils. The GSV and GSE were high along the graded road but were low in the surrounding area, due to leaf litter and fallen tree debris. Water run-off was noted on the track, demonstrating the erosion and movement of A horizon soils. Disturbances include the graded road for the drilling rig and sheet wash erosion.



**Plate 152 Site location photo of RPS Bylong IF031 (KG023), view to the north.**



**Plate 153 Artefact identified at RPS Bylong IF031 (KG023)**



### RPS Bylong IF032 (Field point KG100)

RPS Bylong IF32 is an isolated find located on a contour bank in the northwest corner of a the paddock (**Plate 154**), consisting of one mudstone flake, measuring 5 cm in length by 3 cm in width (**Plate 155**). The site has an extent of 1 m by 1 m, with a northerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE at the site were high due to sheet wash erosion and the presence of cattle trails, exposing the B horizon soils along the top of the bank. In the surrounding areas, the GSV and GSE were low due to the presence of very dense pasture grass. Disturbances are limited to the effects of extensive cattle grazing, in particular the presence of cattle trails.



**Plate 154 Site location photo of RPS Bylong IF032 (KG100), view to the north.**



**Plate 155 Artefact identified at RPS Bylong IF032 (KG100)**

**RPS Bylong AS029 (Field point KG115)**

RPS Bylong AS029 is a large artefact scatter located at the base of a small hill (**Plate 156**). This site is associated with the three grinding groove sites (RPS Bylong GG001, RPS Bylong GG002 and RPS Bylong GG003). It consists of at least eight mudstone flakes (three artefacts were recorded measuring 3 cm by 2 cm, 3.5 cm by 2 cm and 5 cm by 4 cm), one muller (11 cm by 8 cm) and one portable grinding stone made from sandstone, which was broken (measuring 18 cm by 13 cm) (**Plate 157**). The site has an extent of 50 m by 50 m, with an easterly aspect, and the artefacts were situated on redeposited A horizon and exposed clay B horizon soils. The GSV and GSE were moderate in the exposure, but the GSV and GSE surrounding the site were low due to leaf litter and dense pasture grasses. Disturbances included land clearing and cattle grazing in the area.



**Plate 156 Site location photo of RPS Bylong AS029 (KG115), view to the east.**



**Plate 157 Artefacts identified at RPS Bylong AS029 (KG115)**



### RPS Bylong IF033 (Field point PSI 15)

RPS Bylong IF033 is an isolated find located on an access track (**Plate 158**). It consists of one tuff flake measuring 6 cm by 4 cm (**Plate 159**). The site has an extent of 1 m by 1 m, with a southerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE at the site were moderate due to sheet wash erosion, which exposed the B Horizon soils along the track, but the GSV and GSE surrounding the site were low due dense leaf litter and tree fall debris. Disturbances included the use of the graded access track.



Plate 158 Site location photo of RPS Bylong IF109 (PS115), view to the south



Plate 159 Artefact identified at RPS Bylong IF109 (PS115)



**RPS Bylong IF034 (Field point KG029)**

RPS Bylong IF034 was an isolated find located to the side of Road 18 near the eastern boundary of the mine lease (**Plate 160**). It consists of one tuff flake measuring 4 cm in length and 4 cm in width (**Plate 161**). The site has an extent of 1 m by 1 m, with a westerly aspect, and the artefact was situated on A horizon soils which had been redeposited atop clay B horizon soils. The GSV and GSE were high on the graded track but were reduced in the surrounding area due to the formation of an understorey by shrubs and tree regrowth. Water run-off was noted on the track, demonstrating the erosion and movement of A horizon soils, while the B horizon soils showed evidence of sheet wash erosion. Disturbances include the graded tracks and previous vegetation clearing.



**Plate 160 Site location photo of RPS Bylong IF034 (KG029), view to the west.**



**Plate 161 Artefact identified at RPS Bylong IF034 (KG029)**



### RPS Bylong IF035 (Field point KG030)

RPS Bylong IF035 is an isolated find close to graded Road 18, near the quarry (**Plate 162**). The site has an extent of 1 m by 1 m and consists of one quartz flake, measuring 2 cm by 2 cm (**Plate 163**). The site has a westerly aspect and the artefact was situated on A horizon soils which had been redeposited atop clay B horizon soils. The GSV and GSE were moderate across the rehabilitation/plantation area but were low in the surrounding area due to bark and leaf litter. Disturbances include the vegetation clearance and the re/planting of pines



Plate 162 Site location photo of RPS Bylong IF035 (KG030), view to the west.



Plate 163 Artefact identified at RPS Bylong IF035 (KG030)

**RPS Bylong AS030 (Field points KG032, KG033)**

RPS Bylong AS030 was a small artefact scatter located Road 18 near Gate 19 (**Plate 164**), consisting of one quartz raw flake (measuring 3 cm by 2.5 cm) and one mudstone flake (5.5 cm by 3 cm) (**Plate 165**). The site has an extent of 20 m by 1 m, with a southerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE along the graded road were high, but were low in the surrounding area, due to very dense pasture grasses. Disturbance included the graded road and extensive vegetation clearance for farming purposes.



**Plate 164 Site location photo of RPS Bylong AS030 (KG032), view to the south.**



**Plate 165 Example of artefacts identified at RPS Bylong AS030 (KG032)**



### RPS Bylong IF036 (Field point KG034)

RPS Bylong IF036 is an isolated find located on the side of a vehicle track to the east of Road 18 (**Plate 166**), consisting of one sandstone manuport, measuring 11 cm by 7 cm (**Plate 167**). The site has an extent of 1 m by 1 m, with a northerly aspect, and the artefact was situated on A horizon soils. The GSV and GSE were moderate across the track area but low in the surrounding area due to very high and dense pasture grasses. Disturbances included the use of the track and extensive cattle grazing.



**Plate 166 Site location photo of RPS Bylong IF036 (KG034), view to the north.**



**Plate 167 Artefact identified at RPS Bylong IF036 (KG034)**



**RPS Bylong AS031 (Field points KG035, KG036)**

RPS Bylong AS031 is a small artefact scatter located on a small fire trail in a gully (**Plate 168**), consisting of one mudstone flake (measuring 4 cm by 3 cm), one mudstone core (7 cm by 4.5 cm) and one mudstone retouched and ground hand axe (8.5 cm by 6 cm) (**Plate 169**). The site has an extent of 100 m by 40 m, with a north-westerly aspect. The flake and core were situated on exposed clay B horizon soils and redeposited A horizon soils on an access track, while the mudstone ground axe was located at the entrance to the gully. The GSV and GSE along the access track were moderate but in the surrounding area had low GSV and GSE.



**Plate 168 Site location photo of RPS Bylong AS031 (KG035), view to the north-west.**



**Plate 169 Example of artefacts identified at RPS Bylong AS031 (KG035)**



### RPS Bylong IF037 (Field point KG037)

RPS Bylong IF037 is an isolated find located on a well-used access track (**Plate 170**), consisting of one basalt flake, measuring 3 cm by 2.5 cm (**Plate 171**). The site has an extent of 1 m by 1 m, with a northerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high across the track area but were low in the surrounding area due to dense pasture grasses. Disturbances include the use of the track and extensive farming activities.



**Plate 170 Site location photo of RPS Bylong IF037 (KG037), view to the north.**



**Plate 171 Artefacts identified at RPS Bylong IF037 (KG037)**

**RPS Bylong IF038 (Field point KG041)**

RPS Bylong IF038 is an isolated find located in a cattle pasture at the base of Tal Tal Mountain (**Plate 172**). It consists of one mudstone core, measuring 7 cm by 5 cm (**Plate 173**). The site has an extent of 1 m by 1 m, with a westerly aspect, and the artefact was situated on A horizon soils. The GSV and GSE were low across the site and the surrounding area due to dense pasture grasses. Disturbances were predominantly associated with extensive cattle grazing.



**Plate 172 Site location photo of RPS Bylong IF038 (KG041), view to the west.**



**Plate 173 Artefact identified at RPS Bylong IF038 (KG041)**



### RPS Bylong IF039 (Field point KG045)

RPS Bylong IF039 is an isolated find located in a cattle pasture at the base of Tal Tal Mountain (**Plate 174**). The site has an extent of 1 m by 1m and consists of one quartz core, measuring 7 cm by 4.5 cm (**Plate 175**), situated on A horizon soils, with a north-westerly aspect. The GSV and GSE were low across the site and the surrounding area due to dense pasture grasses. Disturbances were predominantly associated with extensive cattle grazing.



**Plate 174 Site location photo of RPS Bylong IF039 (KG045), view to the north-west.**



**Plate 175 Artefact identified at RPS Bylong IF039 (KG045)**



**RPS Bylong IF040 (Field point KG046)**

RPS Bylong IF040 is an isolated find located in a cattle pasture to the north of Woolley's Road (**Plate 176**), consisting of one mudstone flake, measuring 3 cm by 2 cm (**Plate 177**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on exposed clay B horizon soils. . The GSV and GSE were low across the site and the surrounding area due to dense pasture grasses. Disturbances were predominantly associated with extensive cattle grazing.



**Plate 176 Site location photo of RPS Bylong IF040 (KG046), view to the west.**



**Plate 177 Artefacts identified at RPS Bylong IF040 (KG046)**



### RPS Bylong AS032 (Field point KG047)

RPS Bylong AS032 is a large artefact scatter located a natural drainage channel, which has been cut by a vehicle access track (**Plate 178**). It consists of 30 or more banded mudstone, tuff, silcrete and quartz cores and flakes (**Plate 179**). Artefacts recorded included one mudstone blade core measuring 5 cm by 5 cm, one mudstone flake measuring 3 cm by 2.5 cm and a broken mudstone blade measuring 5 cm by 2 cm. The site has an extent of 30 m by 30 m and is associated with RPS Bylong AS033. The site has a north-westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high across the access track and drainage areas but were low in the surrounding area due to dense pasture grasses. Disturbances include the use of the access track water diversion works.



**Plate 178 Site location photo of RPS Bylong AS032 (KG047), view to the north-west.**



**Plate 179 Example of artefacts identified at RPS Bylong AS032 (KG047)**

**RPS Bylong AS033 (Field point KG048)**

RPS Bylong AS033 was a large artefact scatter located a natural drainage channel, which has been cut by a vehicle access (**Plate 180**). It consists of 20 or more mudstone and tuff cores and flakes (**Plate 181**). Artefacts recorded included one silcrete flake measuring 5 cm by 3.5 cm, a tuff flake measuring 4.5 cm by 3.5 cm and a mudstone core measuring 6 cm by 4 cm. The site has an extent of 50 m by 30 m and is associated with RPS Bylong AS032. The location has a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high across the access track and drainage areas but were low in the surrounding area due to dense pasture grasses. Disturbances include the use of the access track and associated drainage works. associated divergence of the drainage channel.



**Plate 180 Site location photo of RPS Bylong AS033 (KG048), view to the north.**



**Plate 181 Example of artefacts identified at RPS Bylong AS033 (KG048)**



### RPS Bylong AS034 (Field point KG049)

RPS Bylong AS034 is a large artefact scatter associated with a rockshelter (RPS Bylong RS003) on the southern foot slope of Tal Tal Mountain (**Plate 182**). It consists of 10 or more tuff and mudstone cores and flakes (**Plate 183**). Artefacts recorded included one tuff blade measuring 5.5 cm by 2 cm. The site has an extent of 30 m by 30 m, with a north westerly aspect, and the artefacts were situated on exposed clay soils with some laterite pebble lag. The GSV and GSE were moderate across the site due to grasses and vegetation clearing for farming purposes up to the midslope. In the surrounding areas to the north, the GSV and GSE were low due to dense pasture grasses. Disturbances include the vegetation clearing, the installation of paddock fencing and extensive cattle grazing.



Plate 182 Site location photo of RPS Bylong AS034 (KG049), view to the north.



Plate 183 Example of artefacts identified at RPS Bylong AS034 (KG049)



**RPS Bylong AS035 (Field point KG112)**

RPS Bylong AS035 is a small artefact scatter located on a cattle trail parallel to the current rail line (**Plate 184**), consists of three mudstone flakes, one measuring 2.5 cm by 2 cm (**Plate 185**). The site has an extent of 5 m by 5 m, with a westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to sheet wash erosion exposing B horizon soils but were low in the area surrounding the site due to leaf litter and dense pasture grasses. Disturbances include sheet water erosion and cattle trails.



**Plate 184 Site location photo of RPS Bylong AS035 (KG112), view to the west.**



**Plate 185 Artefacts identified at RPS Bylong AS035 (KG112)**



### RPS Bylong IF041 (Field point KG053)

RPS Bylong IF041 is an isolated find identified on a contour bank in a paddock, located along the south edge of Tal Tal Mountain (**Plate 186**), consisting of one fine-grained volcanic flake, measuring 3 cm by 2.5 cm (**Plate 187**). The site has an extent of 1 m by 1 m, with a north westerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate across the site area due to the creation of the contour bank, which exposed the B horizon clays, but were low in the surrounding area due to dense pasture grasses. Disturbances include the modification of the land for the creation of the contour bank, as well as extensive cattle grazing.



**Plate 186 Site location photo of RPS Bylong IF041 (KG053), view to the north.**



**Plate 187 Artefact identified at RPS Bylong IF041 (KG053)**

**RPS Bylong IF042 (Field point PS124)**

RPS Bylong IF042 is an isolated find located on Road 07 on a mid slope (**Plate 188**), consisting of one mudstone core measuring 5.5 cm by 5 cm (**Plate 189**). The site has an extent of 1 m by 1 m with a south westerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high at the site due to sheet wash erosion and use of the track, which exposed the B horizon soils but were low surrounding the site due to dense vegetation, including eucalyptus and black cypress pines, medium sized acacias and native grasses. Disturbances include use of the vehicle track.



**Plate 188 Site location photo of RPS Bylong IF042 (PS124), view to the north west**



**Plate 189 Artefact identified at RPS Bylong IF042 (PS124)**



### RPS Bylong IF043 (Field point KG055)

RPS Bylong IF043 is an isolated find and was located on a vehicle access track in a paddock located along the south edge of Tal Tal Mountain (**Plate 190**). It consists of one tuff proximal flake, measuring 2.5 cm by 1.5 cm (**Plate 191**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate across the site area due to exposures of soil on the contour bank. In the surrounding area, the GSV and GSE were low due to dense pasture grasses. Disturbances include the use of the track and extensive cattle grazing.



Plate 190 Site location photo of RPS Bylong IF043 (KG055), view to the west.

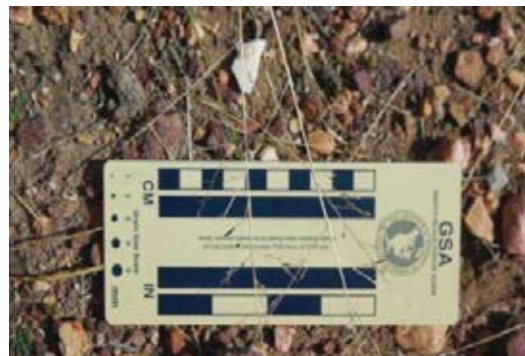


Plate 191 Artefact identified at RPS Bylong IF043 (KG055)



**RPS Bylong IF044 (Field point KG056)**

RPS Bylong IF044 is an isolated find located in an open field (**Plate 192**), which consists of one mudstone core, measuring 9 cm by 8 cm (**Plate 193**). The site has an extent of 1 m by 1 m with a north westerly aspect and the artefact was situated on A horizon soils. The GSV and GSE were low across the site and the surrounding area due to dense pasture grasses. Disturbances include extensive vegetation clearing for farming purposes and cattle grazing.



**Plate 192 Site location photo of RPS Bylong IF044 (KG056), view to the north-west.**



**Plate 193 Artefact identified at RPS Bylong IF044 (KG056)**



### RPS Bylong IF045 (Field point KG057)

045 is an isolated find located on a sloping overgrown vehicle track, which consisted of one mudstone core, measuring 14 cm by 10 cm (**Plate 194**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on A horizon soils. The GSV and GSE were low across the site and the surrounding area due to dense pasture grasses. Disturbances include extensive vegetation clearing for farming purposes and cattle grazing.



**Plate 194 Artefact identified at RPS Bylong IF045  
(KG057)**

**RPS Bylong IF046 (Field point KG059)**

RPS Bylong IF046 is an isolated find located in an open paddock (**Plate 195**), which consists of one mudstone flake, measuring 2 cm by 2 cm (**Plate 196**). The site has an extent of 1 m by 1 m, with a north westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate across the site due to soil exposure, however the GSV and GSE of the surrounding area were low due to dense pasture grasses. Disturbances include extensive vegetation clearing for farming purposes and cattle grazing.



**Plate 195 Site location photo of RPS Bylong IF046 (KG059), view to the west**



**Plate 196 Artefacts identified at RPS Bylong IF046 (KG059).**



### RPS Bylong IF047 (Field point KG060)

RPS Bylong IF047 is an isolated find located on the main access track to the west of Upper Bylong Road (**Plate 197**), consisting of one mudstone flake, measuring 2.5 cm by 2 cm (**Plate 198**). The site has an extent of 1 m by 1 m with a north westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high across the site due to the use of the vehicle access track, which has exposed the clay B horizon soils, but were low in the surrounding areas due to the presence of pasture grasses. Disturbances include extensive vegetation clearing, use of the access track and cattle grazing.



Plate 197 Site location photo of RPS Bylong IF047 (KG060), view to the north-west.



Plate 198 Artefact identified at RPS Bylong IF047 (KG060)



**RPS Bylong AS036 (Field point KG062)**

RPS Bylong AS036 is a small artefact scatter located on a vehicle access track (**Plate 199**) which consists of two fine-grained volcanic flakes (measuring 3.5 cm by 2 cm and 3 cm by 3 cm) and one chert flake (2.5 cm by 2 cm) (**Plate 200**). The site has an extent of 30 m by 5 m with a northerly aspect and the artefacts were situated on A horizon soils which has been redeposited atop exposed clay B horizon clays. The GSV and GSE were moderate across the track as a result of use by vehicles and low in the surrounding area, due to very tall and dense pasture grasses. Disturbances include extensive vegetation clearance, use of the access track and cattle grazing.



