WILPINJONG COAL PROJECT

APPENDIX F

Aboriginal Cultural Heritage Assessment

Wilpinjong Coal Project

Appendix F
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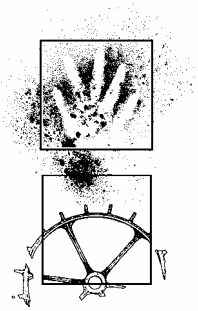
5 April 2005



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A Report prepared for Wilpinjong Coal Pty Limited

SUMMARY

An Aboriginal cultural heritage assessment has been conducted for the Wilpinjong Coal Project, including literature and database review, Aboriginal consultation and input on cultural heritage values and Aboriginal group participation in field surveys.

Aboriginal cultural heritage survey was conducted across approximately 2,510 hectares (about 25 square kilometres) including comprehensive survey of the Project disturbance area and sample survey of other areas adjacent to the Project disturbance area.

Aboriginal groups involved in the Project Aboriginal cultural heritage assessment were the Mudgee Local Aboriginal Land Council, Murong Gialinga Aboriginal and Torres Strait Islander Corporation and Warrabinga Native Title Claimants Aboriginal Corporation. Aboriginal consultation included:

- phone liaison;
- introductory meetings;
- participation and involvement of Aboriginal community representatives in fieldwork;
- Aboriginal representatives and groups provided advice on cultural heritage values of the Project area;
- provision of reports to the Aboriginal representative groups of site data and issues raised following the first two field survey periods;
- initial written feedback from some of the Aboriginal groups following the first two stages of field survey and receipt of associated reports;
- a field day and Aboriginal heritage management workshop for Aboriginal community members (particularly Elders who could not participate in the field work) following the third stage of field survey;
- provision of a report for consultation that summarised all site recordings and proposed management strategies following the completion of field surveys and on-site management workshops;
- presentation of the Aboriginal cultural heritage assessment findings and management strategies at a meeting with the Mudgee Local Aboriginal Land Council and members of the Murong Gialinga Aboriginal and Torres Strait Islander Corporation;
- attendance of company representatives at a further Mudgee Local Aboriginal Land Council meeting;
- formal written responses from two of the Aboriginal groups; and
- consideration of formal responses received from Aboriginal stakeholder groups.

Numerous archaeological assessments have been undertaken over the past thirty years around the Project area, including Ulan, Gulgong and Mudgee. Eight Aboriginal sites had been recorded on the Department of Environment and Conservation (DEC) Aboriginal Heritage Information Management System (AHIMS) database near the Project area. These consisted of a scarred tree, a grinding groove site, four rock shelters with rock art, an artefact scatter and a bora ceremonial ground with carved trees. Of these, none occur in the proposed Project disturbance area or Mining Lease Application area.

A total of two hundred and thirty eight (238) recordings were made during field surveys conducted within the Project area. Of these recordings, two hundred and twenty-four (224) relate to Aboriginal occupation or stated Aboriginal cultural significance, three are survey scar trees of undebated European origin (which were recorded for comparative purposes), and 11 were interpreted differently by the archaeologists and some Aboriginal representatives regarding a natural, European or Aboriginal origin.

Excluding the three European scar tree recordings, one hundred and twenty three (123) of the recordings occur within the Project disturbance area, with an additional 22 occurring in the Project disturbance area on the boundary of the open cut pits. A further 38 recording were outside of, but within 100 m of the Project disturbance area. The remainder (52) are located more than 100 m outside of the Project disturbance area. The approximate density of recordings within the Project disturbance area (excluding European surveyors' scarred trees and sites of debated origin) is approximately 1 recording per 11.5 ha.

Sites identified in the Project area include:

70 open artefact scatters;

1 open artefact scatter and procurement site;

64 isolated finds;

19 rock shelters with surface artefacts (may also contain potential or confirmed archaeological deposit);

21 rock shelters with potential archaeological deposit (only);

3 rock shelters with rock art, (may also contain surface artefacts, and confirmed or potential archaeological deposit);

24 possible Aboriginal scarred trees;

15 probable Aboriginal scarred trees;

3 surveyor's scarred trees (undebated European origin);

3 probable surveyor scarred trees (debated origin);

1 indeterminate tree feature (debated origin);

3 other (debated origin) scarred trees;

2 potential archaeological deposits (PAD) (open context);

2 reported places of Aboriginal cultural significance (disputed by some other Aboriginal representatives);

3 springs/natural pothole ('waterhole' recorded at the request of an Aboriginal representative); and

4 other (debated origin) isolated finds, lithic scatters or stone arrangements.

Eight stone material categories were recorded during the survey. The dominant categories were quartz (noted in 75% of all artefact occurrences), and tuff (36%).

Just under half of the recorded Aboriginal sites occur within valley floor contexts, a third within basal valley slope contexts, 19% occur on mid valley slope contexts and 4% in upper valley contexts.

There are three recordings each for sites with between 51 to 100, and 101 to 500 estimated surface artefacts. These sites are located near the banks of Cumbo and Wilpinjong Creeks, as well as some basal slope contexts. Two sites were recorded with more than an estimated 500 artefacts. Both occur along the banks of Wilpinjong Creek and outside of the Project open cut mine and contained infrastructure area. The margin of one of these sites would potentially be disturbed by realignment of an electricity transmission line.

Three rock shelter sites with rock art were identified during the field program. All occur outside of the Project disturbance area and within sandstone and conglomerate rocks. Identifiable motifs include upward pointing tridents or arrows shapes, and red hand stencils.

Forty-nine modified trees were recorded during the field program, these occur both within and outside of the Project disturbance area. None of these were recorded by archaeologists as a definite Aboriginal scar tree, however, 39 were classed as having a possible or probable Aboriginal origin and include 41 scars. Six are interpreted by the Project archaeologists as probable surveyor's scars (three of which are debated by some Aboriginal participants), three are not considered by archaeologists to be human in origin, though this is debated by some of the Aboriginal participants (who preferred to conservatively attribute an Aboriginal cause), and one consists of an axed depression of an indeterminate origin.

Five recordings were made solely on the basis of non-archaeological features advised by Aboriginal representatives. Three of these sites were recorded at the request of some Aboriginal participants as waterholes/depressions that may have been used by Aboriginal people as a water source and two were natural landforms of reported cultural significance (the identification of these two sites was strongly disputed by some Aboriginal representatives).

Approximately half of the recordings identified during the survey are located within the Project disturbance area and would be subject to direct disturbance during the life of the Project. Approximately 10% of recordings are located within the Project disturbance area on the boundaries of the Project open cut pits and are also likely to be disturbed, subject to the detailed mine design. One site of high archaeological significance (within a local context) occurs within the Project disturbance area. This is a large open artefact scatter with more than 500 artefacts that may be impacted on its margin by the realignment of an electricity transmission line. No other recordings of high archaeological significance occur within the Project disturbance area.

No sites have been identified in the assessment that would warrant listing on the National Heritage List, Commonwealth Heritage List or are of National Significance under the *Environment Protection and Biodiversity Conservation Act, 1999*.

Most of the archaeological sites recorded within the Project disturbance area occur on relatively shallow, texture contrast soils with distinct clay subsoils. These sites are unlikely to contain undisturbed or *in situ* archaeological deposits. A limited number of deposits occur which include potential for *in situ* archaeological material and which warrant some form of archaeological subsurface investigation as the Project is developed. These consist of aggrading landforms such as alluvial flats, fans, and terrace deposits, locally elevated spurlines adjacent to watercourses, and three sand and gravel deposits.

Based on the known and predicted cultural heritage places and values identified within the proposed Project disturbance area, it is concluded that impacts to those places and values can be effectively managed or mitigated through the conduct of the actions and strategies specified in Section F12 of this report.

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F1 INTRODUCTION

F1.1 The Development Proposal

Wilpinjong Coal Pty Limited (WCPL) (a wholly owned subsidiary of Excel Coal Limited) is the Proponent for the development of the Wilpinjong Coal Project (the Project) near the township of Wollar, approximately 40 kilometres (km) north-east of Mudgee (refer Figure F1.1).

The main activities associated with development of the Project would include (refer Figure F1.2):

- development and operation of an open cut mine within the Mining Lease Application (MLA 1) area to produce coal for domestic electricity generation and export markets;
- selective highwall mining of the Ulan Seam within the MLA 1 area;
- a Coal Handling and Preparation Plant (CHPP) and mine facilities area;
- water management infrastructure including the relocation of Cumbo Creek;
- water supply bores and associated pump and pipeline system;
- placement of mine waste rock (i.e. overburden, interburden/partings and coarse rejects) predominantly within mined-out voids;
- placement of tailings within a combination of out-of-pit and in-pit tailings storages;
- development and rehabilitation of final mine landforms and establishment of woodland vegetation in areas adjacent to the Project;
- a mine access road, temporary construction camp access road, internal access roads and haul roads;
- closure of Wilpinjong Road and Bungulla Road;
- realignment of two sections of Ulan-Wollar Road (including the relocation of two road-rail crossings);
- relocation of the existing 11 kilovolt (kV) electricity transmission line;
- an on-site temporary construction camp to accommodate up to 100 people during the construction phase;
- a rail spur and rail loop;
- coal handling and train loading infrastructure;
- transportation of product coal to market via train; and
- Enhancement and Conservation Areas (ECAs).

F1.2 Survey Coverage

The survey coverage for the Project comprised the Project disturbance area and adjacent lands.

The Project disturbance area includes all lands that would be directly affected by the development activities described in Section F1.1 above (also refer Figure 1.2). Survey coverage within the Project disturbance area was comprehensive in scope, allowing for an assessment of the potential development impacts (refer Section F2.3).

Selected adjacent lands outside of the Project disturbance area were also surveyed to determine their heritage values and management requirements.

F1.3 Report Outline

This report was commissioned by WCPL and forms the Aboriginal cultural heritage component of the Environmental Impact Statement (EIS) for the Project. The remainder of this report is structured as follows:

Section F2 Study Methodology	Description of the survey methodology, including field survey, personnel and acknowledgments.
Section F3 Aboriginal Community Participation	Description of the Aboriginal community participation in the surveys and the consultation process.
Section F4 Environmental Context	Description of the Project area environment with particular reference to variables relevant to the archaeological resource.
Section F5 Ethno-Historic Context	A brief outline of the Aboriginal history of the region and early references to Aboriginal occupation in the local area.
Section F6 Archaeological Context	A presentation of background information which places the present assessment into the context of previous archaeological work within the local and regional area. This includes an outline of previously recorded sites.
Section F7 Survey Results	Presentation of the results of the field survey conducted for the present investigation, including an overview of the survey recordings, an assessment of ground surface visibility during the survey, and an assessment of the potential below ground archaeological resource.
Section F8 Significance Assessment	An assessment of the cultural heritage significance of the Project area, including the archaeological and Aboriginal cultural values of the recorded sites.
Section F9 Project Statutory Requirements	A brief overview of the statutory requirements relevant to the Project recordings.
Section F10 Potential Consequences of the Project on Aboriginal Cultural Heritage	A discussion of the potential impacts of the Project on archaeological and cultural values.
Section F11 Project Heritage Management Strategies	A discussion of potential strategies for the mitigation of impacts and the management of cultural heritage values within the Project area.
Section F12 Recommendations	A numbered description of the recommended strategies for the management of Aboriginal cultural heritage values within the Project area.
Section F13 References	List of sources used for the preparation of this report, including all references cited in the text.

Attachments

F1. *Records of Aboriginal Field Survey Participation - August 2004*	Records of the field participation of Aboriginal community representatives.
F2. *Descriptions of Aboriginal Site Types*	Description of the site type categories used in this report.
F3. *Formal Responses from Aboriginal Stakeholder Groups*	Letters and reports presented to WCPL by Aboriginal stakeholder groups regarding the cultural heritage of the Project area and its future management.
F4. *Examples of Field Data Recording Forms*	Examples of the field recording forms used for the survey.
F5. *Tabulated Site Context and Content Data*	Tables containing site context and content data. *Given the sensitive nature of some of this information, some members of the Aboriginal community have requested that access to this Attachment be restricted.*
F6. *Site Recording Inventory and Detailed Location Maps*	This Attachment consists of an inventory of site recordings and maps including specific site location information. *Given the sensitive nature of some of this information, some members of the Aboriginal community have requested that access to this Attachment be restricted.*

F2 STUDY METHODOLOGY

F2.1 Outline of the Project Assessment Program

The Aboriginal cultural heritage assessment of this Project has generally followed the following program sequence:

A Project Planning Focus Meeting

- The Project Planning Focus Meeting was conducted on 20 April 2004. The Planning Focus Meeting was facilitated by the Department of Infrastructure, Planning and Natural Resources (DIPNR).

B Engagement of Navin Officer Heritage Consultants to conduct Aboriginal cultural heritage assessment in accordance with Director-General's Requirements provided by DIPNR on 10 June 2004

- Preparation of an indicative study methodology and timeline (May/June 2004).

C Initial Aboriginal community consultation

- First contacts with government and community organisations and determination of principal stakeholder groups (June 2004).

- Introductory meetings with each Aboriginal group, including a presentation on: the Project description; the requirement for an Aboriginal cultural heritage assessment; and discussion of proposed assessment methodology, timing, aims and expectations (August 2004). The groups were requested to provide within the agreed timeframe, a description of the cultural heritage values of the Project area in a letter, report or verbally for use in the assessment.

D Background research into known and potential Aboriginal cultural heritage sites within the Project area

- Search of the DEC Aboriginal Heritage Information Management System (AHIMS) (Aboriginal sites register).

- Review previously conducted archaeological and cultural heritage assessments.

- Development of a predictive model for Aboriginal archaeological sites and their locations within the Project area.

- Refinement and further development of the survey and assessment methodology following the results of the background research and Aboriginal community group consultation.

E Archaeological field survey - focussed on Project disturbance areas

- Comprehensive survey of the majority of the Project disturbance area was conducted in two survey periods during August 2004. Including the recording the identification of sites or places which they knew or believed to have cultural values.

- Concise discussion sessions on survey findings, cultural values, issues of concern and management requirements were held in the field on a site-by-site basis and at the site office at the end of each day following surveys. Where relevant, the outcomes of these discussions were recorded.

F Reports of survey data provided to Aboriginal stakeholder groups following each survey period

- Reports which presented a survey of site recordings and an outline of relevant issues were provided to each participant Aboriginal community group following the end of each survey period (reports issued in August and September 2004).

G Written feedback from Aboriginal stakeholder groups following reporting of Project disturbance area survey results

- Both the Mudgee LALC and the Warrabinga Native Title Claimants Aboriginal Corporation (Warrabinga NTCAC) responded in writing to an invitation to formally comment on the results and issues presented in the reports.

H Geomorphological assessment of the Project area by geomorphologist, Dr Peter Mitchell

- Inspection of the Project area occurred in December 2004.

I Archaeological field survey of adjacent lands

- In response to requests by some of the Aboriginal group representatives for wider survey coverage, and as part of an assessment of potential conservation areas additional field survey was conducted in areas adjacent to the Project disturbance area (January 2005).

J Field Day and Workshop of Management Issues for Aboriginal Community Members

- Following requests from some of the Aboriginal groups for an opportunity to allow Elders and other members of the community to view the Project area at first hand, field days were organised at the end of the archaeological field survey program (14/15 January 2005).

- Following each field inspection, a summary of survey results and management issues was presented and participants then discussed a range of topics, including the Project description, cultural values of the Project area, and Aboriginal cultural heritage management measures for specific sites and overall management strategies.

K Provision of a report of all site recordings and proposed management measures and strategies

- A report of the field survey results was compiled, together with proposed management measures and strategies. This report included information on all of the field recordings and included consideration of the discussions held during the field days on cultural values and site management measures.

- Copies of the report were provided to each of the three Aboriginal community groups who participated in the field survey (25 January 2005). Each group was invited to comment on the management proposals, to contribute their assessments of Aboriginal cultural values, and to propose any further management strategies or changes.

- A period of 21 days was allowed to receive formal responses and reports from each of the Aboriginal groups.

L Presentation of a summary of findings and proposed management measures and strategies at meetings with the Mudgee LALC and the Murong Gialinga ATSIC

- A meeting was called by the Mudgee LALC and representatives of the Murong Gialinga on 9 February 2005, where the company made a presentation on the Project.

- A description of the Project, a summary of the survey findings and draft management measures and strategies for the Project were presented and a full discussion of the management proposals was conducted. As requested during the meeting, multiple copies of the slides used during the presentation were provided on 15 February 2005 for future discussion and distribution.

- A further formal meeting of the Mudgee LALC was held on 28 February 2005, where the Project archaeological assessment was discussed and a formal response formulated.

M Written feedback from Warrabinga NTCAC

- The Warrabinga NTCAC provided written feedback (Attachment F3) on the Aboriginal cultural heritage assessment and the report that had been issued for consultation. The letter expresses Warrabinga NTCAC's satisfaction with the consultation undertaken by WCPL, survey methodology and coverage, and the proposed Aboriginal cultural heritage management measures.

N Written feedback from Mudgee LALC

- The Mudgee LALC provided written feedback (Attachment F3) on the Aboriginal cultural heritage assessment and the report that had been issued for consultation. The letter expresses Mudgee LALC's satisfaction with the consultation undertaken by WCPL, survey methodology and that MLALC would like to work closely with WCPL in the development of an Aboriginal Cultural Heritage Management Plan.

O Incorporation of received stakeholder comments into final assessment report

- This report incorporates responses and reports received from the Aboriginal groups prior to 1 April 2005.

- Comments received from Aboriginal individuals and groups during the assessment have been considered in the survey methodology, consultation strategy and reporting.

- This has included alteration of the survey strategy, increased consultation (including opportunities for Elders and members of the community to visit the site), management measures, and where possible the addressing of comments provided in formal responses from the groups.

F2.2 Background Research

A range of documentation was used in assessing knowledge regarding Aboriginal cultural heritage of the Project area and surrounding region.

Sources included:

- the DEC Aboriginal Heritage Information Management System (AHIMS);
- associated DEC files and relevant archaeological reports submitted to DEC;
- published articles;
- previous archaeological and heritage assessments;
- the private papers and manuscripts of R.H. Mathews held in the Australian National Library; and
- theses held in the library of the Department of Archaeology and Anthropology, Australian National University.

This background research was used to identify previously recorded Aboriginal sites and heritage values within the wider area, to facilitate site prediction on the basis of known regional and local site patterns, and to place the Project area within an archaeological and research management context.

F2.3 Field Survey Program

F2.3.1 Overview

Aboriginal cultural heritage survey has been conducted across approximately 2,510 hectares (about 25 square kilometres) (refer Figure F2.1). Approximately 1,950 hectares of this coverage consists of the Project disturbance area (refer Section F1.1 above). The remaining 560 hectares of survey was conducted in adjacent lands. The surveys in adjacent lands consisted of sample survey areas selected with the aim of characterising the Aboriginal cultural heritage values within areas adjacent to the Project disturbance area, and/or other areas with potential for archaeological conservation management.

Survey was conducted progressively during a 5 month interval, in three fieldwork periods, across a total 17 field days and using two survey teams. Survey was conducted within the majority of the Project disturbance area during two separate periods totalling 13 days in August 2004 (between 10-15 and 19–25 August 2004). Survey within areas adjacent to the Project disturbance area was subsequently conducted over four days in January 2005 (11-14 January 2005). Survey of the temporary construction camp area was also conducted in the January 2005 survey period.

Each of these survey periods included the simultaneous deployment of two separate field teams. Each team would survey a specified area, either in co-ordination or independently of the other team. Each team consisted of one archaeologist and a field assistant from Navin Officer Heritage Consultants, and when available, one representative from each of the three local Aboriginal community organisations. A representative from Resource Strategies Pty Ltd (Resource Strategies) would often also accompany one of the survey teams.

The whole survey program accounted for approximately 136 person days.

F2.3.2 Survey within the Project Disturbance Area

The survey coverage of the Project disturbance area was comprehensive. This means that all of the subject lands were inspected and assessed according to the survey methodology outlined below, and all sites encountered were recorded to a consistent level of detail. All areas were subject to a minimum level of assessment, and greater scrutiny was conducted where ground surface conditions allowed. Survey areas in which a comprehensive methodology was conducted are shown in yellow on Figure F2.1.

Survey coverage across the Project disturbance area was achieved using a variety of methods, according to the nature of the ground surface visibility present. Where ground surface visibility was negligible (such as in an area with dense grass cover and no erosion scalds), sample traverses would be conducted either on foot or via four wheel drive motor vehicle. In areas characterised by a low incidence of ground exposure, all substantial ground exposures were inspected on foot. This was often achieved in combination with vehicle based traverses between exposures. In areas with a greater incidence of surface exposure, survey coverage was achieved mostly or solely on foot using multiple and opportunistic traverses across the area. All ground exposures were inspected.

In large areas of bare ground (more than a hectare with a high exposure incidence and high ground surface visibility), multiple sample traverses were conducted on foot with the aim of inspecting all microtopographic variation and between 10 and 50% of the visible land surface.

All survey conducted in forest or closed woodland was conducted on foot. In all survey areas, the inspection of all old growth trees, sandstone tors and outcrops, and exposed vertical soil profiles was a priority. Where landforms were considered to have a high degree of archaeological potential (such as the Cumbo Creek riparian corridor, and debris slopes adjacent to escarpments), survey was conducted on foot using evenly spaced surveyors following both systematic formal strait line transects and opportunistic traverses. This configuration was adopted regardless of the degree of ground surface visibility present. A similar configuration was adopted for survey in forested areas. This provides a high degree of confidence in the inclusive nature of the survey coverage.

All sites encountered within the Project disturbance area were recorded to a sufficient level of detail to determine their type, size and nature. In addition, all potential archaeological deposits within rock shelter contexts were systematically recorded. Refer Attachment F4 for examples of the field data recording forms used for this Project. The parameters used in defining site types and potential archaeological deposits are described in Section F2.4 below.

The prediction of potential archaeological deposits in open contexts was conducted following the field survey program. This was due to two factors:

- the development of predictive criteria was dependent on the results of the current survey program as the extent of previous archaeological investigation within the local and broader area was limited; and
- the location of open context potential archaeological deposits is likely to be closely related to landform. Post-survey mapping of landform characteristics was considered to provide the most reliable method of mapping predicted archaeological sensitivity.

In general, up to ten lithic artefacts were described in detail for any particular site, together with any artefacts of particular interest. Where the visible number exceeded the number described in detail, a count or estimate of all surface artefacts was made, and a series of observations about the technological characteristics of the assemblage were recorded.

The generation of a total inventory of surface artefacts for each site, or a consistent percentage such as 10%, was not considered to be an effective methodology, or to add value of assessment conducted for this Project. It is known from previous Australian archaeological research that technological diversity in open context artefact distributions increases proportionately to the size of the assemblage. When site type and context variables are combined with generalised observations of the size and nature of the surface assemblage, the resulting record provides an effective baseline for assessing archaeological significance within the context of a surface survey based methodology.

F2.3.3 Survey of the Lands Adjacent to the Project Disturbance Area

The survey methodology for areas outside of the Project disturbance area differed from the rest of the coverage in the following ways:

- Survey areas were selected with the aim of characterising Aboriginal cultural heritage values within areas adjacent to the Project disturbance area, and/or with potential for archaeological conservation management. Full survey of these areas was not required. Survey focused on landform types where archaeological sites were considered most likely to occur, based on the experience gained during the previous surveys.
- The systematic recording of sites was prioritised over documenting potential sites. Where there was a high incidence of potential archaeological deposits in rock shelters, the recording of individual locations was replaced by broad area mapping of this occurrence (all shelters were inspected for rock art and archaeological deposits).

Areas in which this alternative survey methodology was conducted are shown in grey in Figure F2.1.

F2.3.4 Assessment of Archaeological Survey Coverage and Visibility Variables

For all survey methodologies and all survey areas, basic data regarding survey coverage, the incidence of ground surface exposures, and the average ground visibility within those exposures was noted. This data was used to generate an assessment of the visibility levels encountered by the surveys, and thus the effectiveness of the surface survey in measuring the archaeological resource present in the Project area. Refer to Section F7.5 for the results of this analysis.

F2.3.5 Geomorphological Assessment

A geomorphic assessment of the Project area was conducted by Dr Peter Mitchell of Groundtruth Consulting in December 2004. The assessment addressed the nature of and potential for subsurface archaeological material across the Project area. The assessment was based on literature review, air photo interpretation and a field reconnaissance survey. The results of this assessment have been incorporated into the *Environmental Context* and *Management Consideration* sections of this report (Sections F4 and F11).

F2.4 Recording Parameters

The archaeological survey aimed at identifying material evidence of Aboriginal occupation as revealed by surface and above ground artefacts, and rock shelters with potential archaeological deposits in contexts unassociated with artefacts. In addition, a number of places were identified by Aboriginal monitors and community members as having cultural value. Although in each case the validity of these places was the subject of debate between groups and between individual group members, their locations was still recorded. These places did not necessarily include archaeological or material evidence of human occupation. Where the identification of a material feature or place as an archaeological site differed between archaeologists and Aboriginal representatives, a recording of 'debated origin' was made.

The recordings generated by the survey fall into five broad categories: artefact occurrences (including artefact scatters and isolated finds), rock shelter sites, scarred or modified trees, potential archaeological deposits, debated origin recordings, and non-archaeological sites/places of reported Aboriginal cultural significance.

F2.4.1 Archaeological Sites

It is important to note the distinction between an archaeological site and a potential archaeological deposit or other form or heritage recording. The identification of a site is dependent on the presence of the material evidence of past Aboriginal occupation. A potential archaeological deposit consists of sedimentary deposit where there is considered to be better than low potential for the presence of buried Aboriginal artefacts. This potential is neither discounted nor confirmed by the surface evidence (which may or may not include surface artefacts).

For the purposes of this assessment, a site is generally defined as any material evidence of past Aboriginal activity that remains within a context or place which can be reliably related to that activity.

Frequently encountered site types within southeastern Australia include isolated finds, open artefact scatters, coastal and freshwater middens, rock shelter sites including occupation deposit and/or rock art, grinding groove sites and scarred trees. Most Aboriginal sites in the Upper Hunter Valley are identified by the presence of three main categories of artefacts: stone or shell artefacts situated on or in a sedimentary matrix, marks located on or in rock surfaces, and scars on trees.

An **isolated find** is a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a radius of 60 metres. In some cases a larger radius may be applied depending on a site specific assessment. Isolated finds may be indicative of:

- random loss or deliberate discard of a single artefact;
- the remnant of a now dispersed and disturbed artefact scatter; and
- an otherwise obscured or sub-surface artefact occurrence.

Except in the case of the latter, isolated finds are considered to be constituent components of the *background scatter* present within any particular landform.

The distance used to define an isolated artefact varies according to the survey objectives, the incidence of ground surface exposure, the extent of ground surface disturbance, and estimates of *background scatter* or *background discard* densities. In the absence of baseline information relating to background scatter densities, the defining distance for an isolated find must be based on methodological and visibility considerations. Given the varied incidence of ground surface exposure and deposit disturbance within the Project area, and the lack of background baseline data, the specification of 60 metres is considered to be an effective parameter for surface survey methodologies. This distance provides a balance between detecting fine scale patterns of Aboriginal occupation and avoiding environmental biases caused by ground disturbance or high ground surface exposure rates. The 60 metre parameter has provided an effective separation of low density artefact occurrences in similar southeast Australian topographies outside of semi-arid landscapes.

Background scatter is a term used generally by archaeologists to refer to artefacts that cannot be usefully related to a place or focus of past activity (except for the net accumulation of single artefact losses).

Two or more artefacts, situated no more than 60 metres away from any other constituent artefact located on the ground surface, and/or within a sedimentary matrix, and in an open context, are classed as an **open artefact scatter**. The 60 metre specification relates back to the definition of an isolated find (refer above).

In a **rockshelter**, the presence of one or more artefacts within or immediately adjacent to the sheltered space constitutes a site. Unlike a single artefact in an open context, a rock shelter provides a probable occupational focus for the interpretation of a single artefact. As a consequence, the uncertainty associated with the isolated find category are not considered necessary.

Any location containing one or more marks of Aboriginal origin on rock surfaces is classed as a site. Marks typically consist of grinding features such as **grinding grooves** for hatchet heads, and **rock art** such as engravings, drawings or paintings. The boundaries of these sites are defined according to the spatial extent of the marks, or the extent of the overhang, depending on which is most applicable to the site.

F2.4.2 Scarred or Modified Trees

Scarred or modified trees form a major recording sub group. Each tree is normally considered to be a separate recording. The identification of a scar as Aboriginal in origin is dependent on a set of inter-related interpretive criteria. The credibility of alternative causal explanations such as natural traumas and other types of human scarring must be tested for each scar.

A number of diagnostic criteria have been developed to assist in the identification of Aboriginal scarred trees. The following numbered criteria are based on archaeological work conducted by Simmons (1977) and Beesley (1989). It should be noted that these criteria are not based on well substantiated and replicated data, and their application is mostly qualitative in nature. This is because of the long time scale required to correlate trauma types with regrowth patterns, and the destructive nature of some testing methodologies supporting radiocarbon dating and dendrochronology.

1. *The scar does not normally run to ground level:* (scars resulting from fire, fungal attack or lightning nearly always reach ground level). However, ground termination does not necessarily discount an Aboriginal origin (some ethno-historic examples of canoe scars reach the ground).

1(a). *If a scar extends to the ground, the sides of the original scar must be relatively parallel:* (natural scars tend to be triangular in shape).

2. *The scar is either approximately parallel sided or concave, and symmetrical:* (few natural scars are likely to have these properties except fire scars which may be symmetrical but are wider at the base than their apex. Surveyors marks are typically triangular, and sometimes have a worked surface).

3. *The scar should be reasonably regular in outline and regrowth:* scars of natural origin tend to have irregular outlines and may have uneven regrowth.

4. *The ends of the scar may retain evidence of the original scar shape, such as being squared off, or pointed.* (In a majority of cases, pointed ends are simply the likely result of natural regrowth across the scar surface and the original scar shape cannot be reliably determined). A 'keyhole' profile with a down-aligned 'tail' is suggestive of natural branch loss).

5. *A scar which contains adze or axe marks* on the scar surface is likely to be the result of human scarring. The morphology and distribution of such marks may lend support to an interpretation of an Aboriginal origin: (marks produced after the scarring event may need to be discounted).

6. *The tree must date to the time of Aboriginal bark exploitation within its region:* (within the Upper Hunter a scar age of at least 100-150 years is considered to be prerequisite)

7. *The tree must be endemic to the region:* (and thus exclude historic plantings).

Field based identification of scarred trees, is rendered difficult by the limited nature of the evidence available for interpretation. In most cases a recorder only has access to surface features, and extensive regrowth or erosion has obscured any potentially surviving diagnostic features. As a consequence most interpretations are qualified by a classification of the recorder's degree of certainty. This refers to two stages of interpretation. The first is a determination of a human rather than a natural origin. The second is the determination of an Aboriginal rather than a European or other non-indigenous origin.

In the Project area, a significant number of the scarred tree recordings have a high degree of confidence in the interpretation of an intentional human origin. However, the differentiation of an Aboriginal origin from other ethnic groups remains difficult. This is because past rates of regrowth for local trees are not known, and following initial European contact, the common use of metal tools and possibly also harvest techniques obscure ethnic origin. An added complication is that Aboriginal people may have cut bark for trading with Europeans, and as a consequence the shape of the scars may relate to European material usage such as for roofing slabs.

The following categories have been used when recording scarred trees:

Aboriginal Scarred Tree	This is a scar which conforms to all of the criteria and/or has, in addition, a feature or characteristic which provides definitive identification of an Aboriginal origin, such as diagnostic axe or adze marks, or documentary or oral testimony. All conceivable natural causes of the scar can be reliably discounted. This is a rare classification and no recordings of this type were made by the field archaeologists in the Project area.

Probable Aboriginal Scar	This is a scar that conforms to all of the criteria and where a human origin is thought most likely. Despite this, a natural origin cannot be ruled out. An Aboriginal origin is considered to be the most probable, based on the morphology of the scar and its age.
Possible Aboriginal Scar	This is a scar that conforms to all or most of the criteria and where the potential for an Aboriginal origin is considered by the recorder to be roughly equal to a possible natural origin, or a European/Surveyor origin The characteristics of the scar may also be consistent with a natural cause.
Probable Surveyor's Scarred Tree	This is a scar that conforms to all of the criteria and where a human origin is thought most likely. An original function as a European boundary marker or surveyor's reference tree is thought to be most likely due to the estimated age of the scar and the position of the tree on or near a fenceline, or cadastral boundary or corner. Despite these interpretations, an Aboriginal origin cannot be entirely ruled out.
Surveyors Reference Scarred Tree	This is a scar that conforms to all of the criteria and where a surveyor origin is considered highly probable due to the presence of carved portion numbers on the scar surface, the location of the tree on or near the corner of cadastral boundaries, and the estimated age of regrowth.
Debated Origin	In a number of cases, interpretations of scars made by field archaeologists, using these criteria and classifications, were in contrast to interpretations communicated by Aboriginal representatives. In these cases, the representatives considered that an Aboriginal origin was more certain than that allowed for in the archaeological assessment, which generally considered a natural or non-indigenous human origin more likely. In these cases, a recording was made and tagged as having a 'debated origin'. The classification employed follows the archaeological interpretation, such as 'probable surveyors scarred tree' or simply 'scarred tree' where a natural origin was favoured.

F2.4.3 Potential Archaeological Deposits

A potential archaeological deposit, or PAD, is defined as any location where the potential for subsurface archaeological material is considered to be moderate or high, relative to the surrounding landscape. The systematic recording of PADs unassociated with surface artefacts was limited to those occurring within rock shelters during the field program.

The following criteria are used as guidelines in identifying potential archaeological deposits in rock shelters:

- the shelter should contain a sediment floor at least one square metre in area;
- the shelter deposit must be at least 5 cm in estimated maximum depth;
- the shelter deposit should be relatively compact and show evidence for a significant period of accumulation (the deposit should not be spongy and contain only clean sand derived from recent stone surface weathering);

- the shelter space should be at least one metre high and one metre deep (but exceptions may occur, such as where the deposit is deep); and
- the shelter interior should be relatively dry.

Where one or more surface artefacts occur on a sedimentary deposit, either in an open or rock shelter context, a PAD may also be identified where there is insufficient evidence to assess the nature and content of the underlying deposit. This is mostly due to poor ground surface visibility.

F2.4.4 Recordings with a 'Debated Origin'

In a number of cases, archaeological interpretations of material features or traces made by field archaeologists, were in contrast to interpretations communicated by Aboriginal representatives which were more conservative. In these cases, the representatives considered that an Aboriginal origin was more certain than that allowed for in the archaeological assessment, which generally considered a natural or non-indigenous human origin more likely. In these cases, a recording was made and tagged as having a 'debated origin'.

F2.4.5 Non-archaeological Sites/Places of Reported Aboriginal Cultural Significance

The location, nature and extent of these recordings were conveyed to the archaeologists in the field by the Aboriginal survey participants. Although in each case, the validity of these places was the subject of debate between groups and individual group members, their locations were still recorded. The identification of these places is based on the cultural knowledge and beliefs of the individual(s) identifying them.

F2.4.6 Geomorphological Landscape Categories

In order to record landscape variables relevant to each heritage recording, the following categorisations were used:

Broad Scale Landscape Context

This classification seeks to record the broad scale context of the recorded place, and in particular, position relative to the total relief and drainage pattern within the Project area. All of the categories are dependent on and relative to the morphology of the surrounding topography and are not defined simply by geology, or elevation. The following four categories were used – Valley Floor, Basal Valley Slopes, Mid Valley Slopes and Upper Valley. Descriptions of these categories are provided in Section F4.4.

Fine Scale Landscape Context

This typology seeks to record the fine scale context of the recorded place, and in particular, position relative to the local relief and micro-topography. A total of thirty possible categories are presented on the site card, to best characterise the recorded context (refer site card examples in Attachment F4). Categories include topographies such as ridge and spurlines, knolls, saddles and shoulders, micro-topographic divisions such as crests, upper, middle and basal slopes, alluvial flats, fans and terraces. Other variables include major and minor stream margins, escarpments, isolated tors and talus slopes.

F2.5 Assessment Personnel

The Aboriginal cultural heritage assessment and survey was managed by Kelvin Officer.

Field survey personnel from Navin Officer Heritage Consultants were Tessa Bo Mah, Charlie Dearling, Vanessa Myles, Trish Saunders, Lindsay Smith and Tom Taverner.

Aboriginal community representatives who participated in the field survey program were:

- Larry Flick, Lavinea Flick, Nathan Flick, David Maynard and Rosie Pye, representing variously the Murong Gialinga Aboriginal and Torres Strait Islander Corporation or the Mudgee LALC;
- Eli Kennedy and Christine Maynard for the Murong Gialinga Aboriginal and Torres Strait Islander Corporation; and
- Martin DeLauney, Wendy Lewis, Lance Syme and Emma Syme for the Warrabinga Native Title Claimants Aboriginal Corporation.

Josh Peters and Stirling Bartlam, Resource Strategies staff members, also participated in survey work, provisioned survey teams with lunch, and facilitated property access.

A specialist geomorphology assessment of the Project area was conducted by Dr Peter Mitchell of Groundtruth Consulting.

This report was written and prepared by Kelvin Officer and Kerry Navin. Text on the geomorphology of the Project area was written by Peter Mitchell and edited by Kelvin Officer.

F2.6 Acknowledgments

Valued assistance and logistical support was provided to the whole field team by Peter Doyle and James Knowles of Excel Coal Limited (Excel Coal) and WCPL, and Stirling Bartlam, Joshua Hunt and Josh Peters of Resource Strategies.

The executive and administrative staff of the Mudgee LALC, the Murong Gialinga ATSIC, and the Warrabinga NTCAC assisted in facilitating Aboriginal community liaison and consultation.

Access to freehold lands was kindly provided by a number of current and former landowners within the survey areas. These included the Close, Gironda, Nagel, Power, Reid, and Robinson families.

The kind assistance of Mr Reid and his tractor is greatly acknowledged for removing an embarrassingly new Toyota Landcruiser from a very old soak.

Dr Peter Mitchell is indebted to Mr James Knowles, Project Geologist for arranging site access and for discussion of several geologic matters.

F3 ABORIGINAL COMMUNITY PARTICIPATION

F3.1 Relevance of the DEC January 2005 Interim Community Consultation Requirements

In January 2005, the Department of Environment and Conservation (DEC) instigated a new interim policy on Aboriginal community consultation requirements for applicants of section 87 or section 90 approvals under Part 6 of the *National Parks and Wildlife Act 1974*. The new policy, titled *Interim Community Consultation Requirements for Applicants* seeks to establish a standard procedure of media notifications, registration of interested parties, formalised opportunities for comment on methodology and reports, and tender procedures for the paid participation of Aboriginal representatives in fieldwork.

A subsequent letter from the DEC to Navin Officer Heritage Consultants dated 17 January 2005, and to WCPL dated 3 February 2005, specifies that the application of the new interim requirements is subject to a 'transition' phase. The letter states that the new requirements do not apply to cultural heritage assessments which were formulated and commenced, particularly those that had a Planning Focus Meeting, prior to January 2005.

The conduct of the Aboriginal cultural heritage assessment for the Project falls into the transitional phase and as a consequence the new interim requirements do not apply. The Planning Focus Meeting for the Project was conducted on 20 April of 2004, and the methodology for the cultural heritage assessment was drafted in consultation with the local Aboriginal community in August 2004.

Despite this, the staging and intent of the community participation process adopted for this assessment mirrors some of the key components of the new requirements. These include:

- an initial period of investigation to determine the appropriate stakeholders;
- inclusion of the Aboriginal community in the development and review of the assessment methodology;
- provision for the Aboriginal community to comment on survey results and participate in the drafting of management proposals;
- issue of reports summarising survey results and agreed management measures to the Aboriginal community for comment;
- provision for the Aboriginal community to provide assessments of Aboriginal cultural values, to comment on potential impacts to those values, and to provide input toward the management of those impacts;
- consideration of all Aboriginal community inputs; and
- a formal opportunity for the Aboriginal community to comment on management proposals.

F3.2 Description of Community Consultation and Participation

This section provides a chronological description of the Aboriginal community consultation program, inclusive of fieldwork participation. It traces the identification of a range of issues of concern to the various Aboriginal community groups and outlines the means by which they have been addressed.

F3.2.1 Preliminary Contacts and Identification of Aboriginal Stakeholder Groups

Inquiries were made in the first half of 2004 by Resource Strategies to the DEC, the Mudgee Shire Council and Ulan Coal Mine regarding the identification of the relevant Aboriginal stakeholder groups for the Project area. Following further initial contacts and discussions (inclusive of the groups below), it was determined that the following groups were the principal local Aboriginal community stakeholder groups:

- *Mudgee Local Aboriginal Land Council (LALC)*

  A council formed under State legislation with an elected executive which represents its membership of Aboriginal and Torres Strait Islander people, most of whom are resident within the defined Council boundaries.

- *Murong Gialinga Aboriginal and Torres Strait Islander Corporation (ATSIC)*

  An Aboriginal corporation which was established to address local Aboriginal cultural heritage issues, to represent the local Mudgee Aboriginal community, and to further the conservation and management of local Aboriginal heritage.

- *Warrabinga Native Title Claimants Aboriginal Corporation (NTCAC)*

  An Aboriginal corporation established to represent and further the interests of Aboriginal people who are descendants of the original tribal peoples of the Mudgee region and the Wiradjuri of the central tablelands.