**Plate 199 Site location photo of RPS Bylong AS036 (KG062), view to the north.**



**Plate 200 Example of artefacts identified at RPS Bylong AS036 (KG062)**



### RPS Bylong IF048 (Field point PS131)

RPS Bylong IF048 is an isolated find located on the bank of a first order drainage channel (**Plate 201**), consisting of one mudstone core measuring 6 cm by 5 cm (**Plate 202**). The site has an extent of 1 m by 1 m with a south westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high at the site due to sheet wash erosion exposing the B horizon soils along the banks but were low surrounding the site due to the presence of dense pasture grasses. Disturbances include sheet wash erosion.



Plate 201 Site location photo of RPS Bylong IF048 (PS131), view to the south-west.

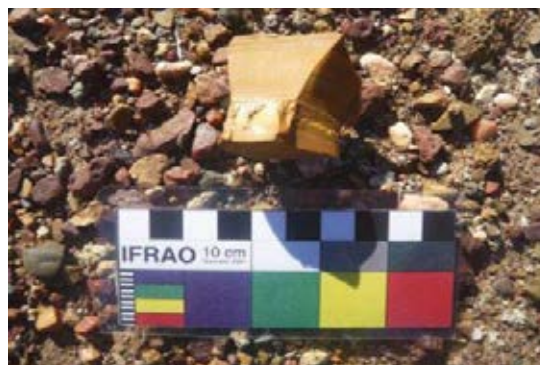


Plate 202 Artefact identified at RPS Bylong IF048 (PS131)

**RPS Bylong AS037 (Field point KG064)**

RPS Bylong AS037 is a small artefact scatter located on a vehicle access track (**Plate 203**), which consists of two fine-grained volcanic flakes and one mudstone flake, measuring 4 cm by 3.5 cm (**Plate 204**). The site has an extent of 5 m by 5 m with a north westerly aspect and the artefacts were situated on A horizon soils which had been redeposited atop exposed clay B horizon clays. The GSV and GSE were moderate across the track area due to the exposed clay B horizon and were low in the surrounding area due to the presence of leaf litter and dense low grasses. Disturbances include extensive vegetation clearance, use of the access track and cattle grazing.



**Plate 203 Site location photo of RPS Bylong AS037 (KG064), view to the north.**



**Plate 204 Example of artefacts identified at RPS Bylong AS037 (KG064)**



### RPS Bylong IF049 (Field point KG065)

RPS Bylong IF049 is an isolated find located on an overgrown access track (**Plate 205**), consisting of one mudstone flake, measuring 4.5 cm by 3.5 cm (**Plate 206**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon clays. The GSV and GSE were moderate across the site due to vegetation clearing and erosion, which exposed the clay B Horizon soils. In the surrounding areas, the GSV and GSE were low due to dense low grasses. Disturbances include extensive vegetation clearance, use of the access track and cattle grazing.



Plate 205 Site location photo of RPS Bylong IF049 (KG065), view to the west.

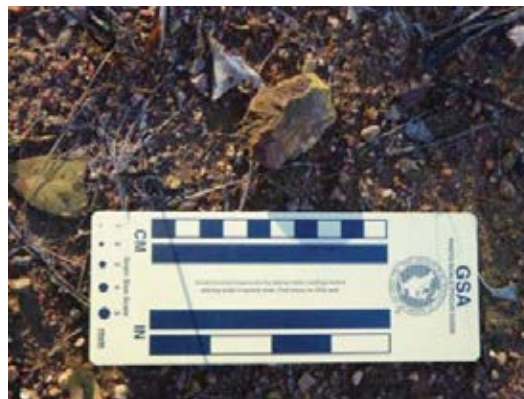


Plate 206 Artefact identified at RPS Bylong IF049 (KG065)



**RPS Bylong AS038 (Field point KG066)**

RPS Bylong AS038 is a small artefact scatter located on an overgrown access track (**Plate 207**), which consists of four mudstone flakes. Measurements of two of the flakes were taken, one measuring 4.5 cm by 4 cm and the other 3 cm by 2 cm (**Plate 208**). The site has an extent of 10 m by 10 m, with an easterly aspect, and the artefacts were situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate across the track area as a result of vehicle use, but were low in the surrounding area due to leaf litter and low but densely growing grasses. Disturbances include extensive vegetation clearing, use of the access track and cattle grazing.



**Plate 207 Site location photo of RPS Bylong AS038 (KG066), view to the east**



**Plate 208 Example of artefacts at RPS Bylong AS038 (KG066)**



### RPS Bylong AS039 (Field point KG067)

RPS Bylong AS039 was a large artefact scatter located on a vehicle access track north west of Roads 01 & 02 (**Plate 209**), consisting of thirty mudstone flakes (**Plate 210**). Some of the artefacts recorded included: one glass flaked artefact measuring 3 cm by 2.5 cm, one mudstone flake measuring 4 cm by 2.5 cm, another mudstone flake measuring 4.5 cm by 2 cm and a mudstone core measuring 6 cm by 4.5 cm. The site has an extent of 120 m by 15 m with a westerly aspect, and the artefacts were situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were high across the track due to use of the area by vehicles and low in the surrounding area due to leaf litter and low growing, dense grasses. Disturbances include extensive vegetation clearing, use of the access track and cattle grazing.



**Plate 209 Site location photo of RPS Bylong AS039 (KG067), view to the west.**



**Plate 210 Example of artefacts identified at RPS Bylong AS039 (KG067)**

**RPS Bylong IF050 (Field point KG068)**

RPS Bylong IF050 is an isolated find located on a cattle trail, consisting of one possible sandstone manuport, measuring 5.5 cm by 5 cm. The site has an extent of 5 m by 5 m with a westerly aspect, and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate across the track due to erosion and damage by water and the presence of cattle, but were low in the surrounding area due to leaf litter and low growing, dense grasses. Disturbances include extensive vegetation clearing, use of the access track and cattle grazing.



**Plate 211 Site location photo of RPS Bylong IF050 (KG068), view to the north.**



**Plate 212 Artefact identified at RPS Bylong IF050 (KG068)**



### RPS Bylong IF051 (Field point KG069)

RPS Bylong IF051 is an isolated find located in an open paddock (**Plate 213**), which consists of one mudstone core, measuring 7.5 cm by 5 cm (**Plate 214**). The site has an extent of 1 m by 1 m with a northerly aspect, and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE at the site and in the surrounding area were low, due to leaf litter and low growing, dense grasses. Disturbances include extensive vegetation clearance and cattle grazing.



Plate 213 Site location photo of RPS Bylong IF051 (KG069), view to the north.



Plate 214 Artefact identified at RPS Bylong IF051 (KG069)



**RPS Bylong IF052 (Field point KG070)**

052 is an isolated find located in an open area (**Plate 215**), which consists of one mudstone core, measuring 12 cm by 9 cm (**Plate 216**). The site has an extent 1 m by 1 m with an easterly aspect, and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE at the site and in the surrounding area were low, due to leaf litter and low growing, dense grasses. Disturbances include extensive vegetation clearance and cattle grazing.



**Plate 215 Site location photo of RPS Bylong IF052 (KG070), view to the east.**



**Plate 216 Artefact identified at RPS Bylong IF052 (KG070)**



### RPS Bylong IF053 (Field point KG071)

RPS Bylong IF053 is an isolated find located in an open area (**Plate 217**), consisting of one mudstone core, 9.5 cm by 9 cm (**Plate 218**). The site has an extent of 1 m by 1 m with a westerly aspect, and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were high across the track due to erosion, while they were low in the surrounding areas as a result of tall, dense pasture grasses. Disturbances include extensive vegetation clearing and cattle grazing.



Plate 217 Site location photo of RPS Bylong IF053 (KG071), view to the west.



Plate 218 Artefact identified at RPS Bylong IF053 (KG071)

**RPS Bylong IF054 (Field point KG072)**

RPS Bylong IF054 is an isolated find located on a farm dam embankment (**Plate 219**), which consists of one silcrete flake, measuring 5 cm by 3.5 cm (**Plate 220**). The site has an extent of 1 m by 1 m with a north westerly aspect, and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate around the dam due to the works associated with the dam construction and use of the area by livestock. However, in the surrounding areas, the GSV and GSE low due to dense pasture grasses. Disturbances include the modification of the land for the creation of the dam embankments.



**Plate 219 Site location photo of RPS Bylong IF054 (KG072), view to the north-west.**



**Plate 220 Artefact identified at RPS Bylong IF054 (KG072)**



### RPS Bylong AS040 Artefact Scatter and PAD (Field points KG109 KG110)

RPS Bylong AS040 is a large artefact scatter and PAD (**Plate 221**). The scatter consists of twenty artefacts including quartz, mudstone and chert flakes and blades (**Plate 222**). Some of the artefacts recorded included one quartz core measuring 5 cm by 4.5 cm, one mudstone blade measuring 7 cm by 1.5 cm, one mudstone flake 4 cm by 2.5 cm, another mudstone flake 4 cm by 2.5 cm and one quartz flake 3.5cm by 3cm. The site has an extent of 50 m by 50 m with a westerly aspect, and the artefact scatter was situated on a contour bank with exposed clay B horizon soils. During the construction of the contour bank, a portion of the PAD had been cut, resulting in the presence of surface artefacts along the surface of the bank. The GSV and GSE were moderate on the contour bank but low for the PAD as this area was covered in dense grasses. Furthermore, the GSV and GSE surrounding the site were also low due to the presence of dense grasses. Disturbances include the modification of the land in order to create the contour bank, particularly at the location of the PAD.



**Plate 221 Site location photo of RPS Bylong AS040 (KG109), view to the west.**



**Plate 222 Example of artefacts identified at RPS Bylong AS040 (KG109)**



**RPS Bylong AS041 (Field point KG107)**

RPS Bylong AS041 is a small artefact scatter located on a vehicle access track (**Plate 223**), which consists of three broken mudstone flakes, one of which measures 3 cm by 2.5 cm (**Plate 224**). The site has an extent of 20 m by 5 m with a southerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to sheet water erosion and use of the track, which have exposed B horizon soils, however, the GSV and GSE surrounding the site were low due to dense leaf litter, tree fall debris and native grasses and shrubs. Disturbances include sheet water erosion and use of the track by vehicles.



**Plate 223 Site location photo of RPS Bylong AS041 (KG107), view to the south.**



**Plate 224 Example of artefacts identified at RPS Bylong AS041 (KG107)**



### RPS Bylong AS042 (Field point KG075)

RPS Bylong AS042 is a small artefact scatter located above a first order drainage channel (**Plate 225**), consisting of three mudstone flakes, measuring 4 cm by 4 cm, 3 cm by 2 cm and 4.5 cm by 3 cm (**Plate 226**). This artefact scatter is associated with three grinding groove sites (RPS Bylong GG001, RPS Bylong GG002 and RPS Bylong GG003). The site has an extent of 10 m by 10 m, with a south westerly aspect. The GSV and GSE were low across the site and surrounding areas due to the presence of dense grasses, broken branches and leaf litter. Disturbances include extensive cattle grazing and modification from agricultural practices.



Plate 225 Site location photo of RPS Bylong AS042 (KG075), view to the south-west.



Plate 226 Example of artefacts identified at RPS Bylong AS042 (KG075)

**RPS Bylong IF055 (Field point KG076)**

RPS Bylong IF055 is an isolated find located along an animal track (**Plate 227**), which consists of one mudstone flake, measuring 3.5 cm by 3.5 cm (**Plate 228**). The site has an extent of 1 m by 1 m, with a westerly aspect, and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were low along the track and in the surrounding areas due to leaf litter, bark, medium sized shrubs and low growing grasses, although there were some patches of exposed B horizon soil.



**Plate 227 Site location photo of RPS Bylong IF055 (KG076), view to the west.**



**Plate 228 Artefact identified at RPS Bylong IF055 (KG076)**



### RPS Bylong AS043 (Field point KG077)

RPS Bylong AS043 is a small artefact scatter located in an open paddock in the proposed Rail Link area (**Plate 229**). It consists of three or more heat-treated mudstone broken flakes, two measuring 4.5 cm by 3 cm and 2.5 cm by 2.5 cm (**Plate 230**). The site has an extent of 15 m by 10 m with a westerly aspect, and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate across the site but low in the surrounding area, due to the dense, tall pasture grasses. Disturbances include sheet wash erosion and extensive cattle grazing.



**Plate 229 Site location photo of RPS Bylong AS043 (KG077), view to the west.**



**Plate 230 Example of artefacts identified at RPS Bylong AS043 (KG077)**



**RPS Bylong IF056 (Field point KG078)**

RPS Bylong IF056 is an isolated find, located on a contour bank (**Plate 231**), which consists of one tuff broken flake, measuring 4 cm by 2.5 cm (**Plate 232**). The site has an extent of 1 m by 1 m with a southerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate across the site due to the contour banking, which contain areas of exposed B horizon soil, but were low in the surrounding area, due to the dense, tall pasture grasses. Disturbances include sheet wash erosion and extensive cattle grazing, as well as the modification of the land during the construction of the contour bank.



**Plate 231 Site location photo of RPS Bylong IF056 (KG078), view to the south.**



**Plate 232 Artefact identified at RPS Bylong IF056 (KG078)**



### RPS Bylong AS044 (Field point KG079)

RPS Bylong AS044 is a small artefact scatter, located on an eroding farm dam bank (**Plate 233**), which consists of four quartz, tuff and banded mudstone flakes. The artefacts recorded included one mudstone flake measuring 3.5 cm by 4.5 cm and a quartz flake measuring 3 cm by 3 cm (**Plate 234**). The site has an extent of 20 m by 50 m with a southerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high across the site due to the presence of the dam embankments, but low in the surrounding area, due to the dense, tall pasture grasses. Disturbances include sheet wash erosion and extensive cattle grazing, as well as the modification of the land during the construction of the dam.



Plate 233 Site location photo of RPS Bylong AS044 (KG079), view to the south.



Plate 234 Example of artefacts identified at RPS Bylong AS044 (KG079)

**RPS Bylong IF057 (Field point KG080)**

RPS Bylong IF057 is an isolated find located on the eroded bank of a drainage line (**Plate 235**), which consists of one tuff flake, measuring 3.5 cm by 3 cm (**Plate 236**). The site has an extent of 1 m by 1 m with a southerly aspect and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate across the site due to the effects of water erosion associated with the drainage line. Disturbances include sheet wash erosion and extensive cattle grazing.



**Plate 235 Site location photo of RPS Bylong IF057 (KG080), view to the south.**



**Plate 236 Artefact identified at RPS Bylong IF057 (KG080)**



### RPS Bylong IF058 (Field point KG081)

RPS Bylong IF058 is an isolated find located on the side of a vehicle access track leading to the 'Bald Hill' antenna platform (**Plate 237**). It consists of one chalcedony flake, measuring 3 cm by 2.5 cm (**Plate 238**). The site has an extent of 1 m by 1 m with an easterly aspect, and the artefact was situated on A Horizon soils, which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate for the site area but low in the surrounding area due to the very tall dense pasture grasses. Disturbances include sheet wash erosion, use of the track by vehicles and extensive cattle grazing.



Plate 237 Site location photo of RPS Bylong IF058 (KG081), view to the west.



Plate 238 Artefact identified at RPS Bylong IF058 (KG081)

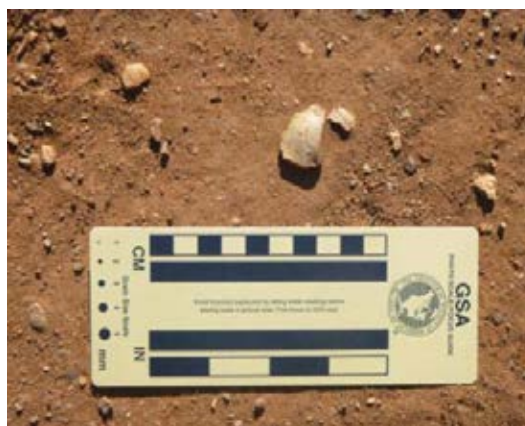


**RPS Bylong IF059 (Field point KG082)**

RPS Bylong IF059 is an isolated find located on a vehicle access track east of 'Bald Hill' (**Plate 239**), consisting of one mudstone broken flake, measuring 2.5 cm by 2.5 cm (**Plate 240**). The site has an extent of 1 m by 1 m. The site has a northerly aspect and the artefact was situated on exposed clay B Horizon soils. The GSV and GSE were high along the track, due to exposed clay B Horizon soils but low in the surrounding area due to the very tall, dense pasture grasses. Disturbances include sheet wash erosion, track usage and extensive cattle grazing.



**Plate 239 Site location photo of RPS Bylong IF059 (KG082), view to the north**



**Plate 240 Artefact identified at RPS Bylong IF059 (KG082)**



### RPS Bylong IF60 (Field point KG083)

RPS Bylong IF60 was an isolated find, located on a vehicle access track, east of 'Bald Hill' (**Plate 241**). It consisted of one mudstone broken flake, measuring 2cm by 2cm (**Plate 242**). The site has an extent of 1 m by 1 m with an easterly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high along the track, due to the vehicle use of the area but low in the surrounding area due to the very tall, dense pasture grasses. Disturbances include sheet wash erosion, use of the track by vehicles and extensive cattle grazing.



Plate 241 Site location photo of RPS Bylong IF060 (KG083), view to the east



Plate 242 Artefact identified at RPS Bylong IF060 (KG083)

**RPS Bylong IF061 (Field point KG084)**

RPS Bylong IF061 is an isolated find located adjacent to a track. Ground surface visibility and exposure were high along the track, due to exposed clay B horizon soils but low in the surrounding area due to the very tall, dense pasture grasses. Disturbances include sheet wash erosion, use of the track by vehicles, and extensive cattle grazing.



**Plate 243 Site location photo of RPS Bylong  
IF061 (KG084), view to the east**



**Plate 244 Artefact identified at RPS Bylong IF061  
(KG084)**



### RPS Bylong IF062 (Field point PS129)

RPS Bylong IF062 is an isolated find located on Road 09 (**Plate 245**), which consists of one mudstone flake measuring 2 cm by 2 cm (**Plate 246**). The site has an extent of 1 m by 1 m with a south westerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high due to sheet wash erosion exposing B horizon soils along the track but were low in the areas surrounding the site due to leaf litter and other vegetation debris. Disturbances include sheet wash erosion, use of the track by vehicles and extensive cattle grazing.



**Plate 245 Site location photo of RPS Bylong IF062, view to the east**



**Plate 246 Artefact identified at RPS Bylong IF062**



**RPS Bylong IF063 (Field point PSI 18)**

RPS Bylong IF063 is an isolated find located on a vehicle access track (**Plate 247**), consisting of one artefact, a mudstone core measuring 6 cm by 6 cm (**Plate 248**). The site has an extent of 15 m by 15 m, with a south westerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high at the site due to sheet wash erosion and use of the track, but were low surrounding the site due to dense pasture grasses. Disturbances include sheet wash erosion, use of the track by vehicles and extensive cattle grazing.



**Plate 247 Site location photo of RPS Bylong IF063 (PS118), view to the east**



**Plate 248 Artefact identified at RPS Bylong IF063 (PS118)**



### RPS Bylong IF064 (Field point KG027)

RPS Bylong IF064 is an isolated find located 15 m north of the gate of Road 01 (**Plate 249**), which consists of one fine grained volcanic manuport measuring 18 cm in length by 9 cm in width, and 6cm in thickness (**Plate 250**). The site has an extent of 1 m by 1 m with an easterly aspect, and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were low at the site and in the surrounding areas due to dense leaf litter and branches associated with woodland regrowth. Disturbances include sheet wash erosion and the installation of farm fences.



**Plate 249 Site location photo of RPS Bylong IF064 (KG027), view to the south east.**



**Plate 250 Manuport identified at RPS Bylong IF064 (KG027)**

**RPS Bylong AS045 (Field point KG089)**

RPS Bylong AS045 is a small artefact scatter located on a contour bank (**Plate 251**), which consists of two mudstone flakes, measuring 1 cm by 1.5 cm and 1.5 cm by 1.5 cm (**Plate 252**). The site has an extent of 5 m by 5 m, with a northerly aspect, and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high along the contour bank where vegetation was scarce, but low in the surrounding area due to the very tall and dense pasture grasses. Disturbances include sheet wash erosion and cattle grazing.



**Plate 251 Site location photo of RPS Bylong AS045 (KG089), view to the north.**



**Plate 252 Artefact identified at RPS Bylong AS045 (KG089)**



### RPS Bylong AS046 (Field point KG090)

046 is an artefact scatter located on a contour bank in the proposed accommodation construction area (**Plate 253**). The site has an extent of 25 m by 5 m and consists of three mudstone flakes, one of which measured 2.5 cm by 2.5 cm, and one quartz flake, 3 cm by 2 cm (**Plate 254**). The site has a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high along the contour bank, where vegetation was scarce, but low in the surrounding area due to the very tall and dense pasture grasses. Disturbances include sheet wash erosion and cattle grazing.



Plate 253 Site location photo of RPS Bylong AS046 (KG090), view to the north.



Plate 254 Example of artefacts identified at RPS Bylong AS046 (KG090)



**RPS Bylong IF065 (Field point PS127)**

RPS Bylong IF065 is an isolated find located on a mid- to lower slope along Road 07 (**Plate 255**), consisting of one mudstone flake measuring 6 cm by 4.5 cm (**Plate 256**). The site has an extent of 1 m by 1 m with a south westerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high at the site due to sheet wash erosion and use of the road but were low in the areas surrounding the site due to leaf litter and other vegetation debris. Disturbances include sheet wash erosion, as well as the grading and use of Road 07.



**Plate 255 Site location photo of RPS Bylong IF065 view to the north**



**Plate 256 Artefact identified at RPS Bylong IF065**



### RPS Bylong AS047 (Field point KG92)

RPS Bylong AS047 is a large artefact scatter located on a farm vehicle access track (**Plate 257**), which consists of twenty-five mudstone, quartz and chert flakes, but there are likely more artefacts in the vicinity (**Plate 258**). Some of the artefacts recorded included the following: two large mudstone flakes, 4.5 cm by 6 cm and 4 cm by 5 cm, two quartz flakes, 4 cm by 2.5 cm and 3 cm by 2 cm, and one mudstone core, 5 cm by 3.5 cm. The site has an extent of 35 m by 7 m with a northerly aspect, and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were high along the access track, as a result of vehicle activity, but low in the surrounding area due to the very tall, dense pasture grasses. Disturbances include sheet wash erosion, use of the track by vehicles and cattle grazing.



Plate 257 Site location photo of RPS Bylong AS047 (KG092), view to the north.



Plate 258 Example of artefacts identified at RPS Bylong AS047 (KG092)

**RPS Bylong IF066 (Field point KG93)**

RPS Bylong IF066 is an isolated find located in a cattle wallow (**Plate 259**). The site has an extent of 1 m by 1 m and consists of one mudstone flake, measuring 4.5 cm by 3 cm (**Plate 260**). The site has a north westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate in the wallow, due to use of the area by cattle? but low in the surrounding area due to the very tall, dense pasture grasses. Disturbances include sheet wash erosion and cattle grazing.



**Plate 259 Site location photo of RPS Bylong IF066 (KG093), view to the north-west.**



**Plate 260 Artefact identified at RPS Bylong IF066 (KG093)**



### RPS Bylong IF067 (Field point KG94)

RPS Bylong IF067 is an isolated find located on a vehicle access track (**Plate 261**), consisting of one mudstone flake measuring 2.5 cm by 2.5 cm (**Plate 262**). The site has an extent of 1 m by 1 m with a westerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high along the track, as a result of vehicle activity but low in the surrounding area due to the very tall, dense pasture grasses. Disturbances include sheet wash erosion, use of the track by vehicles and extensive cattle grazing.



Plate 261 Site location photo of RPS Bylong IF067 (KG094), view to the west.

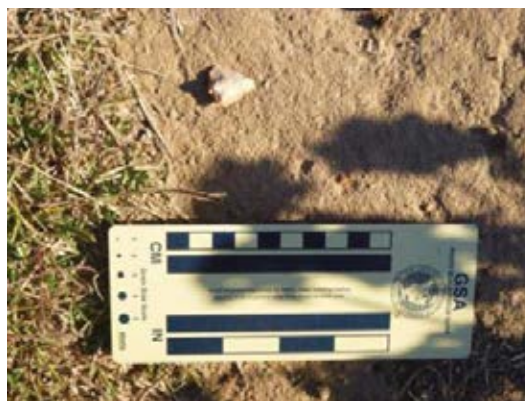


Plate 262 Artefact identified at RPS Bylong IF067 (KG094)



**RPS Bylong IF068 (Field point KG95)**

RPS Bylong IF068 is an isolated find located on a vehicle access track (**Plate 263**), which consists of one mudstone flake, measuring 3 cm by 2 cm (**Plate 264**). The site has an extent of 1 m by 1 m with an easterly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high along the track, as a result of vehicle activity, but low in the surrounding area due to the very tall, dense pasture grasses. Disturbances include sheet wash erosion, use of the track by vehicles and extensive cattle grazing.



**Plate 263 Site location photo of RPS Bylong IF068 (KG95), view to the east.**



**Plate 264 Artefact identified at RPS Bylong IF068 (KG95)**



### RPS Bylong AS048 (Field point KG97)

RPS Bylong AS048 is a small artefact scatter located on an eroded bank (**Plate 265**), consisting of one banded mudstone blade (4 cm by 3 cm), one quartz core (7 cm by 5 cm) and quartz flake (**Plate 266**). The site has an extent of 35 m by 7 m with a northerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate on the eroded bank but low in the surrounding area due to the very tall, dense pasture grasses. Disturbances include sheet wash erosion and extensive cattle grazing.



Plate 265 Site location photo of RPS Bylong AS048 (KG097), view to the north.



Plate 266 Example of artefacts identified at RPS Bylong AS048 (KG097)

**RPS Bylong AS049 (Field point PS034)**

049 is a medium sized artefact scatter located on a contour bank at the base of a toe slope (**Plate 267**). It consisted of seven flakes (**Plate 268**), including: two mudstone flakes 4 cm by 5.5 cm and 5 cm by 3cm, one mudstone blade 5cm by 4cm, one quartz flake 2cm by 2cm and one tuff flake 4.5cm by 2.5 cm. The site has an extent of 130 m by 5 m with a westerly aspect, and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate on the contour bank but low in the surrounding area due to the tall, dense pasture grasses. Disturbances include sheet wash erosion and extensive cattle grazing, as well as the modification to the land during the construction of the contour bank.



**Plate 267 Site location photo of RPS Bylong AS049 (PS034), view to the west.**



**Plate 268 Artefact identified at RPS Bylong AS049 (PS034)**



### **RPS Bylong IF069 (Field point PS035)**

RPS Bylong IF069 is an isolated find located in an open paddock along the fence line adjacent to Woolley's Road and on clay B horizon soils. The GSV and GSE were moderate as a result of cattle activity but low in the surrounding area due to the tall, dense pasture grasses. Disturbances include sheet wash erosion and extensive cattle grazing.



**Plate 269 Site location photo of RPS Bylong IF069 (PS035), view to the west**



**Plate 270 Artefact identified at RPS Bylong IF069 (PS035)**



**RPS Bylong IF070 (Field point PS036)**

RPS Bylong IF070 is an isolated find located on the lower slope and beside a dam. It has an extent of 1 m by 1 m with a westerly aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high due to the erosion of the dam walls but low in the surrounding area due to the tall, dense pasture grasses. Disturbances include sheet wash erosion and extensive cattle grazing, as well as the modification of the land during the construction of the dam.



**Plate 271 Site location photo of RPS Bylong  
IF070 (PS036) view to the west**



**Plate 272 Artefact identified at RPS Bylong IF069  
(PS035)**



### RPS Bylong IF071 (Field point PS038)

RPS Bylong IF071 is an isolated find located on the slope of a contour bank (**Plate 273**), consisting of one tuff flake measuring 4 cm by 3 cm (**Plate 274**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate due to the erosion on the sides of the contour bank but low in the surrounding area due to the dense pasture grasses. Disturbances include sheet wash erosion and extensive cattle grazing, in addition to the modification of the land associated with the creation of the contour bank.



Plate 273 Site location photo of RPS Bylong IF071 (PS038), view to the south-west.



Plate 274 Artefact identified at RPS Bylong IF071 (PS038)

**RPS Bylong IF072 (Field point PS039)**

RPS Bylong IF072 is an isolated find located on the slope of a contour bank (**Plate 275**), consisting of one mudstone flake measuring 2.5 cm in length and 4 cm in width (**Plate 276**). The site has an extent of 1 m by 1 m with an open aspect, and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the erosion soils on the sides of the contour bank but low in the surrounding area due to the dense pasture grasses. Disturbances include sheet wash erosion and extensive cattle grazing, as well as the modification of the land associated with the creation of the contour bank.



**Plate 275 Site location photo of RPS Bylong IF072 (PS039), view to the west.**



**Plate 276 Artefact identified at RPS Bylong IF072 (PS039)**



### RPS Bylong IF073 (Field point PS040)

RPS Bylong IF073 is an isolated find located on a lower slope near a vehicle access track (**Plate 277**). The site has an extent of 1 m by 1 m and consists of one banded mudstone flake measuring 3.5 cm by 5 cm (**Plate 278**). The site has a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high in the site area due to vehicle activity but were low in the areas surrounding the site due to dense pasture grasses. Disturbances include sheet wash erosion, use of the track by vehicles and extensive cattle grazing.



**Plate 277 Site location photo of RPS Bylong IF073 (PS040), view to the west.**



**Plate 278 Example of artefacts identified at RPS Bylong IF073 (PS040)**



**RPS Bylong AS050 (Field point PS041)**

RPS Bylong AS050 is a medium sized artefact scatter located at the base of a lower slope (**Plate 279**), which consists of four mudstone flakes, one of which measured 4.5 cm by 4 cm, one quartz crystal flake measuring 3 cm by 2 cm, one quartz core measuring 5 cm by 4 cm and a possible sandstone manuport measuring 9 cm by 8 cm by 7 cm (**Plate 280**). The site has an extent of 50 m by 30 m with a westerly aspect, and the artefacts were all situated on exposed clay B horizon soils, which had been eroded away by sheet wash. The GSV and GSE were moderate in the site area and low in the surrounding areas due to dense pasture grasses and pine trees. Disturbances include sheet wash erosion, use of the track by vehicles, pine forest planting and extensive cattle grazing.



**Plate 279 Site location photo of RPS Bylong AS050 (PS041) view to the south.**



**Plate 280 Example of artefacts identified at RPS Bylong AS050 (PS041)**



### RPS Bylong AS051 (Field point PS042)

RPS Bylong AS051 is a small artefact scatter located at the base of a lower slope (**Plate 281**), consisting of one quartz flake measuring 4.5 cm by 2.5 cm and one mudstone flake, 4 cm by 6 cm (**Plate 282**). The site has an extent of 10 m by 10 m with a westerly aspect and the artefacts were all situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate in the site area due to sheet wash erosion and the presence of cattle trails, but low in the areas surrounding the site due to dense pasture grasses and acacia shrubs. Disturbances include sheet wash erosion and cattle grazing.



Plate 281 Site location photo of RPS Bylong AS051 (PS042), view to the west.



Plate 282 Example of artefacts identified at RPS Bylong AS051 (PS042)

**RPS Bylong IF074 (Field point PS043)**

RPS Bylong IF074 is an isolated find located at the base of a foot slope of Tal Tal Mountain (**Plate 283**), which consists of one sandstone ground stone measuring 18 cm by 11 cm by 5 cm (**Plate 284**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on A horizon soils which had been redeposited atop B horizon soils. The GSV and GSE were moderate at the site, limited slightly by leaf litter and broken branches. The areas surrounding the site had low GSV and GSE due to dense pasture grasses. Disturbances include sheet wash erosion, an overgrown vehicle access track and cattle grazing.



**Plate 283 Site location photo of RPS Bylong IF074 (PS043), view to the west.**



**Plate 284 Artefact identified at RPS Bylong IF074 (PS043)**



### RPS Bylong IF075 (Field point PS044)

RPS Bylong IF075 is an isolated find located on a vehicle access track (**Plate 285**) consisting of one mudstone core measuring 5 cm by 6 cm by 3 cm (**Plate 286**). The site has an extent of 1 m by 1 m with an easterly aspect and the artefact was situated on A horizon soils which had been redeposited atop B horizon soils. The GSV and GSE were moderate at the site where portions of the vehicle track remained exposed, but low in the surrounding areas due to dense pasture grasses, forest regrowth and leaf litter. Disturbances include sheet wash erosion, use of the track by vehicles and cattle grazing.



Plate 285 Site location photo of RPS Bylong IF075 (PS044) view to the west.



Plate 286 Artefact identified at RPS Bylong IF075 (PS044)



**RPS Bylong AS052 (Field point PS045)**

RPS Bylong AS052 is a small artefact scatter located on a slight rise (**Plate 287**), which consists of one broken tuff flake measuring 4.5 cm by 3.5 cm and one mudstone core, 3 cm by 7 cm by 4 cm (**Plate 288**). The site has an extent of 15 m by 5 m with a north easterly aspect, and the artefacts were identified on A horizon soils which had redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate at the site but were low in the surrounding areas as a result of densely growing pasture grasses. Disturbances include sheet wash erosion and cattle grazing.



**Plate 287 Site location photo of RPS Bylong AS052 (PS045), view to the north**



**Plate 288 Example of artefacts identified at RPS Bylong AS052 (PS045)**



### RPS Bylong IF076 (Field point PS046)

076 is an isolated find located on the side of a contour bank (**Plate 289**), which consists of one mudstone flake (**Plate 290**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on A horizon soils which had been redeposited atop B horizon soils. The GSV and GSE were moderate at the site but low in the areas surrounding the site, limited by dense pasture grasses. Disturbances include sheet wash erosion and cattle grazing.



Plate 289 Site location photo of RPS Bylong IF076 (PS046), view to the west



Plate 290 Artefact identified at RPS Bylong IF076 (PS046)

**RPS Bylong IF077 (Field point PS048)**

RPS Bylong IF077 is an isolated find located on the bank of a farm dam (**Plate 291**), consisting of one banded mudstone flake measuring 4.5 cm by 3.5 cm (**Plate 292**). The site has an extent of 1 m by 1 m with a northerly aspect and the artefact was situated on clay B horizon soils. The GSV and GSE at the site were moderate due to erosion along the dam bank. The areas surrounding the site had low GSV and GSE owing to the dense pasture grasses. Disturbances include sheet wash erosion and cattle grazing.



**Plate 291 Site location photo of RPS Bylong IF077 (PS048), view to the north**



**Plate 292 Artefact identified at RPS Bylong IF077 (PS048)**



### RPS Bylong AS053 (Field point PS049)

RPS Bylong AS053 is a small artefact scatter located on a foot slope along the western side of Tal Tal Mountain (**Plate 293**). It consists of four artefacts (**Plate 294**), including: one tuff flake measuring 4 cm in length and 3 cm in width and a quartz flake measuring 2 cm by 1.5 cm. The site has an extent of 30 m by 10 m with a northerly aspect and the artefacts were all situated on exposed clay B horizon soils. The GSV and GSE at the site were moderate. The areas surrounding the site had low GSV and GSE due to the dense pasture grasses. Disturbances include sheet wash erosion and cattle grazing.



Plate 293 Site location photo of RPS Bylong AS053 (PS049), view to the north



Plate 294 Artefact identified at RPS Bylong AS053 (PS049)



**RPS Bylong AS054 (Field point PS050)**

RPS Bylong AS054 is a small artefact scatter located adjacent to a vehicle access track (**Plate 295**), which consists of one basalt scraper, 11 cm by 7cm by 3cm and one banded mudstone retouched flake measuring 4 cm by 3 cm (**Plate 296**). The site has an extent of 5 m by 5 m with a northerly aspect and the artefacts were situated on clay B horizon soils. The GSV and GSE were moderate at the site as a result of vehicle activity, and low in the areas surrounding the site due to the dense pasture grasses. Disturbances include use of the track by vehicles and cattle grazing.



**Plate 295 Site location photo of RPS Bylong AS054 (PS050), view to the north**



**Plate 296 Example of artefacts identified at RPS Bylong AS054 (PS050)**



### RPS Bylong AS055 (Field point PS051)

RPS Bylong AS055 is a small artefact scatter located on a contour bank (**Plate 297**), consisting of three mudstone flakes, one of which measured 3.5 cm by 3 cm, and one quartz flake measuring 3.5 cm by 3 cm (**Plate 298**). The site has an extent of 25 m by 10 m with a northerly aspect and the artefact was situated on clay B horizon soils. The GSV and GSE at the site were moderate due to erosion along the contour bank but were low in the areas surrounding the site as a result of the dense pasture grasses. Disturbances include cattle grazing and the modification of the land during the creation of the graded contour bank.



Plate 297 Site location photo of RPS Bylong AS055 (PS051), view to the north.