F3.2.2 Initial Meetings with Aboriginal Stakeholder Groups

Following initial phone liaison with the above groups during June and July 2004, it was mutually agreed to hold an introductory meeting with each group where the development proposal could be explained, the forthcoming heritage assessment could be discussed and formulated, and questions could be raised and answered.

Two meetings were subsequently held on 5 August 2004. A combined meeting with members of the Mudgee LALC and Murong Gialinga ATSIC was held at the Land Council office in Mudgee at 9:00 am. A meeting with the Warrabinga NTCAC was held in the afternoon of the same day in Mudgee.

Present for each meeting were Mr Peter Doyle of WCPL, and Kelvin Officer from Navin Officer Heritage Consultants.

Issues discussed at each meeting included:

- the scope and likely impacts of the Project;
- the role and participation of the Aboriginal community in the assessment process (including Aboriginal input on cultural heritage assessment);
- the identification of appropriate Aboriginal community stakeholders;
- the known and likely Aboriginal cultural heritage values of the Project area;
- potential management of Project impacts on Aboriginal cultural heritage values;
- the field survey and recording methodology;

- Project development timing; and
- fieldwork organisation and representation.

F3.2.3 Field Survey within the Project Area

The conduct of the field survey program included the following avenues for the participation and involvement for Aboriginal community representatives:

- Each survey team included, when available, a representative from each of the three Aboriginal stakeholder groups.
- Community representatives were invited to discuss and participate in the interpretation of archaeological sites and their recording.
- Community representatives were also requested to identify, as appropriate, places or sites which they knew or believed to have Aboriginal cultural value (values which need not correspond with archaeological evidence or values). At the end of each survey day, both survey teams came together and provided a brief presentation of the day's findings and any identified issues. These meetings provided a forum for sharing the experiences of each survey participant and the discussion of methodologies and survey effectiveness.
- At the end of the second day of field survey, both survey teams met in the field and reviewed the survey methodology and discussed related issues.

  Topics raised included:

  – the need and staging for more detailed inspection of sites and the recording of all artefacts present;
  – Aboriginal cultural heritage management strategies;
  – the effectiveness of various survey methods and how those employed were commensurate with the aims of the assessment;
  – the need for each survey team to communicate their findings in a meeting at the end of each day; and
  – the role of Aboriginal people according to their relationship to the Project area (local residency, descent from original local tribal groupings, etc.).

F3.2.4 Provision of Reports of Site Data and Issues Raised

Reports of the site data and issues raised were provided to each of the Aboriginal stakeholder groups following each of the two field programs in the Project disturbance area. This information was provided as an aid to reviewing the results of the survey program, and assisting community discussion on Aboriginal cultural values and potential management requirements.

F3.2.5 Initial Written Feedback from Aboriginal Stakeholder Groups

Following completion of the second field program, a report was distributed which included detailed topographic and aerial photography mapping with the distribution of sites identified. The report was accompanied with an invitation to comment on the Aboriginal cultural values of the sites and Project area, and preferred site management strategies.

The Warrabinga Native Title Claimants Aboriginal Corporation (Warrabinga NTCAC) provided a written letter dated the 25 October 2004 and the Mudgee LALC provided a letter dated the 7 December 2004 (refer Attachment F3).

The Warrabinga NTCAC letter states that they have a responsibility to protect all episodes of Aboriginal heritage within the boundaries of the clans that form their group. It is reported that the results of the surveys to date had been discussed amongst organisation members and the following recommendations were presented:

- further investigation of features where an Aboriginal origin remains uncertain;
- preliminary field investigation over the remainder of the Project area;
- more intensive survey of extraction zones prior to ground surface disturbance;
- consideration of commissioning a local Aboriginal history study of the Wilpinjong/Wollar area;
- no photos of Aboriginal sites to be reproduced without permission of WNTCAC (permission for the inclusion of the plates in this report was provided by Wendy Lewis in March 2005);
- visitation to Aboriginal sites to be restricted to essential purposes only and in the company of a WNTCAC member; and
- monitoring of rock art sites on the periphery of the extraction zones.

The Warrabinga NTCAC stated that they looked forward to working further with the proponent as the Project progressed.

Most of the issues raised by the Warrabinga NTCAC are addressed by the strategies and objectives, which form the proposed *Aboriginal Cultural Heritage Management Plan* for the Project (Section F11). These include further investigation of sites prior to impact, site visitation protocols, and monitoring of fragile sites in peripheral areas. The need for further survey was addressed by the further field survey program conducted in January 2005.

The letter from the Mudgee LALC (7 December 2004) states that ‘our heritage is of great importance to us as Aboriginal people and we need to make it a priority to preserve our culture along every avenue as a principle issue’. The letter states that meetings have been conducted and that the community supported the forwarding of the correspondence to WCPL. The Mudgee LALC expresses its support for development and that they look forward to working together with WCPL to resolve certain issues which are paramount to the local Aboriginal community.

The letter cites the concern of the following parties regarding the potential impacts associated with the Project: the Mudgee LALC ('being the peak body'), the Murong Gialinga ATSIC, Traditional Elders of the Mudgee area, and the Wiradjuri Council of Elders. The letter puts forward the following issues:

- The Mudgee LALC is of the opinion that the survey coverage conducted to date was inadequate to fully appreciate the Aboriginal heritage of the Project area. Comprehensive survey over the whole of the WCPL exploration licence area is required, and in particular all escarpments within the licence area.
- Conservation areas must be established in significant areas and incorporated with adequate buffer zones to protect fragile sites from indirect impacts.
- Archaeological significance should not be confused with Aboriginal cultural significance, and they may not always be of the same order.
- Local Aboriginal groups will submit combined management recommendations after the completion of appropriate assessment works and perusal of the report.
- An Aboriginal cultural heritage management plan should be established to address on-going heritage issues during the life of the mine.
- Quarterly meetings should be conducted to address ongoing issues.
- There should be full involvement of local Aboriginal Elders.
- There should be opportunities for field visits with Elders and community members.
- Test excavations should be a part of all archaeological outcomes.
- Other items of concern are stated to be water conservation, opportunities for the Aboriginal community to gain restored lands, and the establishment of a foundation for local Aborigines,

It should be noted that subsequent advice from the Chairperson of the Mudgee LALC (16 February 2005) advised that this letter was not formally ratified and does not accurately reflect the view of the Mudgee LALC.

Notwithstanding the majority of the issues raised in the letter were addressed as follows:

- additional survey was conducted in areas adjacent to the Project disturbance area in a subsequent field program in January 2005;
- ECAs are proposed, including specific management of Aboriginal cultural heritage values;
- provision of reports summarising the survey results and management measures were provided to the community with an opportunity to comment;
- WCPL committed to the development of an Aboriginal Cultural Heritage Management Plan (ACHMP) in consultation with the Aboriginal community that details management strategies for the Project construction and operation;
- agreement to conduct meetings to address ongoing heritage management of the Project, meetings to be conducted quarterly or at longer intervals as determined by the participants; and
- the conduct of field visits to the Project area for Elders and other community members in January 2005.

F3.2.6 Additional Field Survey of Lands Adjacent to the Project Disturbance Area

Additional survey was conducted within sample areas outside of the Project disturbance area to address a number of requirements, including suggestions by some of the Aboriginal community representatives that extra survey was required to gauge the potential indirect impacts of the Project and to gain more understanding of the Project area archaeology. This field program was conducted in January 2005 and included survey of 560 hectares across a full spectrum of landforms, from the adjacent valley floors to the uppermost escarpment cliffs and plateau areas.

F3.2.7 Field Day and Workshop of Management Issues for Aboriginal Community Members

Following requests from some of the Aboriginal groups for an opportunity to allow Elders and other community members to view the Project area at first hand, a field day was organised at the end of the archaeological field survey program in January 2005.

Members of the Warrabinga Native Title Claimants Aboriginal Corporation inspected the area on the 14 January 2005. Members of the Mudgee LALC and the Murong Gialinga Aboriginal and Torres Strait Islander Corporation inspected the Project area on 15 January 2005.

Following each field inspection, a summary of the survey results and an outline of management issues were presented. Participants then discussed a range of topics, including the proposed Project, cultural values, and potential management strategies.

The following is a summary of the salient issues raised.

F3.2.8 Field Day and Workshop with the Warrabinga NTCAC 14 January 2005

Six Aboriginal people attended: Wendy Lewis, Robyn Williams and four children from the Whillock and Foley families.

- The participants stated satisfaction with the assessment methodology conducted to date.
- The organisation is prepared to provide written agreement to section 87 and 90 approval(s) for the whole open cut mine and contained infrastructure (whether conducted as one application for the whole area, or progressively in sections), provided that an ACHMP is developed in consultation with the Warrabinga NTCAC, and includes the strategies presented in the workshop, is instigated for the life of the Project.
- There are no Aboriginal cultural heritage values present within the Project area that should stop the Project from going ahead.
- Support was expressed for conducting further investigation, as part of an ACHMP, of sites to be impacted by the Project, including salvage excavation, and further research on scarred trees.
- The participants did not agree with the identification of recordings WCP58 and WCP59 as places of special Aboriginal cultural value, or as women's and men's sites respectively. It was stated that special management strategies were not required for these places.
- The art site WCP72 was considered of high significance requiring specific management inclusive of access protocols, detailed recording and on going monitoring. Fencing to prevent stock access was also required. The Warrabinga NTCAC should be involved in future management of the site.

- The DEC AHIMS (Aboriginal Site Register) location for a bora-ceremonial ground (36-3-0044) to the north of the Project area was discussed. The group did not hold particular concerns for its management, considering that Wilpinjong Creek, the Ulan-Wollar Road, the Sandy Hollow-Gulgong rail line and a proposed ECA is situated between it and the Project disturbance area.
- An education program on Aboriginal cultural values and site management should be conducted for on-site mine staff. Members of the Warrabinga NTCAC can assist in conducting and providing material for such a program.
- A keeping place should be established for the interim storage of recovered cultural material. A range of management outcomes exist for the permanent placement of recovered materials, including re-placement onto the post-mining rehabilitated land surface, and display of selected scarred trees.
- Rock shelters with archaeological deposit should be avoided wherever possible. If impact unavoidable, any impact should be preceded by careful archaeological salvage.
- Salvage works can be conducted progressively as required prior to direct disturbance by the Project.
- Outside of the Project disturbance area, management actions should include on-going vibration management and monitoring of art sites.
- Management in the proposed ECAs should include avoidance of known sites, where practicable, during any infrastructure development, and rehabilitation of vegetation. It was agreed that when undertaking activities such as fencing, planting trees or drilling a bore, it is not possible to know what is below the surface, but care should be taken to avoid sites based on surface inspections.
- Generally available versions of the cultural heritage assessment report should not include specific site location information.

F3.2.9 Field Day and Workshop with the Mudgee LALC and Murong Gialinga ATSIC 15 January 2005

Eight Aboriginal people attended: Christine Maynard, Lola McConnell, Julie Pumpa and Kevin Pumpa from the Mudgee LALC, Jenny Williams, David Maynard and Jean Thornton from the Murong Gialinga ATSIC, and a child from the Pumpa family.

- David Maynard stated that he was comfortable with the survey and coverage achieved to date but that there are still particular areas outside of the Project disturbance area, which he considered need additional consideration. These consist of the slopes and escarpments adjacent to the far southern and the western boundaries of pits 5 and 6.
- Following completion of the field inspection, all indicated that they were satisfied with the scope of the inspection and the understanding they had gained of the Project disturbance areas.
- When asked if there were any Aboriginal cultural values, which would exclude mining in the Project area, group members responded that they did not know of any but there could be people in the community who have knowledge of the issues involved. It is a matter of tracking people down who have the appropriate knowledge.
- David Maynard stated that avoidance of impact to a site should always be the first option considered.

- Concern was raised regarding impact to the reported women's site (that had been identified by some Aboriginal people) WCP58, which was (then) situated within the boundaries of proposed pit 2. Attendees agreed this place was correctly identified as a place of high significance to Aboriginal women and should be excluded from the mining area or remained silent on the topic. In addition, it was requested that the whole ridgeline be conserved. One attendee subsequently came forward and stated that they believed the site had no cultural value and should not have been recorded as such.

- David Maynard stated that he respected Eli Kennedy's views on the reported men's site (WCP59) and would not contradict his interpretation of the place. David noted that the knoll has a commanding view of the surrounding valley and that it may have been used in hunting and scouting for game, and keeping watch over the area. He stated that impact to this place should be avoided if possible, but realised give and take was required in arriving at a management strategy, which was agreeable to all parties.

- An analysis of the consequences of avoiding both the women's and men's sites (that had been identified by some people) (WCP58 and WCP59) should be undertaken.

- All agreed that the art site WCP72 was of high Aboriginal cultural value. Some representatives stated their belief that the site would have been a place for women and children. The proposed and agreed management strategies for the site were discussed, including fencing to prevent stock animal access, the creation of a baseline site recording, on-going monitoring, and management of vibration caused by mining actions.

- The DEC AHIMS registered location for a bora-ceremonial ground (36-3-0044) to the north of the Project area was discussed. The group did not hold particular concerns for its management, considering that a proposed ECA is situated between it and the Project disturbance area.

- Discussion was held about protocols to be followed in the event that a burial or its remains are encountered during mining operations.

- Discussion regarding blast (vibration) management, potential buffer zones and subsidence were held. It was clarified that the Project did not involve subsidence-inducing underground mining as experienced at Ulan Coal Mine.

- Discussion was held about the need for educating on-site mine staff about Aboriginal sites and heritage values. Caution was also expressed that too much information can also create problems. There was agreement that such a program should be conducted and that the Aboriginal groups should be directly involved.

- Salvage excavation and testing of potential archaeological deposits should be undertaken progressively prior to direct disturbance by the Project. Representatives of the Mudgee LALC and the Murong Gialinga ATSIC should be involved in this work.

- David Maynard identified any potential damage to the surrounding escarpment zones as a key concern of the community. In particular he expressed concern about the management of potential indirect impacts to art sites. Discussion was held regarding the proposed management strategies for fragile or sensitive sites (such as rock art sites and some rock shelters) in areas peripheral to the mining pits. Concerns included the potential impact of dust and vibration.

- David Maynard requested that consideration be given to conducting survey of the adjacent slopes and escarpments adjacent to the far southern and the western boundaries of pits 5 and 6. The potential for conducting this survey in a staged program and as part of the ACHMP was discussed. David stated that there should be a commitment in the EIS to survey of this area in the early stages of the Project.
- The possibility of Aboriginal involvement in the Community Consultative Committee (CCC) was discussed.
- Many participants agreed that representatives from both groups should be involved in training the workforce on Aboriginal issues.
- Opportunities for the employment of Aboriginal people in the various mining programs were discussed.
- The placement of infrastructure (such as bore sites) and other land management works (such as re-vegetation and fencing) in areas not subject to broad area ground surface disturbance from mining should include the avoidance of known sites and pre-clearance survey.
- Access by stock animals to proposed ECAs should be carefully managed.
- Preference was given by the group members for the interim storage of recovered cultural material in a keeping place (such as a locked cabinet) and subsequent permanent management options to include re-placement onto the post-mining rehabilitated land surfaces, and the possible retention of a select number to serve as a display and education collection. It was recognised that potentially recovered materials from scarred trees may have separate management requirements and may not be stored in a keeping place.
- An opportunity for further discussion and ratification of these management proposals by other members of the Mudgee LALC and the Murong Gialinga ATSIC was requested. The potential for staging of an extraordinary meeting of the MLALC for this purpose, with the attendance of WCPL representatives, was discussed. Problems about achieving required quorums were discussed together with the desirability of fitting into WCPL's timetable. It was proposed to work towards a 4 February meeting, subject to confirmation. The meeting was subsequently held on 9 February 2005.

F3.2.10 Provision of a Report of All Site Recordings and Proposed Management Strategies

A report summarising all field survey results was compiled following the completion of the third survey program. The report included proposed management strategies. This report included consideration of the previous letters received from the stakeholder groups and the management workshops held during the field days and workshops.

Electronic and hard copies of the report were provided to each of the three Aboriginal stakeholder groups on 25 January 2005. Each group was invited to comment on the management proposals, to contribute their assessments of Aboriginal cultural values, and to propose any further management strategies or changes. A period of 21 days was allowed to receive formal responses from each group.

F3.2.11 Presentation of a Summary of Findings and Management Strategies at a Meeting of the Mudgee LALC

A meeting of Mudgee LALC was held on the 9 February 2005, between 6 pm and 8 pm at the Mudgee LALC offices. This meeting was called by the secretary of the Mudgee LALC. Eleven members of the Mudgee LALC were present at the meeting. Five of these attendees were also members of Murong Gialinga ATSIC. Three unaffiliated people also attended the meeting.

In addition to Aboriginal community members, the following people attended: Allan Davies (Director) and Peter Doyle (Project Manager) from WCPL, Josh Hunt and Stirling Bartlam from Resource Strategies, and Kelvin Officer from Navin Officer Heritage Consultants.

Members of the LALC executive stated on the night that they believed irregularities in the notification may disqualify the formal status of the meeting. They also expressed their belief that a quorum of members was not present.

The information presentation and discussion was provided. The following is a summary of the key points arising from the discussion:

- The following commitments and accommodations were outlined by WCPL:
  - A field day for Elders and other community members was conducted for the two organisations on 15 January 2005.
  - Following an assessment of the coal resource affected, WCPL has committed not to include in the Project development application the proposal to open cut mine the ridge between the rock art site WCP72 and the area identified by some people in the community as a women's site (WCP58).
  - Additional archaeological survey will be conducted within selected escarpment areas (outside the Project disturbance area) within the first two years of operations, in accordance with specifications in the ACHMP. Management strategies will be developed for any new Aboriginal sites found, in accordance with the ACHMP.
  - More detailed inspection and salvage of selected areas of high archaeological interest as part of the ACHMP implementation.
  - Quarterly meetings to be held with representatives of the local Aboriginal community regarding the management of Aboriginal cultural heritage during the operation of the mine. WCPL agree to facilitate these meetings.
  - WCPL to support an initiative to include an Aboriginal community representative on the Project Community Consultative Committee (CCC).
  - Aboriginal groups to be involved in the education of staff/machine operators.
  - WCPL agree to allow access to the three proposed ECAs and to facilitate controlled access to other Aboriginal sites, subject to operational and safety requirements.
- David Maynard raised concerns about the degree of survey coverage on escarpments adjacent to the Project disturbance area, particularly in the southwestern portion of the Project area, and about sampling of other areas.
  - WCPL committed to conduct additional archaeological survey of selected escarpment areas within the first two years of mine operations, as part of the ACHMP.

  - WCPL indicated that prior to the placement and construction of minor infrastructure outside of the areas currently surveyed, such as water bores and access tracks, a cultural heritage inspection process will be followed which will review previous work, avoid known sites, and involve a commitment to survey those areas which have not already been assessed.

- The potential for the employment of Aboriginal people was discussed.
  - WCPL noted that construction and operational jobs relating to the mine will provide benefits in the region, which can flow through to all of the community, including the Aboriginal community.
  - Aboriginal monitors will be employed in a capacity to be outlined in the ACHMP.
  - Interviews for mining related positions would be made available to Aboriginal people.
  - Aboriginal people would be invited to tender for land management contracts related to the Project.

- Matters relating to mine rehabilitation were discussed, particularly in relation to Cumbo Creek. It was explained that there will be a progressive rehabilitation process, and a strategy for construction of a new channel to divert the flow from its natural course across the pit area.

- Aleeshia Lonsdale asked whether there would be three Aboriginal representatives on the Community Consultative Committee (CCC), as there are three Aboriginal groups involved in this Project. WCPL indicated that the formation of the CCC was controlled by government agencies and that its representation was a matter for the CCC to determine. WCPL can certainly recommend that the Aboriginal community be represented. It could possibly be worked out at the separate quarterly meetings with Aboriginal Community representatives to have the CCC representative rotate between the three groups.

- Discussion occurred about mining methods.

- The timing and consultation required for the development of the ACHMP was discussed. WCPL indicated that the ACHMP would be developed in consultation with the local Aboriginal groups.

- Warranha Ngumbaay talked of customary lore and ceremonies that could be conducted before, during and after mining operations to minimise adverse impacts.
  - WCPL stated that this matter could be addressed in the ACHMP plan, and access to the land would be facilitated for the groups in accordance with the ACHMP.

F3.2.12 Consideration of Formal Responses Received from Aboriginal Stakeholder Groups and Incorporation into Draft Report

A letter from the Warrabinga NTCAC was received by WCPL dated 9 February 2005. A copy of the letter is provided in Attachment F3. The following is a summary of the letter's key points:

- The Warrabinga NTCAC is satisfied that appropriate levels of survey coverage have been achieved.

- Individually the Aboriginal sites within the Project area have minimal significance, however when considered as an inter-related complex of sites their significance is increased. Careful management and research in association with selective impact will both allow the development to proceed, as well as maintain, and in some cases enhance, this level of significance.

- The Warrabinga NTCAC appreciates the need for the Project to occur and that in some instances section 87 and 90 heritage impact permits are required. The Warrabinga NTCAC will consider all permit applications on a case-by-case basis.

- References to the locations of particular sites, including maps, should be removed from all publicly available documents (*subsequent discussions with the Warrabinga NTCAC in March 2005 resolved that inclusion of the diagrams shown in this report are acceptable*).

- The Warrabinga NTCAC looks forward to being involved in all further elements of Aboriginal cultural heritage management for the Project, including the development of an Aboriginal Cultural Heritage Management Plan, and the implementation of its strategies.

- The Warrabinga NTCAC would like to begin working towards a formal Native Title agreement with Wilpinjong Coal.

- The commitment of WCPL toward the conservation and protection of indigenous cultural heritage sites is demonstrated by their commitment to establish a number of heritage offset areas within the Project. Strategies for the culturally sensitive management of these areas will be detailed in the *Aboriginal Cultural Heritage Management Plan*.

A letter from the Chairperson of the Mudgee LALC to Resource Strategies was received on 16 February 2005 which indicated that (refer Attachment F3) the Mudgee LALC is generally satisfied with the consultation and assessment to date and will be discussing the Project in more detail on 28 February 2005. A letter will be forwarded after this meeting to inform on the decisions of the LALC regarding the Project.

F3.2.13 Further Meeting of the Mudgee LALC

A further meeting of the Mudgee LALC was held on the 28 February 2005, at the Mudgee LALC offices to consider a number of agenda items, including the Project. WCPL provided a representative at the meeting and the same material compiled for the previous 9 February meeting was discussed.

A letter from Larry Flick, the Chairperson of the Mudgee LALC was received on 1 March 2005 (dated 28 February 2005) following this meeting, which made the following points (Attachment F3):

- *The MLALC is satisfied with the approach taken by WCPL in the assessment of Aboriginal heritage at the Wilpinjong Coal Project site, including the level of consultation and survey methodologies.*

- *The MLALC is satisfied with the Aboriginal heritage management measures proposed by WCPL and the development of the Aboriginal Cultural Heritage Management Plan.*

- *The MLALC supports the development of the three Enhancement and Conservation Areas proposed by WCPL and is satisfied with them.*

- *The MLALC would like to work closely with the WCPL in the development of the Aboriginal Cultural Heritage Management Plan and the management of Aboriginal Cultural Heritage at the project site.*

- *The Mudgee LALC would like further investigation into the creation of Aboriginal employment initiatives such as Apprenticeships/Traineeships at WCPL.*

F4 ENVIRONMENTAL CONTEXT

F4.1 Background

The following discussion is largely based on a geomorphological assessment of the Project area completed by Dr Peter Mitchell in December 2004.

Most of the Project area lies on the southern bank of the Wilpinjong Creek between the Goulburn River National Park and the Munghorn Gap Nature Reserve (Figures F1.1 and F1.2).

Wilpinjong Creek is situated in the upper reaches of the greater Hunter River Catchment, approximately 10 km east of the Great Dividing Range. It flows predominantly to the east and joins Wollar Creek, seven kilometres south of the Wollar Creek confluence with the Goulburn River.

Local rainfall is about 650 mm per annum and evaporation is about 1,700 mm per annum. Some of the underlying sedimentary rocks in the Project area are commonly associated with saline groundwater and dryland salinity and brackish stream flows can be expected in the lower parts of the Project area.

Few previous geomorphic or pedologic descriptions have been published at a scale that is particularly useful for studies at the Project scale. According to Story *et al*. (1963), the licence area is bordered by rugged topography of the *Lee's Pinch* land system, the valley floor is undulating lowlands of the *Killarney* land system, and they recognise three rounded hills of the *Glendower* land system in the valley. Lawrie and Murphy (1998/9) (DLWC Soil Mapping) subdivided the original Lee's Pinch land system into the plateau unit which they called the *Munghorn* plateau soil landscape and the cliffs plus the debris slopes which used the same original Lees Pinch soil landscape. Lawrie and Murphy (1998/9) used the more appropriate local name of the *Ulan* soil landscape for the main valley rather than Killarney. They did not differentiate any hill features in the valley but did add a strip of shallow texture contrast soils along Cumbo Creek, which they allocated to the *Barigan Creek* soil landscape.

Both of these previous studies involved mapping at 1:250,000 scale and are consequently of limited application when assessing finer scaled topographic variation within the Project area. Story *et al*. and Lawrie and Murphy are useful in that their landscape and soil profile descriptions are consistent and they are important because both identify texture contrast soils (Duplex profiles in the sense of Northcote, 1971) as the dominant profile types. Mapping of soils in the Project area has been conducted by JAMMEL Environmental and Planning Services in 2004 based on the soil landscapes defined by Lawrie and Murphy (1998/9) and the Great Soil Group System.

It is important to acknowledge landscape differences that are particular to the Project area that may be significant in Aboriginal site identification and interpretation when compared to archaeological assessments conducted in the central lowlands of the Hunter Valley. These include:

- A greater diversity of landscape types in a smaller area.
- A larger area of Triassic sandstone landscapes with high cliffs and extensive plateau. These landforms contain the potential for rock shelters sites, rock art sites, grinding grooves and stone arrangements.
- The main stream of Wilpinjong Creek is smaller than similar sized catchments in the central lowlands and it has been less affected by post-European erosion, and therefore Aboriginal sites may be more intact.

- A stream order approach to landscape analysis and Aboriginal site prediction that has proved useful in the central lowlands and on the Cumberland Plain in western Sydney would be ineffective within the Project area as many of the tributary streams have no defined channel. This also implies that water resources in this landscape were probably more limited than in the central lowlands where 'chains of ponds' were common at the time of European settlement.

F4.2 Geology

As would be expected for a region with rich coal resources, the geology is better documented than the geomorphology, with detailed mapping as early as 1900 (Anon, 1900).

The coal resource is in the late Permian Illawarra Coal Measures. It is underlain by Shoalhaven Group sedimentary rocks and overlain by early Triassic Narrabeen Group conglomerate and quartz sandstone. The coal resource thickens to the northeast and has a regional dip of about 1.5^{o} in that direction. A number of igneous dykes are known to intersect the sequence and small areas of Tertiary olivine basalt are located on the ridge crests within the National Park and Nature Reserve outside the licence boundary. All of these geological units are important factors in the differentiation of landscapes and several of them have implications for potential Aboriginal sites. Possible sources of raw materials for artefacts include basalt for edge-ground axes, chert, quartz, probably fossil wood from the coal measures, and the tough ironstone from the sand deposits. Silcrete might also be present in the area, as it has been reported in association with basalt in the Talbragar valley and further down the Hunter River.

Geological mapping and exploration drilling by the former Department of Mineral Resources, Robertson Research (1979), Geological Survey (1998), and WCPL has been used to construct the following stratigraphic section of the rocks and sediments in the Project area (Table F4.1).

Table F4.1
Stratigraphy of the Rocks and Sediments in the Project Area

Geological Age	Group and Formation	Lithology and Other Characteristics
Quaternary		Colluvial slope mantles and valley alluvium. No reliable ages have been determined and basal units may be late Tertiary rather than Quaternary.
Tertiary	Basalt flows and sills circa 14 million years old	Patches of olivine basalt on the sandstone plateau outside the perimeter of the WCPL exploration licence. One small outcrop of a possible sill was located in the gap at the head of Spring Creek. This material would be suitable for edge ground axes.
	Igneous dykes	Weathered dykes of 'trachyte' occur within the WCPL exploration licence striking slightly east of north, age unknown.
Probably Triassic		Quartz sand and gravel deposits of limited extent on low crests at about 400-420 m elevation. The origin of this material is uncertain.
Early Triassic	Narrabeen Group Wollar Sandstone Formation	Quartz, rhyolite and chert pebble conglomerate and quartz sandstone. Forms prominent cliffs 20-50 m high around the valley margin. The entire Triassic sequence is about 150-200 m thick.
Late Permian	Illawarra Coal Measures – Singleton supergroup	Total thickness of the coal measures is about 115 m, including a total of 14-25 m of coal.
	Upper coal seams	
	Sandstones	
	Ulan coal seam	
	Marrangaroo conglomerate	Basal conglomerate forms a prominent rock bench along the middle reach of Cumbo Creek.
	Shoalhaven Group	Siltstone and sandstone.
	Berry Formation	
	Megalong conglomerate	Pebble conglomerate. Not exposed on site.

F4.3 Geomorphic Units

Five geomorphic units were identified across the Project area:

1. Sandstone plateau and prominent cliffs.

2. Steep debris slopes with numerous large boulders buried and partly buried in the colluvial mantle.

3. Gentle bedrock slopes on Permian sedimentary rocks merging with alluviated valleys.

4. Isolated hillcrests within the valley covered in porous quartz sand and gravel.

5. Wide flat valleys filled with deep alluvium, with poorly defined creek channels and reported palaeochannels.

The units are linked to one another in a suite of processes and several can be defined geologically. Their broad pattern is depicted in Figure F4.1 and each unit is discussed below with reference to particular localities. The relationship between these units and the landform categories used in the archaeological analysis is outlined in Section F4.4.

F4.3.1 Sandstone Plateau and Prominent Cliffs

Most of the high ground within the vicinity of the Project area is within either Goulburn River National Park or Munghorn Gap Nature Reserve. These areas are lower Triassic Narrabeen Sandstone plateau or ridges with sandstone and conglomerate cliffs forming a prominent escarpment at the margins of the Project area. Only two significant areas of cliffed plateau are included within the Mining Lease Application Area, one on the eastern margin that is Crown reserve and the second a small part of a vegetated northern promontory that extends from the Munghorn Nature Reserve between Spring Creek and Narrow Creek. Both these areas were mapped as the Lees Pinch soil landscape by JAMMEL, 2005 (Appendix M). No plateau or escarpments occur within the Project disturbance area.

Lawrie and Murphy (1998/9) mapped the majority of the sandstone plateau as the Munghorn Plateau soil landscape. They described it as an area of extensive rock outcrop with siliceous sands, yellow earths and yellow podzolic soil profiles. This area was not subject to assessment in the Project soils surveys as it is outside of the Project disturbance area.

The cliff faces and drainage lines on the plateau are structurally controlled. Joints and bedding planes define coherent blocks of sandstone in the cliff face and open cracks or crevasses develop along the upper edge of the cliff line. The bedding is horizontal and three near vertical joint sets are evident. Based on topographic mapping and aerial photograph interpretation all appear to have similar spacing and persistence and they are oriented at about 10-20^{0}m, 80-100^{0}m and 140-150^{o}m. At the cliff face, blocks of sandstone or conglomerate in the range 6-8 m high, and with generally prismatic section about 8-12 m on either face slowly become isolated as pillars that are eventually subject to mass failure.

The primary cause of failure may be due to a slow collapse of weaker sedimentary rocks (shale for example) at the base of the cliff enabling the slow outward movement of joint blocks and eventual toppling of the blocks as individual rock fall events. This process is similar to the 'block gliding' described by Young (1983). Some blocks fall backward and receive support from the cliff face. They can remain in this quasi-stable condition for centuries before falling again. Other blocks topple at a critical moment, roll down the debris slope and come to rest on one another or as isolated large boulders on the slope. Some smaller movement of blocks is contemporary but is little more than jostling and adjustment of blocks that have moved more substantially in the past. The evidence for this limited movement are fresh fractures in blocks that are resting against one another in inherently unstable positions and slabby blocks on the main cliff lines that bridge previously fallen blocks or lie back against the cliff.

Two forms of rock shelter can develop along the foot of the cliff. The first is the condition described above when a block has moved so as to lean back on the cliff face or a cantilevered block has collapsed onto other rocks leaving a substantial open space beneath or behind it. These overhangs could be associated with Aboriginal occupation debris, depending on their size and amenity. The rock surfaces in these shelters are commonly cemented and are generally not prone to fretting but most of the sandstones and conglomerates are coarse grained and do not present a good surface for the application of rock art pigments.

The second type of shelter occurs where a fretted hollow is formed in friable sandstone. In these shelters, sand is eroded from behind the case hardened rock face by grain separation due to moisture changes affecting clays and perhaps small amounts of salt in the rock. Larger shelters of this type, with level sediment floors may potentially have been used as Aboriginal occupation sites and retain occupation deposits. Such occupation may have included the creation of rock art in the form of applied pigment, however the potential for pigments to remain in these shelters is limited. This is due to the prevalence of actively eroding rock surfaces through 'fretting' and granular decay, and the insufficient consolidation or cementation of the rock matrix.

A high incidence of shelters formed by cavernous weathering was observed along the base of the sandstone escarpments which fringe the upper slopes, and under the dislodged blocks now spread across the steep debris slopes below the escarpments. Most of the shelters formed within the escarpment were found to have sloping rock floors and display shallow deposits of loose, light coloured sands derived from actively eroding interior rock shelter surfaces. None of the shelters with these characteristics were found to contain Aboriginal artefacts, rock art or archaeological deposits.

F4.3.2 Steep Debris Slopes Below the Cliffs

Slopes immediately below the cliff faces are steep debris slopes (18-22^{o}), grading to more gentle slopes (5-10^{o}) and to an abrupt change of slope at the valley floor. This was mapped by Lawrie and Murphy (1998/9) as the Lees Pinch soil landscape that they describe as cliffs and debris slopes on Narrabeen Sandstone. Most of the Lees Pinch soil landscape within the Project soil mapping area was identified by JAMMEL, 2004 (Appendix M) as lithosols, with lesser areas of red podzolic and earthy sands. Numerous isolated boulders are found partly buried on the debris slope, which from a geomorphic and archaeological perspective are quite important (Plates F4.1, F4.2, F4.3 and F4.4).

All of these boulders are derived from the cliffs upslope by rock fall. Mass movement failures occur as single large columns of rock topple from the cliff face down onto the debris slope and break up in transit. All of the observed failures are of an estimated age in hundreds to tens of thousands of years. Only one relatively recent failure was noted along an escarpment.

At the junction of the debris slope and alluvial fans in tributary streams, or on the alluviated valley floor (terrace margin), the large blocks are scattered where they came to rest. The blocks can have any bedding plane orientation, demonstrating that they are not outcrops of sandstone. Over time these blocks are being buried in colluvial and alluvial sediments. Most are buried to about 30-50% of their apparent dimensions and some were totally buried and have now been exposed by gully erosion. Very few blocks were seen that had fresh fractures or any other evidence of having moved in recent centuries and it appears that cliff instability and mass movement events are episodic, infrequent events of the past. This observation suggests that some time in the past (and still in the Quaternary) cliff instability may have been greater than it is at present.

Larger examples of fallen blocks are of potential archaeological interest as they may have been used as rock shelters by Aboriginal people. A variable minority of the larger blocks includes sufficient overhangs from either cavernous weathering (internal surface fretting) or the inclination of exterior faces to provide rock shelters with substantial weather protection. Typically, between 30 and 60% of these shelters inspected during this investigation were found to be consistent with criteria for the identification of potential archaeological deposits. A high proportion of the shelters formed in large blocks near the base of the debris slopes was found to contain surface artefacts and probable archaeological deposits. The depth of burial of these boulders indicates the progressive accumulation of sediment derived from the upper plateau and implies a considerable passage of time Both of these factors introduce the potential for stratified archaeological deposits to be associated with these block shelters, and potentially at considerable depth and therefore age.

The soil materials on these steep slopes are not well exposed but the descriptions of Lawrie and Murphy (1998/9) provide some guidance. They range from shallow siliceous sands, yellow earths and yellow podzolic (texture contrast) soils depending on the subsoil materials present. The majority of these areas were mapped at a larger scale by JAMMEL, 2004 (Appendix M) as lithosols, with lesser areas of red podzolics, yellow podzolics and earthy sands. It is possible that some of the subsoils in these areas are derived from older slope mantle material and may include buried land surfaces.

F4.3.3 Gentle Bedrock Slopes on Permian Sedimentary Rocks

About half of the cleared land on the valley floor consists of gentle slopes (2-4^{o}) with occasional steeper rounded knolls based on Permian conglomerate, sandstone, shale and coal. Lawrie and Murphy (1998/9) map this as the Ulan soil landscape which they describe as Permian shale, sandstone, conglomerate, chert, coal and torbanite.

JAMMEL, 2004 (Appendix M) mapped the majority of the western and south-eastern valley floor as the Ulan soil landscape and an area in the north-eastern valley floor (Cumbo Creek) as the Barigan Creek soil landscape.

The soil mantles in the Ulan soil landscape are predominantly texture contrast profiles (Plate F4.7) with light textured topsoil over pedal clays.

The limitations of the Ulan soil landscape as described by Lawrie and Murphy (1998/9) include moderate to high erosion hazard and susceptibility to soil structure degradation. Such erosion potentially exposes and subsequently degrades Aboriginal archaeological sites.

In these soils the topsoil is a biomantle (formed by bioturbation and rainwash) in the sense of Johnson (1989), Paton *et al*., (1995) and Johnson (2002). It can be shown to be a separate stratum in that it crosses several substrates without significant change and it has all the archaeological properties described for such units in texture contrast soils by Dean-Jones and Mitchell (1993). Specifically these properties are:

- Sites on texture contrast soils are unlikely to be stratified in a chronologically useful sense.

- Artefacts will be confined to the biomantle.

- Artefacts will have been subject to surface dispersion, limited down slope movement, and differential burial or exposure by bioturbation agents and they will contribute to a stone layer between the A and B-horizon where artefacts of all ages accumulate.

- Despite the taphonomic processes affecting artefact distribution in the soil some site use patterns, such as knapping floors, may survive in plan form but with an extended vertical distribution of their components and possible mixing with artefacts from other events. For examples of the complexities of this process see Cahen and Moeyersons (1977), Moeyersons (1978) and Balek (2002).

- Because artefact burial is an ongoing process their surface visibility will be poor except where occasional flakes have been returned to the surface by ploughing, tree fall, animal burrows, or where erosion rates are higher than average.

- In sheet eroded areas a lateral pattern of artefact distribution and redistribution can be expected as erosion processes strip the biomantle and incise the B-horizon.

F4.3.4 Isolated Hillcrests Covered in Porous Quartz Sand and Gravel Deposits

In at least three locations on the valley floor, accumulations of well-rounded quartz pebbles to 30 mm and coarse quartz sand occur as hill crest cappings (Plate F4.8). The elevation of the base of each site is about the same at 400 m.

The best example of this material occurs at the Mittaville homestead where deep sands are exposed in the driveway to the house. During the survey period, a 2 m deep pit in white quartz gravel had been excavated for the installation of a swimming pool.

Mapping by Lawrie and Murphy (1998/9) did not identify any of this material and although Story *et al*., (1963) did map this hill crest, it was wrongly identified as part of the Glendower land system. JAMMEL, 2004 (Appendix M) mapped this area as part of the Ulan soil landscape. The gravely material is so porous that most rainfall passes through it quickly to the base of the deposit where it moves laterally on top of the underlying Permian bedrock to emerge in a mid-slope position as seepage zones. In many places the basal sand and gravel is secondarily cemented with iron oxides and possibly silica to form tough ironstone that often exhibits concentric pipe like structures up to 25 cm in diameter. Some of this material breaks with a good conchoidal fracture and was a potential stone source for artefact manufacture.

Ironstone which has formed at the interface of the sand and underlying bedrock is now evident as cobbles on the surface of a prominent spurline extending to the east of the Mittaville deposit. In this area the overlying sand deposit has been removed by erosion. The surface of many of the cobbles have weathered to form iron oxides or ‘ochres’ in the form of red (Hematite) and yellow (Goethite), the latter being predominant. Most of this material has been collected into piles as part of the removal of surface rock from the surrounding agricultural fields (Plate F4.9).

In some places sand is dominant over gravel but in every case it is coarse grained and contains scattered pebbles 5-15 mm in diameter. Such material is too coarse to be Aeolian (wind blown).

Three potential origins for the sand and gravel deposits have been postulated by Mitchell (2005):

- The hill crests are capped by completely weathered basal Triassic Wollar Sandstone and conglomerate. The lithology and grain size of the pebbles and the sand is consistent with this model and the apparently uniform elevation of the deposits supports it. Six kilometres northwest of Mittaville an underground mining operation to extract kaolin was operated between 1951 and 1968. Geological descriptions of this site by Pogson and Gibbons (1963) describe a sequence of quartz gravel and sand overlying the clay in terms compatible with the Mittaville gravel. Pogson and Gibbons were satisfied that this deposit was deep weathered Permian shale beneath completely weathered Narrabeen grit and conglomerate. The elevation of the clay seam is also about 400-410 m.
- The sand and gravel may have been deposited as alluvial sediments either in a high terrace of Wilpinjong Creek or as alluvial fan facies of Spring Creek. Arguments against this origin are that the deposits are too high in elevation and too mature (clean, well sorted, well rounded, and no soft components) to be consistent with either mode of deposition.
- The Project area is at the head of the Hunter River catchment and only 18 km from the western rivers divide. In the Gulgong – Home Rule area 30 km to the west alluvial deep leads and lacustrine deposits of gravel, sand and clay are found that are of mid-Tertiary age. These sediments were deposited in a drainage system that had a different geography from today's system and it is possible that the Mittaville gravels could have a similar origin. This is the least likely model.

On the present evidence the first model is preferred. The deposits are certainly too old to contain contemporaneous archaeological material however, Aboriginal occupation debris could potentially have been inserted into the upper layers (by the digging of pits) or gradual downward movement via bioturbation. The sandy nature and the depth of these deposits present some potential for Aboriginal burials to occur within these landforms because of the ease of digging (refer Section F6.4).

In summary the potential archaeological significance of these deposits are that:

- the ironstone may have been a source of raw material for artefacts;
- seepages around the flank of the hills may have supported particular food resources or could have been a focus for campsites; and
- the deeper sands may have been used for burials.

F4.3.5 Wide Flat Valleys Filled with Alluvium

Lawrie and Murphy (1998/9) mapped the valley of Cumbo Creek as part of their Barigan Creek soil landscape that is described as: Permian shale, sandstone, siltstone, conglomerate and chert. Red podzolic profiles on higher colluvial slopes and benches, low rises and flats and yellow podzolics on lower slopes. JAMMEL, 2004 (Appendix M) confirmed this, however, the eastern bank of Cumbo Creek near Wilpinjong Road was mapped as part of the Ulan soil landscape (predominantly yellow podzolic), as was the majority of the Project western valley floor (red and yellow podzolic soils).

This general description is reasonable for the valley side slopes, however the valleys have some unusual features that deserve particular description and comment:

- Spring Creek represents a typical tributary stream in long profile. From its source to the junction with Wilpinjong Creek three reaches can be identified. Firstly a partial gorge section with a rapid fall of 70 m in 250 m (15^0 average slope) from the sandstone plateau to the base of the steep debris slope. At this break of slope, terraces of alluvium and colluvium are prominent 3-4 m above the stream flat and for the next 1 to 1.5 km the gradient is reduced to 2^o and an ephemeral stream channel is present. The third section is the last 4 to 4.5 km of valley where the gradient is reduced, no well defined channel is evident, and the alluvium thins to about 3 or 4 m. This reach also exhibits seepage zones and salt scalds.

- Terraces are best developed in the narrow upper valleys immediately below the sandstone cliffs and steep debris slopes of the Lees Pinch soil landscape (Plates F4.10 and F4.11).

- The semi-confined upper valleys are a landscape where alluvial fans from tributary streams on either side of the valley merge with alluvial sediments to completely fill the valley alignment. An approximate depth of 10-15 m of sediment is believed to be present and the fill is so porous that virtually all runoff is absorbed (Plate F4.13).

Cumbo Creek is different in that it has a swampy channel floor with large reed-filled seepage/pools areas (Plate F4.14). Cumbo Creek also has the largest catchment of the streams in the Project disturbance area. This may generate sufficient runoff to maintain a channel. Prosser (1991) describes a common pre-European valley form in the eastern highlands that was a flat-floored grassy meadow through which runoff slowly filtered down valley. At points of incision in the valley scour pools formed large ponds often fed by groundwater seepage.

Other aspects of interest include:

- Coal exploration has demonstrated the presence of buried palaeochannels that cut the coal resource along the alignments of Spring Creek and Bens Creek (J. Knowles pers. com.).

- At the lower end of the tributaries, groundwater moving down the valleys seeps to the surface and evapo-concentrates to create salt scalds generally located between 50 and 200 m from Wilpinjong Creek.

- In comparison to the lower reaches of the Hunter Valley, relatively little post-European soil erosion or gully development has occurred.

- The main channel of Wilpinjong Creek has been destabilised and eroded down stream of the large swamp section at the junction of Narrow Creek near Keylah homestead. Permian bedrock is exposed in places along the streambed but most of this is probably fairly recent exposure. These rock exposures present some potential for Aboriginal grinding grooves and this is confirmed by recorded grooves downstream of the Mining Lease Application Area.

- Four metres of bedded loam and gravely sand alluvium is exposed in the stream bank in this section of Wilpinjong Creek (Plate F4.15). Soil development is not particularly strong in the upper unit but two buried soil profiles are evident in the face and can be traced laterally (Plate F4.15).

F4.4 Broad Scale Landform Units Used in Archaeological Analysis

The geomorphic units described above have relevance to the form that archaeological sites may take, the distribution of past valley resources, and the processes influencing the survival and condition of archaeological deposits. However, categories based solely on geomorphology are less meaningful for the analysis of Aboriginal occupation patterns, where distance to water, proximity to resources, and the ease of open cross-country movement are of primary relevance.

The geomorphic units described above have been considered when forming a number of broad scale landform categories, which have relevance to an archaeological understanding of the Project area. This grouping seeks to record the broad scale context of a recorded place, and in particular, the position of a place relative to the total relief and drainage pattern within the Project area. All of the categories are dependent on and relative to, the surrounding topography and do not relate solely to geology or elevation.

These categories are mapped on Figure F4.2 and are described below (reference to the geomorphic units is made in italics).

1. **The Valley Floor** – this category consists of the low relief and open topography that constitutes the valley floor. It includes the *wide flat valleys* geomorphic unit as well as some of the adjacent open and low gradient *bedrock slopes* terrain. These adjacent areas have similar open contexts and water access characteristics. Away from the main water sources, drainage lines tend to be ill-defined in this category.

   The boundary between the valley floor and basal slopes can be difficult to formalise and depends on the degree of gradient, position relative to a generalised break-of-slope, and continuity with upslope higher gradient landforms.

2. **Basal Valley Slopes** – this category includes the low to moderately graded terrain situated around the valley floor. It includes well defined crests and gullies, small tributary drainage lines, benches, alluvial fan and colluvial deposits, and the detached bedrock debris on the lower *debris slopes*. This category includes lower elevation *bedrock slopes,* the lower portion of the *debris slopes,* and some lower slopes on the *sand and gravel* deposits.

3. **Mid Valley Slopes** – this category includes the land between the escarpment and the basal valley slopes. This topography is more elevated, generally steeper, and more distant from valley floor water sources than the basal slopes. Typically this category is situated downslope of the escarpment cliffline, however some areas also occur on the higher portions of the major interfluve spurlines that extend north-south into the valley. Some bench areas on the eastern margin of the Project area are also included in this category.

   The boundary between basal valley and mid valley slopes can be marked by a difference in gradient, or may be arbitrarily defined according to proximity from the valley floor and escarpment. This category includes the higher elevation *bedrock slopes*, most of the *sand and gravel* unit, and most of the *debris slopes*.

4. **Upper Valley** – this category includes the *prominent cliffs* of the bedrock escarpment, the adjacent upper most *debris slopes*, and the *plateau* above the escarpment.

F5 ETHNO-HISTORIC CONTEXT

F5.1 Tribal Area and Language

At the time of European settlement, the Project area was situated within the territory of people belonging to the *Wiradjuri* tribal and linguistic group Tindale (1974). The Wiradjuri tribal area is situated within the Murray Darling Basin and extends across three general physiographic regions: the highlands or central tablelands in the east, the riverine plains in the west, and the transitional western slopes zone in-between (White, 1986:39).

The Wiradjuri is one of the largest language groups within New South Wales covering an area of 97,100 square kilometres (Ah See, 2003; Tindale, 2000). Wiradjuri speakers extended across the districts of Mudgee, Bathurst, Dubbo, Parkes, West Wyalong, Forbes, Orange, Junee, Cowra, Young, Holbrook, Wagga Wagga, Narrandera, Griffith, and Mossgiel (Tindale, 1974). While the area was noted to have a single basic language, various dialects could be found throughout the region (Tindale, 2000; Wiradjuri Language Development Project, 2004). The Project area is located within the central tablelands and on the eastern margin of the Wiradjuri territory.

Oral tradition records the presence of over 20 clans within the broader Bathurst – Mudgee region, organised according to matrilineal descent (Ms Wendy Lewis pers. com. 2004). Pearson notes that the Mudgee – Rylstone area probably formed the central focus for a clan territory. A clan being made up of a number of fairly independent groups, of up to 20 members, in friendly contact with each other, moving separately for much of the year over a shared territory (Pearson, 1981; Haglund, 1985). Wendy Lewis, a descendent of local Wiradjuri Peggy and Jimmy Lambert, believes the territory of her clan included the Dabee Station, Mount Nullo and ceremonial grounds in the district of Rylstone and that the Station name is based on the original clan name.

F5.2 Early References to Aboriginal Occupation in the Region

White people began their settlement of the upper Hunter valley from the 1820s and most of the prime grazing lands were taken up by the end of this decade (Wood, 1972).

In 1822, George and Henry Cox brought cattle from Bathurst and settled at Munna ('Menah') on the outskirts of the present town of Mudgee. They also attempted to settle at 'Guntawang' in the Gulgong area but were unsuccessful owing to trouble between their party and the local Aborigines (Dormer 1997). Attacks by Aborigines also followed settlement in the same year by John and Edwin Rouse. With consequential European reprisals a pattern of responsive violent contacts was established which was repeated in various locations across the Mudgee Rylstone areas (Dormer, 1997:150). The establishment of white settlements within the well watered and prime occupation areas of the district could only be seen as an invasion of territory by the Wiradjuri. This was a conflict that remained, for the most part, unmediated by attempts at cross cultural understanding or reconciliation.

The incidence of violent incidents on both sides of the conflict escalated. In a dozen raids between late May and mid June of 1824, it was estimated that sixty to seventy Wiradjuri, and twenty Englishmen had been killed in the Bathurst region. Many of these incidents related to actions by a Wiradjuri leader named Windradyne and his warriors. This situation prompted Governor Brisbane to declare martial law in August of 1824 for all of the country 'west of Mount York'. Troops under the command of James Morriset were brought into the district and proceeded to conduct a systematic campaign of raids, attacks and Aboriginal killings across the Bathurst region. These included massacres of both warrior and family groups in the Capertee, Wattle Flat and Cudgegong River regions. Grassby and Hill estimate that one third of the Aboriginal population of the Bathurst region perished, perhaps more than 1,000 people (Grassby and Hill, 1988).

These losses were clearly unsustainable for the Wiradjuri clans of the region and hostilities subsided. Martial law ended on 11 December of that year, and shortly after, Windradyne led his warriors into Parramatta on the 28 December.

By 1832 an Aboriginal mission station was established at Wellington by the Reverend Watson. This later closed in 1842.

In 1845 Graham D. Hunter, Commissioner for Crown lands in the County of Bligh (which included Mudgee-Gulgong), provided a report on the local Aborigines. He stated that the condition of the Aborigines in settled areas had not altered much in recent years. Some were employed and worked well, provided they could leave for periods of time when required by their tribal elders. In newly settled areas however the trouble was still occurring but that the police and the Commissioner were attempting to provide protection for 'both white and black people' (in Dormer, 1997:151).

Following the discovery of gold at Red Hill in April 1870, the non-Aboriginal population of the district increased greatly. By 1872 the population of Gulgong had reached 20,000. The increased population boosted the take up of land and by the late nineteenth century the movement of the Wiradjuri and their occupation of their territories would have been significantly constrained. Aboriginal occupation through this period would have been characterised by occupation and travel between encampments associated with white towns and stations, and the occupation of the remaining crown lands at the margins of European settled lands.

The lesser appeal of the rangelands to white settlers and their possible refuge role for the Wiradjuri may explain why the Upper Hunter valley Aboriginal populations survived longer than those of the lower valley (Rich, 1990:80). Many Aborigines however died in 1860 when there was a major influenza epidemic (Murray-Prior, 1973:27).

Following the violence of the first half of the century, the latter half was characterised by Aboriginal depopulation of the district. Some groups established local encampments and supplemented their economy with European goods gained through barter, labour or money from employment. Other groups and individuals were moved away onto missions and reserves by government authorities. A high mortality rate was reportedly suffered by the local Aboriginal populations during influenza epidemics in 1860 and 1902.

Local oral tradition suggests that following violent incidents, including 'massacres', between Europeans and Aborigines in the Wollar region, some local Aboriginal groups are thought to have been moved to the Brewarrina Station (Mrs Lyn Robinson pers. com Aug 2004). This station was gazetted as two government reserves in 1885 and 1887 (McGuigan n.d.).

A local Aboriginal encampment became established at Wollar, a small township situated on Wollar Creek, some four kilometres east of the Project area. There appears to have been an Aboriginal presence at Wollar for a significant portion of the late nineteenth century, which persisted into the twentieth century. The reported Aboriginal meaning of Wollar is, a waterhole in the rocks – from the word Wallar (Dormer, 1997:148), or a flat, near a creek (McDermott, 1985).

The following undated extract from a local Wollar correspondent was published by the Wollar Centenary Publications Committee (McDermott, 1985):

> 'By 1896 it was a rare sight, to see a colony of Aborigines, as most have long since died out in these parts – Wollar has such a small colony who have cosy quarters on the creek bank, living peaceably and happily enough and at times doing little jobs in the shape of 'ringing', burning off, and other things.

> The police are most particular about persons visiting the encampment without a permit, and he who infringes this rule runs the risk of incurring a substantial fine.'

Some of the town residents in 1985 told of their grandparent's memory of the Aborigines 'voices and laughter echoing across the creek in the night'. It is remembered that the Wollar Aborigines were decimated by an influenza epidemic in 1902 (McDermott, 1985).

Mrs Lyn Robinson, a local resident in the Project area relates how her mother-in-law remembered as a young child, local Aboriginal people passing through the valley and camping 'around the rocks'. She was born in 1906. This information places Aboriginal people camping and passing through the valley in the early twentieth century. Mrs Robinson believes these people were not those that occupied the Aboriginal encampment at Wollar (pers. com. Mrs Lyn Robinson February 2005).

A reference to local traditional Aboriginal practice in the greater Wilpinjong/Ulan area comes from a description of a ceremonial bora ground on Wilpinjong Creek by R.H. Mathews (Mathews, 1894). Mathews inspected the Bora ground near Wilpinjong Creek in December of 1893 in the company of a local resident, Mr William Carr (refer Section F5.3). Mathews notes that Carr had resided in the district since he was a boy and stated that he had known of the Bora ground for more than thirty years and that several Boras had been held there. This information indicates that the Bora ground was present by the 1860s and had been used by Aboriginal people. It is not clear however if these events were remembered as occurring in Mr Carr's lifetime, or prior to this.

The Aboriginal use of the Ulan/Wilpinjong Creek Bora ground in the mid to late nineteenth century would certainly be consistent with scattered references to traditional practice elsewhere in the Hunter Valley. These include a 'tribal fight' at Maitland in 1843 (Miller, 1986:54-6), the use of the 'Kelvinside' ceremonial ground near Aberdeen before 1872 (Brayshaw, 1966:119,122) and an initiation ceremony in about 1880 at Gresford (Miller, 1986:73) (Rich, 1990).

The Wollar district is intimately associated with another episode in the history of Aboriginal and European contact – the story of Jimmy Governor, his brother Joe Governor, and friend Jacky Underwood. Versions of their story have been published in both historical and fictional modes (Clune, 1958; Keneally, 1972; Moore & Williams, 2001), and adapted for film as 'The Chant of Jimmy Blacksmith' directed by Fred Schepisi.

A number of aspects of local Aboriginal life in the late nineteenth and early twentieth centuries can be identified from the Governor story:

- Aboriginal occupation appears to be focused on encampments next to towns and sources of employment for agricultural labour. These camps may have had a significant transient population.
- Aboriginal and White society was clearly differentiated and separated by social, legal and economic boundaries.
- Aborigines are interacting with White society but remain physically isolated to fringe locations and peripheral and periodic in their engagement.
- The location of Aboriginal camps infers that these communities are substantially dependent on components of the European economy, such as money and goods received in exchange for labour.
- Individuals and family groups were capable of movement over considerable distances, sometimes well beyond traditional tribal areas. This suggests people had experience and competence over a large area of country, perhaps as required by travel for seasonal employment and/or through social exchange and marriage.

- A high degree of cross-country knowledge and skill in living off the land is inferred. This may have included the continuity of traditional practices, such as the removal bark from trees for shelter.

F5.3 The Ulan Wilpinjong Creek Bora Ground

The DEC AHIMS Aboriginal site register includes a recording for a Bora ceremonial ground with a map grid reference situated north of the Project area (site no. 36-3-0044). A Bora ground is a generic name used by the DEC for an Aboriginal ceremonial ground where young males underwent an initiation involving ritualised instruction and traditional ceremony. Bora grounds generally consist of one or more circular rings defined by mounded earth and/or rocks. A pathway generally connected two of the rings and could be many hundreds of metres long. Typically one ring was associated with more public ceremonies and the second with restricted and sacred practice. Carved trees and incised or mounded ground sculptures were also a feature of the ground. Bora grounds are most often located on river flats and low ridges.

David Bell recorded the Bora ground on the AHIMS site register in 1981 as part of a larger NPWS research Project on carved trees. Bell's recording is based solely on a description of the site published by R. H. Mathews in 1894 (Mathews, 1894). Bell did not visit or attempt to verify the grid reference provided. The grid reference provided is prefaced with a 'c.' to indicate an approximate location, contains six figures, and references the Dubbo 1:250,000 map sheet. The location identified, which has a nominal accuracy of a 100 x 100 m square, is situated on the plateau margin of a major south facing escarpment. This is contrary to Mathew's description of the site's context. Separate research of this recording and its location has been undertaken and is available upon request. It is not detailed here because the site is neither within, or in the immediate proximity of, the Project area and information relating to this site is culturally sensitive.

F6 ARCHAEOLOGICAL CONTEXT

F6.1 Regional Overview

Within the Wiradjuri region, the presence of Aborigines in the Darling Basin has been dated to 40,000 years ago (Hope, 1981, cited in Haglund, 1985). A spread east into the mountains is thought to have occurred between 14,000 to 12,000 BP (**B**efore **P**resent), well before the end of the Pleistocene.

Broad range and regional studies undertaken in the Wiradjuri region include Pearson (1981), Haglund (1985) and White (1986).

Haglund conducted a study into the prehistoric heritage in the Mudgee Shire in 1985 and noted that in the Mudgee area prior to European settlement small groups of approximately twenty Aborigines acted independently, but engaged in friendly contact. These groups moved at short intervals, often a short distance or within the same area, to obtain and use different resources.

Despite opposition from the Aborigines, settlers, prompted by the need for new pastures due to a drought on the Bathurst Plains, arrived in the Mudgee area during the 1820s. The gold rush of the 1850s resulted in greater exploitation of the area by settlers (Haglund, 1985:5). Early explorers and settlers noted considerable variation in the numbers of Aborigines that would gather for food procurement activities during different seasons of the year. This seasonality was most obvious in the case of gatherings along major rivers, and it has been suggested that during dry periods the water holes remaining in the major rivers would become focal points for the usually scattered groups (Haglund, 1985:5).

Fifty-nine Aboriginal sites were identified in the Mudgee Shire by Haglund in 1985 through the NPWS Aboriginal Sites Register, with a further 11 known sites not listed on the register. Haglund recommended that the Mudgee Shire Council commission detailed archaeological investigations to ascertain the archaeological sensitivity of the area, and the condition of known sites (Haglund, 1985).

In 1981 Pearson completed a PhD thesis on Aboriginal and early European settlement patterns within the Upper Macquarie River region of NSW (Pearson, 1981). The Project area shares many topographic characteristics with the upper catchment sections of Pearson's study area. The majority of his field coverage was directed by information from informants and was thus skewed toward large or obtrusive sites, which had been recognised by local residents. Pearson excavated three rock shelter sites (Botobolar 5, and Granites 1 and 2) which provided a regional record of Aboriginal occupation dating back to around 7,000 years before present.

Pearson's analysis of the patterns of Aboriginal occupation involved an examination of site location characteristics in four sample areas. The following points summarise Pearson's results relevant to the present investigation:

- There is a strong relationship between site location and distance from water sources. Distance to water varied from 10 m to 500 m, but in general the average distance from water decreased as site size increased.
- Sites were found on hilly or undulating places rather than on river flats or the banks of waterways. However it was found that the regional incidence of landform variation biased this sample.
- Good drainage and views over watercourses and river flats were also considered to be important site location criteria.

- Most sites were located in contexts, which would originally have supported open woodlands, with small numbers in original grassland or forest contexts. However, this result is skewed by the predominance of the first vegetation type.
- Burial sites and grinding grooves were situated as close to habitation areas as geological constraints would allow.
- Ceremonial sites such as earth rings ('bora grounds') were located away from campsites.
- Stone arrangements were also located away from campsites in isolated places and tended to be associated with small hills or knolls or were on flat land.
- Quarry sites were located where stone outcrops with desirable working qualities were recognised and were reasonably accessible.
- Based on ethnohistoric information, Pearson suggests that Aboriginal campsites were seldom used for longer than three nights and that large archaeological sites probably represent accumulations of material over a series of short visits.

The Project is situated between the Munghorn Gap Nature Reserve to the south, and the Goulburn River National Park to the north. Both reserves are listed on the Register of the National Estate. These listings cite the inherent flora and fauna values of the reserves and also include mention of Aboriginal cultural heritage values. The Goulburn River National Park listing cites significant indigenous values have been determined in the National Park (DEH, 2005).

F6.2 The Local Area

Numerous archaeological assessments have been undertaken over the past thirty years within the general areas around the Project area, including Ulan, Gulgong and Mudgee. The majority of these studies relate to the Ulan Coal Mines and include site surveys, salvage excavations, site-specific investigations and rock art conservation and monitoring programs (Lambert, 1999). Studies have also been conducted within the local area for proposed transmission lines (Cubis, 1981), hard rock and sandstone quarries (Brayshaw, 1987,and 1988; Smith, 1987; Witter, 1988; Griffiths, 1994a), a sewerage treatment plant (Griffiths, 1994b), vineyards (Maynard, 1999) and roadworks (Benton, 2004).

Prior to the current survey, 197 Aboriginal sites were recorded on the DEC Aboriginal Heritage Information Management System (AHIMS) in a search area 40 x 40 km around the Project area. Site types include rock shelters with art and/or deposit and/or grinding grooves, artefact scatters, grinding grooves, scarred trees, a bora ceremonial/carved tree site, a quarry, a waterhole/well and an isolated find (see Table F6.1).

An early excavation of a rock shelter site at Bobadeen (some 20 km northwest of the Project) conducted by Moore in 1970 recovered 16,000 artefacts. These included a large proportion of Bondi points and bone implements. The majority of artefacts were quartz, followed by fine-grained grey chert. Similarities between stone working industries of the Hunter and inland groups were noted to possibly indicate that there was contact between the two groups, however this could not be confirmed by the recovered tools. Radiocarbon dating was conducted for the site, revealing a basal occupation date of 7,800 years BP.

Table F6.1
Indicative* AHIMS Recorded Site Types in the Local Area

Site Type	Number of Recordings (in a 40 x 40 km area around the Project Area
Shelter with art	27
Shelter with art and deposit	2
Shelter with art, deposit and grinding grooves	1
Shelter with deposit	36
Shelter with deposit and waterhole	1
Shelter with deposit and grinding grooves	1
Artefact scatter	90
Artefact scatter/waterhole	1
Artefact scatter/scarred tree	1
Scarred tree	5
Carved tree	1
Grinding grooves	10
Burials	1
Quarry	1
Isolated find	1
Bora-ceremonial and carved tree	1

Source: AHIMS (2004)
* Not all 197 sites included in this table.

McBryde's broad assessment of 5,000 km^2 covering Dunedoo, Gulgong, Wollar and Coolah resulted in the recording of thirty Aboriginal heritage sites, the majority of which were shelters with rock art. Other site types included shelters with deposit, grinding grooves and quarries (Haglund, 1981a).

Pearson (1981) conducted excavation of a rock shelter at Botobolar (some 25 km south of the Project). The basal occupation date obtained for the site was 5,500 years BP. Also in 1981, Cubis recorded two artefact scatters, two isolated finds and one shelter in granite with potential archaeological deposit in the course of a 35 km transmission line survey between Beryl and Ulan.

Brayshaw (1987) located six artefact scatters and one isolated find during her survey of a proposed hard rock quarry about nine kilometres west of Gulgong on the south bank of the Cudgegong River. This work was commissioned by Boral Limited as a component of an Environmental Impact Statement. All sites were assessed as being of minimal significance by Brayshaw (Smith, 1987). Following concerns expressed by the Central Regional Aboriginal Land Council Smith was commissioned to further assess the significance of the sites within the Project disturbance area (Smith, 1987). An additional seven sites, six artefact scatters and one quartz quarry site were located. The additional sites were assessed as being of some archaeological and interest, and all sites on the Cudgegong River considered to contain some research potential (Smith, 1987).

Further to this work by Brayshaw and Smith, Witter prepared management recommendations for the archaeological resources at the proposed Boral Quarry (Witter, 1988). In a visit to the area, Witter located a small basalt workshop area of 2 by 4 m on the edge of the basalt outcrop. The site included 200 flakes that were indicative of the processing of hatchet preforms.

Navin (1990) conducted a desktop study of Aboriginal heritage sites in Ulan, Broke, and Gunnedah. Within the Ulan area, this study documented 580 Aboriginal heritage sites. The relatively high number of rock art sites in the Ulan/Gulgong area was deemed to possibly indicate regionally specific art site traditions. Potential for artefact scatters was assessed on flats associated with valley corridors and adjacent sandstone slopes within sandstone ranges, with moderate potential along ridge crests. Potential for ceremonial sites, carved trees and art sites was also assessed (Navin, 1990).

An investigation of a proposed Sandstone Quarry at Ulan, approximately 40 kilometres North of Mudgee revealed no Aboriginal sites (Griffiths, 1994a).

In 1998, Kinhill prepared an Environmental Impact Statement for Ulan Coal MLA80, 10 km north of Ulan. Survey of this area revealed 66 shelter sites, 7 containing art, 1 with grinding grooves, and 2 with art and grinding grooves, several PADs and 16 open artefact scatters. It was noted that there was potential for further unrecorded artefact scatters in the Ulan study area (Kinhill, 1998).

Maynard (1999) identified two scarred trees in the course of a survey of an approximately 120 ha parcel of land – an extension to an existing vineyard – located three kilometres south of Gulgong. Maynard also noted that there was a probability that 'artefacts may exist below the grass cover particularly nearer the main Creek areas' (Maynard, 1999:6).

Previous research and investigation of the Ulan Coal Mines was summarised by Kuskie (2000). The majority of these studies have been undertaken by Haglund (1980, 1981a, 1981b, 1992, 1996a, 1996b, 1996c, 1999a, 1999b). Throughout the surveys and salvage excavations in the area, Haglund documented the presence of isolated finds, open artefact scatters, shelters with archaeological deposits, rock shelters with art, rock shelters with archaeological deposit and art, grinding grooves, and scarred trees, in varying numbers and densities. Haglund further provided a synthesis of historical and ethnographic information for the region. The surveyed areas were generally highly disturbed due to vegetation clearance, erosion and agricultural activities.

In 1996, Haglund (1996b) excavated a rock shelter site – DEC site 36-3-177. A total of 391 lithic artefacts and 374 flaking debris items were collected and recorded. The major stone material present was quartz, with chert, igneous rock, and petrified wood also identified. Haglund (1996b) interpreted the presence of cores, core fragments, flakes, flake fragments, flaked pieces and modified flakes as sporadic occupation of the shelter. She also postulated that times of occupation were associated with the production and/or repair of art. Despite the absence of dateable material, the site was considered to have been utilised within the last 5,000 years.

A survey of a four kilometre route for a proposed coal conveyor belt at Ulan by Corkill (1991) recorded two open artefact scatters and an isolated find. One of the artefact scatters located on a level bench on the west bank of Ulan creek contained 50 to 100 artefacts of quartz and chert.

Edgar (1997) conducted a survey at the Ulan Coal Mines to assess the archaeological sensitivity of the area within the Mining Licence 1366. Sixteen new sites were documented, with nine rock overhangs considered to have potential archaeological deposit. Site SG25, (DEC site 36-3-205), an ochre quarry and site SG22, which was associated with a rock pool, were both considered to be of high scientific significance.

Kuskie has more recently prepared two reports on the Ulan Coal Mines (2000, 2002). Kuskie's (2000) assessment of two Aboriginal grinding groove sites at Ulan Coal Mines aimed to determine whether the conservation of site Bobadeen 13 (BO13) would be a suitable alternative to site Bobadeen 5 (BO5) to comply with conditions in the Mining Licence 1468 Developmental Approval.

Site BO5 was recorded in 1995 by Haglund (1999a), who identified fifteen grinding grooves and several stone artefacts including a hatchet blank and flaked quartz. Site BO13 was recorded by Kuskie in 2000. Site BO13 extended over 160 x 115 m and comprised twenty five grinding grooves on five exposed rocks and a further sixty six grooves on exposed sandstone, as well as several stone artefacts. Upon comparison of the environmental and cultural contexts of the two sites, Kuskie (2000) concluded that while probable impact on Site BO5 was less than 60%, Site BO13 satisfied the specific ML1468 Development Approval condition in that it would present a suitable conservation alternative for site BO5.

In 2002 Kuskie conducted a survey of a proposed basalt quarry within Mining Licence 1468 in the Ulan Coal Mines. A quartzite isolated find was recorded in the course of the survey. He noted that quartzite was a naturally occurring material within the basalt quarry study area. According to Kuskie, it appeared that the artefact, a core, had been manufactured elsewhere and transported to its present locality. It was noted that the integrity of the area had been impacted by various factors including the removal of vegetation, erosion, pastoral activities, focalised impacts and bioturbation, and thus evidence of Aboriginal heritage had been adversely affected.

A comprehensive archaeological survey of Longwall Panels 18-22 in Mining Licences 1468 and 1341 within the Ulan Coal Mines was conducted by Kuskie and Webster in 2001. Fifty eight Aboriginal heritage sites, including fifty six open artefact scatters, one rock shelter with an archaeological deposit, and an ochre quarry were documented, along with six potential archaeological deposits. One hundred and seventeen stone artefacts were identified, with quartz being the major stone material. There was a low mean density across the longwall study area sample.

One burial site has been reported from the region and this is evidenced by a low surface mound of stones. This is consistent with other reported burial sites from the Mudgee region (pers. com. David Maynard Jan. 2005). None of these sites appear to have been recorded due to the exposure of skeletal material however. The possibility that burials occur in rock shelter deposits, as has been established elsewhere in the Sydney Basin is suggested by the discovery in the local Mudgee area of probable human bones in a rock shelter in the early 1930s. Police reportedly took custody of the material however a European or Aboriginal origin for the bones was not reported (pers. com. Mrs Lyn Robinson Feb 2005). No additional information has been found on this find.

F6.3 The Project Area

Prior to the current survey, eight Aboriginal sites had been recorded on the DEC AHIMS database near the Project area. These consist of a scarred tree, a grinding groove site, four rock shelters with rock art, an artefact scatter and a Bora ceremonial ground with carved trees (see Table F6.2). None of these occur in the Mining Lease Application area or Project disturbance area. Three sites are located within approximately 850 m of the Mining Lease Application Area (DEC site nos. 36-3-0044, 36-3-0103 and 36-3-0115) (Table F6.2 and Figure F7.1).

Site 36-3-0115 is of interest being the only local site with grinding grooves on *in situ* bedrock (Table F6.2). Approximately ten grinding grooves have recorded on the bed of Wilpinjong Creek at this site (outside of Project disturbance area).

Table F6.2
Previously Recorded Aboriginal Cultural Heritage Sites Near the Mining Lease Application Area

DEC Site Number	Site Name	Site Type	Comments
36-3-0044	Ulan Wilpinjong Creek	Bora/ceremonial ground and carved trees	Recorded by RH Mathews in 1894
36- 3-0098	Wattle Creek No 2	shelter with art	Recorded by Bluff in 1987 Site contains 8 red hand stencils
36-3-0101	Yawanna No 2	shelter with art and artefacts	Recorded by Bluff in 1987 Site contains 35 red hand stencils
36-3-0103	Wilpinjong	scarred tree	Recorded by Bluff in 1987 tree is dead
36-3-0106	Yawanna No 1	shelter with art	Recorded by Bluff in 1987 Site contains 8 red stencils
36-3-0115	Yawanna No 3	grinding grooves	Recorded by Bluff in 1987 10 grinding grooves in bed of Wilpinjong Creek
36-3-0116	Yawanna No 4	artefact scatter	Recorded by Bluff in 1987
36-3-0133	Wattle Creek No 1	shelter with rock art and potential archaeological deposit	Recorded by Bluff in 1987 Site contains 19 red stencils, all hands except for one possible foot.

F6.3.1 Aboriginal Rock Art in the Region

Twenty-six rock shelters with Aboriginal rock art have been recorded within the broader region (40 km around the Project area). These sites are characterised by sandstone or conglomerate rock shelters situated within the outcrops and debris slopes derived from Narrabeen Group and Pilliga Sandstones. A number of qualitative statements can be made regarding the corpus of the known art based on a review of DEC site cards, unpublished field notes (R. H. Mathews Field book No.1 MS 8006/3/2 National Library of Australia) and a small number of publications and theses (Mathews, 1901; McCarthy, 1944; Pearson, 1981; Layton, 1992):

- The art is dominated by the wet (or painted) application of red pigments, and to a lesser degree on the wet application of white pigment.
- The dry (or drawn) application of mostly red pigments occurs as a minority technique.
- Most graphics have been executed using a stencilling technique and consist of human hands, mostly of adult sizes but also in child size ranges. The stencilling of the hand together with the forearm also occurs in rare cases. Possible human foot stencils have also been identified.
- Human hand prints (the direct impression from a real hand) also occur, sometimes as the predominant graphic within a particular shelter site.
- In some cases large numbers of human hand stencilling and prints may be arranged and aligned in rows or spatially related clusters.

- Stencilled animal feet and animal track motifs[1] also occur as a significant component of the art. Kangaroo and dog prints or motifs are noted in particular and often occur in a series of individuals or pairs forming a 'track'. These graphics are predominantly executed in red pigment, although some white examples also occur.

- Other motifs noted include radial arrangements of lines – 'star bursts', 'goannas' and 'snakes', and a range of trident-like linear arrangements which in some cases resemble bird tracks, but which also may include reduced or additional line elements and/or proportions which exclude a bird track or other figurative interpretation. Simple circles or 'suns' and crosses have also been recorded. The majority of these linear combination motifs are executed in red pigment, both wet and dry.

- In a compilation of stencil forms from the Hunter Valley, Layton notes the presence of human hand stencils and prints, and the stencils of boomerangs, spear throwers, animal feet and unidentified objects (Layton, 1992:205).

Four previously recorded rock shelters containing rock art occur within approximately one kilometre of the northern boundary of the Mining Lease Application Area (DEC site nos. 36-3-0098, 36-3-0101, 36-3-0106 and 36-3-0133). All occur in escarpment based cavernous shelters and are associated with tributary valleys draining south to Wilpinjong Creek.

Site number 36-3-0133 is a moderate sized rock shelter 11 m long, situated within a prominent escarpment, containing 18 red stencils on a $2m^2$ panel (DEC site card compiled by W. T. Bluff in 1987). All appear to be of human hands except for one possible foot. The art panels include a considerable amount of scratched and charcoal graffiti. This site is probably 'cave 5' recorded by R.H. Mathews at 'Wattle Creek' in December of 1893. Matthews recorded 13 hand stencils including at least three small hands, 'all in red splash' on 'rough conglomerate' (ANL: MS 8006/3/2 Field Book No1, p7). The 1987 site card for this site appears to have incorrectly superseded an earlier NPWS site recording 36-3-0012, which no longer appears on the site register and was recorded 5 km to the east.

Further upstream of site 36-3-0133, a larger rock shelter 21 m long with two alcoves contains eight recorded red hand stencils on a 1 m^2 panel. This art has similarly been impacted by chalk and charcoal graffiti (DEC site card compiled by W. T. Bluff in 1987).

Site numbers 36-3-0101 and 36-3-0106 are cavernous shelters in adjacent sandstone tors situated at the base of the escarpment debris slope, in basal slope contexts adjacent to the valley floor. They are 4 and 15 m long respectively. The former contains 35 recorded red hand stencils over a $2m^2$ area, and the latter, eight red hand stencils, one possibly showing a missing first finger and second finger to the second joint (DEC site cards compiled by W. T. Bluff in 1987).

[1] A motif is defined as any graphic which has been created or delineated freehand. A simple mechanical reproduction of a real object, such as a stencil or print (impression) is not classed as a motif, because its form and delineation has not been mediated through stylistic choices.

F6.4 Predictive Model for the Location of Aboriginal Sites within the Project Area

The following predictive statements regarding the type and incidence of archaeological sites have been formulated based on previous work conducted in the region, and elsewhere in NSW within comparable landscapes:

- The valley of Wilpinjong Creek in which the Project lies provides a potential east-west access corridor across the Great Divide. This suggests that the valley will have been a focus for cross-country movement and therefore significant transient, together with longer term occupation. As a consequence it may be expected that sites are numerically dominant in and around the valley floor and be characteristic of repeated occupation events over a long period of time.
- Low spurs across the valley floor and within 100 m of streams are likely to contain sites with artefact occurrences with higher densities and numbers, relative to the local sample.
- A very low density of stone artefacts may occur variously across the valley floor contexts of the Project area.
- Open sites with relatively large numbers of surface stone artefacts, are most likely to occur in valley floor contexts on locally elevated, relatively level ground, adjacent to major and permanent streams.
- The number and density of stone artefacts at a site is likely to increase with proximity to water and/or to natural stone sources. This may apply equally for open and rock sheltered sites, depending on the distribution and quality of available shelters.
- The location of sites which include evidence for the exploitation of stone, may be correlated with the natural occurrence of these stone resources, such as surface lag gravels, and stream bed shingle deposits such as point bars.
- Sites that display complexity and/or diversity in their stone technologies are most likely to have relatively large assemblages.
- Rock shelters with occupation deposit may survive where ever suitable overhangs occur. Within the Project area, greatest potential for rock shelter sites occurs within the *in situ* bedrock exposures of sandstone and conglomerate along the upper valley escarpments, and in the eroded and detached material derived from these escarpments which are spread across the associated high to moderately graded downslopes.
- Rock shelters with level sediment floors, and which are located in basal slope contexts may have been preferred occupation sites, due to their amenity and location adjacent to the resources of the valley floor.
- Rock shelters containing pigment rock art may also occur in sandstone and conglomerate escarpments or detached boulders. Most previously recorded art sites in the region appear to be situated on basal slopes and/or in relative association with a substantial drainage line.
- Sites with rock engravings (carvings) are a rare site type and could potentially occur wherever open context or sheltered rock surfaces of sufficient quality have survived.
- Grinding grooves are a rare site type and likely to occur only where sandstone exposures of suitable quality occurs in association with a water source, and/or an occupied rock shelter sites. Grinding grooves on portable sandstone slabs are a possible occurrence in both open and rock shelter sites.

- Burials are a rare site type. Burials may be located in relatively deep and fine grained alluvial or aeolian sediments. Burial remains in the form of stone cairns are also rare possibility.
- Scarred trees may occur wherever suitable old growth trees survive. Aboriginal occupation of the local area by the Wiradjuri can be traced well into the twentieth century, and it is probable that Aboriginal harvesting of bark continued well into the second half of the previous century, if not the early twentieth.
- Archaeological deposits of greatest archaeological significance are most likely to occur in rockshelters, or on locally elevated topographies adjacent to reliable water sources (springs, streams or wetland basins), which have formed on aggrading sediments.
- Elsewhere, sites are unlikely to preserve *in situ* artefactual material or vertical spatial integrity, due to the effects of bioturbation within the predominantly podzolic and texture contrast soils with distinct clay substrates.

F7 SURVEY RESULTS

F7.1 Overview of Survey Recordings

A total of two hundred and thirty eight (238) recordings were made during the field surveys conducted within the Project area (Table F7.1 and Figure F7.1).

Table F7.1
Summary of Recordings

Record Category	Total
Aboriginal Isolated find	64
other (debated origin) isolated find, lithic scatter or stone arrangement	4
open artefact scatter	70
open artefact scatter and procurement site	1
rock shelter with surface artefacts (may also contain potential or confirmed archaeological deposit)	19
rock shelter with potential archaeological deposit (only)	21
rock shelter with rock art, (may also contain surface artefacts, and confirmed or potential archaeological deposit)	3
possible Aboriginal scarred tree	24
probable Aboriginal scarred tree	15
surveyor's scarred tree (European origin)	3
probable Surveyor's scarred tree (debated origin)	3
indeterminate tree feature (debated origin)	1
other (debated origin) scarred tree	3
potential archaeological deposit (PAD) (open context)	2
reported place of Aboriginal cultural significance	2
spring/natural pothole ('waterhole') (recorded at request of an Aboriginal representative)	3
Total	**238**

Of these recordings, 177 relate to surface or potential subsurface Aboriginal stone artefacts, thirty nine are scarred trees of possible or probable Aboriginal origin, three are definite European surveyor scars (that were recorded for comparative purposes), three are natural waterholes, two are natural landscape features which have been reported by some sections of the local Aboriginal community to have Aboriginal cultural significance, three are rock shelters with rock art and eleven were interpreted differently by the archaeologists and some Aboriginal survey participants. For the latter recordings, debate centred on whether a feature was the result of a natural or human agency, and whether a human agency was Aboriginal. These recordings were classed as having a 'debated origin'. Tables F7.2 and F7.3 provide recording totals according to alternative and simplified categories.