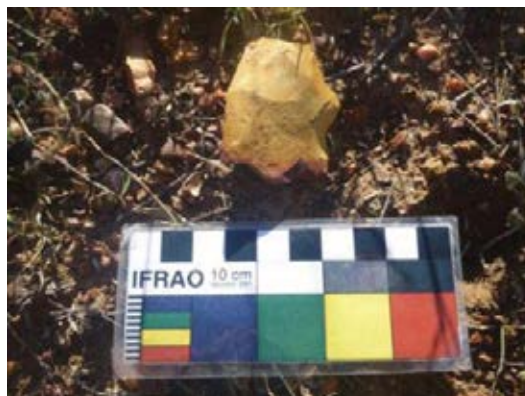
Plate 298 Example of artefacts identified at RPS Bylong AS055 (PS051)

**RPS Bylong AS056 (Field point PS052)**

RPS Bylong AS056 is a small artefact scatter located on a contour bank (**Plate 299**), which consists of three mudstone flakes, including two measuring 4 cm by 3 cm and 6 cm by 4 cm (**Plate 300**). The site has an extent of 20 m by 20 m with a northerly aspect and the artefacts were all situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to erosion along the contour bank, but were low in the areas surrounding the site due to the dense pasture grasses. Disturbances include cattle grazing and the modification of the land during the construction of the graded contour bank.



**Plate 299 Site location photo of RPS Bylong AS056 (PS052), view to the north-west.**



**Plate 300 Example of artefacts identified at RPS Bylong AS056 (PS052)**



### RPS Bylong AS057 (Field point PS053)

RPS Bylong AS057 is a medium sized artefact scatter located across two ants nests hills (**Plate 301**). The scatter consists of seven artefacts, including one quartz flake measuring 3 cm by 2.5 cm, two tuff flakes 2.5 cm by 2 cm and 2cm by 1.5cm (**Plate 302**). The site has an extent of 20 m by 20 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE at the site were moderate due the activity of the ants. The areas surrounding the site had low GSV and GSE owing to the dense pasture grasses. Disturbances include cattle grazing and bioturbation associated with the ant hill.



**Plate 301 Site location photo of RPS Bylong AS057 (PS053), view to the north.**



**Plate 302 Example of artefacts identified at RPS Bylong AS057 (PS053)**



**RPS Bylong IF078 (Field point PS054)**

RPS Bylong IF078 is an isolated find located on a contour bank (**Plate 303**), consisting of one mudstone flake measuring 4 cm in length by 3.5 cm in width (**Plate 304**). The site has an extent of 1 m by 1 m with a northerly aspect and the artefact was situated on clay B horizon soils. The GSV and GSE at the site were moderate due to erosion along the contour bank, but low in the areas surrounding the site as a result of the dense pasture grasses. Disturbances include cattle grazing, sheet wash and the modification of the land during the construction of the graded contour bank.



**Plate 303 Site location photo of RPS Bylong IF078 (PS054) view to the north**



**Plate 304 Artefacts identified at RPS Bylong IF078 (PS054)**



### RPS Bylong IF079 (Field point PS055)

RPS Bylong IF079 is an isolated find located on the side of a contour bank (**Plate 305**), which consists of one quartz flake measuring 2 cm by 3 cm (**Plate 306**). The site has an extent of 1 m by 1 m with a north easterly aspect and the artefact was situated on clay B horizon soils. The GSV and GSE at the site were moderate due to erosion along the contour bank. However, the areas surrounding the site had low GSV and GSE owing to the dense pasture grasses. Disturbances include cattle grazing, sheet wash and the modification of the land during the construction of the graded contour bank.



Plate 305 Site location photo of RPS Bylong IF079 (PS055) view to the north-east



Plate 306 Artefact identified at RPS Bylong IF079 (PS055)

**RPS Bylong AS058 (Field point PS056)**

RPS Bylong AS058 is a small artefact scatter located on a contour bank (**Plate 307**). Three artefacts were recorded at the site, including two mudstone flakes measuring 3 cm by 3 cm and 2 cm by 1.5 cm and a basalt hand axe measuring 8 cm by 9 cm by 2.5 cm (**Plate 308**). The site has an extent of 50 m by 15 m with a north easterly aspect and the artefacts were situated on exposed soil. The GSV and GSE at the site were moderate due to erosion along the contour bank. However, the areas surrounding the site had low GSV and GSE owing to the dense pasture grasses. Disturbances include cattle grazing, sheet wash and the modification of the land during the construction of the graded contour bank.



**Plate 307 Site location photo of RPS Bylong AS058 (PS056) view to the north-east**



**Plate 308 Example of artefacts identified at RPS Bylong AS058 (PS056)**



### RPS Bylong IF080 (Field point PS057)

RPS Bylong IF080 is an isolated find located in the furrows of a harvested oat field (**Plate 309**). It consists of one yellow mudstone hand axe measuring 10 cm by 9 cm by 4 cm (**Plate 310**). The site has an extent of 1 m by 1 m and was situated on clay B horizon soils. The GSV and GSE were low due to the remains of the harvest and the ploughed furrows in the exposed soils. In the areas surrounding the site, GSV and GSE were also very low. Disturbances include cattle grazing and sheet wash, as well as modification to the land resulting from cultivation practices.



Plate 309 Site location photo of RPS Bylong IF080 (PS057), view to the north-east.



Plate 310 Artefact identified at RPS Bylong IF080 (PS057)



**RPS Bylong AS059 (Field point PS058)**

RPS Bylong AS059 is a small artefact scatter located in the furrows of a harvested oat field (**Plate 311**). It consists of two fine-grained mudstone flakes measuring 3.5 cm by 3 cm and 4.5 cm by 3 cm (**Plate 312**). The site has an extent of 10 m by 10 m and the artefacts were situated on eroded soil. The GSV and GSE were low due to the remains of the harvest and the ploughed furrows in the exposed soils. In the areas surrounding the site, GSV and GSE were also very low. Disturbances include cattle grazing and sheet wash, as well as modifications to the land resulting from cultivation practices.



**Plate 311 Site location photo of RPS Bylong AS059 (PS058), view to the east.**



**Plate 312 Example of artefacts identified at RPS Bylong AS059 (PS058)**



### RPS Bylong IF081 (Field point PS059)

RPS Bylong IF081 is an isolated find located in the furrows of a harvested oat field (**Plate 314**). It consists of one mudstone flake with usewear measuring 4 cm by 5 cm (**Plate 315**). The site has an extent of 1 m by 1 m with an open aspect and the artefact was situated on exposed soil. The GSV and GSE were low due to the remains of the harvest and the ploughed furrows in the exposed soils. In the areas surrounding the site, GSV and GSE were also very low. Disturbances include cattle grazing and sheet wash as well as modifications to the land resulting from cultivation practices.



Plate 314 Site location photo of RPS Bylong IF081 (PS059), view to the west.



Plate 315 Artefact identified at RPS Bylong IF081 (PS059)

**RPS Bylong IF082 (Field point PS060)**

RPS Bylong IF082 is an isolated find located on a moderate slope adjacent to a fence line (**Plate 316**), consisting of one mudstone flake measuring 7 cm by 3 cm (**Plate 317**). The site has an extent of 1 m by 1 m with an open aspect and the artefact was situated on A horizon soils which had been redeposited atop clay B horizon soils. The GSV and GSE at the site and in the surrounding areas were low due to dense pasture grasses and leaf litter. Disturbances include the presence of cattle trails and sheet wash.



**Plate 316 Site location photo of RPS Bylong IF082 (PS060), view to the north-west.**



**Plate 317 Artefact identified at RPS Bylong IF082 (PS060)**



### RPS Bylong IF083 (Field point PS061)

RPS Bylong IF083 is an isolated find located on a moderate slope adjacent to a fence line (**Plate 318**), which consists of one mudstone flake measuring 7 cm by 6 cm (**Plate 319**). The site has an extent of 1 m by 1 m with an easterly aspect, facing down to a creek line and the artefact was situated on redeposited A horizon soils atop clay B horizon soils. The GSV and GSE at the site and surrounding areas were low due to dense pasture grasses and leaf litter. Disturbances include the presence of cattle trails and sheet wash.



Plate 318 Site location photo of RPS Bylong IF083 (PS061), view to the east.



Plate 319 Artefact identified at RPS Bylong IF083 (PS061)



**RPS Bylong IF084 (Field point PS062)**

RPS Bylong IF084 is an isolated find located at the base of a felled tree next to a vehicle access track (**Plate 320**). The site has an extent of 1 m by 1 m and consists of one mudstone core measuring 3.5 cm by 3 cm by 2 cm (**Plate 321**). The location has a north westerly aspect facing down to a creek line and the artefact was situated on redeposited soil. The GSV and GSE were low at the site and in the surrounding areas due to dense pasture grasses and leaf litter, except along the access track. Disturbances include cattle trails and sheet wash erosion, as well as historical tree felling.



**Plate 320 Site location photo of RPS Bylong IF084 (PS062), view to the north-west.**



**Plate 321 Artefact identified at RPS Bylong IF084 (PS062)**



### RPS Bylong AS060 (Field point PS063)

RPS Bylong AS060 is a large artefact scatter located in the east corner of the proposed longwall subsidence area, on a vehicle access track west of the major roads (**Plate 322**). It consists of twenty flakes, cores and backed blades, although more artefacts may occur in the vicinity (**Plate 323**). Artefacts recorded included two mudstone backed blades measuring 4 cm by 2 cm and 5 cm by 2 cm, one mudstone core measuring 5.5 cm by 4 cm by 3 cm and a basalt core measuring 6.5 cm by 4.5 cm by 3 cm. The site has an extent of 50 m by 50 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate due to the exposure of the ground surface by vehicle activity. The areas surrounding the site had low GSV and GSE due to the dense pasture grasses and leaf litter. Disturbances include use of the track by vehicles and sheet wash, as well as historical tree felling.



Plate 322 Site location photo of RPS Bylong AS060 (PS063), view to the north.



Plate 323 Example of artefacts identified at RPS Bylong AS060 (PS063)

**RPS Bylong IF085 (Field point PS064)**

RPS Bylong IF085 is an isolated find located on an overgrown access track (**Plate 324**), which consists of one tuff distal flake measuring 5 cm by 3 cm (**Plate 325**). The site has an extent of 1 m by 1 m with a north westerly aspect and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of sheet wash erosion, and low in the surrounding areas as a result of the the dense pasture grasses, fallen tree branches and leaf litter. Disturbances include sheet wash and alterations of the landscape by historical tree felling.



**Plate 324 Site location photo of RPS Bylong IF085 (PS064), view to the north-west.**



**Plate 325 Artefact identified at RPS IF085 (PS064)**



### RPS Bylong AS061 (Field point PS065)

RPS Bylong AS061 is a small artefact scatter located in a clearing in a forest rehabilitation area (**Plate 326**). It consists of two mudstone flakes measuring 4.5 cm by 4 cm and 2 cm by 2 cm (**Plate 327**). The site has an extent of 15 m by 15 m with a westerly aspect and the artefacts were situated on an exposed area of A horizon soil which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate at the site and low in the surrounding areas due to the dense pasture grasses, fallen tree branches and leaf litter. Disturbances include use of the track by vehicles and sheet wash erosion, as well as alteration of the landscape by historical tree felling.



Plate 326 Site location photo of RPS Bylong AS061 (PS065), view to the west.



Plate 327 Example of artefacts identified at RPS Bylong AS061 (PS065)



**RPS Bylong AS062 (Field point PS066)**

RPS Bylong AS062 is a small artefact scatter located on an ant nest (**Plate 328**), consisting of two quartz flakes measuring 4 cm by 2 cm and 2 cm by 2 cm and one mudstone flake measuring 5 cm by 4 cm (**Plate 329**). The site has an extent of 15 m by 10 m, with a westerly aspect and the artefacts were situated on A horizon soils which had been deposited atop exposed clay B horizon soils. The GSV and GSE were moderate at the site due to ant activity and low in the areas surrounding the site due to the dense pasture grasses, fallen tree branches and leaf litter. Disturbances include sheet wash erosion and the alteration of the landscape by historical tree felling.



**Plate 328 Site location photo of RPS Bylong AS062 (PS066), view to the west.**



**Plate 329 Artefact identified at RPS Bylong AS062 (PS066)**



### RPS Bylong IF086 (Field point PS067)

RPS Bylong IF086 is an isolated find located the side of a small hill (**Plate 330**), which consists of one mudstone flake measuring 4 cm by 4 cm (**Plate 331**). The site has an extent of 1 m by 1 m with a north westerly aspect and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were low at the site and in surrounding areas due to the dense pasture grasses, tree branches and leaf litter. Disturbances include sheet wash erosion and the alteration of the landscape by historical tree felling.

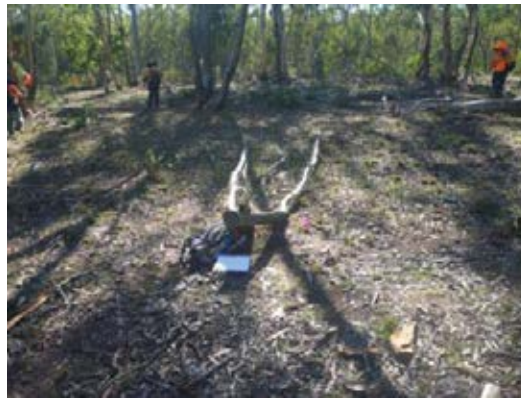


Plate 330 Site location photo of RPS Bylong IF086 (PS067) view to the south.



Plate 331 Artefacts identified at RPS Bylong IF086 (PS067)

**RPS Bylong AS063 (Field point PS068)**

RPS Bylong AS063 is a small artefact scatter located in a clearing in a forest rehabilitation area, on a modified landform (**Plate 332**). The site has an extent of 15 m by 10 m and consists of two yellow mudstone flakes measuring 6 cm by 3.5 cm and 4.5 cm by 3.5 cm (**Plate 333**). The site has a northerly aspect and the artefacts were situated on an exposure in redeposited A horizon soils atop exposed clay B horizon soils. The GSV and GSE were low at the site and in the surrounding areas to the dense pasture grasses, tree branches and leaf litter. Disturbances include sheet wash erosion and the alteration of the landscape by historical tree felling.



**Plate 332 Site location photo of RPS Bylong AS063 (PS068), view to the north.**



**Plate 333 Artefact identified at RPS Bylong AS063 (PS068)**



### RPS Bylong IF087 (Field point PS069)

RPS Bylong IF087 is an isolated find located near the main gate on Road 17 (**Plate 334**), which consists of one chert core measuring 4.5 cm by 3.5 cm (**Plate 335**). The site has an extent of 1 m by 1 m with a northerly aspect and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were high at the site location due to vehicle activity in the area, but were low in the surrounding areas due to the tall, dense pasture grasses. Disturbances include use of the vehicle track and sheet wash run-off.



**Plate 334 Site location photo of RPS Bylong IF087 (PS069), view to the north**



**Plate 335 Artefact identified at RPS Bylong IF087 (PS069)**



**RPS Bylong IF088 (Field point PS070)**

RPS Bylong IF088 is an isolated find located on a mid slope on a small hill (**Plate 336**), which consists of one tuff blade measuring 5 cm by 2 cm (**Plate 337**). The site has an extent of 1 m by 1 m with an easterly aspect and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were low at the site and in the surrounding areas due to the dense pasture grasses, fallen tree branches and leaf litter. Disturbances are limited to sheet wash erosion.



**Plate 336 Site location photo of RPS Bylong IF088 (PS070), view to the east**



**Plate 337 Artefact identified at RPS Bylong IF088 (PS070)**



### RPS Bylong IF089 (Field point PS071)

RPS Bylong IF089 is an isolated find located on the bank of a drainage channel bank (**Plate 338**), consisting of one mudstone core measuring 6.5 cm in length and 4.5 cm in width, with a thickness of 2.5 cm (**Plate 339**). The site has an extent of 1 m by 1 m with a northerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were low at the site and in the surrounding areas due to the dense pasture grasses, fallen tree branches and leaf litter. Disturbances include sheet wash erosion and erosion processes associated with the ephemeral drainage channel.



Plate 338 Site location photo of RPS Bylong IF089 (PS071), view to the north



Plate 339 Artefact identified at RPS Bylong IF089 (PS071)

**RPS Bylong AS064 (Field point KG104)**

RPS Bylong AS064 is a small artefact scatter located on the bank of a large farm dam (**Plate 340**), which consists of two quartz flakes, measuring 2 cm by 1.5 cm and 1.5 cm by 1.5 cm (**Plate 341**). The site has an extent of 5 m by 5 m with a north westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high at the site due to erosion along the dam embankments and low in the surrounding areas due to dense pasture grasses to the west and new growth forest to the east. Disturbances include the modification of the landscape during the creation of the dam, as well as erosion of the dam walls and the presence of cattle.



**Plate 340 Site location photo of RPS Bylong AS064 (PS072), view to the east**



**Plate 341 Example of artefacts identified at RPS Bylong AS064 (PS072)**



### RPS Bylong AS065 (Field point PS073)

RPS Bylong AS065 is a small artefact scatter located on an ants nest (**Plate 342**), which consists of one mudstone core measuring 6.5 cm by 6 cm by 5 cm and two mudstone flakes, measuring 4 cm by 3.5 cm and 4 cm by 3 cm (**Plate 343**). The site has an extent of 10 m by 10 m with a northerly aspect and the artefacts were situated on A horizon soils which had been redeposited atop exposed B horizon soils. The GSV and GSE at the site were moderate due to the activities of the ants, but were low in the aresas surrounding the site due to the dense pasture grasses. Disturbances include cattle grazing and bioturbation associated with the ant nest.



Plate 342 Site location photo of RPS Bylong AS065 (PS073), view to the north



Plate 343 Artefact identified at RPS Bylong AS065 (PS073)



**RPS Bylong AS066 (Field point PS074)**

RPS Bylong AS066 is a small artefact scatter located on a drainage channel at the base of a small hill (**Plate 344**). It consists of four mudstone flakes measuring 4 cm by 2 cm, 4.5 cm by 4 cm, 6 cm by 5 cm and 7 cm by 4 cm (**Plate 345**). The site has an extent of 5 m by 5 m with a northerly aspect and the artefacts were situated on A horizon soils which had been redeposited atop exposed B horizon soils. The GSV and GSE were low at the site and in the surrounding areas due to the dense pasture grasses, fallen tree branches and leaf litter. Disturbances include sheet wash run-off.



**Plate 344 Site location photo of RPS Bylong AS066 (PS074), view to the north**



**Plate 345 Example of artefacts identified at RPS Bylong AS066 (PS074)**



### RPS Bylong AS067 (Field point PS075)

RPS Bylong AS067 is a small artefact scatter located on the access track running parallel with the current rail line in the Rail Link area (**Plate 346**). It consists of two mudstone flakes, both measuring 4.5 cm by 3 cm, and two quartz flakes (**Plate 347**). The site has an extent of 25 m by 10 m with a westerly aspect and the artefacts were situated on exposed B horizon soils. The GSV and GSE were moderate on the access track but were low in the areas surrounding the site due to very dense pasture grasses. Disturbances include use of the track by vehicles and sheet wash run-off.



**Plate 346 Site location photo of RPS Bylong AS067 (PS075), view to the east.**



**Plate 347 Artefact identified at RPS Bylong AS067 (PS075)**

**RPS Bylong IF090 (Field point PS076)**

RPS Bylong IF090 is an isolated find located on the access track running parallel with the current rail line in the Rail Link area (**Plate 348**). It consists of one mudstone flake measuring 5 cm by 3 cm (**Plate 349**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate along the access track and low in the surrounding areas due to very dense pasture grasses. Disturbances include use of the track by vehicles and sheet wash run-off.



**Plate 348 Site location photo of RPS Bylong IF090 (PS076), view to the north.**



**Plate 349 Artefact identified at RPS Bylong IF090 (PS076)**



### RPS Bylong IF091 (Field point PS077)

RPS Bylong IF091 is an isolated find located on the access track running parallel with the current rail line in the Rail Link area (**Plate 350**). It consists of one broken mudstone flake measuring 4.5 cm by 4 cm (**Plate 351**). The site has an extent of 1 m by 1 m, with a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate along the access track and low in the surrounding areas due to very dense pasture grasses. Disturbances include use of the track by vehicles and sheet wash run-off.



Plate 350 Site location photo of RPS Bylong IF091 (PS077), view to the west



Plate 351 Artefact identified at RPS Bylong IF091 (PS077)



**RPS Bylong IF092 (Field point PS078)**

RPS Bylong IF92 was an isolated find located on the bank of an ephemeral drainage channel (**Plate 352**), which consists of one mudstone flake measuring 4 cm by 2.5 cm (**Plate 353**). The site has an extent of 1 m by 1 m with a south westerly aspect and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate along the exposed bank and low in the surrounding areas due to very dense pasture grasses. Disturbances include water erosion in the drainage channel and sheet wash run-off.



**Plate 352 Site location photo of RPS Bylong IF092 (PS078) view to the south-west**



**Plate 353 Artefact identified at RPS Bylong IF092 (PS078)**



### RPS Bylong IF093 (Field point PS079)

RPS Bylong IF093 is an isolated find located in an open exposure next to a contour bank at the base of a foot slope (**Plate 354**). It consists of one mudstone flake measuring 3 cm by 3 cm (**Plate 355**). The site has an extent of 1 m by 1 m with a south westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the contour bank and the fence line, but were low in the surrounding areas due to very dense pasture grasses. Disturbances include cattle grazing and sheet wash run-off, as well as modification of the landform during the creation of the contour bank.



Plate 354 Site location photo of RPS Bylong IF093 (PS079), view to the south-west.



Plate 355 Example of artefacts identified at RPS Bylong IF093 (PS079)

**RPS Bylong IF094 (Field point PS080)**

RPS Bylong IF094 is an isolated find located on a slope within a paddock north of the current rail line (**Plate 356**), consisting of one mudstone flake measuring 3 cm by 4 cm (**Plate 357**). The site has an extent of 1 m by 1 m with a south westerly aspect and the artefact was situated on A horizon soils. The GSV and GSE were low at the site and in the surrounding areas due to the dense pasture grasses. Disturbances include sheet wash run-off and cattle grazing.



**Plate 356 Site location photo of RPS Bylong IF094 (PS080), view to the north-west.**



**Plate 357 Artefact identified at RPS Bylong IF094 (PS080)**



### RPS Bylong IF095 (Field point PS081)

RPS Bylong IF095 is an isolated find located on the bank of a farm dam (**Plate 358**), which consists of one mudstone flake measuring 3.5 cm by 2.5 cm (**Plate 359**). The site has an extent of 1 m by 1 m with an easterly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site as a result of erosion on the dam bank and the activity of cattle, but low in surrounding areas due to very dense pasture grasses,. Disturbances include cattle grazing and sheet wash run-off in addition to modification of the landform during the construction of the dam.



**Plate 358 Site location photo of RPS Bylong IF095 (PS081) view to the east.**



**Plate 359 Artefact identified at RPS Bylong IF095 (PS081)**



**RPS Bylong IF096 (Field point PS082)**

RPS Bylong IF096 is an isolated find located at a gate on the access (**Plate 360**). It consists of one mudstone flake measuring 2 cm by 3 cm (**Plate 361**). The site has an extent of 1 m by 1 m with a north easterly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site as a result of vehicle activity and low in the areas surrounding the site due to dense pasture grasses. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion.



**Plate 360 Site location photo of RPS Bylong IF096 (PS082), view to the east.**



**Plate 361 Artefact identified at RPS Bylong IF096 (PS082)**



### RPS Bylong IF097 (Field point PS083)

RPS Bylong IF097 is an isolated find located on a cattle trail next to the access track in the northeast corner of the proposed north overburden embankment area (**Plate 362**). It consists of one mudstone flake measuring 5 cm by 4.5 cm (**Plate 363**). The site has an extent of 1 m by 1 m with a north easterly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site as a result of vehicle activity but low in the surrounding areas due to dense pasture grasses. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion.



Plate 362 Site location photo of RPS Bylong IF009 (PS0837), view to the north-east.



Plate 363 Artefact identified at RPS Bylong IF009 (PS0837)

**RPS Bylong AS068 (Field point PS084)**

RPS Bylong AS068 is a medium sized artefact scatter located at a gate on the access track running parallel to the foot slope which forms the proposed south overburden emplacement area (**Plate 364**). It consists of six artefacts including three mudstone flakes measuring 5 cm by 4 cm, 3 cm by 3.5 cm and 3 cm by 1.5 cm, and one volcanic core measuring 4 cm by 5 cm by 4 cm, and some small broken flakes (**Plate 365**). The site has an extent of 25 m by 25 m, with a westerly aspect and the artefacts were situated on exposed B horizon soils. The GSV and GSE were moderate at the site as a result of vehicle activity in the area but low in the surrounding areas due to the presence of tall, dense pasture grasses. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion.



**Plate 364 Site location photo of RPS Bylong AS068 (PS084), view to the west.**



**Plate 365 Artefact identified at RPS Bylong AS068 (PS084)**



### RPS Bylong IF098 (Field point PS085)

RPS Bylong IF098 is an isolated find located at a gate on the access track running parallel to the foot slope which forms the proposed south overburden emplacement area (**Plate 366**). It consists of one mudstone flake measuring 1.5 cm by 1.5 cm (**Plate 367**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site as a result of vehicle activity and low in the areas surrounding the site due to the presence of tall, dense pasture grasses. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion.



**Plate 366 Site location photo of RPS Bylong IF085 (PS085), view to the west**



**Plate 367 Artefact identified at RPS Bylong IF085 (PS085)**



**RPS Bylong IF099 (Field point PS086)**

RPS Bylong IF099 is an isolated find located on a vehicle access track adjacent to a low slope (**Plate 368**), consisting of one tuff flake measuring 2.5 cm by 1.5 cm (**Plate 369**). The site has an extent of 1 m by 1 m with a south westerly aspect and the artefact was situated on A horizon soils which had been redeposited atop exposed clay B horizon soils. The GSV and GSE were moderate at the site as a result of vehicle activity but low in the areas surrounding the site due to the presence of tall, dense pasture grasses. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion.



**Plate 368 Site location photo of RPS Bylong IF099 (PS086) view to the south- west**



**Plate 369 Artefact identified at RPS Bylong IF099 (PS086)**



### RPS Bylong AS069 (Field point PS087)

RPS Bylong AS069 is a large artefact scatter located on the access track running parallel to the foot slope which forms the proposed south overburden emplacement area (**Plate 370**). It consists of twelve mudstone and quartz flakes (**Plate 371**). Artefacts recorded included: mudstone flakes measuring 2 cm by 2 cm, 4 cm by 2 cm, 2.5 cm by 2 cm and 3 cm by 3 cm. The site has an extent of 10 m by 10 m with a westerly aspect and the artefacts were situated on B horizon soils and exposed sandstone. The GSV and GSE were moderate as a result of vehicle activity which had exposed the exposed B horizon soils, but were low in the surrounding areas due to the tall, dense pasture grasses. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion.



**Plate 370 Site location photo of RPS Bylong AS069 (PS087), view to the south-west.**



**Plate 371 Example of artefacts identified at RPS Bylong AS069 (PS087)**

**RPS Bylong AS070 (Field point PS088)**

RPS Bylong AS070 is a small artefact scatter located on an access track on the foot slope which forms the proposed south overburden emplacement area (**Plate 372**). It consists of four mudstone flakes measuring 2 cm by 2 cm, 3 cm by 4 cm and 5 cm by 4 cm (**Plate 373**). The site has an extent of 10 m by 30 m with a westerly aspect and the artefacts were situated on B horizon soils due to sheet wash erosion along the site. The GSV and GSE were moderate at the site but low in the surrounding areas due to the tall, dense pasture grasses. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion



**Plate 372 Site location photo of RPS Bylong AS070 (PS088), view to the west.**



**Plate 373 Artefact identified at RPS Bylong AS070 (PS088)**



### RPS Bylong AS071 (Field point PS089)

RPS Bylong AS071 is a small artefact scatter located adjacent to a livestock water trough in the proposed west open cut area (**Plate 374**), which consists of three mudstone flakes, including two measuring 4 cm by 3 cm and 4 cm by 4 cm (**Plate 375**). The site has an extent of 10 m by 10 m with a westerly aspect and the artefacts were situated on B horizon soils at the trough site. The GSV and GSE were moderate as a result of cattle activity around the trough, which exposed the B horizon soils. The areas surrounding the site had low GSV and GSE due to the tall, dense pasture grasses. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion.



**Plate 374 Site location photo of RPS Bylong AS071 (PS089), view to the west.**



**Plate 375 Example of artefacts identified at RPS Bylong AS071 (PS089)**



**RPS Bylong AS072 (Field point PS090)**

RPS Bylong AS072 is a medium sized artefact scatter identified on an access track adjacent to an old car and truck dump on a foot slope (**Plate 376**). The site consists of five artefacts including: one mudstone flake measuring 6 cm by 4 cm and one mudstone core measuring 6 cm by 5 cm (**Plate 377**). The site has an extent of 20 m by 10 m with a westerly aspect and the artefacts were situated on B horizon soils. The GSV and GSE were moderate at the site as a result of the vehicle activity and low in the surrounding areas due to the dense pasture grasses and debris from the edge of the tree line. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion.



**Plate 376 Site location photo of RPS Bylong AS072 (PS090) view to the south.**



**Plate 377 Example of artefacts identified at RPS Bylong AS072 (PS090)**



### RPS Bylong AS073 (Field point PS091)

RPS Bylong AS073 is a small artefact scatter located on a mid slope along the proposed south overburden area (**Plate 378**), consisting of one mudstone flake measuring 4 cm by 3.5 cm, and two quartz flakes measuring 4 cm by 3.5 cm and 2 cm by 1.5 cm (**Plate 379**). The site has an extent of 10 m by 10 m with a westerly aspect and the artefacts were situated on B horizon soils. The GSV and GSE were moderate due to the exposure of the B horizon soils by water movement in the drainage channel. The areas surrounding the site had low GSV and GSE due to the dense pasture grasses and debris from the edge of the tree line. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion



**Plate 378 Site location photo of RPS Bylong AS073 (PS091), view to the west.**



**Plate 379 Example of artefacts identified at RPS Bylong AS073 (PS091)**

**RPS Bylong AS074 (Field point PS092)**

RPS Bylong AS074 is a medium sized artefact scatter located on a mid slope along the proposed south overburden area (**Plate 380**). There were eight artefacts at this site, including: three mudstone flake measuring 4 cm by 3 cm, 5 cm by 3.5 cm and 4 cm by 2 cm, and two quartz flakes measuring 3 cm by 3 cm and 3.5 cm by 3 cm (**Plate 381**). The site has an extent of 30 m by 15 m with a westerly aspect and the artefacts were situated on B horizon soils. The GSV and GSE were moderate due to the exposure of B horizon soils by sheet wash run-off erosion. The areas surrounding the site had low GSV and GSE due to the dense leaf litter and dense acacia shrubs. Disturbances include extensive sheet wash erosion.



**Plate 380 Site location photo of RPS Bylong AS074 (PS092) view to the west.**



**Plate 381 Example of artefacts identified at RPS Bylong AS074 (PS092)**



### RPS Bylong IF100 (Field point PS093)

RPS Bylong IF100 was an isolated find located on a toe slope on the south end of the proposed west open cut area (**Plate 382**). It consists of one quartz flake measuring 3 cm by 3 cm (**Plate 383**). The site has an extent of 1 m by 1 m with a north easterly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of erosion, but were low in the areas surrounding the site due to the dense leaf litter and dense acacia shrubs. Disturbances include extensive sheet wash erosion.



Plate 382 Site location photo of RPS Bylong IF100 (PS093) view to the north-east.



Plate 383 Artefact identified at RPS Bylong IF100 (PS093)



**RPS Bylong AS075 (Field point PS094)**

RPS Bylong AS075 is a small artefact scatter located on a contour bank adjacent to a fence line (**Plate 384**), which consists of two mudstone flakes, both measuring 2 cm by 2 cm (**Plate 385**). The site has an extent of 10 m by 10 m with a north easterly aspect and the artefacts were situated on B horizon soils. The GSV and GSE were moderate at the site and low in the surrounding areas due to dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 384 Site location photo of RPS Bylong AS075 (PS094), view to the north**



**Plate 385 Example of artefacts identified at RPS Bylong AS075 (PS094)**



### RPS Bylong AS076 (Field point PS096, PS097, PS098)

RPS Bylong AS076 is a large artefact scatter located on an access track in a paddock in the north east corner of the proposed east open cut area. The site is adjacent to a fence line (**Plate 386**) and consists of 25 tuff and mudstone flakes and one mudstone core measuring 11 cm by 9 cm by 4 cm (**Plate 387**). Other artefacts recorded included: five mudstone flakes measuring 4.5 cm by 4 cm, 5 cm by 4 cm, 4 cm by 4 cm, 8 cm by 5 cm and 3 cm by 3 cm and one quartz flake measuring 4 cm by 3 cm. The site has an extent of 40 m by 30 m with a north easterly aspect and the artefacts were situated on B horizon soils. The GSV and GSE were moderate at the site but low in the surrounding areas due to very dense pasture grasses. Disturbances include cattle grazing, use of the access track and sheet wash erosion.



**Plate 386 Site location photo of RPS Bylong AS076 (PS096), view to the north-east**



**Plate 387 Example of artefacts identified at RPS Bylong AS076 (PS096)**

**RPS Bylong IF101 (Field point PS099)**

RPS Bylong IF101 is an isolated find located on an access track in a paddock in the north east corner of the proposed east open cut area (**Plate 388**). It consists of one mudstone flake measuring 2.5 cm by 2.5cm (**Plate 389**). The site has an extent of 1 m by 1 m with a north easterly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site and low in the areas surrounding the site due to very dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 388 Site location photo of RPS Bylong IF101 (PS099), view to the north-east**



**Plate 389 Artefact identified at RPS Bylong IF101 (PS099)**



### RPS Bylong IF102 (Field point PS101)

RPS Bylong IF102 is an isolated find located on a contour bank in a paddock in the northwest corner of the proposed east open cut area (**Plate 390**). It consists of one mudstone flake measuring 4 cm by 4 cm (**Plate 391**). The site has an extent of 1 m by 1 m with a northerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site and low in the areas surrounding the site due to very dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



Plate 390 Site location photo of RPS Bylong IF102 (PS101), view to the-east



Plate 391 Artefact identified at RPS Bylong IF102 (PS101)



**RPS Bylong AS077 with PAD (Field point PSI02)**

RPS Bylong AS077 is a small artefact scatter and PAD located on a mid slope on the edge of a small dam in the south end of the proposed south overburden emplacement area (**Plate 392**). It consists of two mudstone flakes measuring 6 cm by 5 cm and 4.5 cm by 4.5 cm (**Plate 393**). The site has an extent of 10 m by 10 m with an easterly aspect and the artefacts were situated on B horizon soils on the surface of an erosion scour. There was an area of PAD to the west of the erosion scour, with up to 30 cm of deposit. The GSV and GSE were high at the site due to the effects of sheet wash run-off. The GSV and GSE in the areas surrounding the site were low due to dense pasture grasses and debris from the edge of the tree line. Disturbances include cattle grazing and sheet wash erosion.



**Plate 392 Site location photo of RPS Bylong AS077 (PS102) with PAD, view to the north**



**Plate 393 Example of artefacts identified at RPS Bylong AS077 (PS102)**



### RPS Bylong IF103 (Field point PS103)

RPS Bylong IF103 is an isolated find located on a mid slope in the south end of the proposed south overburden emplacement area (**Plate 394**). It consists of one mudstone flake measuring 5 cm by 5 cm (**Plate 395**). The site has an extent of 15 m by 5 m with a south easterly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high at the site due to the effects of sheet wash run-off but were low in the surrounding areas due to dense pasture grasses and debris from the edge of the tree line. Disturbances include cattle grazing and sheet wash erosion.



**Plate 394 Site location photo of RPS Bylong IF103 (PS103), view to the north**



**Plate 395 Artefact identified at RPS Bylong IF103 (PS103)**

**RPS Bylong IF104 (Field point PS104)**

RPS Bylong IF104 is an isolated find located on a mid slope in the south end of the proposed south overburden emplacement area (**Plate 396**). It consists of one mudstone flake measuring 3.5 cm by 4 cm (**Plate 397**). The site has an extent of 1 m by 1 m with a north easterly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high at the site due to the effects of sheet wash run-off but low in the areas surrounding the site due to dense pasture grasses and debris from the tree line. Disturbances include cattle grazing and sheet wash erosion.