Table F7.2
Aboriginal Recording Types

Recording Type	Total
open context artefact occurrences	135
rock shelters with artefacts or art	22
possible and probable Aboriginal scarred trees	39
rock shelters with potential archaeological deposit (only)	21
open context potential archaeological deposits	2
reported places of Aboriginal cultural significance	2
spring/natural pothole ('waterhole') (recorded at request of an Aboriginal representative)	3

* Please note, these recording types relate to an undebated Aboriginal origin and are exclusive of European origin or 'debated origin' recordings. These categories do not add up to the total number of sites recorded.

Table F7.3
Basis/Evidence for Recording

Type of Recording	Total
surface or potential subsurface Aboriginal stone artefacts	177
rock shelters with rock art	3
scarred trees of possible or probable Aboriginal origin	39
natural landscape feature or place with reported Aboriginal cultural significance	2
European surveyor scars (recorded for comparative purposes)	3
debated origin recordings	11
spring/natural pothole ('waterhole' recorded at request of an Aboriginal representative)	3
Total	**238**

In order to consider the potential impacts of the Project on the archaeological resource in the Project area, the identified sites were considered in terms of whether they are:

- in the Project disturbance area (as described in Section F1.2);
- outside of but within 100 m of the Project disturbance area (ie. potentially subject to indirect impacts due to proximity); or
- outside and more than 100m away from the Project disturbance area.

In addition, sites that are on the boundary of the open cut pits were also considered separately from the rest of the sites in the Project disturbance area (because the Project impact on these sites would be determined by the final detailed mine design) (refer Section F10).

Excluding the European scar trees, 123 of the recordings occur within the proposed Project disturbance area, an additional 22 occur in the Project disturbance area on the boundary of the proposed pits, and 38 outside of, but within 100 m of the Project disturbance area boundaries. The remainder (52) are located well outside of the Project disturbance areas. (Table F7.4).

Table F7.4
Location of Aboriginal and Debated Origin Recordings
Relative to the Project Disturbance Area

Location Relative to the Project Disturbance Area	Total
recordings within proposed Project disturbance area (excluding sites on pit boundaries)	123
recordings within proposed Project disturbance area (on current proposed pit boundaries)	22
recordings outside of, but within 100 m of the Project disturbance area	38
recordings 100 m or more from the proposed Project disturbance area	52

The approximate density of recordings within the Project disturbance area is approximately 1 recording per 11.5 ha (excluding surveyors' scarred trees and sites of debated origin).

A site inventory is provided in Section F7.4 and a map of site locations is shown on Figure F7.1. A tabulation of site context and content information is presented in Attachment F5. A full inventory of site recordings, including GPS co-ordinates and detailed site location maps are provided in Attachment F6. Some of this information in Attachments F5 and F6 is considered to be culturally sensitive and access to these Attachments is restricted to the proponent, Aboriginal stakeholder groups, statutory authorities, and other parties with the consent of the DEC.

Representative examples of site types, site contexts and content are illustrated in Plates F7.1 to F7.21.

F7.2 Site Location and Site Type

The following results relate to Aboriginal archaeological sites and unless otherwise stated, exclude non-Aboriginal heritage recordings, recordings of debated origin, and non-archaeological sites (such as surface depressions that could collect rain water and could be used as a water source and other sites of reported Aboriginal cultural value).

F7.2.1 Broad Scale Landform Context

The frequency and relative percentages of site types according to broad scale landform classifications are shown in Table F7.5. Figure F4.2 provides a map of the landform units utilised in this analysis.

Table F7.5
The Number and Percentages of Aboriginal
Archaeological Site Recordings According to Type and Broad Scale Landform Context

Broad Scale Landform (and % surveyed area)	Open Isolated Finds		Open Artefact Scatters		Open Context Potential Archaeological Deposit		Rock Shelters with Surface Artefacts, with or without Known or Potential Archaeological Deposit (and no art)		Rock shelters with art (with or without other evidence)		Rock Shelters with Potential Archaeological Deposit Only		Scarred Trees		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Valley floor 65%	46	72	41	58	0	0	7	37	0	0	2	10	7	18	103	47
Basal valley slopes 23%	11	17	25	35	0	0	6	32	0		2	10	23	59	67	31
Mid valley slopes 10%	7	11	5	7	2	100	6	32	2	67	12	57	7	18	41	19
Upper valley 2%	0	0	0	0	0	0	0	0	1	33	5	24	2	5	8	4
Total 100%	64	100	71	100	2	100	19	100	3	100	21	100	39	100	219	100

% values may have minor errors in totals due to rounding

Valley Floor

Just under half of the recorded Aboriginal sites occur within valley floor contexts with 103 or 47% of recordings. Of these, open isolated finds and open artefact scatters make up the majority. This landform category also accounts for the majority of recordings in these site types, with 72% of open isolated finds and 58% of open artefact scatters. The predominance of valley floor recordings in these site categories reflects not only the large proportion of this landform category within the total surveyed area, but also the presence of the larger water sources, and the majority of level and open topographies suitable for camp sites. The highest incidence of isolated finds occurs in the valley floor category. This is thought to reflect the better ground surface exposures along drainage lines and lower catchment valley floor areas, the dispersal of sites from agricultural activities, and the likelihood that Aboriginal activities which resulted in the discard of isolated stone material (such as hunting and temporary camps) were prevalent on the open valley floor.

Seven rock shelters with surface artefacts were recorded on the valley floor (ie. near the base of debris slopes) and two rock shelters with potential archaeological deposit were also recorded. These account for 37% of the former and 10% of the latter site categories. The frequency of rock shelters with surface artefacts are roughly evenly distributed between the valley floor, basal slopes and mid valley categories, although the distinction between the valley floor and basal slopes category is probably relatively meaningless, given that all in these categories are related to the lower contexts of the escarpment debris slopes which fringe the valley. If combined, these two categories account for 69% of all rock shelter sites with surface artefacts. This is strongly indicative of the geomorphological distribution of shelters and also suggests that shelters closer to the valley floor were preferentially occupied.

Only seven scarred trees were recorded from the valley floor, being 18% of recorded possible or probable Aboriginal scarred trees. This most likely reflects the lesser survival of old growth trees on the valley floor due to agricultural activity, rather than supporting an argument for some cultural selection process.

Basal Valley Slopes

Thirty-one percent of recorded Aboriginal sites occur within basal valley slope contexts with 67 recordings. Of these, open artefact scatters and scarred trees make up the majority. This landform category accounts for the majority of scarred tree recordings (59%) and most of the remaining open artefact scatters (35%) (ie. not on the valley floor). Seventeen percent of all open isolated finds occur on basal slopes. As previously noted, 32% of rock shelters with surface artefacts also occur in this category, and this frequency reaches 69% when the shelters in the nearby tors on the margins of the valley floor are included.

Basal valley slopes accounted for 23% of the surveyed area and included 31% of recorded sites. This disproportionate return is a consequence of the 23 scarred tree recordings that are focused in forest and woodland remnants. The presence of rock shelters in this landform appears to offset any occupation constraints posed by smaller and less permanent water resources.

Mid Valley Slopes

Nineteen percent of recorded Aboriginal sites occur on mid valley slope contexts (41 recordings). Of these, rock shelters with potential archaeological deposit are the most common. All of the open artefact occurrences in this category occur on relatively low gradients in elevated but often open contexts. Their position in the mid valley category accurately reflects their distance from the valley floor and limited water sources, but does not necessarily infer a moderate or steeply graded context on an escarpment debris slope.

The actual frequency of rock shelters with potential archaeological deposit is substantially higher than indicated by Table F7.5, due to the strategy of recording in detail only shelters with surface artefacts in some of the survey areas adjacent to the Project disturbance area, where rock shelters were particularly common.

Thirty-two percent of rock shelters with surface artefacts occur in the mid slope category and this, like the lower slope categories, reflects the geomorphological distribution of good shelter sites on the escarpment debris slopes.

Mid valley slopes accounted for approximately 10% of the surveyed area and included 19% of recorded sites. This disproportionate return is a reflection of the high rock shelter incidence in this landform.

Upper Valley

Only eight recordings were made in upper valley contexts (upper slopes, escarpments and plateau), accounting for approximately 4% of all recordings. These consist of one rock shelter with art, five rock shelters with potential archaeological deposit, and two scarred trees.

This category comprised approximately 2% of the surveyed area (and is not represented in the Project disturbance area) but notably included the upper-most slopes and bedrock escarpments which border the remnant plateau land surfaces of the upper catchment. Typically these slopes presented moderate or high gradients and contained a high incidence of rock shelters, most of which consisted of cavernously weathered alcoves at the base of the bedrock escarpment cliffs. In contrast to the common cliffline shelters most of the recordings made, including one art site, occur in dislocated rock tors or masses on the adjacent down-slopes. This can be explained by the nature of the cliffline shelters which mostly contained sloping floors of rock or loose pale sands derived from active erosion of the adjacent shelter surfaces. It is thought that these presented unfavourable and uncomfortable conditions for occupation. The distance from significant water sources may also be a significant factor limiting use of these shelters.

It should be noted that the Project area does not contain escarpment sections where significant drainage lines pass through the escarpment and provide permanent water sources. Site location patterns elsewhere in the Sydney Basin indicate that suitable rock shelters in these contexts were preferentially occupied. It is theorised that (in the Sydney Basin) this was a consequence of their strategic position, being situated on the boundary of varied resource zones, close to water, and along natural creekline access routes between the plateau lands and valley floor.

F7.2.2 Fine Scale Landform Context

A review of the fine scale landform contexts for various recording categories reveals two types of patterning: trends which result from the constraints of site type and geomorphology; and trends which may relate to the cultural choices and preferences which guided Aboriginal occupation (refer Table F7.6). Scarred trees are excluded from this analysis because their current distribution relates to historical European land clearance activities.

Table F7.6
Fine Scale Landform Characteristics According to Type and Relative to Broad Scale Landform Context

Fine Scale Landform Characteristics	**Valley Floor**	Open isolated finds	Open artefact scatters	Rock shelter site	Rock shelter + PAD	**Basal valley slopes**	Open isolated finds	Open artefact scatters	Rock shelter site	Rock shelter + PAD	**Mid valley slopes**	Open isolated finds	Open artefact scatters	Rock shelter site	Rock shelter + PAD	Open PAD	**Upper Valley**	Rock shelter site	Rock shelter + PAD	**Totals**
Major ridge						4		3	1		6	2		2	1	1	5	1	4	15
Spurline	16	6	10			22	4	12	4	2	8	4	3	1			0			46
Bench	3		3			1		1			3	2	1							7
Valley floor	24	12	12			3	1	2			1									28
Crest	13	5	8			12	3	9			10	3	4	1	1	1				35
Break-of slope	9	2	7																	9
Upper slopes	6	2	4			2		1			6		3	1	2		5	1	4	19
Mid slopes	2		1			7	1	6			11	1		2	8		2	1	1	22
Basal slopes	51	23	19	7	2	25	6	11	6	2	8	2		4	2					84
Knoll	7	2	5			1		1			1			1						9
Shoulder	1	1				3		3			2	2								6
Saddle						1		1			3		1	1	1					4
Alluvial flats	4	1	3													1				5
Terrace	9	3	6			1		1												10
Fan	1		1			2	1	1								1				4
Escarpment											1			1			2	1	1	3
Heavy rock outcropping	1		1								1				1		1		1	3
Discontinuous outcrops											2	1		1			1		1	3
Isolated tor/outcrop	9			7	2	9	1		6	2	16			5	11		3		3	37
Minor stream margin	31	13	18			5		5			1	1								37
Major stream margin	6	2	4			2	1	1												8
Total Site Recordings*	96	46	41	7	2	44	11	25	6	2	34	7	5	8	12	2	6	1	5	

* Please note, each of the recordings totalled may be associated with one or more fine scale classification and therefore the total number of sites in this table exceeds the total number recorded.

F7.2.2.1 Valley Floor

Amongst valley floor recordings (96 in total), the most noted fine scale landform characteristics were a basal slope position (53% of recordings), followed by a position on the margin of a minor stream line (32% of recordings), a valley floor context (25% of recordings), spurlines (17% of recordings) and crests (14% of recordings). All of these categories were relatively evenly represented by both open isolated finds and open artefact scatters.

These characteristics emphasise a preference for site location on locally elevated ground, close to or on the valley floor and drainage lines. The predominance of the minor streamline category together with the valley floor fine scale context reflects the geomorphology of the Project area which is dominated by smaller tributaries, many of which have indistinct drainage beds on the lower reaches. The six recordings on major stream margins relate to sections of Cumbo and Wilpinjong Creek (the largest streams in the Project area).

Basal Valley Slopes

In the basal valley slope category, basal slope contexts are the most noted characteristic (57% of recordings), followed by spurline and crest contexts (50%, and 27% of recordings respectively). This probably can best be explained by a preference for camping on level ground. In all of these categories open artefact scatters are recorded more than isolated finds. Five recordings are noted on minor stream margins and two on major streams. This reflects the geomorphology of the survey area, as does the incidence of rock shelters in isolated rock tors.

Mid Valley Slopes

Within the mid valley slope category, recordings in isolated tors and (fine scale) mid slope contexts are predominant. This reflects the high number of rock shelter recordings on the mid slopes of the escarpment debris slopes. Lower numbers of spurline and slope contexts reflect some of the more open mid valley contexts surveyed. The number of sites noted to be on stream margins is limited to one. This reflects the geomorphological characteristics of this category where drainage is often limited to small gullies or indistinct drainage paths.

Upper Valley

The upper valley fine scale recordings reflect the dominance of rock exposures and high gradient slopes in this category.

F7.3 Site Content

F7.3.1 Number of Surface Artefacts

For each site recording, the number of surface stone artefacts visible to the recorder was counted or estimated. In the case of rock shelters this quantification is unlikely to characterise the site because there is generally little visibility of the underlying and subsurface deposits. For sites in open contexts, surface artefact counts may be more indicative of site character, depending on the nature of the ground surface exposures providing the visibility. Small and isolated exposures can only reveal limited artefact numbers and as a consequence, the nature of the sites revealed may be underestimated. In contrast, relatively continuous exposures across broad areas or tracks can provide a more reliable ‘window’ into the artefact content of a soil profile. While limited visibility was a factor in the present investigation, many low density artefact scatters and isolated finds were identified in areas with good visibility, such as the salt scalds in the lower catchments, and vehicle track exposures. This visibility allowed recorders to assess around one third of all isolated find recordings as having low potential to be larger in area and artefact numbers. These comprise a significant proportion of the recordings (refer Table F7.7), suggesting that broad scale trends in the data, especially indications of relatively low artefact density, are likely to provide a reliable indication of the archaeological resource in the Project area.

Table F7.7
The Number and Percentage of Known or Estimated Surface Stone Artefacts at Open Context Artefact Occurrences

No. of Surface Artefacts	Valley Floor		Basal Valley Slopes		Mid Valley Slopes		Upper Valley		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
1	46	72	11	17	7	11	-	-	64	100
2 – 10	23	60	12	31	3	8	-	-	38	100
11 – 50	13	52	10	40	2	8	-	-	25	100
51 – 100	2	67	1	33	-	-	-	-	3	100
101 – 500	1	33	2	67	-	-	-	-	3	100
500+	2	100	-	-	-	-	-	-	2	100
Totals	87	64	36	27	12	9	-	-	135	100

Table F7.7 and Figure F7.2 present the number and percentages of recorded surface artefacts across a number of site and landform categories.

Isolated finds are predominant on the valley floor. Seventy two percent of all isolated finds were recorded in this context, accounting for 53% of all valley floor recordings. It is probable that a proportion of these recordings is indicative of larger sites. The underestimated site component, however, probably relates to deposits with relatively low artefact densities and limited archaeological value.

The high percentage of isolated find recordings on the valley floor compared to the other land categories (72% compared with 17% basal valley slopes, 11% mid valley slopes and 0% upper valley) suggests a real site trend. Support for this conclusion is provided by a comparison of the frequency curves for the valley floor and basal valley slopes (Figure F7.2). The valley floor presents a steep and almost exponential decrease in the number of recordings of single to 500+ artefacts. In contrast, on the basal slopes the three categories between one and 50 surface artefacts are relatively equally represented, and present a flat line. An alternative explanation is that these differences are the result of differing visibility conditions.

However the effective survey coverage results for each land unit are comparable (Section F7.5). It is therefore unlikely that differences in visibility are a significant causal factor.

The high proportion of valley floor recordings continues for sites with 2 to 10 surface artefacts, with 60% of recordings compared with 31% on basal slopes. However the proportions are roughly similar across the two landforms for sites with 11 to 50 surface artefacts (52% and 40% [Table F7.7]). This may reflect a tendency for sites to be more dense and focused on the basal slopes, where spurline crest and basal slope contexts limit available camp sites. This may be compared to the lower relief of the valley floor, and a consequential tendency for sites to be more spread out, less dense, and for exposures to reveal smaller numbers of artefacts.

There are three recordings each for sites with between 51 to 100, and 101 to 500 estimated surface artefacts. All of these bigger open artefact sites occur on basal slope and valley floor contexts only. The contexts of these sites relate to locally elevated topographies in relative proximity to streamlines, including Cumbo Creek, and spring resources such as at Spring Flat.

Two sites were recorded with more than an estimated 500 artefacts. Both occur along the banks of Wilpinjong Creek to the north of the Project disturbance area (Plate F7.17).

It can be concluded that there is a broad level consistent pattern in both the location, size and incidence of artefact occurrences across the Project area. Large sites are limited in frequency and are very specific in their location. As sites become smaller in size, their distribution becomes less focused and distance from water may become greater. Sites tend to be larger when adjacent to more substantial water sources. The largest sites occur along the riparian corridor of Wilpinjong Creek. The next largest site categories occur along its tributaries, notably Cumbo Creek and the defined courses of other north-south draining tributaries to the west. Where these drainage lines become indistinct across the broad open floors of their lower reaches, sites also become smaller and less focused. Over the majority of the Project disturbance area, which falls within the valley floor and basal valley slope categories, the low relief and general lack of significant or defined drainage lines appears to be reflected in a large number of isolated finds, and low density scatters. Sites become more focused on the basal slopes, owing to greater relief.

F7.3.2 Stone Materials and Sources

Up to eight stone material categories were recorded for the stone artefacts visible at each site. Where a material type was estimated to be dominant or a significant minority, this was also noted.

Table F7.8 tabulates site type frequency according to the number of stone material categories and known or estimated number of surface artefacts present. Table F7.9 shows the frequency of stone material types according to the known or estimated number of surface artefacts present.

Table F7.8

Site Type Frequency According to the Number of Stone Material Categories and the Known or Estimated Number of Surface Artefacts Present

No. Stone Material Categories	Isolated finds	Open Artefact Scatter (2-10 artefacts)	Open Artefact Scatters (11-50 artefacts)	Open Artefact Scatters (51-100 artefacts)	Open Artefact Scatters (101 500 artefacts)	Open Artefact Scatters (>500 artefacts)	Rock Shelter Sites	Number of Sites	Percentage of Sites with Surface Artefacts
1	64	17	1				7	89	57
2		17	5				13	35	23
3		4	9			1	1	15	10
4			6	1				7	5
5			2		2			4	3
6			1	1	1			3	2
7				1		1		2	1

There is a clear trend for material diversity to increase with the number of artefacts present. The steep decrease in recordings from one material type (57%), through to three types (10%) and seven (1%) reflects the same curve for the frequency of site size categories. Apart from isolated finds, the largest categories are one and two material types occurring within artefact scatters of between 2 and 10 surface artefacts (11% of artefact occurrences each). Sites with between 51 and 100 artefacts contain four or more material types and those with more than 101 have five or more (refer Table F7.8).

Quartz is the most recorded material type and was noted in 75% of all artefact occurrences (refer Table F7.9). In twenty-four percent of recordings, quartz was noted to be the dominant or a major component material. The next prevalent category was tuff (also sometimes described as 'indurated mudstone'), which was noted in 36% of all artefact occurrences (Plate F7.18). Tuff was noted to be a major component, and occasionally in smaller sites a dominant material, in 6% of artefact occurrences. Lesser categories, in decreasing order are undifferentiated Volcanics (21%), Quartzite (17%), Chert (13%), Silcrete (10%), Other (8%) and Chalcedony (2%) (refer Table F7.9).

The frequency of tuff occurring as a major component of the surface assemblage is low, and this remains relatively consistent as the number of material types increases. In contrast, quartz is mostly dominant at sites with one, two or three material types, and the frequency then dips substantially at the more diverse and larger sites. The contrasting patterns in the occurrence of quartz and tuff suggests that much of the quartz is from a local source and was used for both general and specialised tool making. This wide spectrum of utility was also suggested by field observations of a wide range in the quality of the artefactual quartz. Fine grained and crystal quartz of high flaking quality tended to occur only on the larger sites of 100 or more artefacts. Tuff, the next most prevalent material, has a more consistent and high quality, and may have had a more restricted or specialised range of functions. Its more constrained use is suggestive of a non local source and/or a rarer local incidence as pebbles.

A significant proportion of the recorded artefacts included alluvial pebble cortex, suggesting that gravel and cobble beds in the local streams, and other surface gravels derived from the erosion of the bedrock conglomerates may have been local stone sources.

Only one stone procurement site was recorded in the Project area (WCP88). This is a small and low density scatter of seven artefacts situated on a locally elevated sand ridge containing a high density of rounded alluvial gravels. The sand deposit appears to be a consequence of *in situ* bedrock erosion (refer Section F4.3.4 above). There remains the possibility that the location of the larger open artefact scatters may relate to the procurement of stone materials from the adjacent stream beds. Sands and silts, rather than gravels and cobbles now characterise the bed load of the local streams, however this may not have been the case in prehistory and prior to European land clearing practices.

A significant proportion of the artefactual volcanic rock consisted of a dense, fine grained green, brown or blue-grey stone, which was worked both by flaking and for the manufacture of hatchets (Plate F7.19). Natural occurrences of this rock type were noted in the form of small to medium sized rounded but angular cobbles. Greatest densities were noted in Wilpinjong Creek and on the alluvial fans at the base of its south draining tributaries.

A small number of artefacts made from a siliceous ironstone were recorded in the northwestern portion of the Project area. This material was recorded within the 'Other' stone type category. It is probable that this material was sourced from surface cobbles of ironstone present on a spurline crest associated with the sand and gravel deposit in the northern portion of pit 5.

Table F7.9
The Incidence of Stone Material Types According to the Number of Stone Material Categories Present at any Site

No. Stone material Categories at a site	Quartz□	As a Dominant or Major Component*	Quartzite	Silcrete□	As a dominant or Major Component*	Chert	Chalcedony	Volcanic□ (undifferentiated)	As a Dominant or Major Component*	Tuff/Indurated□ Mudstone	As a Dominant or Major Component*	Other□	As a Dominant or Major Component*
1	55	-	6	2	-	1	-	6	-	18	-	1	-
2	15	16	5	2	-	6	-	7	1	14	2	1	1
3	4	11	2	2	1	5	2	7	-	7	2	2	-
4	3	4	4	2		3	2	3	-	5	1	1	-
5	1	3	4	2	1	1	-	4	-	2	1	1	-
6	-	3	3	1	-	2	-	3	-	1	2	3	-
7	1	1	2	2	-	2	-	2	-	-	2	2	-
Totals	79	38	-	13	2		-	31	1	47	10	11	1
	117		26	15		20	4	32		57		12	
% of artefact occurrences	51	24		8	1			20	0.6	30	6	7	0.5
	75		17	10		13	2	21		36		8	

Note all material type categories are mutually exclusive. The bottom percentages are calculated using a total of 156 sites with surface artefacts (artefact occurrences), including rock shelters.

□ Only Component or Minor Component.

* Dominant or Major Component where 2 or more types present.

F7.3.3 Diversity

The presence of a range of artefact characteristics was systematically recorded to provide an approximation of assemblage complexity and diversity. Given the taphonomic limitations of surface artefactual material, greater quantification was not considered to be reliable. Some of these traits are tabulated in Table F7.10 according to the number of surface artefacts. The percentage of sites within each site size category, which included the presence of cores, blade manufacture, and bipolar technique, all increase with site size. A similar but less clear trend is presented by the presence of modified flakes and use-wear. This mirrors the trend with increasing stone material types and reflects a consistent pattern of increasing stone artefact diversity with increasing site size, as measured by surface artefact numbers.

Other traits such as the presence of hammer stones, flaked pebble tools/cores, backing, and hatchets did not provide clear trends.

These findings, again, emphasise the importance of the larger sites, which in most cases are located adjacent to more significant and defined water sources such as Wilpinjong Creek. The greater diversity in the content of these sites is an expected consequence of their likely function as base camps were stone tool use, manufacture and maintenance activities would have been conducted.

Given the generally poor level of exposure and deposit visibility in rock shelter locations, the number of artefact recordings from this group of sites is insufficient for a reliable analysis. It can be conjectured, from the open site results, that the shelters on and closest to the resources of the valley floor will be larger and display the greatest diversity in content. Proximity to water will almost certainly also be a factor in this. Consequently the shelters on the lower slopes of the narrow upper valley contexts may have larger and richer archaeological deposits than examples in contexts where water resources are further away.

Table F7.10
Tabulation of Various Artefact Types and Techniques
Present in Different Site Types and Artefact Number Categories. (In each table cell, the number of sites including this trait is tabled, together with the percentage that this number represents of the total number of sites in this artefact number category).

Artefact Type or Technique	Open Isolated Finds		Open Artefact Scatter (2-10 Artefacts)		Open Artefact Scatters (11-50 Artefacts)		Open Artefact Scatters (51-100 Artefacts)		Open Artefact Scatters (101 500 Artefacts)		Open Artefact Scatters (>500 Artefacts)		Rock Shelter Sites	Number of Sites	Percentage of Sites with Surface Artefacts
	No	%	No	%	No	%	No	%	No	%	No	%	No		
Cores	12	19	8	21	16	64	3	100	3	100	2	100	3	47	30
Hammer stones	3	5	2	5	2	8	1	33	-	-	-	-	1	9	6
Modified flakes/use wear	7	11	5	8	14	56	1	33	3	100	2	100	3	35	22
Blade/microblade manufacture	2	3	4	10	13	52	3	100	2	66	2	100	4	30	19
Backing	-	-	1	3	1	4	1	33	1	33	1	50	1	6	4
Hatchets	1	1	3	8	2	8	-	-	1	33	1	50	1	9	6
Bipolar technique	5	8	13	34	8	32	1	33	1	33	2	100	6	36	23
Flaked pebbles	1	1	2	5	-	-	-	-	-	-	-	-	-	3	2
Alluvial pebble cortex	9	14	10	26	13	52	1	33	1	33	2	100	2	40	26

Rock shelters were the only site type in the Project area to be associated with bottom grind stones (Plate F7.21). One valley floor shelter, in a narrow upper catchment valley south of Spring Flat contained two fragments of sandstone bottom-grindstones, each with broad and shallow elongate depressions or ‘grooves’ (WCP49). It seems probable that these grind stones had been stored or ‘cached’ at this location, perhaps for regular use when processing seed or other plant foods from this location. The deposit from this site has been severely impacted by wombat digging and the grind stones may have been unearthed comparatively recently. This opens the possibility that the lack of bottom grind stones from open sites is a consequence of their collection by land owners, rather than an actual characteristic of local Aboriginal occupation.

An alluvial pebble possibly used as a top grind stone was identified in a small open site in a valley floor context in the southern portion of the Project area (WCP127).

Nine sites contained direct evidence of ground edge hatchets (also known as axes, Plate F7.19). In four locations whole or near whole examples were found (WCP134, 139, 144 and 213), and flake fragments from ground edges were found at six locations, one of which also included a whole example (WCP8, 29, 108, 134, 136, 202). These finds were evenly spread across valley floor, basal slope and mid slope contexts (three locations each), as well as occurring across the whole spectrum of site sizes and sites with differing numbers of stone materials. The majority of the finds were made from a dense, fine grained green, brown or blue-grey volcanic (discussed above). Most of the hatchets have been initially shaped through bifacial flaking, though one showed evidence of fine scale shaping from multiple surface pitting (or 'pecking'). Many of the hatchets displayed a considerable degree of flaking of the original ground and bevelled edge. This degraded edge quality may explain their discard. A minority of examples also displayed evidence of use as an anvil or hammer.

F7.3.4 Archaeological Deposits and Potential

A number of qualitative assessments were made in the field regarding the potential for a recorded site to:

- be larger in physical area than recorded;
- contain more than the recorded number of artefacts; and
- contain below-ground (subsurface) *in situ* (undisturbed) archaeological material.

These assessments can be used to gain an understanding of the potential subsurface archaeological resource within the Project area. Table F7.11 provides a tabulation of these assessments according to site type and number of surface artefacts.

Table F7.11
Tabulation of the Assessed Potential for Sites to be Larger, to Contain More Artefacts, and to Contain Subsurface Material, According to Site Type and the Number of Surface Artefacts

Site Type and no. of surface artefacts	Potential to be Larger in Area						Potential to Contain More Artefacts						Potential for Subsurface *in-situ* Material							
	Low		Mod		High		Low		Mod		High		Low		Mod		High		Indet.	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Open isolated finds	25	39	35	55	4	6	18	28	35	55	11	17	49	76	5	8	-	-	10	16
Open artefact scatter (2-10 artefacts)	6	16	24	63	8	21	-		27	70	11	30	20	53	1	3	1	3	16	42
Open artefact scatters (11-50 artefacts)	2	8	16	64	7	28	2	8	11	44	12	48	6	24	10	40	2	8	7	28
Open artefact scatters (51-100 artefacts)	-	-	-	-	3	100	-	-	-	-	3	100	-	-	3	100	-	-	-	-
Open artefact scatters (101-500 artefacts)	-	-	-	-	3	100	-	-	-	-	3	100	-	-	1	33	1	33	1	33
Open artefact scatters (>500 artefacts)	-	-	-	-	2	100	-	-	-	-	2	100	-	-	-	-	2	100	-	-
Rock shelter sites	10	48	7	33	4	19	-	-	3	14	18	86	1	5	4	19	16	76	-	-
Total Artefact Occurrences	43	28	82	53	31	20	20	13	76	49	60	38	76	49	24	15	22	14	34	22

Note: In each table cell, the number of sites including this assessment is tabled, together with the percentage that this number represents of the total number of sites in this type and artefact number category.

Around half (53%) of all artefact occurrences were assessed as having moderate potential to be larger in area. Sites with larger artefact numbers were always rated with a high potential. Thirty nine percent of isolated finds were rated as having a low potential to be larger and only 6% with high potential. For the larger artefact scatters this situation is reversed, with 20% to 30% of recordings with 2-10 and 11-50 artefacts rated with a high potential. These results reflect the visibility conditions encountered in the Project area. A significant number of isolated finds and small sites occurred in substantial areas of visibility, allowing recorder confidence in determining site boundaries. This did not carry over to the larger sites however. It was considered probable that sites extended beyond the boundaries of the existing ground exposures.

Around half (48%) of the rock shelter sites have a low potential to be larger than the sheltered confines of the rock shelter. The remainder have various potential to extend beyond the shelter space. Many of these consist of rock shelters in valley floor or basal slope contexts where prehistoric activity areas probably extended away from the shelter overhang onto the adjacent level ground and low gradient slopes.

The assessment of the potential for sites contain more than the recorded number artefacts followed similar trends to those identified for the potential to be larger in open artefact occurrences. Most sites were assessed having moderate or high potential to contain more artefacts.

Potential for In-situ Materials

The potential for sites to contain subsurface *in-situ* material is an assessment of the potential for archaeological material, such as artefacts and hearths, to survive in relatively undisturbed sedimentary contexts. The nature and potential depth of the deposit, together with the likely impacts of bioturbation (churning of the soil profile by plants and animals) and agricultural practices (forest clearing, ploughing and erosion), are factored into this assessment.

A large majority of isolated finds (76%), and just over one half of open artefact scatters with up to ten surface artefacts were assessed as having low *in situ* potential. In 16 and 42% of recordings in these categories (respectively), the recorder rated this potential as ‘indeterminate’. A quarter (24%) of recordings with between 11 and 50 surface artefacts were also rated with a low potential, with 28% classed as indeterminate. The predominance of low ratings in these categories reflects the shallow and podzolic nature of the soil profiles the sites occur within. As the recordings include larger artefact numbers and become more focused on main water sources, the potential for *in situ* material increases. This is a consequence of the potential depth, and the alluvial or aggrading nature of the landforms these sites occur on. All three sites with between 51 and 100 surface artefacts are rated as having moderate potential, and all sites with over 500 artefacts are rated as having high potential due to their aggrading sedimentary contexts.

Most rock shelter sites (76%) have high potential for *in sit*u material, with 19% (four sites) having moderate and 1 site having low ratings. This reflects the inherently stable and aggrading nature of the rock shelter site type.

In summary it can be concluded that a significant proportion of the sites in the Project area are likely to be larger in area and to contain more artefacts than recorded, as is the case in most archaeological contexts. The potential for subsurface archaeological material to occur in relatively undisturbed (*in situ*) contexts however is substantially limited to alluvial and aggrading landforms, mostly situated on the valley floor, in close association with major and defined water sources and in rock shelters.

F7.3.5 Rock Art

Three rock shelter sites with rock art were identified during survey for this Project (WCP72, 152 and 153). All occur outside of the Project disturbance area, with one (WCP153) being approximately 100 m from a proposed pit boundary. All occur within sandstone and conglomerate rocks (Plates F7.9 to F7.16).

Two of the shelters with art occur in detached rock tors, situated on the debris slopes of west facing escarpments, in the western portion of the Project area. One is situated in a broad scale mid valley slope context (WCP153, Plate F7.9 and F7.10) and the other (WCP 152, Plates F7.11 to F7.13), in an upper valley context on the downslope, adjacent to the bedrock escarpment. Both of these are relatively small shelters, being 10 x 5 and 4 x 2 m in shelter area. Both have only limited areas of flat sediment floor with potential for subsurface archaeological material.

The smaller of the two (WCP153) contains only three red hand stencils, two being small in size and probably those of children (Plate F7.10). The art is situated in a central position on the back wall and occupies a small proportion (less than a third) of the available flat shelter surfaces. Approximately 40% of the surface is actively eroding.

The larger site contains around 18 whole or indeterminate portions of red pigmented motifs. Approximately one fifth of the available rock surfaces include pigment. Around 90% of the shelter surfaces are actively eroding. This suggests the real possibility that this site included more art than is now visible. There are no stencils in this shelter and most of the pigment has been applied as paint and as linear graphic elements. One motif has been drawn with a brown-red pigment. Another indeterminate motif includes an area of shallow surface abrasion. This may have been an infill area for an outlined motif and could be the indirect result of the abrasion resulting from the dry application of a now eroded pigment, or alternatively, may have been the intended surface treatment from deliberate abrasion of the surface with a hard instrument.

Most of the identifiable motifs consist of upward pointing tridents or arrows shapes, which are conventionally interpreted as animal foot motifs, such as Emu or bird (Plates F7.12 and F7.13). They are not arranged in pairs or alignments which would be suggestive of a trackway. In two of these trident shaped motifs there are two paired central longitudinal elements. In a number of other cases the two side linear elements are almost perpendicular to the central axis. This has the effect of reducing their figurative similarity to tracks and consequently can best be described as non-figurative to a modern observer.

The remaining art site (WCP72), consists of a large and spacious east facing shelter, situated at the base of a high escarpment which defines an isolated rocky knoll on an otherwise low profile, watershed ridge crest (Plate F7.14). The shelter has a commanding view across the adjacent creek valley (which will not be directly effected by mining operations). Unlike the other rock art sites in the Project area, and the four previously recorded sites in the wider area, this shelter is not situated on the debris slope of a continuous escarpment. It occurs in a relatively elevated, and therefore mid valley slope context, but is surrounded by open country with access across low gradient slopes to the valley floor.

The shelter is approximately 34 m long, 15 m wide (deep) and up to 12 m high. The floor of the shelter dips moderately to the south, and parallels the predominant dip of the bedding planes of the overlying rock sediments. The floor includes rock benches across its higher, northern end and large rock-fall tors across its front and outside slopes. Up to 50% of the shelter floor has high potential for extensive and *in situ* archaeological deposits, particularly across its lower southern portions. Around 40% of the floor is rock and about 80% is covered with a thick surficial deposit of stock animal manure (Plate F7.15).

The art is evidenced by extensive areas of poorly preserved red pigment which variously occupy virtually all of the available back wall surfaces – an area approximately 28 m long, and up to 3-4 m above the floor level. An exception to this distribution is an apparent hand stencil situated on a ceiling niche surface, some 8 m above the floor level. It is conjectured that access to this panel was obtained by placing a temporary ladder from nearby high rock fall. Around 80% to 90% of the available and accessible rock surfaces display applied pigment.

Nearly all of the visible pigment is red to dark red in colour, with a small minority consisting of red-brown and red-brown to purple pigment. With the exception of some largely indeterminate painted red linear motifs (one consisting of a downward pointing trident-shape or 'bird track'), all of the visible pigment appears to be the result of stencilling. There are approximately 24 definable stencils of hands. A minority of these are small hands which are consistent in size and proportion to children's hands. Based on the extent of surviving pigment, it is likely that over 100 stencils have been executed in this shelter.

Most of the art is in a poor state of preservation, due mostly to the accumulation of dust, bird guano, and the downward secondary transport of pigment possibly from the surface movement of water formed from condensation (Plate F7.16). Other impacts include 'fading' from small scale pigment loss, and surface exfoliation from micro-spalling and the detachment of larger surfaces.

Local land owners note that the stencils have faded over the last 30 years. It is remembered that only hand stencils were present, and that the art was similar in nature to a site known as 'The Drip' on the Ulan Road (Mrs Lyn Robinson pers. com Aug 2004).

The use of the shelter by stock animals (in the recent past by sheep), has certainly impacted the art panels, through direct contact, from scratching, abrasion and adherence of dirt, and indirectly by the accretion of dust generated by stock treadage.

The rock outcrop in which the shelter is situated includes a summit area above the shelter approximately 70 x 70 m in area which includes a relatively flat rock platform (approximately 20 x 20 m in area), with a number of shallow potholes. One pothole is around 1.5 m in length and 10 cm deep. At the time of survey these contained collected rainwater and it is probable that these were used as a water source the Aboriginal occupants of the shelter below after rain.

All Aboriginal community representatives who visited this site were impressed by the position and character of the place, together with the art and its content. Opinions differed about the interpretation of the site and its context.

Some male members of the Mudgee LALC and the Murong Gialinga ATSIC believed the site was primarily significant to women and that the stencils of the younger people's hands were of initiates. One representative stated that red pigment was associated with initiated people and that non-initiates would have avoided the site. Family areas would have been situated on the adjacent creeklines on the valley floor. It was also felt by some members of the Aboriginal community that the significance and cultural values of the rock shelter were linked to WCP58 (which had been reported by some individuals and contested by others), and its associated ridge line located north of the art site.

Some women members from the same organisations who visited the site during a field trip agreed that the site is of high cultural significance and stated their belief that it was a place for women and children. It was suggested that the ridgeline to the north was also significant and may have had related significance. The identification of a women's' site by some members of these organisations on this northern ridge was considered to be important, but it was not felt that the art site would have been accessed with the same level of cultural restrictions.

Members of the Warrabinga NTCAC also consider the art site to have high cultural value but had different beliefs to the those of the other groups. For them, the open valley context and the presence of adult and children's' stencils indicates a site with unrestricted access. Notwithstanding, they advised that the meaning of the art may have had levels of meaning which depended on initiation and knowledge. Whilst the ridgeline to the north has value as part of the surrounding landscape context, it was not considered to have any particular or outstanding Aboriginal cultural values by members of this group.

F7.3.6 Scarred Trees

Forty-nine modified trees were recorded during the field program (Table F7.1, Plates F7.1 to F7.6). Thirty-nine of these are classed as having a possible or probable Aboriginal origin and include 41 scars. Six are interpreted by the Project archaeologists as surveyor's scars or probable surveyor's scars, three are not considered to be human in origin, though this is debated by some of the Aboriginal participants (who preferred to conservatively attribute an Aboriginal cause), and one consists of an axed depression of an indeterminate origin.

Of the 39 scarred trees classed as having scars of possible or probable Aboriginal origin, 23 or 59% occur on basal slope contexts, 7 or 18% occur each on the valley floor and mid valley slopes, and 2 or 5% occur in the upper valley (refer Table F7.5 and tables in Attachment F5). These proportions reflect both the extent to which these zones were subject to survey, as well as the greater number of surviving old growth trees in the forests and woodlands of the basal and mid valley slopes. The same approximate proportions are present for both rating categories (possible and probable Aboriginal scar trees).

Most of the recorded scars are on Grey or White Box trees (59%), followed by Ironbark and unspecified (dead) Eucalyptus trees (13% each), Yellow Box (8%), smooth barked and Stringybark trees (5 and 2% respectively) (refer Table F7.12).

Four possible Aboriginal scars are on fallen and dead trunks, one of which has been partially harvested for fence posts (WCP101). Two possible and two probable scars are on dead standing trees. Two trees were recorded with two scars on the main trunk, all of possible Aboriginal origin (WCP69 and 149).