**Plate 396 Site location photo of RPS Bylong IF104 (PS104), view to the north-west**



**Plate 397 Artefact identified at RPS Bylong IF104 (PS104)**



### RPS Bylong IF105 (Field point PS105)

RPS Bylong IF105 is an isolated find located on an access track in the eastern end of the rail link area (**Plate 398**), consisting of one mudstone flake measuring 3.5 cm by 3.5 cm (**Plate 399**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were high at the site as a result of the effects of sheet wash run-off and vehicle activity on the track. The GSV and GSE in the areas surrounding the site were low due to dense pasture grasses and debris from the tree line. Disturbances include cattle grazing and sheet wash erosion.



**Plate 398 Site location photo of RPS Bylong IF105 (PS105), view to the north.**



**Plate 399 Artefact identified at RPS Bylong IF105 (PS105)**



**RPS Bylong IF106 (Field point PS106)**

RPS Bylong IF106 is an isolated find located on an overgrown access track in the eastern end of the rail link area (**Plate 400**), which consists of one mudstone flake measuring 3 cm by 3 cm (**Plate 401**). The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE at the site and in the surrounding areas were low due to track being overgrown and the presence of dense pasture grasses and debris from the tree line. Disturbances include cattle grazing and sheet wash erosion.



**Plate 400 Site location photo of RPS Bylong IF106 (PS106)**



**Plate 401 Artefacts identified at RPS Bylong IF106 (PS106) view to the north**



### RPS Bylong AS078 (Field point PS107)

RPS Bylong AS078 is a small artefact scatter located on an undulating landform along a previously existing access track (**Plate 402**), consisting of three mudstone flakes, including two measuring 6 cm by 4 cm and 3 cm by 2 cm (**Plate 403**). The site has an extent of 30 m by 10 m with a northwest aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of vehicle use of the access track. The GSV and GSE in the areas surrounding the site were low due to the presence of dense pasture grasses. Disturbances include cattle grazing, vehicle use of the track and sheet wash erosion.



**Plate 402 Site location photo of RPS Bylong AS078 (PS107), view to the north west**



**Plate 403 Artefact identified at RPS Bylong AS078 (PS107)**

**RPS Bylong AS079 (Field point PS108)**

RPS Bylong AS079 is a medium sized artefact scatter located on an ants nest along the side of a drainage line (**Plate 404**). It consists of seven mudstone artefacts including: two cores measuring 8 cm by 7 cm and 6 cm by 7 cm and two flakes measuring 3 cm by 3 cm and 3 cm by 4 cm (**Plate 405**). The site has an extent of 25 m by 25 m with a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of sheet wash erosion and ant activity and low in the surrounding areas due to dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 404 Site location photo of RPS Bylong AS079 (PS108), view to the west**



**Plate 405 Artefact identified at RPS Bylong AS079 (PS108)**



### RPS Bylong IF107 (Field point PS110)

RPS Bylong IF107 is an isolated find located on a mid slope (**Plate 406**). It consists of one weathered sandstone piece, possibly used for grinding, measuring 35 cm by 15 cm by 10 cm (**Plate 407**). The site has an extent of 1 m by 1 m with a northerly aspect and the artefact was situated on A horizon soils. The GSV and GSE were low at the site and in surrounding areas due to the dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



Plate 406 Site location photo of RPS Bylong IF107 (PS110)



Plate 407 Artefact identified at RPS Bylong IF107 (PS110) view to the north



**RPS Bylong IF108 (Field point PS111)**

RPS Bylong IF108 is an isolated find located on an overgrown track near a creek line which runs parallel to Bylong Valley Way (**Plate 408**). It consists of one mudstone flake measuring 3 cm by 3 cm (**Plate 409**). The site has an extent of 1 m by 1 m with a north easterly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site and low in the surrounding areas due to the dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 408 Site location photo of RPS Bylong IF108 (PS111), view to the north west**



**Plate 409 Artefact identified at RPS Bylong IF108 (PS111)**



### RPS Bylong AS080 (Field point PS112)

RPS Bylong AS080 is a small artefact scatter located on a creek terrace (**Plate 410**), which consists of two mudstone flakes, including one measuring 5 cm by 4 cm and one quartz flake measuring 1.5 cm by 1.5 cm (**Plate 411**). The site has an extent of 20 m by 10 m with a southerly aspect and the artefact was situated on A horizon soil which had been redeposited atop B horizon soils. The GSV and GSE were moderate at the site due to the exposure from a cattle trail and low in the surrounding area due to the dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 410 Site location photo of RPS Bylong AS080 (PS112), view to the south.**



**Plate 411 Example of artefacts identified at RPS Bylong AS080 (PS112 )**

**RPS Bylong AS081 (Field point PS113)**

RPS Bylong AS081 is a small artefact scatter located on a toe slope along the edge of the creek line parallel to Bylong Valley Way (**Plate 412**). It consists of two mudstone flakes, one of which measures 3 cm by 4 cm and one tuff flake measuring 2.5 cm by 2.5 cm (**Plate 413**). The site has an extent of 15 m by 15 m with a southerly aspect and the artefact was situated on exposed B horizon soils. The GSV and GSE were moderate at the site due to the exposure from a cattle trail and low in the surrounding area due to the dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 412 Site location photo of RPS Bylong AS081 (PS113) view to the south**



**Plate 413 Example of artefacts identified at RPS Bylong AS081 (PS113)**



### RPS Bylong AS082 (Field point PS114)

RPS Bylong AS082 is a medium sized artefact scatter located on an access track that joins Bylong Valley Way (**Plate 414**). It consists of eight flakes (**Plate 415**). Artefacts recorded include: four mudstone flakes measuring 4 cm by 4 cm, 4.5 cm by 4 cm, 3 cm by 4 cm and 4 cm by 2.5 cm, one tuff flake measuring 2.5 cm by 2.5 cm and a broken sandstone ground stone measuring 6 cm by 8 cm by 4 cm. The site has an extent of 20 m by 10 m with a southerly aspect and the artefact was situated on exposed B horizon soils. The GSV and GSE were high at the site due to the exposure from the track but were low in the surrounding area due to the dense new growth trees, medium sized shrubs such as acacias and native grasses. Disturbances include use of the track by vehicles and sheet wash erosion.



**Plate 414 Site location photo of RPS Bylong AS082 (PS114), view to the north west**



**Plate 415 Example of artefacts identified at RPS Bylong AS082 (PS114)**



**RPS Bylong AS083 (Field point PS116)**

RPS Bylong AS083 is a large artefact scatter located on the crest of a hill north of the creek line running parallel to Bylong Valley Way (**Plate 416**). It consists of approximately fifty mudstone, quartz and tuff flakes (**Plate 417**). Artefacts recorded included: three mudstone flakes measuring 4 cm by 3.5 cm, 5 cm by 2.5 cm and 4 cm by 2.5 cm, one tuff core measuring 5 cm by 4 cm by 5 cm, one tuff blade measuring 6 cm by 1.5 cm and two quartz flakes measuring 3 cm by 3 cm and 5 cm by 4 cm. The site has an extent of 50 m by 100 m, with a north westerly aspect and the artefact was situated on exposed B horizon soils. The GSV and GSE were moderate at the site and low in the surrounding areas due to the dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 416 Site location photo of RPS Bylong AS083 (PS116) view to the north-west**



**Plate 417 Artefact identified at RPS Bylong AS083 (PS116)**



### RPS Bylong AS084 (Field point PS117)

084 is a medium sized artefact scatter located on the crest of a hill north of the creek line running parallel to Bylong Valley Way (**Plate 418**). It consists of ten mudstone flakes, three of which measure: 3.5 cm by 3.5 cm, 4 cm by 3.5 cm and 3.5 cm by 4.5 cm (**Plate 419**). The site has an extent of 30 m by 10 m with a north westerly aspect and the artefacts were situated on exposed B horizon soils. The GSV and GSE were moderate at the site and low in the surrounding area due to the dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 418 Site location photo of RPS Bylong AS084 (PS117), view to the north west**



**Plate 419 Artefact identified at RPS Bylong AS084 (PS117)**

**RPS Bylong AS085 (Field point PS119)**

RPS Bylong AS085 is a small artefact scatter located on a mid slope along Road 20 (**Plate 419**), which consists of two mudstone flakes and two tuff flakes measuring 6 cm by 4 cm and 3.5 cm by 2.5 cm (**Plate 420**). The site has an extent of 25 m by 25 m with a north westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to sheet wash run-off and track usage. The GSV and GSE in the surrounding area were low due to the dense pasture grasses. Disturbances include cattle grazing, use of the track by vehicles and sheet wash erosion.



**Plate 420 Site location photo of RPS Bylong AS085 (PS119), view to the south**



**Plate 421 Example of artefacts identified at RPS Bylong AS085 (PS119)**



### RPS Bylong AS086 (Field point PS120)

RPS Bylong AS086 is a large artefact scatter located on a mid slope near the Goulburn River State Forest along Road 20 (**Plate 421**). It consists of fifteen artefacts, including mudstone and quartz flakes. It included one mudstone core measuring 6 cm by 5 cm by 2 cm (**Plate 422**). Other artefacts recorded include: two mudstone flakes measuring 4 cm by 2 cm and 5 cm by 4 cm, one quartz flake measuring 2 cm by 2 cm. The site has an extent of 30 m by 22 m with a north westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the exposure from sheet wash run-off but were low in the surrounding areas due to the dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



Plate 422 Site location photo of RPS Bylong AS086 (PS120), view to the north west



Plate 423 Example of artefacts identified at RPS Bylong AS086 (PS120)



**RPS Bylong AS087 (Field point PS121)**

RPS Bylong AS087 is a large artefact scatter located on a mid slope along Road 20, on top of an ants nest (**Plate 423**). It consists of twenty artefacts including mudstone and tuff flakes and cores (**Plate 424**). Artefacts which were recorded include: one mudstone core measuring 6.5 cm by 6 cm by 3 cm, two mudstone flakes measuring 4 cm by 3 cm and 4 cm by 3.5 cm and two tuff flakes measuring 5 cm by 2.5 cm and 2 cm by 2 cm. The site has an extent of 40 m by 30 m with a north westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the ant activity and use of the track and low in the surrounding areas due to dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 424 Site location photo of RPS Bylong AS087 (PS121), view to the north-west**



**Plate 425 Example of artefacts identified at RPS Bylong AS087 (PS121)**



### RPS Bylong AS088 (Field point PS123)

RPS Bylong AS088 is a small artefact scatter located on Road 07 (**Plate 425**), which consists of one mudstone core measuring 6 cm by 5 cm by 5 cm and one mudstone flake measuring 5 cm by 6 cm (**Plate 426**). The site has an extent of 30 m by 10 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high at the site due to sheet wash erosion and the presence of the graded access track for the drill rig. In the surrounding areas, the GSV and GSE were low due to dense acacias and leaf litter. Disturbances include use of the track by vehicles and sheet wash erosion.



**Plate 426 Site location photo of RPS Bylong AS088 (PS123) view to the north**



**Plate 427 Artefact identified at RPS Bylong AS088 (PS123)**

**RPS Bylong AS089 (Field point PS128)**

RPS Bylong AS089 is a small artefact scatter located on Road 07 (**Plate 427**) consisting of two mudstone flakes measuring 4 cm by 2.5 cm and 2 cm by 2 cm. The site has an extent of 30 m by 10 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the graded track access for the drill rig access and low in the surrounding area due to dense acacias and leaf litter. Disturbances include use of the track by vehicles and sheet wash erosion.



**Plate 428 Site location photo of RPS Bylong AS089 (PS128) view to the south**



**Plate 429 Artefact identified at RPS Bylong AS089 (PS128)**



### **RPS Bylong AS090 (Field point PS130)**

RPS Bylong AS090 is a small artefact scatter located on a slope opposite the quarry on the east boundary of the mine lease. It consists of two mudstone flakes measuring 3 cm by 2.5 cm and 6 cm by 4 cm. The site has an extent of 30 m by 25 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site and low in the surrounding area due to dense pasture grasses. Disturbances include cattle grazing and sheet wash erosion.



**Plate 430 Site location photo of RPS Bylong AS090 (PS130), view to the south**



**Plate 431 Artefact identified at RPS Bylong AS090 (PS130)**



**RPS Bylong AS091 (Field point PS132)**

RPS Bylong AS091 is a small artefact scatter located on a lower creek bank, which consists of two mudstone flakes measuring 7 cm by 4.5 cm and 3 cm by 2 cm. The site has an extent of 10 m by 5 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of the ephemeral drainage line and low in the surrounding areas due to dense pasture grasses. Disturbances include cattle grazing, water erosion associated with the drainage channel and sheet wash erosion.



**Plate 432 Site location photo of RPS Bylong AS091 (PS132), view to the north west**



**Plate 433 Artefact identified at RPS Bylong AS091 (PS132)**



### **RPS Bylong AS092 (Field point KG098)**

RPS Bylong AS092 is a small artefact scatter located on the bank of a farm dam, consisting of two mudstone flakes, measuring 4 cm by 3 cm and 2.5 cm by 2.5 cm. The site has an extent of 5 m by 10 m with a westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were high on the dam walls due to the effects of sheet wash erosion and low in the surrounding areas due to tall, dense pasture grasses. Disturbances include sheet wash erosion and cattle grazing as well as the modification of the landform during the creation of the dam.



**Plate 434 Site location photo of RPS Bylong AS092 (KG098), view to the west**



**Plate 435 Artefact identified at RPS Bylong AS092 (KG098)**

**RPS Bylong AS093 (Field point KG099)**

RPS Bylong AS093 is a small artefact scatter located on a small exposed rise in a paddock, north west of a dam. It consists of two small mudstone flakes, both measuring 2 cm by 1.5 cm and one small black chalcedony flake, measuring 2 cm by 2 cm. The site has an extent of 50 m by 30 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to sheet wash erosion and low in the surrounding areas due to dense pasture grasses. Disturbance included sheet wash erosion and cattle grazing.



**Plate 436 Site location photo of RPS Bylong AS093 (KG099) view to the north**



**Plate 437 Artefact identified at RPS Bylong AS093 (KG099)**



### RPS Bylong AS094 (Field point KG118)

RPS Bylong AS094 is a small artefact scatter located on a small exposed rise in a paddock, north west of a dam. It consists of two small mudstone flakes, measuring 4 cm by 4 cm and 2 cm by 2 cm. The site has an extent of 5 m by 5 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to sheet wash erosion but low in the surrounding areas due to dense pasture grasses. Disturbances include sheet wash erosion and cattle grazing.



Plate 438 Site location photo of RPS Bylong AS094 (KG118) view to the east



Plate 439 Artefact identified at RPS Bylong AS094 (KG118)



**RPS Bylong AS095 (Field point KG125)**

RPS Bylong AS095 is a large artefact scatter located on an exposed track on the north east side of a farm dam. The site extended at the time of recording to include an area with artefacts exposed in an ants nest. It consists of ten artefacts including: two mudstone flakes measuring 6 cm by 3.5 cm, 4 cm by 4 cm and 2.5 cm by 2 cm, a mudstone core measuring 10 cm by 9 cm by 3.5 cm and a flake measuring 4 cm by 4 cm. The site has an extent of 100 m by 50 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to sheet wash erosion and vehicle activity, which exposed the ground surface on both the dam wall and track. The GSV and GSE in the area surrounding the site were low due to dense pasture grasses. Disturbance included vehicle use of the track, sheet wash erosion and cattle grazing.



Plate 440 Site location photo of RPS Bylong AS095 (KG125) view to the west



Plate 441 Artefact identified at RPS Bylong AS095 (KG125)



### RPS Bylong AS096 (Field point KG127)

RPS Bylong AS096 is a small artefact scatter located on a small exposed rise in a paddock to the west of Road 20, which consists of four small mudstone flakes, measuring 5 cm by 2 cm, 2 cm by 2 cm, 5 cm by 4 cm and 2.5 cm by 2 cm. The site has an extent of 5 m by 5 m with a southerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to sheet wash erosion and low in the surrounding area due to dense pasture grasses. Disturbance included sheet wash erosion and cattle trails.



Plate 442 Site location photo of RPS Bylong AS096 (KG127) view to the south



Plate 443 Artefact identified at RPS Bylong AS096 (KG127)

**RPS Bylong AS097 (Field point KG133)**

RPS Bylong AS097 is a small artefact scatter located on Road 10 consisting of two small mudstone flakes, measuring 3 cm by 2 cm and 4 cm by 2 cm. The site has an extent of 5 m by 5 m with an easterly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to sheet wash erosion and track use, and low in the areas surrounding the site due to dense shrubs such as acacias, leaf litter and tree fall debris. Disturbance included sheet wash erosion and use of the track by vehicles.



**Plate 444 Site location photo of RPS Bylong AS097 (KG133) view to the south west**



**Plate 445 Artefact identified at RPS Bylong AS097 (KG133)**



### RPS Bylong AS098 (Field point KG134)

RPS Bylong AS098 is a small artefact scatter located on a drill rig pad at the end of Road 10, which consists of four mudstone flakes, measuring 4 cm by 3 cm, 3 cm by 3 cm, 2 cm by 2 cm and 4 cm by 3.5 cm). The site has an extent of 50 m by 50 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were low due to the debris from the rehabilitating vegetation across the site and surrounding areas. Disturbance included sheet wash erosion and cattle grazing.



Plate 446 Artefact identified at RPS Bylong AS098 (KG134)



Plate 447 Site location photo of RPS Bylong AS098 (KG134) view to the south



**RPS Bylong IF109 (Field point KG101)**

RPS Bylong IF109 is an isolated find located on a farm dam in the east end of the Rail Link area, which consists of one purple glass flake measuring 4 cm by 3 cm. The site has an extent of 1 m by 1 m with a north westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site and in the surrounding area due to the large exposure on the dam walls. Disturbances include cattle grazing and sheet wash in addition to the modification of the landform during the construction of the dam.



Plate 448 Site location photo of RPS Bylong IF109 (KG101) view to the west



Plate 449 Artefact identified at RPS Bylong IF109 (KG101)



### **RPS Bylong IF110 (Field point KG126)**

RPS Bylong IF110 is an isolated find located on Road 20, consisting of one tuff flake measuring 5 cm by 4 cm. The site has an extent of 1 m by 1 m with a westerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of vehicle activities on the track and low in the surrounding area due to the dense pasture grasses. Disturbances include cattle grazing, use of the vehicle track and sheet wash erosion.



**Plate 450 Site location photo of RPS Bylong IF110 (KG126) view to the south west**



**Plate 451 Artefact identified at RPS Bylong IF110 (KG126)**

**RPS Bylong IF111 (Field point KG132)**

RPS Bylong IF111 is an isolated find located on a track in the northwest corner of the mine lease, which consists of one basalt manuport measuring 9 cm by 5 cm by 4.5 cm. The site has an extent of 1 m by 1 m with a southerly aspect and the artefact was situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of vehicle activities on the track and low in the surrounding area due to the dense forest regrowth and leaf litter. Disturbances include use of the vehicle track and sheet wash erosion.



Plate 452 Site location photo of RPS Bylong IF111 (KG132) view to the north west



Plate 453 Artefact identified at RPS Bylong IF111 (KG132)



### RPS Bylong AS099 (Field point JH027)

099 is a very large artefact scatter located on an access track west of the quarry, which contains approximately 60 artefacts, including flakes, flake tools and cores manufactured from mudstone, tuff, quartz, silcrete and fine volcanic. This site was associated with RPS Bylong AS100. The site has an extent of 350 m by 25 m with a south westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of vehicle activities and low in the surrounding area due to dense pasture grasses. Disturbances included sheet wash erosion, use of the vehicle track and cattle grazing.



Plate 454 Site location photo of RPS Bylong AS099 (JH027) view to the south west



Plate 455 Artefact identified at RPS Bylong AS099 (JH027)



**RPS Bylong ASI00 (Field point JH028)**

is a large artefact scatter located on an access track west of the quarry, beyond a drainage line, which contains approximately 30 artefacts including flakes, flake tools and cores manufactured from mudstone, tuff, quartz, silcrete and fine volcanic. This site was associated with RPS Bylong AS099. The site has an extent of 100 m by 25 m with a south westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of vehicle activities but low in the surrounding areas due to dense pasture grasses. Disturbances included sheet wash erosion, use of the vehicle track and cattle grazing.



Plate 456 Site location photo of RPS Bylong ASI00 (JH028) view to the south west



Plate 457 Artefacts identified at RPS Bylong ASI00 (JH028)



### **RPS Bylong ASI01 (Field point KG119)**

RPS Bylong AS101 is a medium sized artefact scatter located on a drill rig pad at the end of Road 10, which consists of ten mudstone flakes, including four measuring 4 cm by 3 cm, 3 cm by 3 cm, 2 cm by 2 cm and 4 cm by 3.5 cm. The site has an extent of 50 m by 50 m with a westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate due to the effects of cattle hooves and low in the surrounding area due to dense pasture grasses. Disturbances included sheet wash erosion and cattle grazing.



**Plate 458 Artefact identified at RPS Bylong AS101 (KG119)**



**Plate 459 Site location photo of RPS Bylong AS101 (KG119) view to the east**

**RPS Bylong ASI02 (Field point KG120)**

RPS Bylong ASI02 is a medium sized artefact scatter located on an ants nest, which consists of eight mudstone flakes, including four measuring 4.5 cm by 3 cm, 3 cm by 3 cm, 3 cm by 2 cm and 4 cm by 3.5 cm. The site has an extent of 50 m by 50 m with a westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site as a result of the ant activity and low in the area surrounding the site due to dense pasture grasses. Disturbances included sheet wash erosion, bioturbation associated with the ant nest and cattle grazing.



Plate 460 Site location photo of RPS Bylong ASI02 (KG120) view to the west



Plate 461 Artefact identified at RPS Bylong ASI02 (KG120)



### RPS Bylong ASI03 (Field point KG121)

RPS Bylong ASI03 is a small artefact scatter located on a drill rig pad at the end of Road 10, consisting of three mudstone flakes, measuring 4 cm by 2 cm, 3 cm by 3 cm and 2 cm by 2 cm. The site has an extent of 50 m by 20 m with a northerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site area and low in the area surrounding the site due to dense pasture grasses. Disturbances included sheet wash erosion and cattle grazing.



Plate 462 Site location photo of RPS Bylong ASI03 (KG121) view to the northeast



Plate 463 Artefact identified at RPS Bylong ASI03 (KG121)



**RPS Bylong ASI04 (Field point KG122)**

RPS Bylong ASI04 is a medium-sized artefact scatter located on Road 20, which consists of eight mudstone flakes, including four measuring 4 cm by 3 cm, 3 cm by 3 cm, 4 cm by 2 cm and 5 cm by 3.5 cm. The site has an extent of 30 m by 30 m with an easterly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE at the site were low due to regrowth on the track. The GSV and GSE surrounding the site were low due to dense pasture grasses. Disturbances included sheet wash erosion, use of the vehicle track and cattle grazing.



Plate 464 Site location photo of RPS Bylong ASI04 (KG122) view to the northeast



Plate 465 Artefact identified at RPS Bylong ASI04 (KG122)



### **RPS Bylong ASI05 (Field point KG123)**

RPS Bylong ASI05 is a small artefact scatter located on a parallel with the creek line north of Bylong Valley Way. It consists of three mudstone flakes, measuring 4 cm by 4 cm, 3 cm by 3 cm and 4 cm by 3.5 cm. The site has an extent of 5 m by 5 m with a westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were low at the site and in the surrounding area due to the leaf litter and dense pasture grasses, across the site. Disturbances included sheet wash erosion and cattle trails.



**Plate 466 Site location photo of RPS Bylong ASI05 (KG123) view to the northeast**



**Plate 467 Artefact identified at RPS Bylong ASI05 (KG123)**

**RPS Bylong ASI06 (Field point KG124)**

RPS Bylong ASI06 is a small artefact scatter located on a large ant nest alongside Road 20, consisting of six mudstone flakes, including four measuring 4 cm by 5 cm, 3 cm by 3 cm, 2 cm by 2.5 cm and 4 cm by 3 cm. The site has an extent of 50 m by 10 m with a westerly aspect and the artefacts were situated on exposed clay B horizon soils. The GSV and GSE were moderate at the site due to the effects of the ant activity and low in the surrounding area due to dense pasture grasses. Disturbances included sheet wash erosion, bioturbation associated with the ant activity and cattle grazing.



**Plate 468 Site location photo of RPS Bylong ASI06 (KG124) view to the northwest**



**Plate 469 Artefact identified at RPS Bylong ASI06 (KG124)**



## Appendix 4

### Cultural Features



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## Introduction

The following information includes descriptions of 'cultural features' which did not meet the necessary criteria for recording as an archaeological site, as they did not contain potential archaeological deposits (PADs), art, or artefacts. However, these locations were identified as culturally important to the Registered Aboriginal Party (RAP) representatives. They included natural formations such as rock cavities and features such as occupation areas, platforms and mounds that did not meet the archaeological criteria for a PAD. This information has been included so that RAPs can consider whether these areas should be classified as cultural features and if so, what kind of Aboriginal cultural heritage values are associated with these features. On the 3<sup>rd</sup> & 4<sup>th</sup> of July 2014, the Aboriginal Cultural Values sessions were held in Bylong, at the Cockatoo Coal Site Office with the RAP members. It was carried out in accordance with the methodology submitted and agreed to by the RAPs, it should be noted that RAPs did want not to be identified with the information that they provided and thus the results have been presented as a consensus percentage.



### RPS Bylong CUL001

RPS Bylong CUL001 is located to the west of Road 04, a graded access track for the drilling rigs. This cultural feature was considered by the RAPs to be a possible storage cavity (**Plate 466**). This cavity is 1.39 m in height, 1.45 m in width, 2.24 m in depth and 1.32 m above the ground level, with a westerly aspect. No PAD was identified in the cavity. The GSV and GSE were low between the site and the graded track due to dense leaf litter and fallen branches (**Plate 467**). Road 04 can be seen by the RAP member on the track (**Plate 467**). The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs as well as some native grasses in the understorey. All mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. This cultural feature was identified in Week 1 of the survey, on the 20<sup>th</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



**Plate 466 Cultural Feature RPS Bylong CUL001 possible storage cavity**



Plate 467 Outlook to Road 04, to the west of the cavity



## RPS Bylong CUL002

RPS Bylong CUL002 is a sandstone cavity located to the east of Road 04. It was suggested that this cavity may have been used by Aboriginal people as a type of burial chamber. This feature is between 1.2 m and 1.7 m in height within the chamber, with a width of 4.65 m and a depth of 3.2 m (**Plate 468 & Plate 469**). At the drip line, the opening is 0.52 m in height. The sediment in the cavity was greater than 25 cm in depth throughout the space. The cavity has a westerly aspect (**Plate 470**). The GSV and GSE in the surrounding area were low due to dense leaf and branch litter. The vegetation in the area includes eucalypts and acacias as well as low shrubs and native grasses in the understorey. All mature trees were inspected for cultural scarring but no scarred trees were identified. This cultural feature was recorded in Week 1 survey, on the 20<sup>th</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

## PHOTOS



Plate 468 RPS Bylong CUL002, possible burial cavity



Plate 469 Full view of cavity opening



Plate 470 View from cavity, facing west



### RPS Bylong CUL003

RPS Bylong CUL003 is sandstone formation located to the south of Road 04. It was considered possible that this cavity may have been used by Aboriginal people as a shelter. This cavity was 1.3 m in height, with a width of 4.8 m and a depth of 3.5 m (**Plate 471**); the sediment in the back of the cavity was between 3 cm and 5 cm. This cavity is north facing (**Plate 472**) and the GSV and GSE in the surrounding area were low due to dense leaf and branch litter. The vegetation in the area includes eucalypts and acacias, as well as low shrubs and native grasses in the understorey. All mature trees were inspected for cultural scarring but no scarred trees were identified. This cultural feature was recorded in Week 1 of the survey, on the 20<sup>th</sup> of May 2014 by Arthur Fletcher (WONN 1 Contracting) and George Sampson (Cacatua Cultural Consultants).

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



**Plate 471 View of RPS Bylong CUL003, rock cavity**



Plate 472 View from cavity, facing north

### RPS Bylong CUL004

RPS Bylong CUL004 is a sandstone formation located to the south of Road 04. The site was recorded as a rock formation shaped like a bird's head, with a northerly aspect (**Plate 473 & Plate 474**). No measurements were possible due to the height of the formation, which was situated among other sandstone outcrops. The GSV and GSE were low due to dense leaf litter and fallen branches in the surrounding area. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs. Some native grasses are present in the understorey. All mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. This cultural feature was recorded in Week 1 of the survey, on the 20<sup>th</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 50% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 473 RPS Bylong CUL004 bird's head feature (facing south west)



Plate 474 Bird's head cultural feature (facing west)



### RPS Bylong CUL005

RPS Bylong CUL005 is a sandstone formation located on the south face of a ridgeline of outcropping sandstone to the south of Road 04. It is considered by the RAPs that Aboriginal people in the past may have used this formation as a shelter. The cavity is 3.5 m in height, 3.1 m wide and 6.5 m deep (**Plate 475**); the sediment was generally shallow throughout the area beneath the overhang, except in the rear, which contained sediment up to 15 cm in depth. The floor of this cultural feature was steeply sloping down to the entrance of the cavity. This cultural feature has a southerly aspect (**Plate 476**). The GSV and GSE in the surrounding area were low due to dense leaf and branch litter, as well as debris from collapsing sandstone outcrops. The vegetation in the area includes new growth eucalypts and acacias, in addition to scattered shrubs and native grasses in the understorey. This cultural feature was recorded in Week 1 of the survey, on the 20<sup>th</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 475 RPS Bylong CUL005, cultural rockshelter



Plate 476 View from cultural feature, facing south

**RPS Bylong CUL006**

RPS Bylong CUL006 is a cultural rockshelter formed by a large sandstone boulder situated beneath the ridgeline, located to the west of Road 06. It was considered possible that Aboriginal people used this formation as a shelter. This cavity is 1.95 m in height, 2.4 m in width and 3.2 m in depth (**Plate 477**); the sediment in the cavity was between 2 and 3 cm deep, where present in the cavity. This feature has an easterly aspect (**Plate 478**) and the GSV and GSE in the surrounding area were low due to dense leaf and branch litter. The vegetation in the area includes new growth eucalypts and acacias, and low shrubs and native grasses in the understorey. Any mature trees were inspected for cultural scarring but no scarred trees were identified. This cultural feature was recorded in Week 1 of the survey on the 21<sup>st</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

**PHOTOS**

**Plate 477 RPS Bylong CUL006, cultural rockshelter**



Plate 478 View from the cultural feature, facing east



**RPS Bylong CUL007**

RPS Bylong CUL007 is a sandstone formation located to the east of Road 06, a graded access track for the drilling rigs. The cultural feature was recorded as a 'face' shaped rock formation (**Plate 479 & Plate 480**) with a westerly aspect. No measurements were possible due to the height of the formation. The GSV and GSE in the surrounding area were low due to dense leaf litter and fallen branches. The vegetation in the area includes eucalypts, black cypress pines and acacia shrubs, with native grasses forming the understorey. All mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. This cultural feature was recorded in Week 1 of the survey, on the 21<sup>st</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 50% agreed that it may have some value and should be inspected as part of the AACHMP.

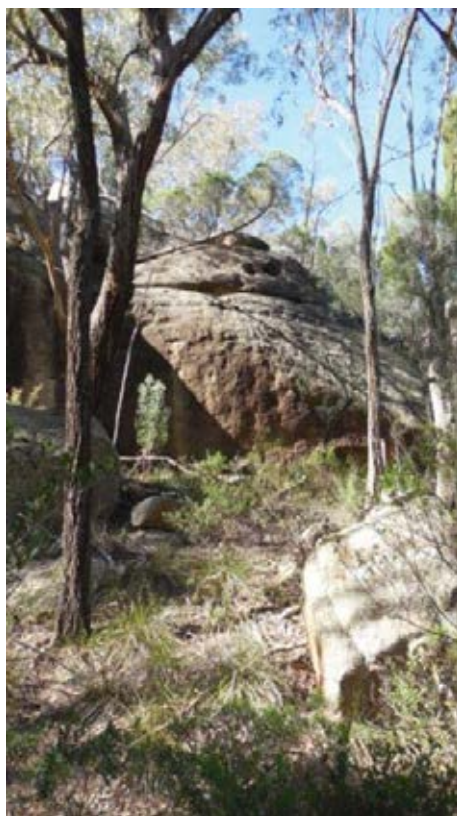
**PHOTOS**

Plate 479 RPS Bylong CUL007, 'face' formation in the sandstone (facing east)



Plate 480 'Face' formation in the sandstone

**RPS Bylong CUL008**

RPS Bylong CUL008 is a cultural rockshelter located on the west face of a steep sandstone outcrop, on a ridgeline to the west of Road 06. It was considered possible that Aboriginal people may have used this cavity as a shelter. The feature measures 1.0 m in height, with a width of 1.9 metres and a depth of 2.9 metres (**Plate 481**). There was some sediment present in the very rear of the cavity. This cultural feature has an easterly aspect (**Plate 482**). The GSV and GSE in the surrounding area were low due to dense leaf and branch litter, and large boulders of sandstone that had rolled down the slope. The vegetation in the area includes new growth eucalypts and dense acacia, and scattered shrubs and native grasses in the understorey. This cultural feature was recorded in Week 1 of the survey, on the 21<sup>st</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

**PHOTOS**

**Plate 481 RPS Bylong CUL008, cultural rockshelter**



Plate 482 View from cultural feature, facing east



**RPS Bylong CUL009**

RPS Bylong CUL009 is a series of cavities located high on the west face of a steep sandstone outcrop, on a ridgeline to the west of Road 06. It was considered possible that Aboriginal people used these cavities for shelter. Due to accessibility issues, this cultural feature could not be measured (**Plate 484**). These cavities had a westerly aspect (**Plate 485**) and were situated on a very steep slope. The GSV and GSE in the surrounding area were low due to dense leaf and branch litter, and large boulders of sandstone that had rolled down the slope. The vegetation in the area includes new growth eucalypts and dense acacias, with scattered shrubs and native grasses forming the understorey. This cultural feature was recorded in Week 1 of the survey, on the 21<sup>st</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

**PHOTOS**

**Plate 484 RPS Bylong CUL009, a series of cavities, possible cultural rock shelters**



Plate 485 View from outcrop, facing east down steep slope

**RPS Bylong CUL010**

RPS Bylong CUL010 was nominated as a possible occupation area, formed by a flat 'island' between two large creek lines. The sediment in the area was highly eroded with the depth of the A horizon soils reaching 3 cm to 5 cm maximum. No artefacts or cultural objects were identified in the area. **Plate 486 and Plate 487** show the views of the cultural feature facing north and south respectively. GSV was moderate; limited by short, dense grass covering the area while GSE was very low, with no exposures present, except for along the creek lines. The vegetation in the area includes some eucalypts, scattered shrubs and pasture grasses. This cultural feature was recorded in Week 2 of the survey, on the 28<sup>th</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 50% agreed that it may have some value and should be inspected as part of the AACHMP.

**PHOTOS**

**Plate 486 RPS Bylong CUL010, facing north across cultural feature**



Plate 487 View across cultural feature



### RPS Bylong CUL011

RPS Bylong CUL011 is a cultural 'platform' feature. This sandstone outcrop was over 80 m in length and approximately 20 m in width running north to south, with a westerly aspect. No artefacts were identified in the area. **Plate 489** shows the view from the centre of the platform to the south while **Plate 490** is the view facing north. The GSV and GSE were moderate, limited by short sparse grasses covering the platform in patches between the sandstone outcropping. The vegetation in the area below the cultural feature, contained eucalypts and scattered acacias while the surrounding area was vegetated by dense pasture grasses. This cultural feature was recorded in Week 2 of the survey, on the 29<sup>th</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 50% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 489 RPS Bylong CUL011, cultural 'platform' feature, facing south



Plate 490 Cultural 'platform' feature, facing north

**RPS Bylong CUL012**

RPS Bylong CUL012 is sandstone formation was located at the head of a first order drainage channel and consists of a series of stepped platforms leading to a 1.7 m waterfall. **Plate 491** shows the view north towards the waterfall, while **Plate 492** faces south, to the head of the drainage line. The GSV and GSE were moderate, limited by short sparse grasses covering the areas around the rocky outcrops and exposures on and between the sandstone outcropping. The area below the sandstone outcrop and waterfall was vegetated by eucalypts and scattered acacias, while the surrounding area was covered by dense pasture grasses. This cultural feature was recorded in Week 3 of the survey, on the 5<sup>th</sup> of June 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 50% agreed that it may have some value and should be inspected as part of the AACHMP.