Table F7.12
The Frequency of Tree Types (species groups) with Possible and Probable Aboriginal Scars

Tree type	Possible Aboriginal Scar(s)	Probable Aboriginal Scar(s)	Combined Total	Percentage of Total
Grey or White Box	14	9	23	59
Ironbark	3	2	5	13
Yellow Box	2	1	3	8
Stringybark	1		1	2
smooth barked	1	1	2	5
Unspecified Eucalyptus (dead)	3	2	5	13
Totals	24	15	39	100

Six trees with scars thought by the archaeologists to be made by European surveyors were recorded for comparative purposes. These fall into two groups. A high degree of surety exists for three scars with visible portion numbers and/or survey arrows carved into their face (WCP131, 132 and 133). Three other scars have morphologies which would not exclude an Aboriginal origin, but which are considered likely to be surveyor's scars based on their location at or near portion corners (WCP7, 68 and 77). These are classed as recordings with a debated origin.

The surveyor status of one of the scars, WCP131, has been confirmed by finding documentation of its creation on a Crown survey portion plan and verifying its location using the original survey data. In February, March and April of 1881, James Granter, a licensed Surveyor, conducted surveys of 51 portions in the parishes of Cumbo and Wilpinjong. The resulting Crown survey plan includes reference to a 'Box' tree near the southwestern corner of portion 124, parish of Cumbo identified as 'v' and situated on a bearing of 323.20 and 17 links from the portion corner (Department of Lands Cat. No. P1141.2125 ALN81.7504). The numbers 124 were carved into the tree and remain partially visible on the tree scar today (Plate F7.1).

The tree scar recordings WCP7 and WCP77 are also likely to correspond to survey reference scars referred to on the same Crown survey plan as tree 'a^3' marking portion 78, and 'K" ' marking portions 78 & 80.

It is considered possible that a systematic and detailed review of nineteenth century surveyor documentation may confirm surveyor origins for some of the scars currently rated as having a possible Aboriginal origin.

The difficulty in differentiating European and Aboriginal scars is compounded by the probable contemporaneous nature of each activity and the likelihood that both groups used the same tools and possibly also the same bark harvesting techniques. This Project's review of local Aboriginal occupation (refer Section F5.2) suggests that Aboriginal people remained in the district up to the end of the nineteenth century and at least early into the next century. Groups of Aborigines may have removed bark for a number of reasons during these post European contact periods. These include:

- for making shelter or receptacles whilst camping in the valley, and during travel to and from the Wollar encampment;
- stripping of bark for the cladding of either traditional or European-type structures built by Aboriginal people whilst living on and labouring for local farming estates; and
- stripping of bark for sale or barter to European home owners for the construction and maintenance of buildings, or as material for tanning.

It is probable that iron axes were quickly adopted by Aboriginal people following contact with Europeans and that after this time most scars were made with metal tools. The identification of the narrow and sharp cuts made by iron tools cannot therefore be used on its own as a distinguishing trait of European bark removal.

Twelve scars, recorded as one probable and 11 possible Aboriginal scars, include visible metal axe marks (Plates F7.2 to F7.5). Many of these display roughly rectangular shaped ends. Six of the trees are Grey or White Box, two are Ironbarks, two Stringybark, and two are unspecified (dead) Eucalypts. Most of these recordings occur in or near the eastern margin of the Project disturbance area, in or near proposed pit 3.

Typically the axe marks are arranged in one, two, or three horizontal straight rows of cut marks situated from 160 to 251 cm apart and generally located near the top and/or bottom of the scar. Thirty eight percent of upper rows are single, 31% are paired, and one example had three rows. Most lower rows are single, with only three occurring in pairs. This suggests that axe mark rows near the top of a scar are more likely to occur in multiples than the lower rows. Seven scars have upper and lower rows, the remainder have only upper or lower rows (three in each case), always located near the top or bottom of the scar. These findings should be moderated by the observation that regrowth may now obscure some rows. Six (50%) of these scars extend to the ground. This has the consequence that the recorded configuration of lower rows is likely to be more accurate than for upper rows.

In all but one case, the axe marks are orientated roughly horizontally, and where surface detail has survived, the individual marks tend to be overlapped above or below the preceding one (Plate F7.5). In one case (WCP114), the marks are joined according to a 'cross-cut' or 'zig-zag' pattern (Plates F7.2 and F7.3). In both these methods the intention appears to have been ensuring that all horizontally orientated fibres were cut. The indication that upper rows of axe marks are more likely to occur in multiples suggests that a full cut of the bark was more important for the upper cut than the lower. Where the scars extend to the ground, only one of the six examples had a paired lower row of axe marks. This may indicate that the dislodgement of bark to the ground was due to a failure of the lower cut.

The 'criss-cross' technique for cutting the bark is illustrated in nineteenth century instruction manuals for settlers. A version of these is shown in Figure F7.3 (from Archer 1996:69, also Long 2003:15). This illustration also shows a single row of axe cuts along the base of the scar, a preference also demonstrated in the Project area examples.

The use of a 'zig-zag' pattern is identified by Long (2003:16), as one of several diagnostic traits of bark removal by Europeans. Long developed a manual for recording Aboriginal tree scars for Aboriginal Affairs Victoria, based on a comprehensive review of data and recordings. Other traits proposed by Long to distinguish European made scars are:

- a limited range of tree species, mostly stringybark, messmate and box species;
- limited to rectangular panels approximately 1-3 m in length (reflecting their primary use as building cladding;
- invariably located at the base of a tree, generally ending within 0.5 m of the ground surface;
- steel hatchets were often used at the top of the scar, but never stone tools;
- European scars will be less than 170 years in age (Long 2003:16);
- frequent use of a full sized woodsman's axe (10-15 cm long), especially when severing the bark slab near ground level; and
- large scars are divided into two or more panels.

Most of the scars with axe marks from the Project area are consistent with the first five of these seven traits, providing a strong argument for considering a European origin for these scars. Despite this, an Aboriginal origin cannot yet be excluded, given the potential for Aboriginal people to adopt European techniques, especially if employed by or stripping for a European market and function.

An analysis of original scar and subsequent regrowth dimensions provides an additional set of evidence to investigate the question of European or Aboriginal origin. Figures F7.4 and F7.5 present plots of original scar length versus width, and regrowth maximum depth versus maximum width. In terms of scar proportion, both the possible and probable rated Aboriginal scars form a relatively consistent and dense group around a linear relationship based on a 1:2, width versus length ratio. The known and probable surveyor scars also fall into this group. The ratios for scars with axe marks are more diverse and less clumped. They are also all situated at the longer and wider margins of the graph.

Most scars without axe marks exhibit shorter lengths than those with scars. These patterns indicate that the scars with axe marks tend to be the larger of those recorded and less consistent in their width to length ratio. Both factors suggest an intention to remove large slabs of bark and perhaps also to maximise their length and width up preferred maximums. Based on the Project area examples, the desired maximum dimensions may have been perhaps 2 to 2.5 metres wide and 4 metres long. In all cases the bark removal did not extend all the way around the tree. In one case (WCP149), the creation of a second scar ensured the retention of live bark between both margins of the scars, thus ensuring the tree remained alive. The extent of original scar width, as a percentage of the total (modern) tree girth ranges from 43 to 75%, with an average of 56%. This clearly indicates that there was no intention to maximise bark width.

The fact that most scars with axe marks are longer than those without, introduces the possibility that in the shorter examples the marks have been covered with regrowth. This possibility can be tested by looking at trends in regrowth dimensions. If true, scars without visible axe marks should tend to be older. A plot of maximum regrowth depth versus maximum regrowth width may provide an indication of the spread of scar ages across the recordings. Both the known 1881 survey scar and the scars displaying metal axe marks provide chronological anchors to the distribution, the latter scar group all post dating European occupation and the introduction of metal axes.

From Figure F7.5, it can be seen that the depth of regrowth varied from 5 to 36 cm and width ranged between 12 and 65 cm. Scars with metal axe marks occur throughout these ranges, as do scars with a probable Aboriginal origin. Scars with axe marks show no trend to be younger in age than those without. This suggests that their surviving presence is not a simple product of age and that the differentiation of this group is justified and relates to a real distinction in bark harvesting methods.

If it is assumed that regrowth rates over the long term were broadly consistent for older trees within the Project area, then a number of conclusions can be made regarding the age of the recorded scars. The presence of James Granter's 1881 scar within the middle of the distribution suggests that around half of the scars post date this time. This places the creation of a large proportion of the recorded scars squarely within the middle to late nineteenth century when there was substantial building activity by European settlers. The fact that scars which display greater regrowth depth and width also include instances of metal axe use, across the full regrowth range, provides a strong case for concluding that all of the recorded scars date from the local introduction of metal tools. This probably occurred some decades after European colonisation on the east coast, in the late eighteenth century.

This finding for the maximum age of the scars is supported by age estimates generated from regrowth rates calculated from the 1881 survey scar (WCP131). These are 2.7 mm for regrowth across the scar face (also known as occlusion), and 1.8 mm for regrowth depth (also known as radial outgrowth). The latter is thought to be more reliable as it is directly related to the outgrowth of the tree as a whole. Using this scale, the maximum recorded regrowth depth (36 cm) represents a creation year of 1805 and the minimum depth of 5 cm equates to 1977, Figure F7.5. It is interesting to note that a line defined by these annual regrowth rates includes the other two known survey scars. These age extrapolations must be considered a rough guide only given that they are based on a single dated scar. However, it is considered unlikely that the identification of further dated examples will alter the overall pattern or order of magnitude.

F7.3.7 Non-archaeological Sites with Reported Aboriginal Cultural Value

Five recordings were made solely on the basis of reported Aboriginal cultural values arising from non-archaeological features. In all cases, these features consisted of natural landscape forms and were identified by Aboriginal survey participants. Two recordings are of ridgeline knolls, and three consist of natural depressions interpreted as potential sources of water for Aboriginal people.

WCP58 Reported Place of Aboriginal Cultural Significance to Women

This recording consists of a prominent knoll, with an elevation of just over 440 m AHD, which is situated on a north-south aligned ridgeline. It was identified as a site of special significance to women by two younger Aboriginal survey participants who were representatives of the Murong Gialinga ATSIC. The initial perceptions of these recorders were later supported by some older female members of the Mudgee LALC and Murong Gialinga ATSIC who visited the site during a community field inspection. One attendee subsequently came forward and stated that they believed the site had no cultural value and should not have been recorded as such.

Members of the Warrabinga NTCAC who visited the same area, including older women do not believe the knoll and ridgeline have any particular or special cultural significance and contest its identification as such.

WCP59 Reported Place of Aboriginal Cultural Significance to Men

This recording consists of a low and small knoll, with an elevation of just over 420 m AHD, situated on an open section of a broad north-south aligned ridgeline. The knoll is located just under two kilometres to the west of WCP58. The site was identified by a younger male survey participant, a representative of the Murong Gialinga ATSIC. Following inspection of the site, David Maynard stated that he respected the views of the initial site recorder and would not contradict his interpretation of the place. He noted that the location provided a commanding view of the surrounding valley and that it may have been used in hunting, scouting for game, and keeping watch over the area.

Members of the Warrabinga NTCAC who also inspected this area, voiced an opposing interpretation. The knoll was not considered by this group to have any particular or special cultural significance.

F7.3.7.1 Other Natural Features

Recordings were made of three natural depressions, identified by Aboriginal survey participants as water holes that would have been utilised by Aboriginal people. One recording consists of a round and relatively deep naturally formed ‘pot hole’ on the upper surface of a sandstone tor (WCP79). The tor is situated on the basal slopes of a debris slope. The depression was filled with water at the time of recording and was in relative proximity to a rock shelter with potential archaeological deposit.

Another recording consists of a small dug-out area (about 1 x 1 m in area) under a rock near the top of a small gully and an associated small drainage line cascade (WCP62). The drainage line was dry at the time of the survey and included a former rock pool at its base, now filled with gravels. The archaeologist could not see evidence of the depression being the result of human excavation.

The third recording consists of a similar small excavated depression under a tilted tabular piece of rock, near the top of a break-of-slope on a ridgeline bench (WCP61). The archaeologist could not see evidence of the depression being the result of human excavation.

F7.3.8 Sites with a Debated Origin

Eleven site recordings are considered to have ‘debated origins’. In these instances, interpretations of material features made by field archaeologists using archaeological criteria, were in contrast to interpretations communicated by Aboriginal representatives. In each case, the representatives considered that an Aboriginal origin was more certain than that allowed for in the archaeological assessment, which generally considered a natural or non-indigenous human origin more likely.

It should be noted that the dissenting Aboriginal opinion was not unanimous across all representatives and was often limited to one or more of the representatives present at the time of the recording.

The debated origin recordings consist of the following:

- Two isolated finds in which ridges (WCP212), and a worn hollow (WCP60), were considered to be natural features by the archaeologist. Aboriginal interpretation included the possibility of use as an anvil stone.

- A group of mounds of collected cobbles, thought by the archaeologist to be the result of rock collection from an adjacent agricultural field by Europeans (WCP142). Aboriginal interpretation was that one could not rule out the possibility of the mounds being burial locations.

- A scatter of flaked and crushed volcanic rock was originally considered to be the result of Aboriginal bipolar flaking technology, however more detailed field inspection indicated a probable machine source and a distribution restricted to fencelines and cattle treadage areas (WCP194). The property owner later confirmed that he had imported the material and used it to harden surfaces susceptible to erosion. Aboriginal interpretation did not concede a European or machine origin for the material.

- Four scarred trees where a natural, machine or recent non-Aboriginal origin was considered most likely by the archaeologist (WCP46, 52, 113 and 124). In each case Aboriginal interpretation did not recognise the criteria used by the archaeologist to exclude an Aboriginal origin.

- An indeterminate tree feature consisting of an eroded and axed depression in a dead and fallen tree (WCP63). The archaeologist considered the feature too young to be considered Aboriginal in origin, however Aboriginal interpretation preferred a more cautious and inclusive approach to the recording.

Two human made tree scars, considered by the archaeologist, on the balance of probability to be made by surveyors (WCP7 and 77). The strongest evidence for such an interpretation was considered to be their shape, and location on or near to cadastral boundaries. Aboriginal interpretation preferred a more cautious and inclusive approach to recording.

F7.4 Inventory of Survey Recordings

This inventory is organised into two tables. The first table (Table F7.13) includes all recordings considered to be Aboriginal or probably Aboriginal in origin according to archaeological judgement. The second table (Table F7.14) includes all other recordings. Each recording has a separate Project number with the prefix WCP (WCPL Project).

Map grid references for each recording are provided in Attachment F6.

Table F7.13
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP1	open artefact scatter	a large site of up to 100 surface artefacts extending across 400 m along Cumbo Creek	12	50 – 100
WCP2	open artefact scatter		11	
WCP3	open artefact scatter	a large site of up to 100 surface artefacts	14	up to 100
WCP4	open artefact scatter		5	
WCP5	isolated find		1	
WCP6	possible Aboriginal scarred tree	tree is dead, scar may not be very old		
WCP8	isolated find		1	
WCP9	potential archaeological deposit	includes crestline of E-W ridge, subject to confirmation		
WCP10	isolated find	may be extension of site WCP88	1	
WCP11	open artefact scatter		7	
WCP12	open artefact scatter	up to 50 estimated surface artefacts	23	up to 50
WCP13	open artefact scatter		4	
WCP14	isolated find	probably part of WCP15	1	
WCP15	open artefact scatter		5	
WCP16	isolated find		1	
WCP17	isolated find		1	
WCP18	isolated find		1	
WCP19	isolated find		1	
WCP20	isolated find		1	
WCP21	isolated find		1	
WCP22	open artefact scatter		3	
WCP23	isolated find		1	
WCP24	isolated find		1	
WCP25	open artefact scatter		5	
WCP26	open artefact scatter		2	
WCP27	isolated find		1	
WCP28	isolated find		1	
WCP29	open artefact scatter		9	
WCP30	isolated find		1	

Table F7.13 (Continued)
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP31	open artefact scatter		3	
WCP32	isolated find		1	
WCP33	open artefact scatter	up to 100 estimated surface artefacts	13	up to 100
WCP34	open artefact scatter		2	
WCP35	open artefact scatter		2	
WCP36	rock shelter with surface artefacts and archaeological deposit	one of three forming a close group	4	
WCP37	rock shelter with surface artefacts and archaeological deposit	one of three forming a close group	3	
WCP38	rock shelter with surface artefacts and archaeological deposit	one of three forming a close group	3	
WCP39	rock shelter with surface artefacts and archaeological deposit		4	
WCP40	isolated find		1	
WCP41	isolated find		1	
WCP42	open artefact scatter		2	
WCP43	isolated find		1	
WCP44	rock shelter with potential archaeological deposit			
WCP45	rock shelter with surface artefacts and archaeological deposit		1	
WCP46	isolated find		1	
WCP47	rock shelter with potential archaeological deposit	one of three forming a close group	1	
WCP48	rock shelter surface artefacts and archaeological deposit		1	
WCP49	rock shelter surface artefacts and archaeological deposit	this site includes two sandstone grinding stones	3	
WCP50	isolated find		1	
WCP51	isolated find		1	
WCP53	possible Aboriginal scarred tree			
WCP54	isolated find		1	

Table F7.13 (Continued)
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP55	possible Aboriginal scarred tree	dead and fallen		
WCP56	isolated find		1	
WCP57	open artefact scatter	up to an estimated 50 surface artefacts	13	up to 50
WCP58	reported place of cultural significance (knoll and ridgeline)	this knoll and the associated benched ridgeline is thought by some members of MLALC and MGATSIC to be a 'women's place' and a place were women's ceremonies were conducted other members of the MLALC and MGATSIC disagree members of WNTCAC disagree with this identification and do not believe the ridgeline or knoll have any particular or special cultural significance		
WCP59	reported place of cultural significance (knoll)	this knoll is thought by some members of MLALC and MGATSIC to be a 'men's place' and a place were men's ceremonies were conducted other members of the MLALC and MGATSIC disagree members of WNTCAC disagree with this identification and do not believe the knoll has any particular or special cultural significance		
WCP61	reported 'spring' or waterhole	an Aboriginal surveyor identified this feature (an excavated hole, under a stone slab), as a formerly utilised Aboriginal water source the archaeologists could not distinguish the feature from an area of animal digging within porous sediments the feature is situated just below a break-of-slope on a small benched spurline crest. (recorded 12/8/04)		
WCP62	reported 'spring' or waterhole	Aboriginal surveyors identified this feature as an excavated hole, formerly utilised as an Aboriginal water source the archaeologist could not distinguish the feature from an area of animal digging within porous sediments under sandstone boulders The feature is situated just below the break-of-slope within a nick-point gully of an upper catchment drainage lines some sediment filled former rock pools are situated immediately downstream, at the foot of the nick-point slope		
WCP64	probable Aboriginal scarred tree	appears to be in road easement of Mudgee-Wollar Rd		
WCP65	isolated find		1	
WCP66	open artefact scatter		2	

Table F7.13 (Continued)
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP67	open artefact scatter		3	
WCP69	possible Aboriginal scarred tree	this tree has two possible Aboriginal scars		
WCP70	isolated find		1	
WCP71	isolated find		1	
WCP72	rock shelter with rock art and potential archaeological deposit (shallow rock pot holes on the rock outcrops above the shelter may have been a source of water)	a large rock shelter in a prominent and isolated sandstone/conglomerate outcrop, with a formerly large back wall area (approx. 28m long) with rock art, dominated by red hand stencils there is good potential for undisturbed occupation deposit	1	
WCP73	isolated find		1	
WCP74	isolated find		1	
WCP75	probable Aboriginal scarred tree	a probable Aboriginal origin can only be confirmed if a surveyor origin for this tree can be excluded it may be a surveyor's scar marking the E boundary of portion 52/W boundary of portion 80		
WCP76	isolated find		1	
WCP78	open artefact scatter		2	
WCP79	natural shallow rock pot hole	recorded at the request of an Aboriginal surveyor this natural feature may have been utilised as a water source by Aborigines.		
WCP80	isolated find		1	
WCP81	open artefact scatter	a site with an estimated up to 50 surface artefacts which extends along spurline crest outside of the open cut mine and contained infrastructure	17	up to 50
WCP82	rock shelter with potential archaeological deposit	a low shelter on an isolated sandstone/conglomerate boulder, next to WCP81		
WCP83	open artefact scatter		5	
WCP84	isolated find	likely to be associated with archaeological deposit, within a localised sandstone tor complex	1	
WCP85	rock shelter with surface artefacts and potential archaeological deposit	rock shelter is situated in localised sandstone tor complex which include WCP84	2	
WCP86	open artefact scatter		2	
WCP87	open artefact scatter	up to 50 surface artefacts	18	up to 50

Table F7.13 (Continued)
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP88	open artefact scatter and procurement site	up to 15 surface artefacts in area characterised by a high density lag of natural gravels derived from the underlying conglomerates the artefacts have been made from these local gravels (hence a procurement site)	7	up to 15
WCP89	possible Aboriginal scarred tree			
WCP90	probable Aboriginal scarred tree			
WCP91	possible Aboriginal scarred tree			
WCP92	potential archaeological deposit			
WCP93	possible Aboriginal scarred tree			
WCP94	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP95	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP96	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP97	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin, most of scar on fallen and dead section of trunk		
WCP98	probable Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP99	probable Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP100	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP101	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin, tree is dead and most of trunk (and scar) has been felled and partially harvested for fence posts		
WCP102	isolated find		1	
WCP103	isolated find		1	
WCP104	isolated find		1	
WCP105	open artefact scatter		3	up to 5
WCP106	open artefact scatter		2	2
WCP107	isolated find		1	
WCP108	open artefact scatter	hatchet fragment	2	
WCP109	isolated find		1	
WCP110	isolated find		1	
WCP111	possible Aboriginal scarred tree			

Table F7.13 (Continued)
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP112	possible Aboriginal scarred tree			
WCP114	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin, tree has fallen and is dead		
WCP115	rock shelter with surface artefacts and archaeological deposit		2	
WCP116	rock shelter with surface artefacts and archaeological deposit	boulder includes pothole (c.15cm deep) as a potential water source, site includes adjacent areas of open potential archaeological deposit	2	
WCP117	rock shelter with potential archaeological deposit	boulder includes pothole (>45cm deep) as a potential water source		
WCP118	rock shelter with surface artefacts and archaeological deposit	two alcoves (one overhang) on S side of boulder/tor	8	up to 15
WCP119	rock shelter with surface artefacts and archaeological deposit	shelter on N side of WCP118 boulder/tor	3	up to 15
WCP120	rock shelter with surface artefacts and archaeological deposit		2	
WCP121	open artefact scatter		2	
WCP122	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP123	open artefact scatter	up to an estimated 50 surface artefacts present	6	up to 50
WCP125	open artefact scatter		2	
WCP126	open artefact scatter	up to an estimated 50 surface artefacts present	15	up to 50
WCP127	open artefact scatter		3	
WCP128	open artefact scatter		10	up to 15
WCP129	possible Aboriginal scarred tree			
WCP130	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP134	open artefact scatter	a large and extensive site with an estimated 500+ surface artefacts, which extends along the elevated southern bank of Wilpinjong Creek site includes a hatchet head (stone axe).	26	500+
WCP135	isolated find		1	
WCP136	open artefact scatter	a large and extensive site with an estimated 100+ surface artefacts, which extends along the elevated northern bank of Wilpinjong Creek	10	up to 500

Table F7.13 (Continued)
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP137	rock shelter with surface artefacts and potential archaeological deposit		2	up to 5
WCP138	open artefact scatter		8	up to 15
WCP139	open artefact scatter	this site surrounds WCP140 and WCP141 and includes a hatchet head (stone axe)	8	up to 15
WCP140	rock shelter with surface artefacts and potential archaeological deposit	shelter on S side of tor which also supports shelter WCP141	3	
WCP141	rock shelter with potential archaeological deposit	shelter on N side of tor which also supports shelter WCP140		
WCP143	rock shelter with potential archaeological deposit			
WCP144	rock shelter with surface artefacts and archaeological deposit		1	
WCP145	rock shelter with potential archaeological deposit			
WCP146	rock shelter with potential archaeological deposit			
WCP147	rock shelter with potential archaeological deposit			
WCP148	rock shelter with potential archaeological deposit			
WCP149	possible Aboriginal scarred tree	tree has two scars, both with axe marks, may be Aboriginal or European in origin		
WCP150	probable Aboriginal scarred tree			
WCP151	open artefact scatter	site is low density but spread out over large area across high ground adjacent to south bank of Wilpinjong Creek, may be continuous with, or be part of WCP192	11	up to 20
WCP152	rock shelter with art, surface artefacts and potential archaeological deposit	shelter contains 18 drawn and painted motifs or indeterminate areas in red to dark red pigment only seven are easily seen. Identifiable motifs include tridents (‘arrows’ or ‘bird tracks’)	2	2
WCP153	rock shelter with art and potential archaeological deposit	shelter contains three red hand stencils, one large and two small hands.		
WCP154	rock shelter with potential archaeological deposit			
WCP155	isolated find		1	1
WCP156	open artefact scatter		6	up to 15
WCP157	open artefact scatter		7	up to 15
WCP158	open artefact scatter		19	up to 50

Table F7.13 (Continued)
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP159	open artefact scatter		7	up to 50
WCP160	possible Aboriginal scarred tree			
WCP161	probable Aboriginal scarred tree			
WCP162	open artefact scatter		10	up to 50
WCP163	probable Aboriginal scarred tree			
WCP164	rock shelter with potential archaeological deposit	shelter is fractured and may be vulnerable to vibration		
WCP165	rock shelter with potential archaeological deposit			
WCP166	probable Aboriginal scarred tree			
WCP167	probable Aboriginal scarred tree			
WCP168	rock shelter with potential archaeological deposit			
WCP169	probable Aboriginal scarred tree	grouped with WCP170 & 171		
WCP170	probable Aboriginal scarred tree	grouped with WCP169 & 171		
WCP171	probable Aboriginal scarred tree	grouped with WCP169 & 170		
WCP172	rock shelter with potential archaeological deposit			
WCP173	rock shelter with surface artefacts and potential archaeological deposit		2	up to 5
WCP174	open artefact scatter	a large scatter of over 500 estimated surface artefacts along 250 m of the north bank of Wilpinjong Creek	10	500+
WCP175	isolated find		1	
WCP176	open artefact scatter		7	
WCP177	isolated find		1	
WCP178	rock shelter with surface artefacts and archaeological deposit		12	
WCP179	open artefact scatter		9	
WCP180	isolated find		1	
WCP181	isolated find		1	
WCP182	isolated find		1	
WCP183	isolated find		1	
WCP184	open artefact scatter		6	up to 15

Table F7.13 (Continued)
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP185	open artefact scatter		2	
WCP186	isolated find		1	
WCP187	isolated find		1	
WCP188	open artefact scatter		2	
WCP189	open artefact scatter		5	
WCP190	open artefact scatter	approx 5-10 surface artefacts, including an anvil stone		up to 10
WCP191	open artefact scatter	2 surface artefacts	2	
WCP192	rock shelter with surface artefacts and archaeological deposit	rock shelter in boulder/tor in group of boulders on basal slopes, artefacts include tuff and a possible hammer stone		
WCP193	open artefact scatter	two artefacts identified in carpark adjacent to Cumbo Creek homestead (now WCPL Office), site likely to be larger	2	
WCP195	open artefact scatter		2	up to 5
WCP196	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP197	possible Aboriginal scarred tree	a definite human made scar, may be Aboriginal or European in origin		
WCP198	open artefact scatter	up to an estimated 50 surface artefacts present	12	up to 50
WCP199	isolated find		1	
WCP200	isolated find		1	
WCP201	isolated find		1	
WCP202	open artefact scatter		2	
WCP203	isolated find		1	
WCP204	isolated find		1	
WCP205	isolated find		1	
WCP206	isolated find		1	
WCP207	possible Aboriginal scarred tree	may be a surveyors reference tree marking SE corner of portion 102 (parish of Wilpinjong) and/or boundary of Driftway reserve		
WCP208	open artefact scatter	up to an estimated 50 surface artefacts	13	up to 50
WCP209	open artefact scatter		14	14
WCP210	isolated find		1	

Table F7.13 (Continued)
Aboriginal Cultural Heritage Site Recordings

Project Code	Recording type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP211	open artefact scatter		5	5
WCP213	open artefact scatter	up to an estimated 50 surface artefacts	11	up to 50
WCP214	open artefact scatter	up to an estimated 50 surface artefacts	11	up to 50
WCP215	isolated find		1	
WCP216	open artefact scatter	up to an estimated 500 surface artefacts. Site extends over area 500 x 200 m.	10	up to 500
WCP217	open artefact scatter		2	up to 5
WCP218	isolated find	may be part of recording WCP217	1	
WCP219	open artefact scatter		5	
WCP220	open artefact scatter	up to an estimated 50 surface artefacts	11	up to 50
WCP221	isolated find		1	
WCP222	open artefact scatter		2	up to 5
WCP223	isolated find		1	
WCP224	open artefact scatter	site with an estimated up to 50 surface artefacts	10	up to 50
WCP225	isolated find		1	
WCP226	open artefact scatter		2	
WCP227	open artefact scatter	approx. 200-300 estimated surface artefacts, a large site which extends along spurline, greatest artefact densities along crest, flaking floors evident in quartz and tuff, cores and artefacts with secondary flaking noted	11	up to 500
WCP228	rock shelter with potential archaeological deposit			
WCP229	rock shelter with potential archaeological deposit			
WCP230	rock shelter with potential archaeological deposit			
WCP231	rock shelter with potential archaeological deposit			
WCP232	rock shelter with potential archaeological deposit			
WCP233	rock shelter with potential archaeological deposit			
WCP234	probable Aboriginal scarred tree			
WCP235	isolated find		1	1
WCP236	probable Aboriginal scarred tree			
WCP237	Isolated find		1	1
WCP238	isolated find		1	1

Table F7.14
Sites of Debated Origin and European Scar Trees Recorded for Potential Research Purposes

Project Code	Recording Type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP7	probable surveyors scarred tree (debated origin)	recorded at the request of an Aboriginal surveyor who believed the tree scar may be Aboriginal in origin the archaeologists believe the scar was made by a surveyor to mark the NW corner of portion 78/NE corner of portion 106 / S boundary of portion 77		
WCP52	scarred tree (debated origin)	recorded at request of Aboriginal surveyors who believe the tree scars are Aboriginal in origin the archaeologists, and members of the WNTCAC consider the two scars on this tree to be natural in origin (probably the result of fire)		
WCP60	isolated find (debated origin)	rock thought by some Aboriginal surveyors to be an Aboriginal anvil stone the Project archaeologists consider this rock to be the result of a combination of natural weathering around a (now absent) inclusion, and possible plough impact Aboriginal surveyors requested that a note be made of the stone and its location		
WCP63	indeterminate tree feature (debated origin)	a possibly human-made aperture into the hollow centre of a dead (sawn) and fallen trunk an axe mark is evident but may not be contemporaneous with the formation of the hollow feature is weathered and indeterminate.		
WCP68	probable surveyors scarred tree (debated origin)	may be Aboriginal if can't demonstrate its creation by a surveyor to mark NW corner of portion 138 / NE corner portion 9 / S boundary of portion 75		
WCP77	probable surveyors scarred tree (debated origin)	recorded at the request of an Aboriginal surveyor who believed the tree scar is Aboriginal in origin the archaeologists believe the scar was made by a surveyor to mark the NE corner of portion 52/NW corner of portion 80, SE corner portion 106/SW corner portion 78		
WCP113	scarred tree (debated origin)	recorded at the request an Aboriginal surveyor the archaeologist considers a non-Aboriginal origin is likely for this scar		
WCP124	scarred tree (debated origin)	recorded at the request of an Aboriginal surveyor, archaeologist considers a mechanical origin for this scar is likely		
WCP131	surveyors reference scarred tree	recorded for comparison with other scarred tree recordings, marks SW corner of portion 124		
WCP132	surveyors reference scarred tree	recorded for comparison with other scarred tree recordings, may mark SE corner of portion 147, or NE corner of portion 155 (Parish of Cumbo), or NW corner of portion 1, or SW corner of portion 89 (Parish of Wollar)		

Table F7.14 (Continued)
Sites of Debated Origin and European Scar Trees Recorded for Potential Research Purposes

Project Code	Recording Type	Comments	No. Artefacts Described in Detail	Actual or Estimated Surface Stone Artefacts
WCP133	surveyors reference scarred tree	recorded for comparison with other scarred tree recordings, marks NW corner of portion 145, and NE corner of portion 144		
WCP142	probable European clearing mounds (debated origin)	group of six mounds of collected stones interpreted by archaeologists as stones collected by Europeans to clear agricultural fields, however an Aboriginal surveyor believed these features may mark Aboriginal burials		
WCP194	lithic scatter of debated origin	recorded at the request of an Aboriginal surveyor, a scatter of flaked and crushed 'blue metal' gravels, some present characteristics of bipolar cores local farmer (Lloyd Reid) later identified this material as 'metal' dumped by him to stabilise surfaces trampled by stock		
WCP212	isolated find (debated origin)	this find consists of a rock fragment with pronounced ridges and grooves, probably natural in origin, but it was considered prudent to make a record the find occurs in close proximity to recording WCP123	1	

F7.5 Survey Coverage and Visibility Variables

The effectiveness of archaeological field survey is to a large degree related to the obtrusiveness of the sites being looked for and the incidence and quality of ground surface visibility encountered. In order to gauge the effectiveness of the survey, ground surface visibility variables were noted during the survey and compiled for each of the landform categories surveyed.

Ground surface visibility is a measure of the bare ground visible to the archaeologist during the survey. There are two main variables used to assess ground surface visibility, the frequency of exposures encountered by the surveyor, and the quality of visibility within those exposures. The main factors affecting the quality of ground surface visibility within an exposure are the extent of vegetation and ground litter, the depth and origin of the exposure, the extent of recent sedimentary deposition, and the level of visual interference from surface gravels.

Ground surface visibility will substantially influence the ability of surveyors to detect sites, which consist of artefacts on or within the ground or a sedimentary matrix. Typically these are isolated finds and open artefact scatters. Sites on open rock platforms such as grinding grooves and art engravings may also be affected. In contrast, the detection of site types that occur solely or partially above ground is mostly independent of ground surface conditions. These sites include scarred trees, and rock shelters. Deposits situated within rock shelters remain subject to ground visibility constraints, however the absence of surface artefacts is often a precursor to a recording as a potential archaeological deposit.

For these reasons, the measurement of ground surface visibility encountered during a survey is most pertinent to assessing the effective detection of open artefact occurrences. By contrast, the detection of site types such as scarred trees and rock shelters is likely to approach 100% when a comprehensive survey strategy is adopted.

The obtrusiveness of different site types is also an important factor when assessing the effectiveness of archaeological survey. Old growth trees and rock exposures are easily recognisable and likely to be inspected during a comprehensive survey. In another example, artefacts made from locally occurring rock, such as quartz, may be more difficult to distinguish amongst naturally present gravels than imported rock types, such as tuff or silcrete. Sites with more visible artefacts are more likely to be recorded than those with unobtrusive rock types. The visual interference posed by natural gravels and its effect on artefact detection is one of the factors taken into account when estimating ground surface visibility.

Values for the following two ground surface visibility variables were compiled during the survey:

- a percentage estimate of the total area of ground inspected which contained useable exposures of bare ground; and

- a percentage estimate of the average levels of ground surface visibility within those exposures. This is a net estimate and accounts for all impacting visual and physical variables including the archaeological potential of the sediment or rock exposed.

In addition, qualitative observations were made of the incidence of rock overhangs, sandstone platforms, and old growth trees.

Table F7.15 at the end of this section presents exposure incidence and average ground surface visibility data for broad scale landform categories within the surveyed sections of the Project area. Refer Figure F4.2 for a map of the broad scale landforms divisions across the surveyed area. A total of 2,510 hectares was subject to archaeological survey. Seventy eight percent of this area (1,950 ha) was subject to comprehensive survey as outlined in Section F2.3.2 above. This portion included all of the proposed open cut mine and contained infrastructure. A more focused survey strategy was conducted in the remaining 560 hectares, which included sample areas within the proposed ECAs.

A graphic approximation of the surface survey coverage achieved within the Project area is shown in Figure F2.1.

Both survey modes included the use of vehicle based inspection when traversing ground with near zero ground surface exposures. Vehicle based inspection was generally restricted to agricultural grasslands on the valley floor. An estimated 1,630 hectares or 65% of the total surveyed area was subject to survey and inspection on foot. Of this area, 12% (201 ha) provided useable archaeological exposures.

Taking into account survey coverage, archaeologically useable exposures, and visibility variables within those exposures, the effective survey coverage (ESC) was 5.8% of the total survey area. The ESC attempts to provide an estimate of the proportion of the total Project area that provided a net 100% level of ground surface visibility to archaeological surveyors.

The ESC calculation is defined and required by the DEC and stated to be of use in assessing and cross comparing the adequacy of archaeological surface surveys. The actual utility of the ESC calculation however is challenged by many archaeologists. The limitations of the ESC calculation are emphasised by differences in the subjective assessment of exposure and visibility levels, variations in how survey units are defined and measured, and differences in how and which variables are estimated and combined. In reality, ESC results tend only to be meaningful when compared across surveys conducted by the same surveyors and ESC measurers.

Within each of the broad scale landform categories where comprehensive survey was conducted, the ESC was roughly the same, ranging from 5.5% on the basal valley slopes to 6.3% on the mid valley slopes. Higher and lower values were achieved in the areas subject to focused survey, ranging from 2% on the upper valley, to 10.8% on the mid valley slopes. The greater range reflects the local characteristics of the sample survey areas.

Across the valley floor, ground surface exposures were provided by a wide range of processes including vehicle tracks, animal tracks and burrows, the banks of creeks and drainage lines, terrace and bench slopes, salt scalds, erosion from rilling, sheet wash and gullying, and ploughed fields. Surface outcrops of rock were rarely encountered and were generally limited to small platforms and low relief exposures, primarily along the edge of low benches and in the beds of drainage lines.

In basal valley slope contexts a similar range of exposures was encountered, with the exception of major drainage lines and terrace formations. This category includes the base of the debris slopes which fringe the valley escarpments and as a consequence included a low to moderate incidence of sandstone and conglomerate tors of varying size and surface relief. A high proportion of these were found to support overhangs and cavernous shelters with surface artefacts. The incidence of exposures away from the tors was less than for the valley floor due to a lower incidence of tracks and salt scalds.

On the mid valley slopes, the exposure incidence was significantly greater due to the higher slope gradients and surface instability, retention of forest and woodland, and poor understorey and grass cover. The incidence of sandstone and conglomerate tors increased to moderate to high levels and included a wide variety of sizes. Like the basal slope contexts, most of these appeared to comprise dislocated rock from the upslope escarpments. A significant proportion of the shelters formed in these tors was found to either contain surface artefacts or potential archaeological deposits.

A significant contrast in the incidence of shelters on mid valley contexts was noted between east and west facing debris slopes. Tors and rock debris distributed across east facing slopes were found to support a substantially lesser number of shelters suitable for occupation. It is speculated that this may be a result of smaller overall debris size, which may in turn be a consequence of differing climatic or geological characteristics on the east facing escarpments.

Only a small proportion of upper valley topography was subject to survey as it is not in the Project disturbance area, all areas inspected formed part of the focused survey coverage outside of the Project disturbance area. Most of this survey coverage consisted of the base of the main escarpment, the adjacent upper slopes, and some adjacent areas of plateau topography above the escarpment. Exposure incidence on the plateau was typically low due to low numbers of erosion features and good forest and understorey vegetation. Best exposures were afforded by animal tracks, the high gradient scree slopes, and the surface of deposits in escarpment rock shelters.

The incidence of cavernous weathering along the base of the main escarpment was noted to be moderate to high (between 0.5 and 5 large shelters per 100 metres). These shelters have mostly formed either in massive in situ exposures of the bedrock. Despite this, a very small number of sites or potential deposits were recorded in this upper context. This is probably a consequence of the morphology of these shelters, which typically have sloping floors with either rock surfaces, and/or loose and pale sandy floor deposits derived from the active erosion of the adjacent rock walls and ceilings. It is thought that these characteristics were not conducive for Aboriginal occupation. By contrast the shelter sites recorded from the lower slopes have relatively level floors, with compact deposits of brown sandy loams and more stable wall and ceiling surfaces. Proximity to valley floor water resources may also have been a factor for higher usage of these shelters.

Old growth trees were found to occur throughout the Project area, from creek banks on the valley floor to the top of the escarpments. The incidence of old growth trees is closely correlated with the retention of native vegetation. On the downstream portions of the valley floor, old trees occur rarely as isolated shade trees and along field boundaries. Higher up in the catchment, on basal slopes and in a small number of road or driftway reservations, old growth trees survive in remnant woodland and forest pockets. Open forest, still survives on the valley floor and basal slopes of the eastern margin of the Project disturbance area (predominantly regrowth), and on surrounding higher gradient slopes. These forests display a significant loss of large trees from previous land clearing events, selective human felling, ring barking, storm damage, and fire. Despite this, old growth trees were found to occur sporadically along the steeper slopes, and in small contained areas on the basal slopes and valley floor.