**PHOTOS**

**Plate 491 RPS Bylong CUL012, unusual rocky creek line formation (facing north)**



**Plate 492 Unusual rocky creek line formation (facing south)**



### RPS Bylong CUL013 (Fieldpoint CRS001)

RPS Bylong CUL013 (CRS001) was accessed from Road 04, a graded access track for the drilling rigs. The cultural feature was considered to be a space that may have been used by Aboriginal people as a temporary shelter (**Plate 493**). The cavity is 1.4 m in height, 3.3 m in width and 1.4 m in depth, with a southerly aspect (**Plate 494**). The GSV and GSE were low between the site and the graded track due to dense leaf litter and fallen branches. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses present in the understorey. All mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. This cultural feature was identified on the 20<sup>th</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 493 RPS Bylong CUL013 (CRS001) cultural feature, rockshelter





**Plate 494 View from the cavity, facing south**



### RPS Bylong CUL014

*On the 3<sup>rd</sup> & 4<sup>th</sup> of July 2014, the Aboriginal Cultural Values sessions were held in Bylong, at the Cockatoo Coal Site Office with the RAP members. It was decided among the members that this CUL014 is not of Aboriginal cultural value and therefore has not been included.*

### RPS Bylong CUL015 (Fieldpoint CRS002)

RPS Bylong CUL015 (CRS002) was accessed from Road 05, a graded access track for the drilling rigs. The cultural feature was recorded as a space that may have been used by Aboriginal people as a temporary shelter (**Plate 495**). The cavity is 1.05 m in height, 5.2 m in width and 4.8 m in depth with a very steep sloping base, facing south (**Plate 496**). The GSV and GSE were low between the site and the graded track due to dense leaf litter, small shrubs, native grasses and fallen branches. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs. Any mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. This cultural feature was recorded in Week 1 of the survey, on the 20<sup>th</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



**Plate 495 RPS Bylong CUL015 (CRS002), cultural cavity**



**Plate 496 View from the cavity, facing south**



### RPS Bylong CUL016 (Fieldpoint CRS003)

RPS Bylong CUL016 (CRS003) was accessed via Road 05, a graded access track for the drilling rigs, and was recorded as a cultural feature that Aboriginal people may have used as a temporary shelter (**Plate 497**). The cavity is 1.5 m in height, 3.2 m in width and 3.1 m in depth with a very steep sloping floor and a southerly aspect (**Plate 498**). The GSV and GSE were low between the sandstone feature and the graded track due to dense leaf litter, small shrubs, native grasses and fallen branches. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs. Any mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. This cultural feature was identified on the 20<sup>th</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 497 RPS Bylong CUL016 (CRS003), cultural feature





**Plate 498 View from the cavity, facing south**



### RPS Bylong CUL017 (Fieldpoint KG001)

RPS Bylong CUL017 is a cultural feature accessed from Road 04, a graded access track for the drilling rigs and was identified as a location which Aboriginal people may have used as a temporary shelter or storage as they moved through the area. The feature is 2.17 m in height, 14.7 m in width and 2.8 m in depth (**Plate 499**), with a large flat overhang that is open at both ends. There was no sediment on the base of the shelter that could have been considered to be a PAD. There were no artefacts identified at the location. The cultural feature has a northerly aspect (**Plate 500**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses and small shrubs present in the understorey. This cultural feature was identified on 19<sup>th</sup> May 2014, in Week 1 of the survey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 499 RPS Bylong CUL017, cultural feature



**Plate 500 View from platform, facing north**



### RPS Bylong CUL018 Fieldpoint KG024

RPS Bylong CUL018 was accessed from Road 01, a graded access track for the drilling rigs. This site is considered to be a possible temporary shelter or storage for Aboriginal people as they moved through the area. The cavity is 1.1 m in height, 2.26 m in width and 3.1 m in depth (**Plate 501**), with sediment approximately 10 cm in depth forming the floor. There were no artefacts identified at the location. This site has westerly aspect (**Plate 502**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses and small shrubs present in the understorey. The cultural feature was identified on the 22<sup>nd</sup> May 2014 in Week 1 of the survey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 501 RPS Bylong CUL018, cultural feature





**Plate 502 View from cavity, facing west**



### RPS Bylong CUL019 (Fieldpoint RPS001JH)

RPS Bylong CUL019 is located to the east of Road 04 and was identified as a possible temporary shelter or storage for Aboriginal people as they moved through the area. The cavity is approximately 1 m in height, 2.29 m in width and 3.2 m in depth (**Plate 503**), with the sediment which forms the floor reaching a maximum depth of 1 cm throughout. There were no artefacts identified at the location. The cultural feature has a north westerly aspect (**Plate 504**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation in the area included new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses and small shrubs present in the understorey. This cultural feature was identified on the 19<sup>th</sup> May 2014 in Week 1 of the survey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 503 RPS Bylong CUL019, cultural feature



**Plate 504 View from the cavity, facing north west**



### RPS Bylong CUL020 (Fieldpoint RPS002JH)

RPS Bylong CUL020 is located to the east of Road 04, a graded access track for the drilling rigs and was identified as a possible temporary shelter or storage used by Aboriginal people as they moved through the area. The cavity is 2.4 m in height, 3.54 m in width and 4.05 m in depth (**Plate 505**), with the sediment which forms the floor reaching a maximum depth of 1 cm. There were no artefacts identified at this location. The feature has a north westerly aspect (**Plate 506**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, rock tumble, fallen branches and trees. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses and small shrubs present in the understorey. This cultural feature was identified on the 19<sup>th</sup> May 2014 in Week 1 of the survey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS

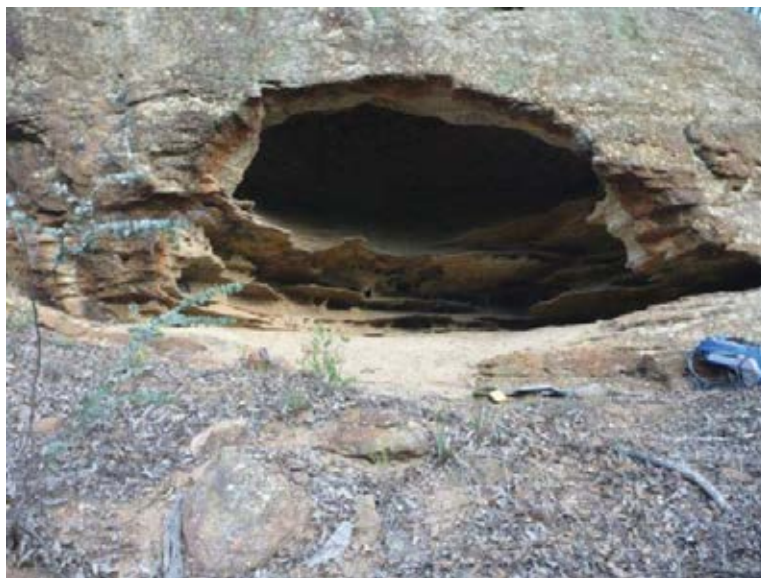


Plate 505 RPS Bylong CUL020, cultural feature





**Plate 506 View from cavity, facing north west**



### RPS Bylong CUL021 (Fieldpoint RPS003JH)

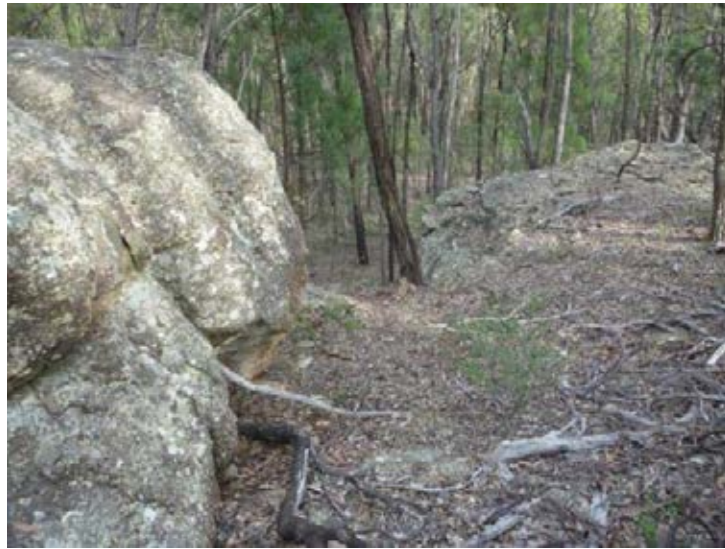
RPS Bylong CUL021 was accessed via Road 04, a graded access track for the drilling rigs and was identified as a possible temporary shelter or storage used by Aboriginal people as they moved through the area. The cavity is 0.8 m in height, 1.33 m in width and 3.65 m in depth (**Plate 507**), with the sediment which forms the floor reaching a maximum depth of 5 cm. There were no artefacts identified at this location. The location has a westerly aspect (**Plate 508**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, rock tumble, fallen branches and trees. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses and small shrubs present in the understorey. This cultural feature was identified on the 20<sup>th</sup> May 2014 in Week 1 of the survey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 507 RPS Bylong CUL021 cultural feature



**Plate 508 View from cavity, facing west**



### RPS Bylong CUL022 (Fieldpoint RPS004JH)

RPS Bylong CUL022 was accessed via Road 04, a graded access track for the drilling rigs and was identified as a possible temporary shelter or storage for Aboriginal people as they moved through the area. The cavity is 1.5 m in height, 2.03 m in width and 6.56 m in depth (**Plate 509**) and contained no sediment that could be considered a PAD. There were no artefacts identified at this cultural feature. This cultural feature has a northerly aspect (**Plate 510**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, rock tumble, fallen branches and trees. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses and small shrubs present in the understorey. This cultural feature was identified on the 20<sup>th</sup> May 2014 in Week 1 of the survey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 509 RPS Bylong CUL022 cultural feature





**Plate 510 View from the cavity facing west**



### RPS Bylong CUL023 (JH009)

RPS Bylong CUL023 was accessed via a graded access track Road 05 for the drilling rigs and was identified as a temporary shelter or storage for Aboriginal people as they moved through the area. This cavity is 2.4 m in height, 3.8 m in width and 8.8 m in depth (**Plate 511**). There were no artefacts identified at this location. The cavity has a westerly aspect and is situated on a moderate slope (**Plate 512**). The base of the rockshelter was covered by sediment to a depth of approximately 5 cm. The GSV and GSE were low between the site and the graded track due to very dense leaf litter, rock tumble, fallen branches and trees. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs with some native grasses and small shrubs present in the understorey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 511 RPS Bylong CUL023, cultural feature



**Plate 512 View from the cavity, facing west**



### RPS Bylong CUL024 (Field points JH010)

RPS Bylong CUL024 was accessed via Road 05, a graded access track for the drilling rigs and was identified on the 20<sup>th</sup> May 2014 in Week 1 of the survey. This cultural feature was identified as a possible temporary shelter or storage for Aboriginal people as they moved through the area. The cavity is 2.82 m in height, 7.2 m in width and 6.79 m in depth (**Plate 513**), with a sloping roof. The sediment that forms the floor of the cavity reached approximately 5 cm in depth. There were no artefacts identified at this location. The cultural feature has an easterly aspect (**Plate 514**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, rock tumble, fallen branches and trees. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses and small shrubs present in the understorey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 513 RPS Bylong CUL024, cultural feature





**Plate 514 View from cavity entrance, facing east**



### RPS Bylong CUL025

RPS Bylong CUL025 was accessed via Road 08, a graded access track for the drilling rigs and was identified as a possible temporary shelter or storage for Aboriginal people as they moved through the area. The cavity is 1.46 m in height at the entrance, with a sloping roof reducing the height toward the back of the cavity, 7.91 m in width and 7.81 m in depth (**Plate 515**). There was very little to no sediment present within the cavity and no artefacts were identified at the location. This cultural feature has an easterly aspect (**Plate 516**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses and small shrubs present in the understorey. The cultural feature was identified on the 27<sup>th</sup> June 2014 in Week 5 of the survey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 515 RPS Bylong CUL025, cultural feature



**Plate 516 View from the entrance of the cavity, facing east**



### RPS Bylong CUL026

RPS Bylong CUL026 was accessed via Road 08, a graded access track for the drilling rigs and was identified as a possible temporary shelter for Aboriginal people as they moved through the area. The overhang is 2.12 m in height, 7.4 m in width and 4.1 m in depth (**Plate 517**), with no sediment present on the ground surface and no artefacts identified at the location. This cultural feature has south easterly aspect (**Plate 518**). The GSV and GSE were low between the site and the graded track due to very dense leaf litter, fallen branches and trees. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs, with some native grasses and small shrubs present in the understorey. The cultural feature was identified on the 27<sup>th</sup> June 2014 in Week 5 of the survey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 517 RPS Bylong CUL026, cultural feature





**Plate 518 View from the cavity, facing south east**



### RPS Bylong CUL027 (Fieldpoint CRS004)

RPS Bylong CUL027 (CRS004) was accessed via Road 06, a graded access track for the drilling rigs and was recorded as a space that may have been used by Aboriginal people as a temporary shelter (**Plate 519**). This cavity is 2.07 m in height, 3.1 m in width and 10.27 m in depth, with a steeply sloping open ground surface. The cultural feature has a westerly aspect (**Plate 520**). The GSV and GSE were low between the site and the graded track due to dense leaf litter, small shrubs, native grasses and fallen branches. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs. Any mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. The cultural feature was recorded in Week 1 on the 21<sup>st</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 519 RPS Bylong CUL027 (CRS004), cultural feature



Plate 520 View from the cavity, facing west



### RPS Bylong CUL028 (Fieldpoint CRS005)

RPS Bylong CUL028 (CRS005) was accessed via Road 06, a graded access track for the drilling rigs and was recorded as a space that may have been used by Aboriginal people as a temporary shelter (**Plate 521**). The cavity is 1.08 m in height, 3.4 m in width and 6.3 m in depth with a sloping ground surface and a southerly aspect (**Plate 522**). The GSV and GSE were low between the site and the graded track due to dense leaf litter, small shrubs, native grasses and fallen branches. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs. Any mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. The cultural feature was recorded in Week 1 on the 21<sup>st</sup> of May 2014 of the survey.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 521 RPS Bylong CUL028 (CRS005), cultural feature





**Plate 522 View form the cavity facing south**



### RPS Bylong CUL029 (Fieldpoint CRS006)

RPS Bylong CUL029 (CRS006) was accessed via Road 06, a graded access track for the drilling rigs and was recorded as a space that may have been used by Aboriginal people as a temporary shelter (**Plate 523**). The cavity is 2.2 m in height, 3.1 m in width and 3.7 m in depth with a sloping ground surface and a north easterly aspect (**Plate 524**). The GSV and GSE were low between the site and the graded track due to dense leaf litter, small shrubs, native grasses and fallen branches. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs. Any mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. The cultural feature was reported in Week 1 on the 21<sup>st</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 523 RPS Bylong CUL029 (CRS006), cultural feature



**Plate 524 View from the entrance of the cavity, facing north east**



### RPS Bylong CUL030 (Fieldpoint CRS015)

RPS Bylong CUL030 (CPS 015) was located on a rocky, sloped landform surrounded by sandstone outcrops adjacent to a tributary of Dry Creek. The cultural feature had a north westerly aspect (**Plate 525**). RPS Bylong CUL030 was identified as a large sandstone formation containing an overhang, which may have been used by Aboriginal people as a temporary shelter. This formation was approximately 6 m in height, 8 m in width and 7 m in depth (**Plate 526**). The sediment on the ground surface was likely to have been from internal erosion and was no more than 5 cm in depth. The GSE and GSV in the surrounding area were low due to dense leaf litter and fallen branches, sandstone tumble and shrubs. The vegetation in the area includes both mature and new growth eucalypts, scattered shrubs and grasses. No scarred trees were identified. Disturbances in the area included erosion and weathering, as well as the general disturbances caused by wildlife. This cultural feature was recorded in Week 3 survey on the 6<sup>th</sup> June 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 525 RPS Bylong CUL030, cultural feature





**Plate 526 View to the north west from inside of the cavity**



### PS Bylong CUL031 (Fieldpoint CRS008)

RPS Bylong CUL031 (CRS008) was accessed via Road 02, a graded access track for the drilling rigs and was recorded as a space that may have been used by Aboriginal people as a temporary shelter (**Plate 527**). The cavity is 1.5 m in height, 5.5 m in width and 3.5 m in depth, with a westerly aspect (**Plate 528**). The GSV and GSE were low between the site and the graded track due to dense leaf litter, small shrubs, native grasses and fallen branches. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs. Any mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. This cultural feature was recorded in Week 1 of the survey on the 22<sup>nd</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 527 RPS Bylong CUL031 (CRS008), cultural feature



**Plate 528 View from the cavity entrance, facing west**



### RPS Bylong CUL032 (Fieldpoint CRS009)

RPS Bylong CUL032 (CRS009) was accessed via Road 02, a graded access track for the drilling rigs and was recorded as a space that may have been used by Aboriginal people as a temporary shelter (**Plate 529**). The cavity is 1.5 m in height, 5.2 m in width and 3.5 m in depth, with a sloping ground surface and a westerly aspect (**Plate 530**). The GSV and GSE were low between the site and the graded track due to dense leaf litter, small shrubs, native grasses and fallen branches. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs. Any mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. This cultural feature was recorded in Week 1 of the survey on the 22<sup>nd</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 529 RPS Bylong CUL032 (CRS009), cultural feature





**Plate 530 View from the cavity entrance, facing west**



### RPS Bylong CUL033 (Fieldpoint CRS010)

RPS Bylong CUL033 (CRS010) was accessed via Road 02, a graded access track for the drilling rigs and was recorded as a space that may have been used by Aboriginal people as a temporary shelter (**Plate 531**). The cavity is 1.2 m in height, 3.5 m in width and 2.8 m in depth with a sloping ground surface and a westerly aspect (**Plate 532**). The GSV and GSE were low between the site and the graded track due to dense leaf litter, small shrubs, native grasses and fallen branches. The vegetation in the area includes new growth eucalypts, black cypress pines and acacia shrubs. Any mature trees in the survey area were inspected for cultural scarring but no scarred trees were identified. This cultural feature was recorded in Week 1 of the survey on the 22<sup>nd</sup> of May 2014.

This site was discussed during the cultural values workshop, not all RAPs agreed on this as being a cultural feature, but approximately 70% agreed that it may have some value and should be inspected as part of the AACHMP.

### PHOTOS



Plate 531 RPS Bylong CUL033 (CRS010), cultural feature



**Plate 532 View from the cavity entrance, facing west**