Table F7.15
Survey Coverage Data

Survey Time	Survey Unit	Landform	Survey Mode	Main Exposure Types	Unit Area (ha)	Proportion of Unit Surveyed on Foot %	Exposure Incidence %	Average Exposure Visibility %	Net Effective Exposure (ha)	Effective Survey Coverage of Survey Unit %	Archaeological Recordings (excluding scarred trees and debated origin recordings)
August 2004	1	valley floor	comp.	vehicle tracks, animal tracks and digging, creek and stream banks, terrace edges, salt scalds, sheet and gully erosion, ploughed areas	1342	50 (671 ha)	15 (101 ha)	80	80.5200	6.0	• 96 Aboriginal recordings • 41 open artefact scatters • 46 isolated finds • 7 rock shelters with artefacts/art/deposit • 2 rock shelter with pad only • 1 open site per 18.6 a
January 2005	2	valley floor	focused	vehicle tracks, animal tracks and digging, creek and stream banks, terrace and bench edges, salt scalds, sheet and gully erosion, ploughed areas	281	70 (197 ha)	8 (16 ha)	70	11.015	3.9	
August 2004	3	basal valley slopes	comp.	vehicle tracks, animal tracks and digging, stream banks, bench slopes, salt scalds, sheet and gully erosion, ploughed areas, low grassed areas around rock tors	475	85 (404 ha)	10 (40 ha)	65	26.244	5.5	• 44 Aboriginal recordings • 25 open artefact scatters • 11 isolated finds • 6 rock shelters with artefacts/art/deposit • 2 rock shelters with pad only • 1 open site per 16 ha
January 2005	4	basal valley slopes	focused	vehicle tracks, animal tracks and digging, stream banks, bench slopes, salt scalds, sheet and gully erosion, ploughed areas, low grassed areas around rock tors	102	100 (102 ha)	5 (5 ha)	65	3.315	3.3	

Table F7.15 (Continued)
Survey Coverage Data

Survey Time	Survey Unit	Landform	Survey Mode	Main Exposure Types	Unit Area (ha)	Proportion of Unit Surveyed on Foot %	Exposure Incidence %	Average Exposure Visibility %	Net Effective Exposure (ha)	Effective Survey Coverage of Survey Unit %	Archaeological Recordings (excluding scarred trees and debated origin recordings)
August 2004	5	mid valley slopes	comp.	vehicle tracks, animal tracks and digging, stream banks, bench slopes, sheet erosion, gullies, low grassed areas on moderate slopes and around rock tors/escarpments	133	70 (93 ha)	15 (14 ha)	60	8.379	6.3	• 34 Aboriginal recordings • 5 open artefact scatters • 7 isolated finds • 8 rock shelters with artefacts/art/deposit • 12 rock shelters with pad only • 2 open pad's • 1 open site per 22 ha
January 2005	6	mid valley slopes	focused	vehicle tracks, animal tracks and digging, stream banks, bench slopes, sheet erosion, gullies, low grassed areas on moderate slopes and around rock tors/escarpments	130	90 (117 ha)	20 (23 ha)	60	14.040	10.8	
August 2004	7	upper valley	focused	animal tracks and digging, gully erosion, low grassed areas on moderate slopes and around rock tors/escarpments	47	100 (47 ha)	5 (2 ha)	40	0.940	2.0	• 6 Aboriginal recordings • 1 rock shelter with artefacts/art/deposit • 5 rock shelters with pad only • 0 open sites
Totals					2510	65 (1630 ha)	12 (201 ha)		144.453	5.8%	• 178 archaeological recordings (excl open pads) • 135 open sites • 1 open site per 18.6 ha

F7.6 The Potential Subsurface Archaeological Resource

Archaeological survey is, by its very nature, limited to recording artefactual material situated above or on the ground surface. The degree to which this evidence is an accurate indicator of the below-ground resource can vary dramatically according to a range of visibility variables. In all cases, the boundaries of surface artefact distributions will largely reflect the incidence of ground surface exposure rather than the true extent of sub-surface materials. Similarly, the nature of the exposure will influence the quality of the sample as an indicator of the eroded deposit. Shallow exposures may not extend deep enough to reveal artefact bearing sediments and deep exposures may be dominated by clay substrates with little potential for artefacts.

Landform-based test excavation programs on the Cumberland Plain, NSW South Coast and Southern Highlands have all demonstrated that surface sites are generally an inaccurate representation of subsurface deposits and that artefactual material can be expected to occur at varying densities throughout most landscapes. In many cases artefact densities below the ground are significantly greater than those found on the surface (c.f. McDonald & Rich, 1993).

In the case of rock shelter deposits, test excavation programs in the Sydney Basin reveal a high incidence of archaeological material within identified potential archaeological deposits. In an investigation of the Upper Mangrove Creek catchment, Attenbrow (1987) found that almost 90 percent of recorded PADs in rock shelters contained archaeological material.

It is probable that the subsurface archaeological resource within the Project area is consistent with these findings from elsewhere in the Sydney Basin and NSW. Surface finds are likely to present a similar degree of under-representation of the sub-surface resource, and will not completely reflect the spatial extent of subsurface material.

These predictions are supported by the assessments of potential made by field recorders. Around half (53%) of all artefact occurrences were assessed as having moderate potential to be larger in area. Most recordings with high potential are located in valley floor contexts, and those with moderate potential in valley floor and basal slope contexts. The potential for sites to contain more than the recorded number artefacts followed similar trends (refer Section F7.3.4 above).

A consequence of this reasoning is that Aboriginal artefacts can be expected to occur in varying density throughout the soil profiles of the Project disturbance area. Given the results of the site content and location analyses it can be predicted that densities will vary at a broad scale according to relative landform context and distance to water, and at a fine scale according to micro-topographic variation. Crests, basal slopes and level ground on locally elevated landforms will tend to have higher densities, especially when adjacent to a defined watercourse. Areas of higher density will tend to be more focused in distribution within basal slope broad scale contexts, and more extensive on the valley floor. Much of the valley floor will be characterised by a spread-out and relatively low artefact density, reflecting the absence of defined watercourses across much of the valley floor.

These conclusions can be further refined by considering the nature of the soil profile that contains the sub-surface resource.

Most of the archaeological sites in the Project disturbance area occur on relatively shallow and texture contrast soils with distinct clay substrates. These sites are unlikely to contain undisturbed or *in situ* archaeological deposits due to natural processes of soil bioturbation and erosion, and human actions such as vegetation clearance, and ploughing. The distinct clay boundary at a relatively shallow depth acts as a barrier to downward movement of artefacts moving under the influence of the biomantle (the zone of biological activity generated by plant roots, vertebrates and invertebrates). Dense gravel layers form a similar barrier.

Artefacts discarded on these soils will have been subject to surface dispersion, limited down slope movement, and differential burial or exposure by bioturbation agents. As a result, artefacts of all ages will accumulate and contribute to a stone layer between the clay and upper soil horizons (the A and B-horizon). Sites on texture contrast soils are therefore unlikely to be stratified in a chronologically useful sense.

Despite these processes, some site use patterns, such as knapping floors, may survive in plan form but with an extended vertical distribution of their components and possible mixing with artefacts from other events. This remnant horizontal distribution can have research value and a program of salvage excavation (Section F11) may seek to sample this record, especially in sites with high diversity or large artefact numbers.

In contrast to this predominant soil profile, a limited number of aggrading landforms provides potential for *in situ* archaeological material. Due to a significant build up of sediment over time and the consequential elevation of the biomantle, the vertical distribution of any incorporated artefacts may retain a degree of information about their relative depositional sequence, and therefore chronology. These aggrading landforms are typically alluvial in nature and consist of alluvial flats, fans, and terrace deposits. Where these landforms overlap with archaeologically sensitive topographies, there exists a degree of potential for better preserved subsurface archaeological deposits. The combination of aggrading landforms with locally elevated, low gradient ground adjacent to defined watercourses, differentiates a small proportion of the Project disturbance area. These areas are mostly situated in upper valley contexts or on the alluvial flats of the lower reaches (refer Figure F7.6).

Rock shelters represent another significant potential source of *in situ* archaeological deposits. Within the confines of a dry, rock sheltered deposit, bioturbation is more restricted, and barring the efforts of wombats and other large burrowers, the build-up of sediment provides high potential for stratified archaeological deposits. Most of the rock shelter recordings (76%) were assessed as having high potential for *in sit*u material. In addition, shelters on or close to the valley floor displayed considerable potential for their archaeological deposits to extend beyond the limit of the rock shelter onto the adjacent level ground and low gradient slopes.

The incidence of rock shelters in the Project area is confined to the escarpments and associated debris slopes which fringe the open basal slopes and floor of the valley. The presence of potential archaeological deposits was found to be rare in shelters situated within the continuous bedrock escarpments of the upper valley. Potential deposits were more frequently associated with shelters on the middle and lower sections of the debris slopes, with greatest potential suggested by the lower examples. Tors and rock debris on east facing slopes were found to support fewer shelters suitable for occupation (refer Section F7.5). Based on survey results from escarpment and debris slope areas, the known and predicted distribution of rock shelters with potential archaeological deposits have been mapped at a broad scale and are shown in Figure F7.7.

Only one rock shelter occurs within the Project disturbance area (WCP85). The shelter occurs in a group of rock tors situated on the southeastern boundary of pit 2 (Plate F7.7).

Two other landform categories have characteristics that present a potential requirement for some archaeological subsurface testing during the Project life. These are the three sand and gravel deposits in the middle and northwestern sections of the Project disturbance area, and a select number of locally elevated bedrock spurs and benches adjacent drainage lines and the valley floor (Figure F7.6).

The sand and gravel deposits are most probably the residues from the erosion of once overlying sandstone and conglomerate beds (refer Section F4.3.4). The deposits have substantial depth, and water seepage around the flanks of the deposit may have been a focus for Aboriginal occupation. However, apart from a grouping of small sites on an associated bedrock spurline (WCP102-04, 108-09 and 196), there is little evidence for such a focus. This lack of evidence may reflect the tendency for artefacts on sand surfaces to move down the soil profile due to bioturbation. In addition, the sand deposits may have been used for burials. This potential is suggested by the deep and easily dug nature of the deposit, and proximity to the Wilpinjong Creek corridor.

A number of locally elevated level ground areas with archaeological research potential occur within the Project disturbance area (Figure F7.6). Two are associated with sand and gravel deposits and may contain information about the exploitation of resources associated with these deposits, namely alluvial gravels for artefact manufacture (such as at the small procurement site WCP9), and ironstone and iron oxide deposits. The remaining areas are situated on either side of Cumbo Creek. Despite the fact that soil profiles on this ground are likely to be shallow, the potential for, and confirmed presence of, relatively large sites near Cumbo Creek presents an opportunity to salvage archaeological material from the largest order riparian zone within the Project disturbance area. The likely retention of a degree of horizontal integrity in artefact distribution within these deposits increases the potential archaeological value of a salvage operation in these areas during the Project life.

F8 SIGNIFICANCE ASSESSMENT

F8.1 Assessment Criteria

The Burra Charter of Australia defines cultural significance as 'aesthetic, historic, scientific or social value for past, present and future generations' (Australia ICOMOS, 1987). The assessment of the cultural significance of a place is based on this definition but often varies in the precise criteria used according to the analytical discipline and the nature of the site, object or place.

In general, Aboriginal archaeological sites are assessed using five potential categories of significance:

- significance to contemporary Aboriginal people;
- scientific or archaeological significance;
- aesthetic value;
- representativeness; and
- value as an educational and/or recreational resource.

Many sites will be significant according to several categories and the exact criteria used will vary according to the nature and purpose of the evaluation. Cultural significance is a relative value based on variable references within social and scientific practice. The cultural significance of a place is therefore not a fixed assessment and may vary with changes in knowledge and social perceptions.

Aboriginal significance can be defined as the cultural values of a place held by and manifest within the local and wider contemporary Aboriginal community. Places of significance may be landscape features as well as archaeologically definable traces of past human activity. The significance of a place can be the result of several factors including: continuity of tradition, occupation or action; historical association; custodianship or concern for the protection and maintenance of places; and the value of sites as tangible and meaningful links with the lifestyle and values of community ancestors. Aboriginal cultural significance may or may not parallel the archaeological significance of a site.

Scientific significance can be defined as the present and future research potential of the artefactual material occurring within a place or site. This is also known as archaeological significance.

There are two major criteria used in assessing scientific significance:

1. The potential of a place to provide information that is of value in scientific analysis and the resolution of potential research questions. Sites may fall into this category because they: contain undisturbed artefactual material, occur within a context which enables the testing of certain propositions, are very old or contain significant stratified deposits, contain large artefactual assemblages or material diversity, have unusual characteristics, are of good preservation, or are a constituent of a larger significant structure such as a site complex.

2. The representativeness of a place. Representativeness is a measure of the degree to which a place is characteristic of other places of its type, content, context or location. Under this criteria a place may be significant because it is very rare or because it provides a characteristic example or reference.

The value of an Aboriginal place as an educational resource is dependent on: the potential for interpretation to a general visitor audience, compatible Aboriginal values, a resistant site fabric, and feasible site access and management resources.

The principal aim of cultural resource management is the conservation of a representative sample of site types and variation from differing social and environmental contexts. Sites with inherently unique features, or which are poorly represented elsewhere in similar environment types, are considered to have relatively high cultural significance.

The cultural significance of a place can be usefully classified according to a comparative scale, which combines a relative value with a geographic context. In this way a site can be of low, moderate or high significance within a local, regional or national context. This system provides a means of comparison, between and across places. However it does not necessarily imply that a place with a limited sphere of significance is of lesser value than one of greater reference.

The following assessments are made with full reference to the scientific, aesthetic, representative and educational criteria outlined above.

Also incorporated are references and identifications of Aboriginal cultural significance and values communicated to the consultants up to the time of writing. It should be noted that Aboriginal cultural significance can only be determined by the Aboriginal community and the information presented here is sourced from oral comments made during field surveys, inspections and meetings, and in subsequent written correspondence. Some of these references occur from the meetings conducted and copies of formal correspondence are presented in Attachment F3. Summaries of the field survey results were progressively provided to representatives of each of the three local Aboriginal community groups with the aim of facilitating the interpretation of the findings amongst the community. Each was accompanied with an invitation to provide assessments of Aboriginal cultural significance. The field day and workshops conducted with each group on the 14 and 15 January 2005, also furthered this process.

F8.2 Archaeological Values of the Project Area

F8.2.1 Site Specific Assessments

A compilation of site-specific assessments is presented in Table F8.1 and the category totals summarised in Table F8.2. Each table is subdivided according to location relative to the proposed Project.

In general, the assessment of archaeological significance was guided by one or more of the following relative criteria:

no significance	difficult or impossible to relate to past Aboriginal occupation or practice
low significance	no potential for *in situ* subsurface material
	low artefact numbers
	low diversity in content
	low or limited research potential
	common features and traits
	high levels of disturbance

moderate significance	limited to moderate potential for *in situ* subsurface material
	moderate artefact numbers
	moderate diversity in content
	moderate research potential
	may include uncommon features and traits
	may occur as part of a related group of sites
	may have a degree of value in representing a type or form of archaeological evidence
	limited or low levels of disturbance
high significance	moderate or greater potential for *in situ* subsurface material
	moderate to high artefact numbers
	moderate to high diversity in content
	high research potential
	may include rare features and traits
	may occur as an important or key component of a related group or complex of sites
	may be representative of a type or form of archaeological evidence
	generally low levels of disturbance

The majority of the recordings made for this assessment consist of artefact occurrences and their assessment has been guided by the following local characteristics:

- the finding that diversity and complexity in site content is largely proportional to the number of artefacts present;
- sites with greatest potential for *in situ* material consist of rock shelter deposits and those situated on aggrading landforms and valley floor alluvium; and
- the variety of artefact occurrences within the Project area are unlikely to be rare site types within the dissected sandstone plateau valleys of the surrounding region.

Seven recordings are assessed as having no archaeological significance. These consist of items that the archaeologists consider to be natural features or to relate to relatively recent and non-Aboriginal occupation. All occur within or on the boundary of the Project disturbance area.

The low significance category includes forty six recordings and comprises isolated finds with no assessed potential for *in situ* archaeological material, and generally low or moderate potential for the recording to be larger in content or size. Thirty-four (74%) of these occur within the Project disturbance area, four occur within 100 m of the Project disturbance area and eight occur well outside the Project disturbance area.

The low to moderate category includes sixty nine recordings and contains the largest number of recordings. The recordings consist of isolated finds with a degree of potential for *in situ* archaeological material, open artefact scatters with up to twenty surface artefacts, open context potential archaeological deposits, and possible Aboriginal scarred trees in poor condition. Two recordings have this level of assessment based on their reported Aboriginal cultural value. Fifty-two recordings (75%) occur within the Project disturbance area, twelve occur within 100 m of the Project disturbance area and five occur well outside the Project disturbance area.

Forty-eight recordings are assessed as having moderate significance. These include open artefact scatters with between 21 and 50 surface artefacts, most possible and probable Aboriginal scarred trees, and the only procurement site recorded in the survey area. Most of the scarred tree recordings fall into this category, regardless of their condition or the surety of their identification, due to their research potential as a group. Two recordings have this level of assessment based on their reported Aboriginal cultural value. Thirty-six recordings (75%) occur within the Project disturbance area, five occur within 100 m of the Project disturbance area and seven occur well outside the Project disturbance area.

The second largest category is moderate to high significance with 59 recordings. This category includes all artefact occurrences with between 51 and 500 surface artefacts, all rock shelters with surface artefacts and either confirmed or potential archaeological deposit, and all rock shelters with potential archaeological deposit only. For all of the rock shelters (without rock art), this assessment is indicative. If a program of archaeological testing were to be conducted within this group of recordings it may be found that some deposits were of low significance, while others may warrant a high assessment. The likelihood that rock shelters with deposit are relatively common within the sandstone escarpments of the region may also reduce their overall scientific value.

Fifteen recordings with moderate to high significance (25%) occur within the Project disturbance area, sixteen (27%) occur within 100 m of the Project disturbance area and twenty-eight (47%) occur well outside the Project disturbance area.

The high significance category contains only six recordings. These are the three rock art sites, the two open artefact scatters with over five hundred surface artefacts, and one place with reported Aboriginal cultural significance (WCP58). The latter recording falls into this category based on its reported cultural values (refer Section F8.3). The art site WCP72 originally included a large number of art graphics and this trait places it within a small number of sites in the region with similar large assemblages. Although the art is poorly preserved, the inclusion of an extensive deposit with high archaeological potential, and the unusual topographic context of the site (an escarpment in a prominent and isolated outcrop surrounded by open country), combine to provide a high archaeological significance assessment. By comparison, the two remaining art sites are quite limited in their art content and potential deposits. Similarly, they are situated in topographic contexts, which are more typical of other art sites recorded from the region. The art also appears consistent with the stylistic traits recorded for the region. All of these factors combine to provide a moderate to high assessment of archaeological value. These sites are placed in the high category based on their reported Aboriginal cultural values (refer Section F8.3).

One of the high significance recordings occurs within the Project disturbance area (the margin of site WCP134 may be disturbed by relocation of an electricity line). One occurs approximately 100 m of the proposed pit boundaries and four occur well outside the Project disturbance area.

F8.2.2 Collective Assessments

In addition to assessments based on individual site characteristics, the interrelation between sites can provide a collective level of assessment whereby the significance of a group of recordings may be greater than those of its constituent elements. Often this value may be related to potential research themes, and the relevant groupings may vary according to the questions being investigated. In other cases, a complex of sites may be demonstrative of interlinked occupation or exploitation patterns, such as for a particular environment, resource, or period in time.

The sites within the Project area, have a degree of collective significance due to their landscape context, the range of site types present, and their basis as a set of recordings generated by a systematic recording methodology conducted across a significant sample area.

Despite approximately half of the recordings having a low or low to moderate rating, this corpus retains a limited degree of research value when investigating resource exploitation and occupation patterns across distance and landform variables. Sites with greater levels of site specific significance may have proportionately key roles in providing data for such research.

A relatively large corpus of scarred tree recordings has been made within the Project area. These include a range of traits and formal variation including proportion, age, and technique. When this is combined with data from dated or potentially dateable surveyor scars, the recordings as a group provide considerable scope for further research, particularly in determining age, and distinguishing European from Aboriginal scar tree forms. This collective value is reflected in the moderate significance classification attached to most of these individual recordings.

F8.3 Aboriginal Cultural Values of the Project Area

F8.3.1 General Assessments

The Project area as a whole was generally recognised by Aboriginal groups to have value, as part of the broader cultural landscape of the region. This value did not identify the Project disturbance area as a specific entity, but rather as a part of larger traditions. References were made to:

- custodial obligations to the land through descent from its original tribal and clan occupants;
- the valley's traditional function as an access route and corridor;
- the patterns of traditional occupation in the open valley, in contrast to those on the escarpment and plateau;
- the occurrence of massacres in unspecified locations across the broader Mudgee district during the early period of contact with European settlers;
- the knowledge that a Bora ground was situated in the greater area; and
- the association of the local district with the story of the Governor brothers.

Wendy Lewis of the Warrabinga NTCAC made consistent reference to the Project area and surrounding district as the tribal and clan lands of her ancestors and of many members of the Warrabinga NTCAC. She explained that inherent to this lineage is a spiritual and custodial relationship. For the Warrabinga NTCAC, the traditional lands of their members have enormous cultural value as a focus for their cultural identity.

Individual members from the Mudgee LALC and Murong Gialinga ATSIC also expressed a cultural affinity with the Project area and general district. Whilst acknowledging that in some cases the Mudgee region was not their ancestral tribal land, they explained a deeply felt sense of care and responsibility, and an obligation born from their residence in the region.

Members from each of the three local Aboriginal community organisations referred variously to their belief that all evidence of the past occupation of the Project area by Aboriginal people was of cultural value. Both the Mudgee LALC and the Warrabinga NTCAC reinforce this with statements regarding their obligation to conserve this evidence. The Mudgee LALC states that 'our heritage is of great importance to us as Aboriginal people and we need to make it a priority to preserve our culture along every avenue as a principle issue' (letter 7 December 2004). The Warrabinga NTCAC describe a similar obligation and make specific reference to the descent of their members from the original Wiradjuri clans of the district – '[we] have a responsibility to protect all episodes of Aboriginal heritage within the boundaries of the clans which form [our] group'.

The Mudgee LALC reiterates that archaeological significance should not be confused with Aboriginal cultural significance, and they may not always be of the same order (letter 7 December 2004).

All groups communicated a conviction that if the Project proceeded, the cultural values of some of the sites recorded could be effectively managed through a variety of archaeological and culturally based actions. Following the 14 January 2005 field inspection, members of the Warrabinga NTCAC were asked directly if there were Aboriginal cultural values present in the Project disturbance area that should prevent the Project from proceeding. Their reply indicated that no such values existed, provided that those present were managed according to an ACHMP developed in consultation with their group representatives.

In response to the same question following a similar field inspection by members of the Mudgee LALC and Murong Gialinga ATSIC on the 15 January 2005, some members of the group nominated the reported women's site (WCP58) and associated ridgeline linking to the art site (WCP72) as being a place which should not be mined. Some members also stated that there could be people in the community who have knowledge of the issues involved.

In a letter dated the 9 February 2005, the Warrabinga NTCAC state that individually, the Aboriginal sites within the Project area have minimal significance, however when considered as an inter-related complex of sites their significance is increased. They go on to note that careful management and research in association with selective impact will both allow the Project to proceed, as well as maintain, and in some cases enhance, this level of significance.

Some members of the Mudgee LALC and Murong Gialinga ATSIC stipulated that avoidance of site impact should always be the first considered strategy. Other members advocated a more prioritised approach according to perceived levels of value. Still others expressed difficulty with the whole assessment process, and questioned the exercise of ranking material manifestations of a deeply felt cultural relationship between a people and land.

Warranha Ngumbaay expressed her view that disturbance to the earth from mining was always a violation, such as rape, and that energies were changed as a result. She suggested that the conduct of ceremony, according to customary lore and by appropriately knowledgeable and acknowledged persons, could ameliorate this impact.

Following his participation in field survey, Eli Kennedy (Murong Gialinga ATSIC) expressed his belief that some very significant and sacred sites occurred in the Project area, and that the valley contained many burial sites. He stated that the land was his mother and that he felt he had a cultural connection with the land and a responsibility toward it (pers. comm. 21 August 2004). Nathan Flick, who accompanied Eli in the field, added that the country belonged to the spirits of their ancestors and that these special places should not be harmed. Harming the land would also harm the spirits (pers. comm. 21 August 2004). Eli Kennedy discontinued his involvement in the survey and explained his position as the result of an irreconcilable conflict between his strong spiritual empathy with the land, his responsibilities as a community representative, and his opinion that the Project was inevitable.

David Maynard, who variously acted as a representative, advocate, and coordinator of Aboriginal survey participants for both the Mudgee LALC and the Muronga Gialinga ATSIC, consistently expressed his view that a level of 'give and take' was required when considering the impacts of proposed developments and spoke in terms of priorities, with some areas providing greater cause for concern, and conservation action than others. David was consistent in expressing his views that the escarpment slopes surrounding the Project disturbance area were a potential location of places with high cultural value, and supported conclusions by some other members about the high cultural values of the rock art sites and the reported women's site (WCP58). He also was consistent in referring back to the broader community via its representative organisations as the ultimate arbiter of cultural value.

The conduct of a 'smoking ceremony' by survey participants from the Mudgee LALC and the Murong Gialinga ATSIC variously illustrated differing approaches and attitudes to Aboriginal cultural values in the Project area by the three community groups. David Maynard stated his strong belief that the conduct of the ceremony was a critical and a requested prerequisite for the survey participation of most of the members from the Mudgee LALC and the Murong Gialinga ATSIC. It was explained that the ceremony was required to protect members from spirits or powers, which may be encountered without the conduct of appropriate traditional protocols during survey. Without the ceremony, survey participants may fall sick.

Some members of the Warrabinga NTCAC were strongly opposed to the conduct of the smoking ceremony. The validity of the ceremony was questioned, as well as the roles and responsibilities that were presumed by the conduct of the ceremony by members of the Mudgee LALC and Murong Gialinga ATSIC groups. Opposition was specifically expressed as a perceived infringement of the custodial responsibility solely held by descendants of the local Wiradjuri clans.

While these positions are in opposition, both reveal the Project area to be a landscape with a hidden topography of cultural meaning for the Aboriginal community. Such values are variously interpreted throughout the tribal territories of the region and form the foundation for many of the dynamics within the contemporary Aboriginal community.

F8.3.2 Place Specific Assessments

In keeping with general comments from all of the groups that all Aboriginal archaeological sites include a degree of cultural value, each site assessment, as presented in Table F8.1 is marked as having value. Where no site specific or detailed assessments have been provided by Aboriginal sources, a tick symbol (✓) denotes a notional assessment value. For archaeological sites with a debated origin, the allocation of the same notional assessment refers only to the views of the Aboriginal representative(s) who provided the field interpretation.

For many sites of moderate to greater archaeological significance, Aboriginal cultural values listed in Table F8.1 are of similar value or greater. This is based on comments made by representatives both in the field and in meetings where the expressed values of these sites appeared proportional to their archaeological content. Where specific comments were made with reference to the level of Aboriginal cultural value, these values are given.

Members from all three Aboriginal community groups were in general agreement that the rock art sites WCP72, 152 and 153 are of high cultural value, with the larger of the sites (WCP72) providing particularly strong impressions. The stated interpretations regarding the function and meaning of the large art site varied substantially according to the perceptions and knowledge of each visitor. These are broadly outlined in Section F7.3.5 above. Despite this, all were in agreement that the cultural values of the art sites were such that they should be managed so that they are not adversely impacted by the Project.

All Aboriginal community groups shared a similar attitude to the Ulan Wilpinjong Creek Bora ground (refer Section F3.2). The proximity of the approximate registered site location to the Project disturbance area (approximately 850 m distant from the nearest pit boundary) was not identified as a cause for concern.

All Aboriginal groups shared a recognition of the cultural values of rock shelter sites. Some of these values parallel the archaeological significance of the potential archaeological deposits they conserve. Additional components include aesthetic, educational and landscape contextual values. Each group stated that any unavoidable impact to rock shelters should be preceded by careful archaeological salvage and analysis.

Views regarding the identification and values of the reported women's site (WCP58) varied extensively.

Following the initial identification of a prominent ridgeline knoll by two younger Aboriginal survey participants as a site with cultural significance to women, some older women, of both the Mudgee LALC and the Murong Gialinga ATSIC agreed this place was correctly identified as a place of high significance to Aboriginal women and should be excluded from the mining area or remained silent on the topic. In addition, it was requested that the whole ridgeline be conserved. One attendee subsequently came forward and stated that they believed the site had no cultural value and should not have been recorded as such.

Members of the Warrabinga NTCAC who visited the same area, including older women, voiced an opposing interpretation. The knoll and the ridgeline were not identified as having any particular or special cultural significance by individuals of this group. Wendy Lewis stated her belief that such an identification should be the jurisdiction of descendants of the local Wiradjuri people, and in particular subject to the views of older women descendants.

A site with reported cultural significance to men was also identified by a younger male survey participant. This is recording WCP59, which consists of a low knoll along a broad watershed ridgeline. Following inspection of the site David Maynard noted that the location provided a commanding view of the surrounding valley and that it may have been used in hunting, scouting for game, and keeping watch over the area.

Members of the Warrabinga NTCAC who also inspected this area, voiced an opposing interpretation. The knoll was not considered to have any particular or special cultural significance by individuals of this group.

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F8.4 Tables of Cultural Heritage Significance Assessments

Table F8.1
Table of Site-Specific Significance Assessments

Note: this table includes all heritage recordings with the exception of the definite European surveyor scarred trees WCP131, 132, 133, and includes all recordings of debated origin.

Within Project Disturbance Area – Excluding Sites on Proposed Pit Boundary

WCP Site Codes	Site Category	Archaeological Scientific Value	Represent-activeness	Educational Value	Aesthetic Value	Aboriginal Cultural Value	Summary Significance Rating
134	open artefact scatters with 500+ estimated surface artefacts	high	high	moderate	moderate	high	high archaeological significance in a local context
216	open artefact scatter with up to 500 estimated surface artefacts	moderate-high	moderate-high	moderate	moderate	moderate to high	moderate to high archaeological significance in a local context
1, 3, 33	open artefact scatters with up to 100 estimated surface artefacts	moderate-high	moderate-high	moderate	moderate	moderate to high	moderate to high archaeological significance in a local context
12, 57, 81, 123, 126, 198, 208, 214, 220	open artefact scatters with up to 50 estimated surface artefacts	moderate-high	moderate-high	moderate	moderate	moderate	moderate to high archaeological significance in a local context
11, 29, 151, 176, 179, 219	open artefact scatters with up to 20 estimated surface artefacts	low-moderate	low-moderate	low	low	✓	low to moderate archaeological significance in a local context
4, 13, 15, 22, 25-6, 31, 35, 42, 66-7, 78, 83, 105-06, 108, 121, 125, 189, 202, 217, 226	open artefact scatters with up to 5 estimated surface artefacts	low-moderate	low	low	low	✓	low to moderate archaeological significance in a local context
88	open artefact scatter and procurement site	moderate	moderate	moderate	moderate	✓	moderate archaeological significance within a local context
10, 14, 17, 19, 20, 24, 32, 43, 51, 74, 76, 102-04, 175, 177, 180, 182-83, 186, 199-200, 201, 203-06, 218, 221, 223, 225, 237-38	isolated find	low	low	low	low	✓	low archaeological value within a local context
5, 16, 18, 23, 27-8, 30, 40-1, 50, 65, 80, 107, 109, 201,	isolated find	low or moderate	low	low	low	✓	low to moderate archaeological value (based on subsurface potential)

Table F8.1 (Continued)
Table of Site-Specific Significance Assessments

Within Project Disturbance Area – Excluding Sites on Proposed Pit Boundary (Continued)

WCP Site Codes	Site Category	Archaeological Scientific Value	Represent-activeness	Educational Value	Aesthetic Value	Aboriginal Cultural Value	Summary Significance Rating
8, 110	isolated find	low or moderate	low	low	low	✓	moderate archaeological value (based on subsurface potential)
60	isolated find (debated origin)	nil	nil	nil	nil	✓	no archaeological value
53, 55, 69, 89, 91, 93-6, 100-01, 111-12, 122, 129, 207	possible Aboriginal scarred tree	moderate	moderate	moderate	moderate	moderate, (subject to confirmation of Aboriginal origin)	moderate archaeological significance within a local context (based primarily on research value)
75, 90, 99	probable Aboriginal scarred tree	moderate	moderate	moderate	moderate	moderate, (subject to confirmation of Aboriginal origin)	moderate archaeological significance within a local context
7, 68, 77	probable surveyors scarred tree (debated origin)	moderate	moderate	moderate	moderate	moderate, (subject to confirmation of Aboriginal origin)	moderate archaeological significance within a local context (based primarily on research value)
52, 113	scarred tree (debated origin)	nil	nil	nil	nil	✓	no archaeological value
63	indeterminate tree feature	nil	nil	nil	nil	low	no archaeological value
9, 92	potential archaeological deposit (open context)	low-moderate (subject to confirmation from salvage excavation)	low (subject to confirmation from salvage excavation)	low	low	✓	low to moderate potential within a local context (subject to confirmation from salvage excavation)
59	reported place of cultural significance	--	--	low-moderate	low-moderate	low-moderate (disputed)	low to moderate Aboriginal cultural values to some individuals of MLALC and MGATSIC Aboriginal groups

Table F8.1 (Continued)
Table of Site-Specific Significance Assessments

Within Project Disturbance Area – Excluding Sites on Proposed Pit Boundary (Continued)

WCP Site Codes	Site Category	Archaeological Scientific Value	Represent-activeness	Educational Value	Aesthetic Value	Aboriginal Cultural Value	Summary Significance Rating
62	reported 'spring' or waterhole	--	--	--	--	low-moderate	low to moderate Aboriginal cultural values to some individuals of MLALC and MGATSIC Aboriginal groups
194	probable modern scatter of crushed rock (debated origin)	nil	nil	nil	nil	✓	no archaeological significance

Within Project Disturbance Area - On Proposed Pit Boundary

WCP Site Codes	Site Category	Archaeological Scientific Value	Represent-activeness	Educational Value	Aesthetic Value	Aboriginal Cultural Value	Summary Significance Rating
87	open artefact scatters with up to 50 estimated surface artefacts	moderate-high	moderate-high	low-moderate	low-moderate	moderate	moderate/high archaeological significance in a local context
213, 224	open artefact scatters with up to 50 estimated surface artefacts	moderate	moderate	moderate	low	moderate	moderate archaeological significance in a local context
2, 184	open artefact scatters with up to 20 estimated surface artefacts	low-moderate	low-moderate	low-moderate	low	✓	low to moderate archaeological significance in a local context
34, 86, 188	open artefact scatters with up to 5 estimated surface artefacts	low-moderate	low	low	low	✓	low to moderate archaeological significance in a local context
84	isolated find	moderate	moderate	low	low	✓	moderate archaeological value (based on subsurface potential) in a local context
21, 54,	isolated find	low	low	low	low	✓	low archaeological value in a local context
212	isolated find (debated origin)	nil	nil	nil	nil	✓	no archaeological value

Table F8.1 (Continued)
Table of Site-Specific Significance Assessments

Within Project Disturbance Area - On Proposed Pit Boundary (Continued)

WCP Site Codes	Site Category	Archaeological Scientific Value	Represent-activeness	Educational Value	Aesthetic Value	Aboriginal Cultural Value	Summary Significance Rating
97, 130, 196-97	possible Aboriginal scarred tree	moderate	moderate	moderate	moderate	moderate (subject to confirmation of Aboriginal origin)	moderate archaeological significance in a local context (based primarily on research potential)
98, 169-71	probable Aboriginal scarred tree	moderate	moderate	moderate	moderate	moderate (subject to confirmation of Aboriginal origin)	moderate archaeological significance in a local context and high research value
124	scarred tree (debated origin)	nil	nil	nil	nil	✓	no archaeological value
85	rock shelter with potential archaeological deposit	moderate to high	moderate to high	moderate to high	moderate	moderate to high	potential for moderate or high archaeological significance in at least a local context (assessments subject to confirmation of presence and nature of archaeological deposit)

Outside of but Within 100 m of Project Disturbance Area

WCP Site Codes	Site Category	Archaeological Scientific Value	Represent-activeness	Educational Value	Aesthetic Value	Aboriginal Cultural Value	Summary Significance Rating
128	open artefact scatters with up to 20 estimated surface artefacts	low-moderate	low-moderate	low-moderate	low	✓	low to moderate archaeological significance in a local context
139, 190	open artefact scatters with up to 20 estimated surface artefacts	low-moderate	low-moderate	low	low	✓	low to moderate archaeological significance in a local context
127, 185, 193, 195, 211, 222	open artefact scatters with up to 5 estimated surface artefacts	low-moderate	low	low	low	✓	low to moderate archaeological significance in a local context

Table F8.1 (Continued)
Table of Site-Specific Significance Assessments

Outside of but Within 100 m of Project Disturbance Area (Continued)

WCP Site Codes	Site Category	Archaeological Scientific Value	Represent-activeness	Educational Value	Aesthetic Value	Aboriginal Cultural Value	Summary Significance Rating
71, 155, 235	isolated find	low	low	low	low	✓	low archaeological value in a local context
73,	isolated find	low or moderate	low	low	low	✓	low to moderate archaeological value (based on subsurface potential) in a local context
114, 160	possible Aboriginal scarred tree (114 is dead and fallen)	low-moderate	low-moderate	low	low	✓	low to moderate archaeological significance in a local context (a degree of research value remains for 114)
64, 163, 167	probable Aboriginal scarred tree	moderate	moderate	moderate	moderate	✓	moderate archaeological significance in a local context
153	rock shelter with art	moderate to high	moderate to high	moderate to high	moderate to high	high	moderate to high archaeological significance in a local context and high Aboriginal cultural significance
36-9, 48-9, 140, 178	rock shelter with surface artefacts and confirmed or potential archaeological deposit	moderate or high	moderate or high	moderate	moderate to high	moderate to high	potential for moderate or high archaeological significance in at least a local context (assessments subject to confirmation of presence and nature of archaeological deposit)
44, 47, 82, 141, 145, 229-31	rock shelter with potential archaeological deposit	moderate or high	moderate or high	moderate	moderate to high	moderate to high	potential for moderate or high archaeological significance in at least a local context (assessments subject to confirmation of presence and nature of archaeological deposit)
79	reported ‘spring’ or waterhole	---	---	---	--	moderate	moderate Aboriginal cultural values
142	probable European clearing mounds (debated origin)	low	low	low	low	✓	low archaeological significance. An alternative Aboriginal interpretation of these features as possible Aboriginal burials may warrant a precautionary high Aboriginal cultural significance rating

Table F8.1 (Continued)
Table of Site-Specific Significance Assessments

More Than 100m Outside of Project Disturbance Area

WCP Site Codes	Site Category	Archaeological Scientific Value	Represent-activeness	Educational Value	Aesthetic Value	Aboriginal Cultural Value	Summary Significance Rating
174	open artefact scatters with 500+ estimated surface artefacts	high	high	moderate	moderate	high	high archaeological significance in a local context
136, 227	open artefact scatters with up to 500 estimated surface artefacts	moderate-high	moderate-high	moderate	moderate	moderate to high	moderate to high archaeological significance in a local context
158-59, 162	open artefact scatters with up to 50 estimated surface artefacts	moderate-high	moderate-high	moderate	moderate	moderate	moderate to high archaeological significance in a local context
138, 156-57, 190, 209	open artefact scatters with up to 20 estimated surface artefacts	low-moderate	low-moderate	low	low	✓	low to moderate archaeological significance in a local context
191	open artefact scatters with up to 5 estimated surface artefacts	low-moderate	low	low	low	✓	low to moderate archaeological significance in a local context
46, 56, 70, 135, 181, 187, 210, 215,	isolated find	low	low	low	low	✓	low archaeological value in a local context
6, 149	possible Aboriginal scarred tree	low-moderate	low-moderate	low-moderate	moderate	✓	moderate archaeological significance in a local context
150, 161, 166, 234, 236	probable Aboriginal scarred tree	moderate	moderate	moderate	moderate	✓	moderate archaeological significance in a local context
72	rock shelter with art	high	high	high	high	high	high archaeological significance in a local and possible regional context, high Aboriginal cultural significance
152	rock shelter with art	moderate to high	high	high	high	high	moderate to high archaeological significance in a local context, high Aboriginal cultural significance
45, 115, 116, 118-20, 137, 144, 173, 192	rock shelter with surface artefacts and confirmed or potential archaeological deposit	moderate or high	moderate or high	moderate	moderate to high	moderate to high	potential for moderate to high archaeological significance in at least a local context (assessments subject to confirmation of presence and nature of archaeological deposit)

Table F8.1 (Continued)
Table of Site-Specific Significance Assessments

More Than 100m Outside of Project Disturbance Area (Continued)

WCP Site Codes	Site Category	Archaeological Scientific Value	Represent-activeness	Educational Value	Aesthetic Value	Aboriginal Cultural Value	Summary Significance Rating
117, 143, 146-48, 154, 164-65, 168, 172, 228, 232-33	rock shelter with potential archaeological deposit	moderate or high	moderate or high	moderate	moderate to high	moderate to high	potential for moderate to high archaeological significance in at least a local context (assessments subject to confirmation of presence and nature of archaeological deposit)
58	reported place of cultural significance	---	----	high	moderate-high	high (to some members of some groups)	high Aboriginal cultural values to some members of the MLALC and MGATSIC Aboriginal groups. disputed by some MLALC, MGATSIC and WBNTCAC members
61	reported 'spring' or waterhole	--	--	--	--	low-moderate	low to moderate Aboriginal cultural values to MLALC and MGATSIC Aboriginal groups

Table F8.2 Summary of Site Significance Categories (Local Context)

Significance Rating	WCP Site Codes	Total
Within Project Disturbance Area (excluding Sites on Pit Boundary)		
nil	52, 60, 63, 113, 194	5
low	10, 14, 17, 19, 20, 24, 32, 43, 51, 74, 76, 102, 103, 104, 175, 177, 180, 182, 183, 186, 199, 200, 203, 204, 205, 206, 218, 221, 223, 225, 237, 238	32
low to moderate	4, 5, 9, 11, 13, 15, 16, 18, 22, 23, 25, 26, 27, 28, 29, 30, 31, 35, 40, 41, 42, 50, 65, 66, 67, 78, 80, 83, 92, 105, 106, 107, 108, 109, 121, 125, 151, 201, 202, 176, 179, 189, 217, 219, 226 *59, 62 (Aboriginal significance – some people in some groups*)	47
moderate	7, 8, 53, 55, 68, 69, 75, 77, 88, 89, 90, 91, 93, 94, 95, 96, 99, 100, 101, 110, 111, 112, 122, 129, 207	25
moderate to high	1, 3, 12, 33, 57, 81, 123, 126, 198, 208, 214, 216, 220	13
high	134	1
Within Project Disturbance Area - On Proposed Pit Boundary		
nil	124, 212	2
low	21, 54	2
low to moderate	2, 34, 86, 184, 188	5
moderate	84, 97, 98, 130, 169, 170, 171, 196, 197, 213, 224	11
moderate to high	85, 87	2
high		
Outside of but Within 100 m of Project Disturbance Area		
nil		
low	71, 142, 155, 235	4
low to moderate	73, 114, 127, 128, 139, 185, 190, 193, 195, 211, 222 *61 (Aboriginal significance – some people in some groups*)	12
moderate	64, 160, 163, 167 *79 (Aboriginal significance – some people in some groups*)	5
moderate to high	36, 37, 38, 39, 44, 47, 48, 49, 82, 140, 141, 145, 178, 229, 230, 231	16
high	153	1
More Than 100m Outside Of Project Disturbance Area		
nil		
low	46, 56, 70, 135, 181, 187, 210, 215,	8
low to moderate	138, 156, 157, 191, 209	5
moderate	6, 149, 150, 161, 166, 234, 236	7
moderate to high	45, 115, 116, 117, 118, 119, 120, 136, 137, 143, 144, 146, 147, 148, 154, 158, 159, 162, 164, 165, 168, 172, 173, 192, 227, 228, 232, 233	28
high	72, 152, 174, *58 (Aboriginal. significance – some people in some groups*)	4

F9 PROJECT STATUTORY REQUIREMENTS

Aboriginal 'objects' as defined under the *National Parks and Wildlife Act 1974* have been identified within the Project area. It is an offence to knowingly disturb an Aboriginal Object (or site) without an appropriate permit or consent (Sections 87 and 90).

Consequently, no development or other activity can occur in the areas of the identified Aboriginal sites in the Project area until the DEC has issued the appropriate permit or consent.

In addition, interpretation of the surface survey results indicate that Aboriginal Objects can be expected to occur in varying density in subsurface contexts throughout the open cut mine and contained infrastructure.

It should be emphasised that this type of subsurface incidence and distribution can be expected as a normal characteristic of similarly situated valleys elsewhere within the ranges of southeastern Australia. Varying subsurface artefact distributions, which can be correlated with microtopographic variation and resource distribution, are now a repeated and consistent finding of many landscape based archaeological subsurface testing programs (cf McDonald and Rich, 1993; Navin Officer Heritage Consultants, 2000, 2003, 2004 and 2005).

Consistent with this finding, the receipt of a Section 90 permit from the DEC, as a prerequisite to the commencement of any construction activities involving ground disturbance is required. Such a permit will need to cover all Aboriginal Objects situated within the lands subject to construction activities.

No sites have been identified in the assessment that would warrant listing on the National Heritage List, Commonwealth Heritage List or are of National Significance under the *Environment Protection and Biodiversity Conservation Act, 1999*.

F10 THE POTENTIAL CONSEQUENCES OF THE PROJECT ON ABORIGINAL CULTURAL HERITAGE

The potential consequences of the Project on the Aboriginal cultural heritage of the Project area include both negative and positive outcomes. Potential negative outcomes include the direct impacts of mining and associated activities and include the destruction of sites via the removal of the soil and substrate. Potential positive outcomes include the increase in knowledge from the analysis of recovered and salvaged materials, and the improved conservation management of retained sites, particularly those within the proposed ECAs.

The potential for indirect impacts would also occur at some sites that are proximal to the Project disturbance area and could include physical effects (eg. dust deposition) or perceptual effects.

A discussion of Project consequences can best be discussed by separating the heritage recordings according to the potential for direct and indirect impact. This has been done by recognising four main zones:

- the Project disturbance area (as described in Section F1.2) where direct impacts are associated with the open cut mine and related infrastructure;
- the boundary of the open cut pits (where direct Project impacts would be determined by the final mine design);
- outside of but within 100 m of the Project disturbance area, where sites may potentially be subject to indirect impacts due to proximity; and
- outside of, and more than 100m away from the Project disturbance area (where there is less possibility of indirect effects).

In addition, as described in Section F11.3, there are areas potentially subject to the construction of ancillary infrastructure that may be outside of the Project disturbance area (including vehicle tracks, fencing, revegetation and environmental restoration works) where there is some degree of flexibility in design and placement.

F10.1 Archaeological Values

F10.1.1 Potential Direct and Indirect Impacts

A consequence of the direct impact of mining operations is the broad area disturbance of the current land surface, and in most cases also, its associated substrate and landscape context. This would effectively destroy the archaeological material associated with the affected landforms.

These impacts on archaeological values fall into three categories:

- the loss of information which could otherwise be gained by conducting research today;
- the loss of the archaeological resource for future research using methods and addressing questions not available today; and
- the permanent loss of the physical record.

These impacts can be mitigated to various degrees, depending on the nature and significance of the site. Where sites are of low significance, their destruction may have little consequence. This could be due to the lack of useful information that could be gained from research, or the availability of many equivalent and alternative sites for study.

Sites with greater significance may be the subject of archaeological investigation prior to their disturbance. This allows for the salvage of information, and the recovery of a sample of artefactual materials according to current methods and research priorities. To offset the loss to future research and the surviving physical record, sites of equivalent size, form and context, can be reserved and subject to conservation management as is proposed in the ECAs for this Project. The need for both salvage investigations and future offset management must be balanced with an appreciation of likely site incidence and research potential elsewhere in the region. Sites and site groupings which are common elsewhere may not require the same degree of salvage attention or offset priority as those which are rare, of high significance, and subject to active deterioration.

In areas where the Project works do not involve significant earthmoving, (eg. construction of fencing, conservation works) impacts may be limited to minor surface disturbance, limited disturbance of the associated substrates or landforms and no significant alteration of the landscape context.

A positive outcome of salvage investigations can be the discovery of new knowledge about the Aboriginal occupation of an area. Despite the loss of physical evidence involved, the information gained can in turn aid the interpretation and better management of the remaining archaeological resource. This can often be understood as a net positive gain for the archaeological resource of a wider region.

Potential indirect impacts to archaeological sites could include the following:

- adverse impact on rock art surfaces caused by vibration from mine blasting;
- deposition onto rock art panels of dust generated by mining;
- damage to sites caused by inadvertent or inappropriate visitor behaviour (eg. graffiti, camp fires and deposition of rubbish in rock shelter sites);
- inadvertent damage to sites caused by the passage of vehicles across artefact scatters and deposits; and
- inadvertent damage to scarred trees from vehicle impact, or felling for firewood.

All of these potential impacts can be effectively mitigated and the risk of occurrence minimised through effective management.

F10.1.2 Project Impacts

Table F10.1 presents recording totals for different significance categories relative to the four zones of potential Project impact. All significance ratings relate to a local context only.

Approximately half of the recordings (52%), identified during the survey are located within the Project disturbance area (excluding sites on the boundary of the open cut pits) and would be subject to direct disturbance during the life of the Project.

No rock shelters with rock art, or recordings of high archaeological significance occur within the Project open cut mine and contained infrastructure area. One rock shelter site is located on the boundary of this area and may potentially be subject to disturbance (WCP85). This is the only rock shelter recording located within the Project disturbance area.

One site of high significance occurs within the Project disturbance area. This is a large open artefact scatter (WCP134) which may be impacted on its southern margin by the realignment of the electricity transmission line.

Table F10.1
Significance Categories in Relation to the Four Zones of Potential Project Impact

Significance Rating	Within Project Disturbance Area (excluding sites on boundary of open pits)		Within Project Disturbance Area On Boundary of Open Pits		Outside of but within 100m of Project Disturbance Area		More than 100 m outside of Project Disturbance Area		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Nil	5	4	2	9					7	3
Low	32	26	2	9	4	10	8	15	46	20
Low to moderate	47	38	5	23	12	32	5	10	69	29
Moderate	25	20	11	50	5	13	7	13	48	20
Moderate to high	13	11	2	9	16	42	28	53	59	25
High	1	1			1	3	4	8	6	2
Total	123	100	22	100	38	100	52	100	235	
% of all recordings	52		10		16		22		100	

Note: This table analysis excludes the three undebated surveyor's scar trees.

Thirteen recordings of moderate to high significance occur within the Project disturbance area. These consist of artefact occurrences with between 51 and 500 surface artefacts. There is one scatter with up to five hundred surface artefacts which extends into the Project disturbance area, located adjacent to Spring Creek, and three scatters with up to 100 artefacts. Twenty-five recordings are of moderate significance and consist mostly of scarred trees together with a small artefact scatter and stone procurement site, and isolated finds with subsurface potential. Recordings of less than moderate significance within the Project disturbance area include isolated finds and most artefact scatters with up to twenty surface artefacts.

Most of the archaeological sites recorded within the Project disturbance area occur on relatively shallow texture contrast soils with distinct clay substrates. These sites are unlikely to contain undisturbed or *in situ* archaeological deposits due to the natural processes of soil bioturbation and erosion, and human actions such as vegetation clearance, and ploughing.

In contrast to this dominant Project area soil profile, a limited number of deposits occur which include potential for *in situ* archaeological material and which warrant some form of archaeological subsurface investigation as the Project is developed. These consist of aggrading landforms such as alluvial flats, fans, and terrace deposits, locally elevated spurlines adjacent to main water sources, and three sand and gravel deposits (Figure F7-6). A review of the local region's topographic characteristics suggests that these landforms are likely to be relatively common. Some of these deposits extend beyond the boundaries of the Project disturbance area and others are contained within.

In addition to the recordings outlined above, twenty-two recordings (approximately 10% of all recordings) are also classed as occurring within the Project disturbance area as they are situated on the boundary of the proposed open cut pits. Given the likely placement of vehicle tracks, top soil stripping and other ground works within this zone, it is probable that these sites will be wholly or largely disturbed, unless specific management strategies are put in place to protect them. The nature of potential impacts would be determined by the detailed mine design. Two recordings are of moderate to high significance, an open artefact scatter with between twenty one and fifty surface artefacts situated on an elevated terrace deposit (WCP87), and a rock shelter with potential archaeological deposit (WCP85). The terrace on which the former is located extends outside of and upstream of the pit boundary. The rock shelter occurs within a group of rock tors, which also shelters an open site with potential for *in-situ* archaeological deposit (WCP84). Careful management of the pit boundary and the adjacent zone could facilitate the conservation of sites WCP84 and WCP85.

Thirty-eight recordings (16% of all recordings) occur within a 100 m margin of the Project disturbance area. One is of high significance, sixteen of moderate to high significance, and four of moderate significance. The high significance site consists of a shelter with rock art (WCP153). All of the moderate to high rated sites consist of rock shelters, and most of the moderate assessments belong to scarred trees. None of these recordings will be subject to direct impacts but would be subject to potential indirect impacts in the absence of an effective program of proactive management.

Fifty-two recordings (22% of all recordings) occur beyond 100 m of the Project disturbance area. These include four high significance recordings, 28 moderate to high, and seven with a moderate rating. One high significance rating is based on Aboriginal cultural values as determined by some Aboriginal representatives (disputed by others). The high significance sites consist of two rock art sites, an artefact occurrence of over five hundred surface artefacts and a place of reported Aboriginal cultural significance. The moderate to high significance recordings consist mostly of rock shelters with surface artefacts and/or potential archaeological deposit and includes open artefact occurrences with between twenty one and five hundred surface artefacts. All moderate rated recordings are scarred trees.

Sites which occur within 100 m of the Project disturbance area have a higher potential risk of indirect impacts from vibration, dust deposition, vehicle damage, peripheral activities, and visitation. The nature and extent of this risk varies with site type and distance from the Project disturbance area. Sites close to the pit edge may potentially be impacted by vehicle use, earthworks and boundary related erosion. Inappropriate visitation and its effects constitute a potential negative impact particularly to rock shelters that remain a focus for interim campsites to the present day. Recordings within the operational arena of vehicles, and line of sight from staff areas are most likely to be at risk from these forms of impact.

The effects of vibration and the transport of dust may extend further than a hundred metres and the risk of damage from these sources is relevant to rock shelter sites with rock art. The three known rock art sites located in relative proximity to the Project disturbance area are situated between 200 and just under 100 m from the open pit boundaries.

Careful management of the potential risks posed by indirect impacts, can be effectively mitigated through effective management (refer Section F11).

Indirect impact also includes the loss of a site's contextual landscape value. An example would be where a development transforms the landscape context of a site to such a degree that a visitor can no longer appreciate its original function and context. This can amount to a substantial impact where the context of a site is an important component of its assessed significance. The Project includes some potential to cause this type of indirect impact via its development of the open cut mine areas.

It should be noted that the potential for impact to the contextual values of a high value art site was substantially reduced with the decision by WCPL to exclude from open cut mining the ridgeline between the art site WCP72 and site WCP58. The retention of this locally elevated landform conserves a significant component of the original landscape context of site WCP72.

F10.1.3 Potential Positive Outcomes from Conservation Management

A potential positive consequence of the Project is the proposed establishment and management of the three ECAs (refer Figure F1.2). These areas have been proposed as an offset to the impacts within the Project disturbance area. The management of these areas would involve both ecological and heritage values and would combine the conservation of archaeological sites with the enhancement of habitat for flora and fauna. The three proposed areas include a full spectrum of landform contexts from the riparian corridor of the Cumbo and Wilpinjong Creeks on the valley floor, to escarpment and upper valley areas.

In order to evaluate the competence of these areas to include archaeological sites a number of focused surveys were conducted across sample areas amounting to around 75% of the proposed ECAs twenty-one recordings were made, consisting of eleven rock shelters with surface artefacts and potential archaeological deposit, two rock shelters including rock art, two open artefact scatters with more than 500 surface artefacts, two with between 101 and 500, two with between 11 and twenty, one with up to five artefacts, a single isolated find, one probable Aboriginal scarred tree and seven rock shelters with potential archaeological deposit only. These include four recordings with high archaeological significance, twenty with a moderate to high rating, and one with moderate significance. The high proportion of recordings with moderate or greater significance relates largely to the number of rock shelters and to the location of large open artefact scatters adjacent to Wilpinjong Creek. These results reflect the topographies in proposed areas B and C which include 19 and ten recordings respectively. Only one recording, a probable Aboriginal scarred tree, was found in ECA-A. This ECA however includes a significant portion of the Cumbo Creek corridor and many of its included landforms have high potential to contain large open artefact scatters.

Due to the strategy of recording in detail only shelters with surface artefacts in ECA areas, the number of rock shelter sites with potential archaeological deposit (only) is significantly under-represented in the totals for areas B and C.

These survey results clearly indicate that the landforms within proposed ECAs have high archaeological value and contain a significant proportion of high significance sites, and/or the potential for such sites. These areas contain similar sites to those in the disturbance areas, as well as a more diverse range of site types. Many of these sites have scientific and cultural significance. The long term conservation management of these areas represent a significant positive outcome for the Aboriginal cultural heritage of the Project area.

The active conservation management of the large art site, WCP72 would also represent a positive heritage outcome. Despite the original erection of fencing around this site by farmers, the shelter is no longer fenced and a significant degree of impact from stock animal usage has and continues to occur. The site would now benefit greatly from the erection of protective fencing and knowledge of local rock art characteristics would be furthered by the creation of a detailed base line recording. A similar level of recording will be required for the other two art sites in relative proximity to the Pit 5 (WCP152 and 153) and which are located in ECA-C.

F10.2 Aboriginal Cultural Values

References made by Aboriginal participants to the potential impacts of the Project on Aboriginal cultural values fall into three categories:

- impact to the value of the Project area as a whole or to generalised and non-specific areas;
- impact to the values of specific places in the Project area; and
- impact to the values inherent in the archaeological materials.

F10.2.1 General References

The potential impact of the Project on the broad scale or generalised values of the Project area and local district was acknowledged by a number of individuals.

For the Warrabinga NTCAC, the careful management of Project impacts in consultation with its members provides a means of exercising custodial responsibilities and ensuring the maintenance of important cultural values. The organisation states that individually the Aboriginal sites within the Project area have minimal significance, but when considered as an inter-related complex their significance is increased. Careful management and research in association with selective impact will maintain, and in some cases enhance, this level of significance (letter dated 9 February 2005).

Eli Kennedy (Murong Gialinga ATSIC) stated his belief that some very significant and sacred sites occurred in the Project area. He felt that his spiritual empathy with the land as his mother was irreconcilable with the necessary process of assessing its potential impact from mining. Nathan Flick expressed his view that the country belonged to the spirits of their ancestors and that these special places should not be harmed. Harming the land would also harm the spirits.

Warranha Ngumbaay expressed a view that disturbance to the earth from mining was a violation, comparable to rape, and that energies were changed as a result. She suggested that ceremonies could be conducted, according to customary lore to ameliorate this impact.

F10.2.2 Place-Specific References

A small number of places were the subject of specific attention regarding the potential impact of the Project on Aboriginal cultural values. These were the rock art sites WCP72, 152 and 153, and two places of reported Aboriginal cultural value, WCP58 and 59.

The artistic expression evident in rock art is a highly valued cultural component of the archaeological record by the Aboriginal community. The graphic traits of colour, technique, motif and arrangement can be variously interpreted according to the knowledge and experience of the viewer. This engagement of the visitor distinguishes rock art sites as places of particular value for cultural education and the practice of tradition. For many Aboriginal participants in the Project assessment, the conservation of the topographic context of these sites was an important consideration in managing cultural value. The qualities of the place were discussed in equal terms to the art they had inspired. For members of the Warrabinga NTCAC, the conservation of the whole rock outcrop that supports the WCP72 escarpment is a priority, as was maintenance of sufficient separation between the site and the open cut. Similar concerns were expressed by members of the other community organisations. The significant area of unmined land and remnant vegetation located between site WCP 72 and pit 3 was considered positive by many of the Aboriginal people consulted, in that rural vista from the site towards the east would not be significantly altered by the Project.

For the smaller art sites, their position on forested slopes adjacent to an escarpment resulted in confidence by Aboriginal people that retention of their contextual values would occur.

For many of the Aboriginal participants, the potential risks from inappropriate visitation to the art sites were of some concern. The view was generally expressed that these sites should not be promoted as destinations, and that visitors should respect their Aboriginal significance and not damage or put the site at risk from inappropriate behaviour (such as from camping, lighting fires, and climbing or touching the art panels).

For some members of the Mudgee LALC and Murong Gialinga ATSIC, who believe a ridgeline knoll to the north of the WCP72 art site is a women's place (WCP58), the extension of that ridgeline back towards WCP72 was identified as an important component of that cultural value.

Site WCP58 was identified as a site of special significance to women by two younger Aboriginal survey participants who were representatives of the Murong Gialinga ATSIC. The initial perceptions of these recorders were later supported by some older female members of the Mudgee LALC and Murong Gialinga ATSIC who visited the site during a community field inspection. One attendee subsequently came forward and stated that they believed the site had no cultural value and should not have been recorded as such. Members of the Warrabinga NTCAC who visited the same area, including older women do not believe the knoll and ridgeline have any particular or special cultural significance.

For the Aboriginal people who stated an empathy with site WCP58, a proposal to remove the landform to enable open cut mining of the underlying coal was considered to be unacceptable. Jean Thornton expressed her view that disturbance to such a site was equivalent to violence against women's bodies themselves.

A smaller and lower knoll, situated nearly two kilometres to the west, in a more open context was identified by a younger male survey participant as a place of cultural significance to men (WCP59). David Maynard stated that he respected the views of the initial site recorder and would not contradict his interpretation of the place. He noted that the location provided a commanding view of the surrounding valley and that it may have been used in hunting, scouting for game, and keeping watch over the area. In discussions about the consequences of mining, many fieldtrip attendees from the Mudgee LALC and Murong Gialinga ATSIC felt that site WCP58 should be the primary consideration for avoidance and WCP59 was a lesser priority.

It should be noted that the reported cultural values of the two knolls (WCP58 and 59) are strongly contested by the Warrabinga NTCAC who believe there are no cultural values associated with either of these locations.

F10.2.3 Archaeological Sites

Not withstanding the fact that Aboriginal cultural values may diverge considerably from archaeological value, it remains true that for much of the archaeological record, the two value systems run in parallel. The creation of knowledge about the past can enrich both the scientific and Aboriginal communities and consequently, the research potential of a site is frequently a shared criterion of value. Both value systems share a concern for the maintenance of sites, and the conservation of rare and representative sites.

The management strategies for the salvage and monitoring of archaeological value proposed in this report have also been variously advocated by Aboriginal community representatives as a means of mitigating impact to Aboriginal cultural values. For sites with stated key value, such as rock shelter sites on escarpment slopes, and large and diverse open artefact scatters, the maintenance of value through salvage excavation and recording programs are shared objectives of archaeologists and the Aboriginal community.

F11 PROJECT HERITAGE MANAGEMENT STRATEGIES

This section presents proposed strategies for the management of cultural heritage values within the Project area that may be subject to direct or indirect impacts by the Project.

Site specific management proposals are provided in Section F11.5.

F11.1 General Considerations

F11.1.1 Aboriginal Cultural Heritage Management Plan

Given that the Project will occur across a 21 year period, it is proposed to implement the various management programs progressively. Some strategies, such as the survey of adjacent escarpment slopes may be brought forward in order to satisfy community requirements or monitoring and analysis prerequisites.

The optimal means of coordinating and implementing the proposed management strategies is to integrate them into a single program and document in the form of the ACHMP. The ACHMP would cover all actions and requirements to be conducted in the Project disturbance area, the proposed ECAs, and other lands under the control of WCPL. The ACHMP would remain active for the life of the Project and define the tasks, scope and conduct of all Aboriginal cultural heritage management activities. The ACHMP should be developed in consultation with the local Aboriginal community.

F11.1.2 Role of the Local Aboriginal Community

WCPL is committed to involving the local Aboriginal community as an integral participant in the management of Aboriginal cultural heritage values in the Project area. The strategies outlined in this report have been developed in parallel with the views of community representatives and the ACHMP would be drafted in consultation with the local Aboriginal community.

The ACHMP would define a protocol for consultation with representatives of the local Aboriginal community over the life of the Project. This would include the establishment of appropriately representative Aboriginal cultural heritage liaison committee.

The conduct of actions involving the recording, salvage, monitoring, and curation (or replacement) of recovered materials, would occur with the invited participation of local Aboriginal community representatives.

Consideration would also be given to providing employment and tender opportunities to local Aboriginal community members and their organisations.

F11.1.3 Statutory Requirements

Under the National Parks and Wildlife Act 1974, all actions which involve the disturbance or destruction of Aboriginal Objects must be conducted in accordance with the provisions of a section 90 permit (Heritage Impact Permit) from the DEC. In addition, all actions involving salvage excavation for, and the collection of, Aboriginal Objects may require a permit under section 87 of the same Act.

No management actions which involve direct contact or movement of Aboriginal Objects can occur without an appropriate and current permit.

Given that permits conventionally remain current only for 2 years, several permits may be required over the life of the Project.

F11.1.4 Access to Aboriginal Sites

A number of Aboriginal organisations have expressed concern about how they may gain access to sites of particular cultural significance, and how damage to sites from inappropriate use may be avoided.

It is proposed that access to Aboriginal sites situated on Project lands would be controlled by a protocol, and would be subject to the normal operational and safety constraints associated with accessing mine sites. The protocol would specify:

- who could gain access and for what purpose;
- any requirements for access; and
- any conservation constraints and disallowed activities.

F11.1.5 Site Management and Cultural Awareness Training

The effective application of the ACHMP and its strategies is dependent on an appreciation of its content and function by on-site staff and employees. All local Aboriginal community groups have mentioned the need for training of on-site personnel to facilitate an appreciation of the cultural values the ACHMP will manage.

It is proposed to provide training to all on-site personnel regarding the ACHMP strategies and constraints relevant to their employment tasks. This would be integrated where possible with Aboriginal cultural awareness training. The training program would be developed in consultation with representatives of the local Aboriginal community, and an opportunity would be provided for the participation of appropriately experienced community members in the conduct of this training.

F11.1.6 Conduct of Ceremonial and Traditional Practice

The potential impact of the mine proposal on Aboriginal cultural values has not been consistently identified or agreed by the three local Aboriginal community groups. Approaches to managing or mitigating that impact have therefore varied and are supported variously amongst the community.

Several individuals have proposed the conduct of ceremonies according to customary lore to ameliorate the impact of the mine on cultural values. Such ceremonial practice may be required prior to, during and following mining activities. The proponents of this course of action specify that only people with the appropriate experience and knowledge should conduct the ceremonies. This approach, or the people proposed to conduct it, may not be agreed to by all of the local Aboriginal groups.

In order to accommodate the potential conduct of Aboriginal ceremony for Aboriginal cultural purposes, it is proposed to provide reasonable opportunity for their conduct as requested and considered appropriate by Elders of the local Aboriginal community. Any actions of this nature must be compatible with current occupational health and safety standards and the operational procedures of the mine.

F11.2 Direct Impacts within the Project Disturbance Area

F11.2.1 Avoidance

The avoidance of mining impact to high value sites has been considered by WCPL based on an appreciation of Aboriginal cultural values as communicated by community representatives, and on the coal resources affected. As a consequence of this process the area of open cut mining has been reduced to avoid direct impact to a ridgeline linking two sites of reported Aboriginal cultural significance (WCP72 and 58).

F11.2.2 Salvage Program

Mitigation of the direct impacts to archaeological values within the Project disturbance area can be realised through an archaeological salvage program. This program would also mitigate impacts to some Aboriginal cultural values. The salvage program would have the following aims:

- the integral involvement of the local Aboriginal community in the management of their cultural heritage;
- the recovery of a sample of surface and subsurface artefactual material in selected areas according to archaeological and Aboriginal cultural salvage priorities;
- the archaeological analysis of surface and subsurface recording data to provide information about the past occupation of the Project area by Aboriginal people; and
- the recovery of artefactual material with particular Aboriginal cultural value for the purpose of either re-placing it in the future onto the rehabilitated post-mining landscape, or otherwise providing for its long term curation.

The salvage program would include the following components:

- More detailed recording of selected sites. This may include detailed analysis of artefacts from selected sites and varying scales of spatial recording at the larger artefact scatters.
- The systematic pre-disturbance inspection and recovery of all evident surface artefacts from open artefact scatters and from selected isolated find locations.
- The selective salvage and sampling of scarred trees. The scope and form of salvage will depend on an assessment of the representativeness, research potential and Aboriginal cultural values of each site. Not all sites would warrant full salvage of the scarred area. The recovery and analysis of salvaged materials should form part of a research program designed to investigate the age, origin and techniques evidenced by the scarred trees in the Project area. The potential for carved surfaces behind regrowth should be considered for all scars where most of the original scar surface is obscured.
- The conduct of archaeological salvage excavation at selected sites and areas. The low artefact densities and shallow soil profile at many sites does not warrant the conduct of salvage excavation at most sites. A sample of sites would be selected from sites with more than five surface artefacts according to their representativeness, research potential, and Aboriginal cultural values. Some exploratory salvage excavation may also be conducted within the areas identified in Section F7.6 and Figure F7.6. The scope of sampling across these deposits would be defined by the requirements to identify and characterise any potentially occurring archaeological material. Salvage excavation methods would include by-hand and mechanical techniques, depending on the nature and research value of the deposit.

- The conduct of archaeological analysis, where appropriate, of artefacts and other materials recovered from the salvage program. Detailed analysis may not be required of artefacts from all salvage actions.

- The temporary storage of recovered materials in a Keeping Place (refer below).

F11.2.3 Management of Recovered Materials

Conduct of the salvage program would generate a considerable quantity of recovered artefactual material. With the exception of any human skeletal materials (which, if present, would be managed according to a separate protocol) this material would need to be managed and appropriately stored. The Aboriginal community has indicated a preference for materials to be returned to the rehabilitated landscape following mining, and for other options, such as the creation of an education collection or public display, to be considered in select cases. The latter may involve high quality or representative examples of stone artefacts, and possibly also a good example of a scarred tree. In addition, the community has requested that wherever feasible, recovered artefacts be temporarily stored in a secure facility within the Project area.

It is proposed to manage recovered materials according to the following procedures:

- The temporary storage of recovered cultural heritage material at a Keeping Place which would consist of a lockable secure area within the Project site and controlled by WCPL.

- A protocol would be developed in the ACHMP to facilitate access to the Keeping Place by relevant WCPL employees and Aboriginal community representatives.

- Recovered materials may be removed from the Project area and Keeping Place for the purpose of conducting analysis and research as required by the ACHMP. All material removed for this purpose must be returned to the Keeping place following completion of the analysis.

- Following the progressive rehabilitation of relevant mining areas, the recovered materials would be progressively replaced onto the new landforms. The new locations would be appropriately recorded and site cards lodged with the DEC. The local Aboriginal community would be consulted in regard to the replacement of all materials.

- A collection of representative and high quality selected artefacts could potentially be created for the purpose of education and/or permanent display by the Aboriginal community, if they decide to do so.

- A representative example of a scarred tree could be developed for public display in consultation with the local Aboriginal community.

F11.2.4 Monitoring of Selected Project Surface Earthworks

The potential for Aboriginal burials to occur within the Project disturbance area cannot be fully discounted. Landforms with a degree of potential for burial sites include the three sand and gravel deposits in the central and northwestern areas, and deep alluvial sediments associated with valley infill deposits. These areas are shown in Figure F7.6. Burials may occur singly or in groups and need not be associated with occupation sites. It is proposed to conduct selective archaeological excavation in some of these deposits as part of the salvage program.

Burial sites have high cultural significance to Aboriginal communities and the potential presence of burials in the Project area has been mentioned by some Aboriginal community members. The culturally appropriate management of any potentially occurring burial sites is a concern of the community.

In order to address the potential for burial sites it is proposed to monitor Project earthworks in specified areas of potential and to apply a protocol to the exposure of all human skeletal remains. The areas of identified potential consist of the three sand and gravel deposits and valley infill deposits identified in Figure F7.6. The boundaries of these areas are subject to confirmation following further field inspection. Monitoring should be conducted by personnel with an appropriate level of experience or training.

F11.2.5 Human Skeletal Remains Protocol

The ACHMP would include a protocol that would be triggered in the event that human skeletal material is exposed within the Project disturbance area. The protocol would include the cessation of works in the subject area, the notification of relevant authorities and the Aboriginal community and the development of appropriate management measures.

F11.2.6 Collection of Ochre

The presence of red and yellow ochre in the form of surface cobbles of weathered ironstone in the northwestern portion of the Project disturbance area presents an opportunity for members of the local Aboriginal community to collect this material for their own use. No evidence of Aboriginal exploitation was identified during field survey and the material cannot be considered artefactual or as Aboriginal Objects under the *National Parks and Wildlife Act 1974*. It is proposed that an opportunity be provided to interested members of the local Aboriginal community to collect the ochre prior to the disturbance of this landform by mining activity if they so wish.

F11.3 Potential Impacts Outside of the Project Disturbance Area

F11.3.1 Identification, Management and Monitoring of Rock Art Sites

Rock art sites of moderate to high and high archaeological value, and high Aboriginal cultural value have been identified in surveyed areas adjacent to the Project disturbance area. There remains potential for other rock art sites to be identified in the lands surrounding the Project disturbance area.

The Aboriginal community have identified the rock art sites as a high management priority and have expressed concern that these sites may be impacted by indirect impacts such as from dust and vibration generated by mining activities. Rock art sites are also vulnerable to the consequences of inappropriate visitor behaviour, such as graffiti, litter and smoke damage from campfires.

In order to address these issues the following strategies are proposed:

- Further detailed archaeological survey in escarpment and debris slope sections (within 500 m of the Project disturbance area) with the specific aim of identifying sites which may be vulnerable to indirect impacts and which require monitoring during adjacent mining operations. These areas are shown in Figure F7.7. WCPL have made a commitment to conduct this survey within the first two years of mine operation, and that this would occur prior to the commencement of mining in the adjacent pit areas.

- All rock shelter sites with rock art that are assessed as being vulnerable to potential indirect impacts of the Project would be the subject of a monitoring program. This program would include:
  - the rock art sites WCP72, 152 and 153;
  - the conduct of a pre-construction or 'base-line' recording of the site and its rock art, together with the variables which will be subject to monitoring;
  - monitoring of vibration and dust levels immediately adjacent to the shelters during the period of mining in adjacent areas; and
  - an assessment of any potential impacts of vibration and dust on the rock art surfaces.
- WCPL have made a commitment to conduct mining activities in such a way that vibration at rock art sites adjacent to mining areas is managed, and the potential for adverse impacts to rock surfaces with art pigment is minimised.
- It is anticipated that the dust management measures proposed in the Project EIS in relation to human health and amenity at surrounding dwellings would also be sufficient to minimise potential impacts to rock art sites. This expectation would be subject to assessment from the results of the site monitoring program.
- Fencing would be installed with the aim of excluding stock animals from the rock art sites WCP72, 152 and 153. The need for fencing should also be considered in the event that other rock art sites are discovered.

F11.3.2 Management of Other Sites in Relative Proximity to Project Disturbance Areas

A range of Aboriginal site types, other than rock art sites, would be situated in close proximity to the boundaries of the Project disturbance area. These include scarred trees, rock shelters with known or potential archaeological deposit and large open artefact scatters. In order to prevent inadvertent or unnecessary damage to these sites, the following strategies are proposed:

- An appropriate form of demarcation would be installed around sites which are located in close proximity to mining or construction areas and which are assessed as vulnerable to indirect or unintentional direct impacts.
- The education of Project personnel regarding the need for and management of vulnerable Aboriginal sites.

F11.3.3 Ancillary Infrastructure

There is a range of infrastructure that will be situated around the periphery of the Project site, including water bores and associated reticulation, vehicle tracks, fencing, revegetation and environmental restoration works. All works that involve ground surface disturbance have the potential to impact upon Aboriginal archaeological sites. To ensure that impact to Aboriginal cultural heritage values is avoided or mitigated, it is proposed to conduct inspections prior to the construction and installation of any required infrastructure or other ground surface disturbance works situated outside of areas previously subject to archaeological survey. The objective of these inspections would be to avoid disturbance of known Aboriginal archaeological sites where practicable. Section 87 and 90 permits would be sought if required for these areas.

F11.4 Management of Heritage Values in the Project Enhancement and Conservation Areas

Archaeological survey conducted within the proposed Project ECAs has demonstrated that Areas B and C contain Aboriginal archaeological sites of high significance and conservation value. In addition, Area A includes a significant area of the Cumbo Creek drainage line that is expected to have significant archaeological potential for *in-situ* deposits. The local Aboriginal community believes these areas provide a valuable opportunity to conserve a sample of sites from the Project area.

It is proposed to manage all three proposed ECAs according to the ACHMP, which would recognise the conservation of Aboriginal archaeological sites as a priority. The ACHMP would include:

- the exclusion of stock animals;
- required actions, constraints or opportunities which are a consequence of the management of Aboriginal sites;
- integrating the regeneration of native vegetation with the maintenance of Aboriginal archaeological sites; and
- inspections prior to any works involving significant ground surface disturbance.

F11.5 Table of Proposed Site Specific Management Strategies

Table F11.1
Proposed Site Specific Management Strategies

Note: This table includes all heritage recordings excluding definite European surveyor scarred trees, and includes all debated origin recordings.

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Within Project Disturbance Area – Section 87 and 90 permit required					
134	open artefact scatters with 500+ estimated surface artefacts	within area of proposed electricity transmission line re-alignment outside of but within 100 m of pit boundary (site occurs to north of Ulan-Wollar Road) Occurs partially within proposed ECA-B	high archaeological significance in a local context	electricity transmission line re-alignment would disturb the southern margin of this site potential for disturbance from activities conducted around periphery of Project disturbance area	• section 87 and 90 permit required for those portions of the site to be impacted • pre-disturbance inspection – collection of surface artefacts in areas subject to impact • consider salvage excavation in areas to be impacted if warranted by condition of deposits • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain a select collection for education • monitoring of earthworks – opportunistic salvage • conserve unimpacted portion of site within management regime of ECA-B • manage potential activities around periphery of mining areas to protect site • identify area as a restricted access area for off-road vehicles • fence site where appropriate to demarcate site boundary and to control access
216	open artefact scatter with up to 500 estimated surface artefacts	within Project disturbance area	moderate to high archaeological significance in a local context	within open cut mine and contained infrastructure area/ Cumbo Creek relocation corridor/ access road	• section 87 and 90 permit • pre-disturbance inspection – collection of surface artefacts • selective salvage excavation at a sample of sites • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain a select collection for education • monitoring of earthworks – opportunistic salvage
1, 3, 33	open artefact scatters with up to 100 estimated surface artefacts	within Project disturbance area			
12, 57, 81, 123, 126, 198, 208, 214, 220	open artefact scatters with up to 50 estimated surface artefacts	within Project disturbance area			

Table F11.1 (Continued)
Proposed Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Within Project Disturbance Area – Section 87 and 90 permit required (Continued)					
11, 29, 151, 176, 179, 219	open artefact scatters with up to 20 estimated surface artefacts	within Project disturbance area	low to moderate archaeological significance in a local context	within open cut mine and contained infrastructure area/ temporary construction camp/ access road	• section 87 and 90 permit • pre-disturbance inspection – collection of surface artefacts • consider selective salvage excavation at a sample of sites • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain select examples for an education collection
4, 13, 15, 22, 25-6, 31, 35, 42, 66-7, 78, 83, 105-06, 108, 121, 125, 189, 202, 217, 226	open artefact scatters with up to 5 estimated surface artefacts	within Project disturbance area	low to moderate archaeological significance in a local context	within open cut mine and contained infrastructure area/ access road	• section 87 and 90 permit • pre-disturbance inspection – collection of surface artefacts • selective analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain select examples for an education collection
88	open artefact scatter and procurement site	within Project disturbance area	moderate archaeological significance within a local context	within open cut mine and contained infrastructure area	• section 87 and 90 permit • pre-disturbance inspection – collection of surface artefacts • selective salvage excavation of a sample of the site • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain select examples for an education collection
5, 8, 10, 14, 16-20, 23-4, 27-8, 30, 32, 40-1, 43, 50-1, 65, 74, 76, 80, 102-04, 107, 109-10, 175, 177, 180, 182-83, 186, 199-201, 203-06, 218, 221, 223, 225, 237-38	isolated find	within Project disturbance area	generally low archaeological value in a local context (12 are low to moderate, and two are moderate archaeological value)	within open cut mine and contained infrastructure area/ access road	• section 87 and 90 permit • selective pre-disturbance inspection – collection of surface artefacts • analysis of select recovered artefacts if appropriate • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain select examples for an education collection

Table F11.1 (Continued)
Proposed Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Within Project Disturbance Area – Section 87 and 90 permit required (Continued)					
60	isolated find (debated origin)	within Project disturbance area	no archaeological value	within open cut mine and contained infrastructure area/ access road	• artefact collection if requested by Aboriginal community • storage in Keeping Place prior to relocation onto rehabilitated lands.
53, 55, 69, 89, 91, 93-6, 100-01, 111-12, 122, 129, 207	possible Aboriginal scarred tree	within Project disturbance area	moderate archaeological significance in a local context and moderate research value	within open cut mine and contained infrastructure area/ access road	• section 87 and 90 permit • selective salvage and sampling of scars • analysis of salvaged materials • storage in Keeping Place prior to relocation onto rehabilitated lands • potential to conserve a sample of salvaged representative examples.
75, 90, 99	probable Aboriginal scarred tree	within Project disturbance area	moderate archaeological significance in a local context and moderate research value	within open cut mine and contained infrastructure area	• section 87 and 90 permit • selective salvage and sampling of scars • analysis of salvaged materials • storage in Keeping Place prior to relocation onto rehabilitated lands • potential to conserve a sample of salvaged representative examples.
7, 68, 77	probable surveyor scarred tree (debated origin)	within Project disturbance area	moderate archaeological significance in a local context and moderate research value	within open cut mine and contained infrastructure area	• section 87 and 90 permit • selective salvage and sampling of scars • analysis of salvaged materials • storage in Keeping Place if appropriate, prior to relocation onto rehabilitated lands
52, 113	scarred tree (debated origin)	within Project disturbance area	no archaeological value	within open cut mine and contained infrastructure area	• salvage if requested by Aboriginal community • storage in Keeping Place if appropriate prior to relocation onto rehabilitated lands.
63	indeterminate tree feature	within Project disturbance area	no archaeological value	within open cut mine and contained infrastructure area	• collection if requested by Aboriginal community • storage in Keeping Place if appropriate prior to relocation onto rehabilitated lands.

Table F11.1 (Continued)
Proposed Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Within Project Disturbance Area – Section 87 and 90 permit required (Continued)					
9, 92	potential archaeological deposit (open context)	within Project disturbance area	low to moderate potential within a local context	within open cut mine and contained infrastructure area	• section 87 and 90 permit • consider selective and sample salvage excavation as part of wider investigation of predicted zones of archaeological sensitivity within open cut mine and contained infrastructure • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain a select collection for education
59	reported place of cultural significance	within Project disturbance area	low to moderate Aboriginal cultural values to some members of the MLALC and MGATSIC Aboriginal groups	within open cut mine and contained infrastructure area	• Record site in detail prior to disturbance, with the assistance of the relevant Aboriginal groups. • Consider reinstating a similar landform on the rehabilitated land surface.
62	reported 'spring' or waterhole	within Project disturbance area	low to moderate Aboriginal cultural values to some individuals of the MLALC and MGATSIC Aboriginal groups	within open cut mine and contained infrastructure area	• consider creating similar features in rehabilitated landscape (ie. localised surface depressions) • accurately record details of site prior to disturbance
194	probable modern scatter of crushed rock (debated origin)	within Project disturbance area	no archaeological significance	within open cut mine and contained infrastructure area	• no further action

Table F11.1 (Continued)
Proposed Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Within Project Disturbance Area - On Proposed Pit Boundary – Section 87 and 90 permit if required in these areas					
87, 213, 224	open artefact scatters with up to 50 estimated surface artefacts	on proposed pit boundary	moderate to high archaeological significance in a local context	partially located within open cut mining area	• consideration of avoidance • section 87 and 90 permit if required • pre-disturbance inspection – collection of surface artefacts • consider selective salvage excavation at a sample of sites • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain a select collection for education
2, 184	open artefact scatters with up to 20 estimated surface artefacts	on proposed pit boundary	low to moderate archaeological significance in a local context	partially located within open cut mining area	• consideration of avoidance • section 87 and 90 permit if required • pre-disturbance inspection – collection of surface artefacts • consider selective salvage excavation at a sample of sites • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain a select collection for education
34, 86, 188	open artefact scatters with up to 5 estimated surface artefacts	on proposed pit boundary	low to moderate archaeological significance in a local context	partially located within open cut mining area	• consideration of avoidance • section 87 and 90 permit if required • pre-disturbance inspection – collection of surface artefacts • consider selective salvage excavation at a sample of sites • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain a select collection for education

Table F11.1 (Continued)
Proposed Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Within Project Disturbance Area - On Proposed Pit Boundary – Section 87 and 90 permit if required in these areas (Continued)					
21, 54, 84	isolated find	on proposed pit boundary	generally low archaeological value within a local context (one has moderate archaeological value)	probably located within area subject to disturbance	• consideration of avoidance • section 87 and 90 permit if required • selective pre-disturbance inspection – collection of surface artefacts • analysis of select recovered artefacts if appropriate • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain select examples for an education collection
212	isolated find (debated origin)	on proposed pit boundary	no archaeological value	probably located within area subject to disturbance	• consideration of avoidance • artefact collection if requested by Aboriginal community • storage in Keeping Place prior to relocation onto rehabilitated lands.
97, 130, 196-97	possible Aboriginal scarred tree	on proposed pit boundary	moderate archaeological significance in a local context (primarily research value)	probably located within area subject to disturbance	• consideration of avoidance • section 87 and 90 permit if required • selective salvage and sampling of scars • analysis of salvaged materials • storage in Keeping Place prior to relocation onto rehabilitated lands • potential to conserve a sample of salvaged representative examples.

Table F11.1 (Continued)
Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Within Project Disturbance Area - On Proposed Pit Boundary – Section 87 and 90 permit if required in these areas (Continued)					
98, 169-71	probable Aboriginal scarred tree	on proposed pit boundary	moderate archaeological significance within a local context and high research value	probably located within area subject to disturbance	• consider avoidance where feasible • section 87 and 90 permit if required • selective salvage and sampling of scars • analysis of salvaged materials • storage in Keeping Place prior to relocation onto rehabilitated lands • potential to conserve a sample of salvaged representative examples
124	scarred tree (debated origin)	on proposed pit boundary	no archaeological value	probably located within area subject to disturbance	• salvage if requested by Aboriginal community • storage in Keeping Place if appropriate prior to relocation onto rehabilitated lands.
85	rock shelter with potential archaeological deposit	on proposed pit boundary	potential for moderate or high archaeological significance in at least a local context	probably located within area subject to disturbance	• consider avoidance of this site if avoidance is not feasible, then • section 87 and 90 permit if required • selective salvage excavation of shelter deposit • analysis of salvaged materials • storage in Keeping Place prior to relocation onto rehabilitated lands • potential to retain select examples for an education collection

Table F11.1 (Continued)
Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Outside of but within 100 m of Project Disturbance Area - Section 87 and 90 permit may be required in some areas					
128, 139	open artefact scatters with up to 20 estimated surface artefacts	potentially within 100 m of Project disturbance area	low to moderate archaeological significance in a local context	potential for disturbance during construction of access road/water bore	• section 87 and 90 permit if required • mark off area for avoidance during construction • consider selective salvage excavation in areas subject to impact • pre-disturbance inspection – collection of surface artefacts • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain select examples for an education collection
190	open artefact scatter with up to 20 estimated surface artefacts	within 100 m of Project disturbance area	low to moderate archaeological significance in a local context	potential for disturbance from construction of realigned electricity transmission line	• section 87 and 90 permit if required • mark off area for avoidance during construction • pre-disturbance inspection – collection of surface artefacts, if site will be effected • analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain select examples for an education collection
185, 195, 211	open artefact scatters with up to 5 estimated surface artefacts	outside of but within 100 m of Project disturbance area	low to moderate archaeological significance in a local context	potential for disturbance from activities conducted around periphery of mining areas	• consider conservation and management of WCP185 within management regime of WCP72 • manage potential activities around periphery of mining areas to protect site • identify area as restricted access area for off-road vehicles • fence site where appropriate to demarcate site boundary and to control access

Table F11.1 (Continued)
Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Outside of but within 100 m of Project Disturbance Area - Section 87 and 90 permit may be required in some areas (Continued)					
127, 222	open artefact scatters with up to 5 estimated surface artefacts	potentially within 100 m of Project disturbance area	low to moderate archaeological significance in a local context	may be partially impacted by road construction	• section 87 and 90 permit if required • mark off area for avoidance during construction • pre-disturbance inspection – collection of surface artefacts • selective analysis of recovered artefacts • storage in Keeping Place prior to relocation onto rehabilitated lands. • potential to retain select examples for an education collection
193	open artefact scatter with up to 5 estimated surface artefacts	located at Cumbo Creek homestead and within 100 m of temporary construction camp	low to moderate archaeological significance in a local context	potential for disturbance from activities conducted around construction camp	• Avoid or minimise impact to this site when conducting activities which involve ground disturbance • Any impact to site would require a section 90 and/or 87 permit
71, 73, 155, 235	isolated find	outside of but within 100 m of Project disturbance area	generally low archaeological value within a local context (one has low to moderate archaeological value)	potential for disturbance from activities conducted around periphery of mining areas/access road	• manage potential activities around periphery of mining areas to protect site • identify area as restricted access area for off-road vehicles
114, 160	possible Aboriginal scarred tree	outside of but within 100 m of Project disturbance area (114 is dead and fallen and partially harvested for fence posts)	low to moderate archaeological significance in a local context	potential for disturbance from activities conducted around periphery of mining areas	• consider this site for inclusion within a scarred tree research program • manage potential activities around periphery of mining areas to protect site • identify area as a restricted access area for off-road vehicles • fence site where appropriate to demarcate site boundary and to control access

Table F11.1 (Continued)
Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Outside of but within 100 m of Project Disturbance Area - Section 87 and 90 permit may be required in some areas (Continued)					
64, 163, 167	probable Aboriginal scarred tree	outside of but within 100 m of Project disturbance area	moderate archaeological significance in a local context	potential for disturbance from activities conducted around periphery of mining areas	• manage potential activities around periphery of mining areas to protect site • identify area as a restricted access area for off-road vehicles • fence site where appropriate to demarcate site boundary and to control access
153	rock shelter with art	outside of but within 100 m of Project disturbance area	moderate to high archaeological significance in a local context and high Aboriginal cultural significance	potential for indirect impact from vibration and dust, from inappropriate visitation occurs within proposed ECA-C.	• conserve site within management regime of ECA-C • conduct a baseline (archival) recording of the site • manage vibration from adjacent mining • conduct regular monitoring of the site to assess potential impacts and the effectiveness of management strategies • manage potential activities around periphery of mining areas to protect site • identify area as restricted access area for off-road vehicles • fence site where and if appropriate to demarcate site boundary and to control access
36-9, 48-9, 178	rock shelter with surface artefacts and confirmed or potential archaeological deposit	outside of but within 100 m of Project disturbance area	moderate to high archaeological significance in at least a local context	potential for indirect impact from vibration, erosion, from inappropriate visitation, and activities conducted around periphery of mining areas sites 36-39 occur within proposed ECA-C	• consider, if necessary, modifying pit boundaries where sites occur in close proximity, to protect sites • manage potential activities around periphery of mining areas to protect site • identify area as restricted access area for off-road vehicles • fence site where appropriate to demarcate site boundary and to control access • conduct regular monitoring to assess potential impacts and the effectiveness of management strategies
44, 47, 82, 229-31	rock shelter with potential archaeological deposit	outside of but within 100 m of Project disturbance area			

Table F11.1 (Continued)
Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Outside of but within 100 m of Project Disturbance Area - Section 87 and 90 permit may be required in some areas (Continued)					
140	rock shelter with surface artefacts and potential archaeological deposit	within 100 m of proposed bore location outside of open cut mine and contained infrastructure	moderate to high archaeological significance in at least a local context	potential for disturbance from activities conducted around periphery of bore area sites occur within ECA-B	• conserve site within management regime of Project ECA-B • avoid impact to this site when conducting activities which involve ground disturbance (eg. fencing and installation of bores) • identify area as restricted access area for off-road vehicles • fence site where appropriate to demarcate site boundary and to control access
141, 145	rock shelter with potential archaeological deposit	within 100 m of proposed bore location outside of open cut mine and contained infrastructure			
79	reported 'spring' or waterhole	outside of but within 100 m of Project disturbance area	moderate Aboriginal cultural values to some individuals of the MLALC and MGATSIC Aboriginal groups	potential for impact from inappropriate visitation, and activities conducted around periphery of mining areas	• manage potential activities around periphery of mining areas to protect site
61	reported 'spring' or waterhole	outside of but within 100 m of Project disturbance area	low to moderate Aboriginal cultural values to some individuals of the MLALC and MGATSIC Aboriginal groups	potential for impact from inappropriate visitation, and activities conducted around periphery of mining areas	• manage potential activities around periphery of mining areas to protect site

Table F11.1 (Continued)
Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
Outside of but within 100 m of Project Disturbance Area - Section 87 and 90 permit may be required in some areas (Continued)					
142	probable European clearing mounds (debated origin)	within 100 m of proposed bore location outside of open cut mine and contained infrastructure	low archaeological significance. An alternative Aboriginal interpretation of these features as possible Aboriginal burials may warrant a precautionary high Aboriginal cultural significance rating	potential for disturbance from activities conducted around periphery of bore area site occurs within ECA-B	• conserve site within management regime of Project ECA-B • avoid impact to this site when conducting activities which involve ground disturbance (eg. fencing and installation of bores) • identify area as restricted access area for off-road vehicles • fence site where appropriate to demarcate site boundary and to control access
More Than 100m Outside of Project Disturbance Area (Section 87 and 90 Permit not required unless intersected by ancillary infrastructure)					
174	open artefact scatters with 500+ estimated surface artefacts	outside of open cut mine and contained infrastructure	high archaeological significance in a local context moderate to high archaeological significance in a local context	no anticipated impact sites 174, 136 and 227 occur within ECA-B	• where appropriate, conserve site within management regime of ECA-B • avoid impact to these sites when conducting activities which involve ground disturbance • any impact to sites would require a section 87 and/or 90 permit
136, 227	open artefact scatters with up to 500 estimated surface artefacts	outside of open cut mine and contained infrastructure			
158-59, 162	open artefact scatters with up to 50 estimated surface artefacts	outside of open cut mine and contained infrastructure			
138, 156-57, 209	open artefact scatters with up to 20 estimated surface artefacts	outside of open cut mine and contained infrastructure	low to moderate archaeological significance in a local context	no anticipated impact 138 and 191 occur within ECA-B	• where appropriate, conserve site within management regime of Project ECA-B • elsewhere, consider conservation of sites within a joint management zone for agricultural grazing and conservation of archaeological sites. • Avoid or minimise impact to these sites when conducting activities which involve ground disturbance • any impact to sites would require a section 87 and/or 90 permit
191	open artefact scatters with up to 5 estimated surface artefacts	outside of open cut mine and contained infrastructure			
46, 56, 70, 135, 181, 187, 210, 215	isolated find	outside of open cut mine and contained infrastructure	low archaeological value within a local context	no anticipated impact 135 occurs within ECA-B	

Table F11.1 (Continued)
Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
More Than 100m Outside of Project Disturbance Area (Section 87 and 90 Permit not required unless intersected by ancillary infrastructure) (Continued)					
6, 149	possible Aboriginal scarred tree	outside of open cut mine and contained infrastructure WCP6 occurs in close proximity to site WCP72	moderate archaeological significance within a local context	no anticipated impact	• conserve site WCP6 within management regime of WCP72 • Avoid impact to these sites and manage each area with the objective of their conservation.
150, 161, 166, 234, 236	probable Aboriginal scarred tree	outside of open cut mine and contained infrastructure	moderate archaeological significance within a local context	no anticipated impact 150 occurs in ECA-A	• where appropriate, conserve site within management regime of ECAs • identify area as restricted access area for off-road vehicles • fence sites if necessary to demarcate site boundary and to control access
58	reported place of cultural significance	outside of open cut mine and contained infrastructure	high Aboriginal cultural values to some individuals of the MLALC and MGATSIC Aboriginal groups. Significance contested by WNTCAC.	potential for indirect impacts from inappropriate visitation, and activities conducted around periphery of mining areas.	• conserve and manage this site as part of a landscape conservation zone between this site and the art site WCP72. • management strategies to be determined in consultation with local Aboriginal community representatives. • install a fence between the site and the pit boundary

Table F11.1 (Continued)
Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
More Than 100m Outside of Project Disturbance Area (Section 87 and 90 Permit not required unless intersected by ancillary infrastructure) (Continued)					
72	rock shelter with rock art and potential archaeological deposit (stock currently access the site causing degradation and dust generation)	outside of open cut mine and contained infrastructure	high archaeological significance within a local and possible regional context, very high Aboriginal cultural significance	potential for indirect impacts from vibration and dust, from inappropriate visitation, and activities conducted around periphery of mining areas.	• conserve and manage this site within a landscape conservation zone which may include basal slope areas which are jointly managed in conjunction with grazing • install a fence around the site which is inclusive of the main rock outcrops, with the aim of preventing stock animal entry, but allowing people access • conduct a baseline (archival) recording of the site • manage activities around periphery of mining areas to protect site • manage vibration from adjacent mining to minimise potential adverse impacts at the site • conduct regular monitoring of the site to assess the effectiveness of management strategies • identify area as restricted access area for off-road vehicles • educate on-site staff regarding appropriate visitation protocols
152	rock shelter with art, surface artefacts and potential archaeological deposit	outside of open cut mine and contained infrastructure	high archaeological significance within a local context, high Aboriginal cultural significance	potential for indirect impact from vibration and dust, from inappropriate visitation occurs within ECA-C	• conserve site within management regime of ECA-C • conduct a baseline (archival) recording of the site • manage activities around periphery of mining areas to protect site • manage vibration from adjacent mining to minimise potential adverse impacts at the site • conduct regular monitoring of the site to assess the effectiveness of management strategies • identify area as restricted access area for off-road vehicles • fence site where and if appropriate to demarcate site boundary and to control access

Table F11.1 (Continued)
Site Specific Management Strategies

WCP Site Codes	Site/recording category	Development Context	Significance	Potential Impact	Proposed Management Measures
More Than 100m Outside of Project Disturbance Area (Section 87 and 90 Permit not required unless intersected by ancillary infrastructure) (Continued)					
45, 115, 116, 118-20, 137, 144, 173, 192	rock shelter with surface artefacts and potential archaeological deposit	outside of open cut mine and contained infrastructure	potential for moderate to high archaeological significance in at least a local context	no anticipated impact some sites occur within ECA-B (137, 143, 144, 146, 172, 173, 192 and 228) and ECA-C (154)	• where appropriate, conserve site within management regime of ECAs • elsewhere, consider conservation within an archaeological conservation zone, which may be compatible with other land uses • Avoid impact to these sites when conducting activities which involve ground disturbance
117, 143, 146-48, 154, 164-65, 168, 172, 228, 232-33	rock shelter with potential archaeological deposit	outside of open cut mine and contained infrastructure			

F12 RECOMMENDATIONS

Based on the known and predicted cultural heritage places and values identified within the Project disturbance area, it is concluded that impacts to those places and values can be effectively managed or mitigated through the conduct of the following actions and strategies.

If WCPL proceeds with the Wilpinjong Coal Project, the following is recommended:

1. An ACHMP be prepared for the Project which identifies all statutory, conservation, salvage and management actions to be conducted over the anticipated life of the Project, including infrastructure construction, mining and rehabilitation works.

2. The ACHMP should be developed in consultation with representatives of the Aboriginal community (including the local residential community and those with traditional ties to the Project area) and be based on and generally incorporate the strategies and actions outlined in Section F11 of this report.

3. The ACHMP should include the following:

    a) A protocol for consultation with representatives of the local Aboriginal community over the life of the Project. This should include:

        - Establishment of a representative Project Aboriginal cultural heritage liaison committee through which issues and actions regarding cultural heritage and continuing Aboriginal involvement in the Project can be discussed and implemented.

        - Meetings of the Project Aboriginal cultural heritage liaison committee are initially to be held quarterly, or at greater intervals according to the agreement of the participants.

        - The participation of local Aboriginal community representatives in Aboriginal cultural heritage salvage, monitoring and field management works (at a level of representation as defined in the ACHMP).

    b) A list of statutory requirements regarding the ACHMP actions (such as section 87 and section 90 permits [Heritage Impact Permits] under the *National Parks and Wildlife Act 1974*), and a time frame for their application and receipt.

    c) A salvage program that includes the following actions prior to the commencement of Project related ground surface disturbance in those areas:

        - the recovery of surface artefacts at selected sites as identified in the ACHMP;

        - more detailed recording of selected sites (eg. art sites) as identified in the ACHMP;

        - conduct of archaeological salvage excavation at selected sites and areas as identified in the ACHMP;

        - salvage and further investigation of selected scarred trees as identified in the ACHMP; and

        - archaeological analysis, where appropriate, of artefacts and other materials recovered from the salvage program.

d) A storage and re-placement program that identifies the various procedures for:

- the temporary storage of recovered cultural heritage material, at a Keeping Place;
- the placement of recovered cultural heritage material onto mine landforms as they are progressively rehabilitated as close as practicable to the original recorded location of the site; and
- the development of a collection of selected artefacts for the purpose of education and/or permanent display by the local Aboriginal community if they desire to do so.

e) A protocol that defines the actions to be followed in the event that human skeletal material is encountered within the Project disturbance area. The protocol would include the cessation of works in the subject area, the notification of relevant authorities and the Aboriginal community, and the development of appropriate management measures.

f) A protocol that defines how Aboriginal sites of cultural value situated on WCPL lands can be accessed by members of the Aboriginal community.

g) A program for monitoring Project related surface earthworks in selected places within the Project disturbance area, with the aim of ensuring that any human skeletal material that may be disturbed is identified and appropriately managed. Monitoring should be conducted by personnel with an appropriate level of experience or training.

h) A program for the regular monitoring of potential indirect impacts of the Project on selected sensitive Aboriginal sites such as rock art sites (as identified in the ACHMP), located within, or in relative proximity to the Project disturbance area.

i) A requirement for mining activities to be conducted in such a way that vibration levels at Aboriginal rock art sites in areas adjacent to mining are managed, and the potential for adverse impacts to rock surfaces with art pigment is minimised.

j) A schedule and design to conduct further detailed archaeological survey on the slopes up to, and including the escarpments, within 500 m of the Project disturbance area. This program should be conducted with the primary aim of identifying Aboriginal sites which may be vulnerable to potential indirect mining impacts (eg. rock art sites). The survey program:

- should not include areas already subject to comprehensive survey;
- can be conducted progressively;
- should be completed in any particular area prior to the commencement of mining adjacent to those areas (eg. within 500 m or as defined in the ACHMP); and
- should be completed within two years of the commencement of Project mining activities.

k) A conservation management program for Aboriginal cultural heritage sites and values situated within the proposed ECAs.

l) A program of active conservation management at selected sites in relative proximity to mining or other mining infrastructure areas. This should include:

- the installation of fencing with the aim of excluding stock animals from the rock art sites (WCP72, 152 and 153);
- the installation of an appropriate form of demarcation around sites which are located in close proximity to the Project disturbance area and which may be vulnerable to indirect or unintentional direct impacts; and
- the education of field personnel regarding the need for and management of vulnerable Aboriginal sites (eg. rock art).

- the education of field personnel regarding the need for and management of vulnerable Aboriginal sites (eg. rock art).

m) The conduct of a systematic program of Aboriginal cultural awareness training for all on-site personnel which communicates the need for, and the various management strategies to be conducted for the management of Aboriginal cultural heritage.

n) The conduct of an inspection prior to the construction and installation of any required ancillary infrastructure or other ground surface disturbance works (eg. installation of water bores and pipelines) if situated outside of areas previously subject to archaeological survey.

o) Provision by WCPL of reasonable opportunity for the conduct of Aboriginal cultural ceremonies with regard to the impact of mining operations on Aboriginal cultural values, as requested in writing by the local Aboriginal community. Any actions of this nature must be compatible with current occupational health and safety requirements and operational procedures at the mine.

4. An opportunity should be provided to interested members of the local Aboriginal community to collect yellow and red ochre from a limited surface distribution of weathered ironstone cobbles in a small section of pit 5 prior to its disturbance by mining activity.

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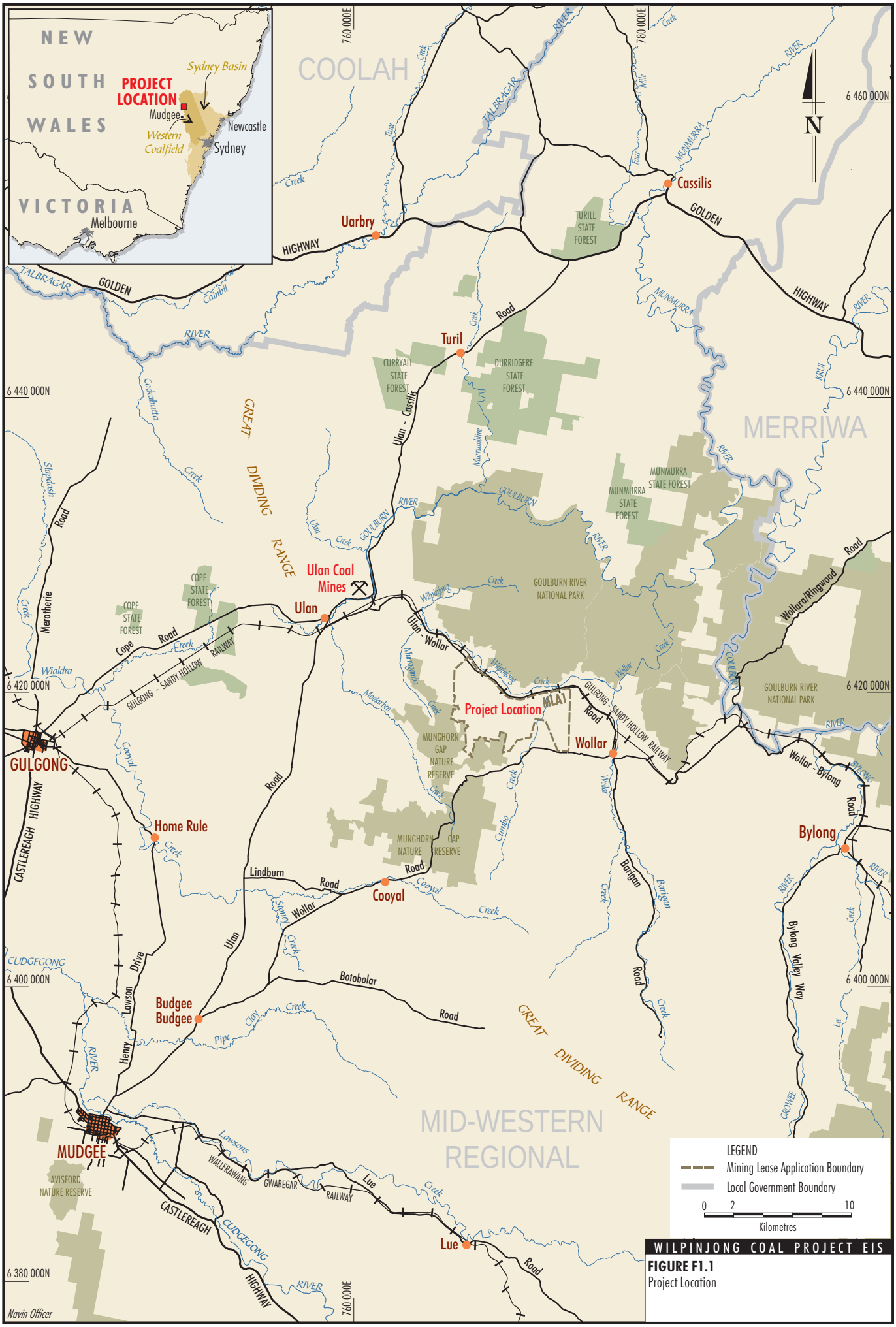
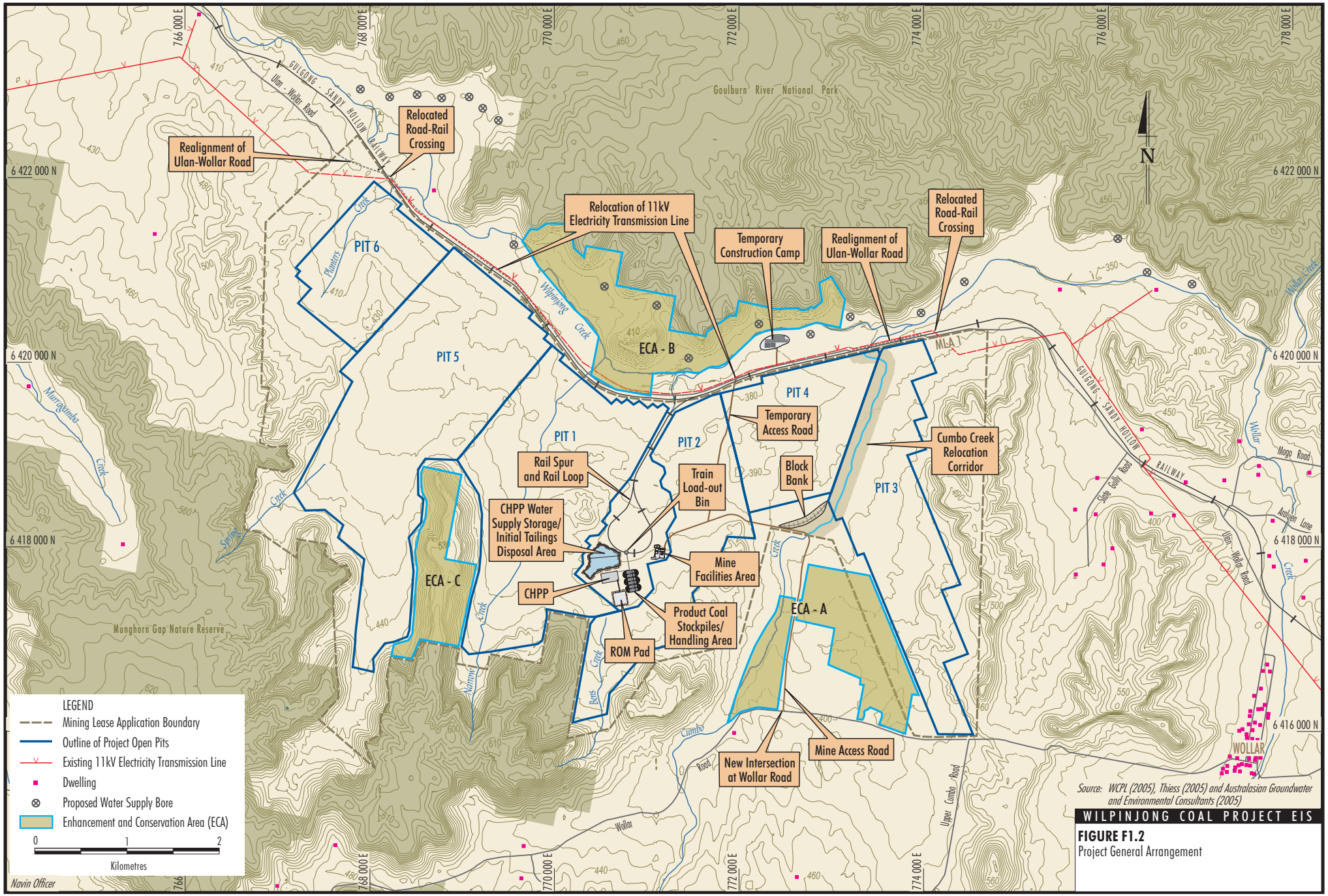
FIGURES



WILPINJONG COAL PROJECT EIS

FIGURE F1.1
Project Location

WIL-04-01 AbHer_007F

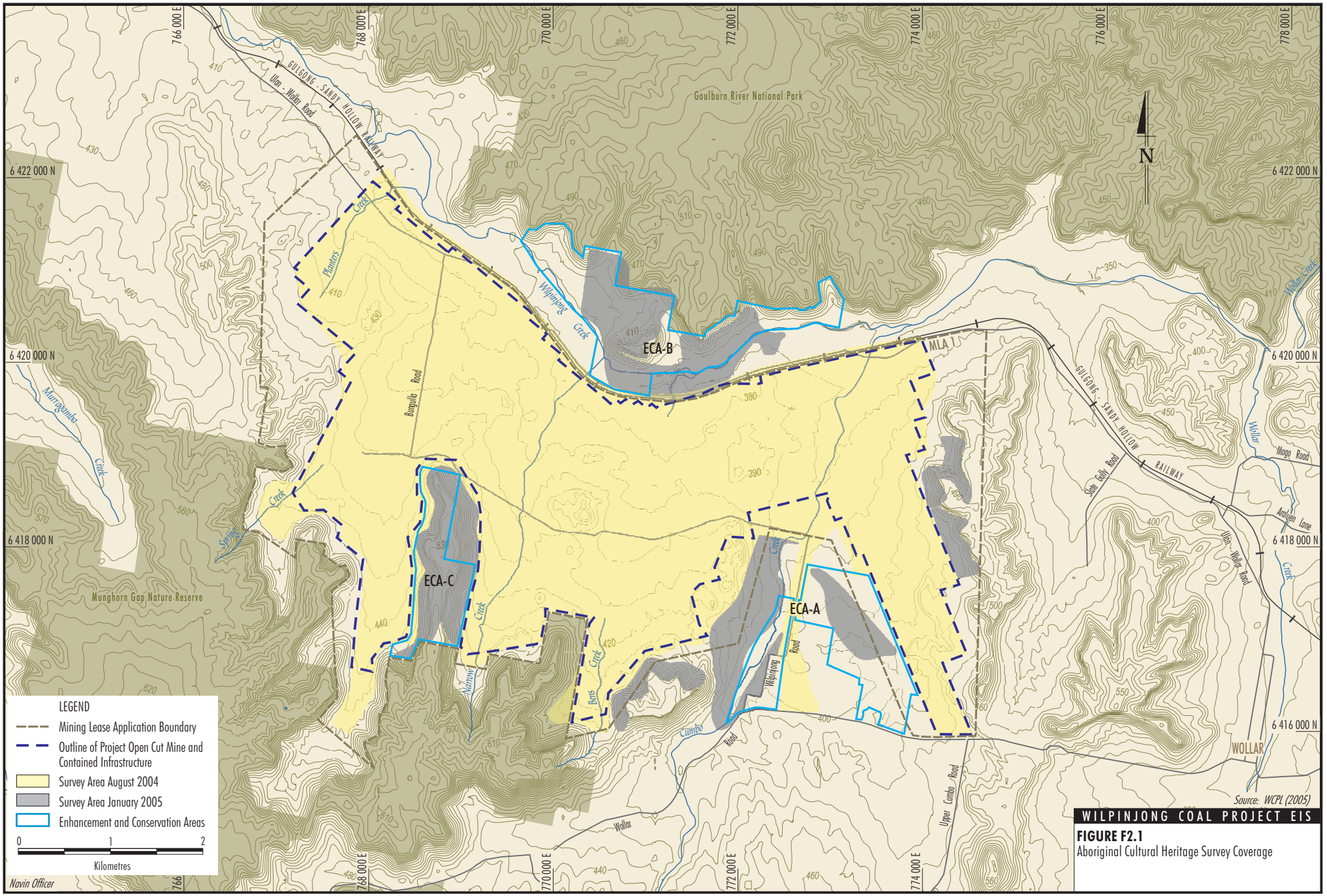


Source: WCPL (2005), Thiess (2005) and Australasian Groundwater and Environmental Consultants (2005)

WILPINJONG COAL PROJECT EIS

FIGURE F1.2
Project General Arrangement

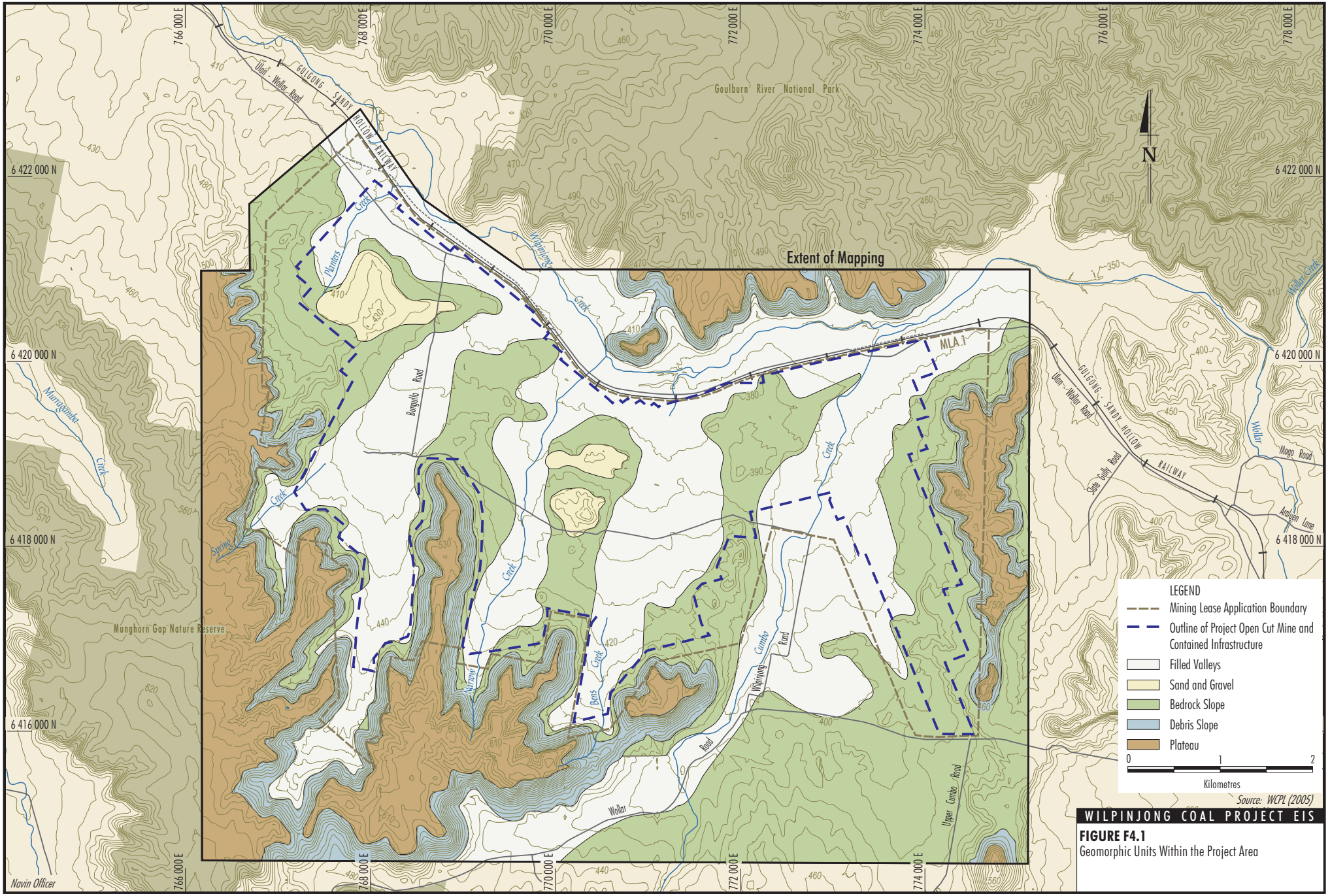
WIL-04-01 AbHer_008H



WILPINJONG COAL PROJECT EIS

FIGURE F2.1
Aboriginal Cultural Heritage Survey Coverage

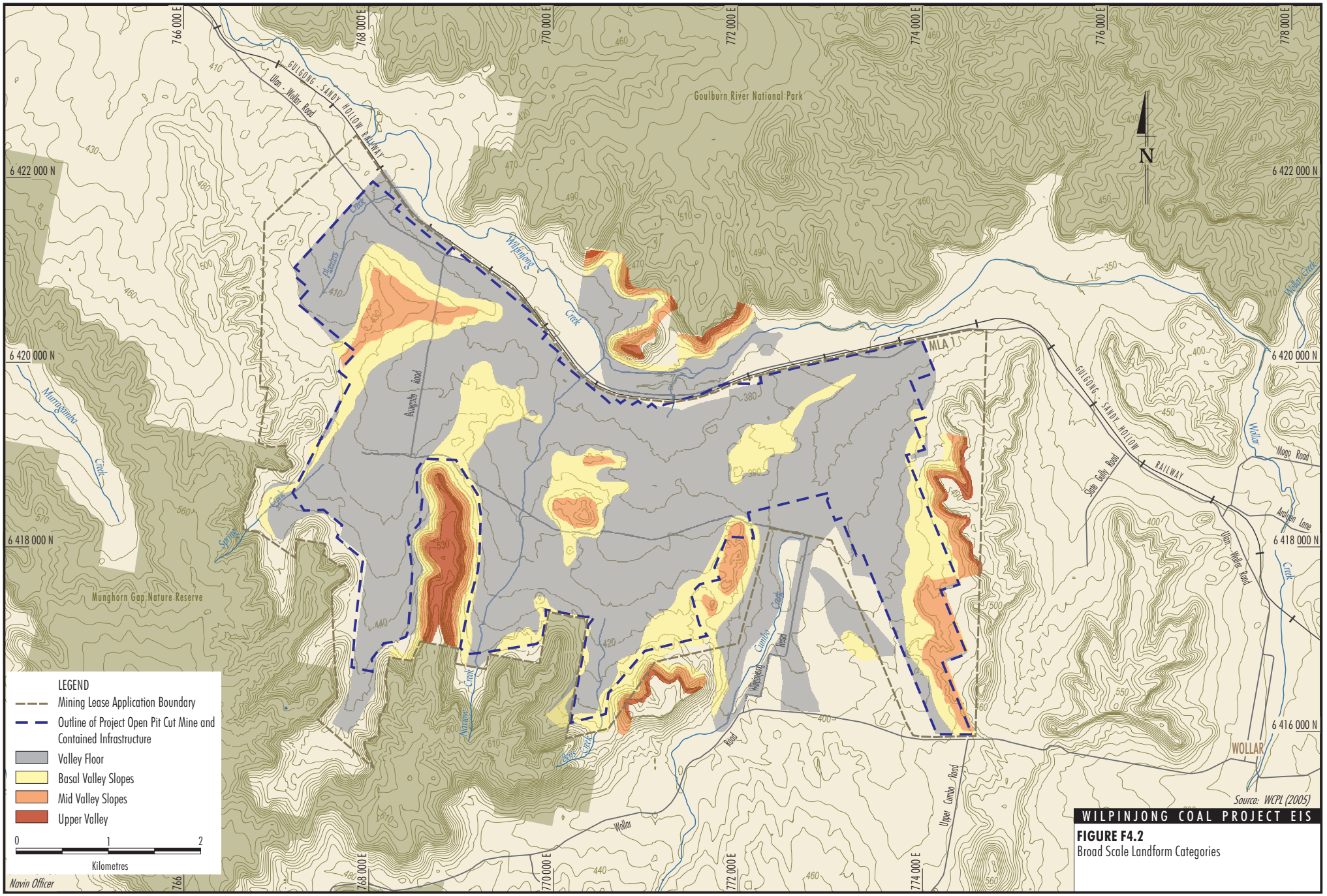
WIL-04-01 AbHer_004E



WILPINJONG COAL PROJECT EIS

FIGURE F4.1
Geomorphic Units Within the Project Area

WIL-04-01 Ab Her_003E



WILPINJONG COAL PROJECT EIS

FIGURE F4.2
Broad Scale Landform Categories

WIL-04-01 AbHer_005F

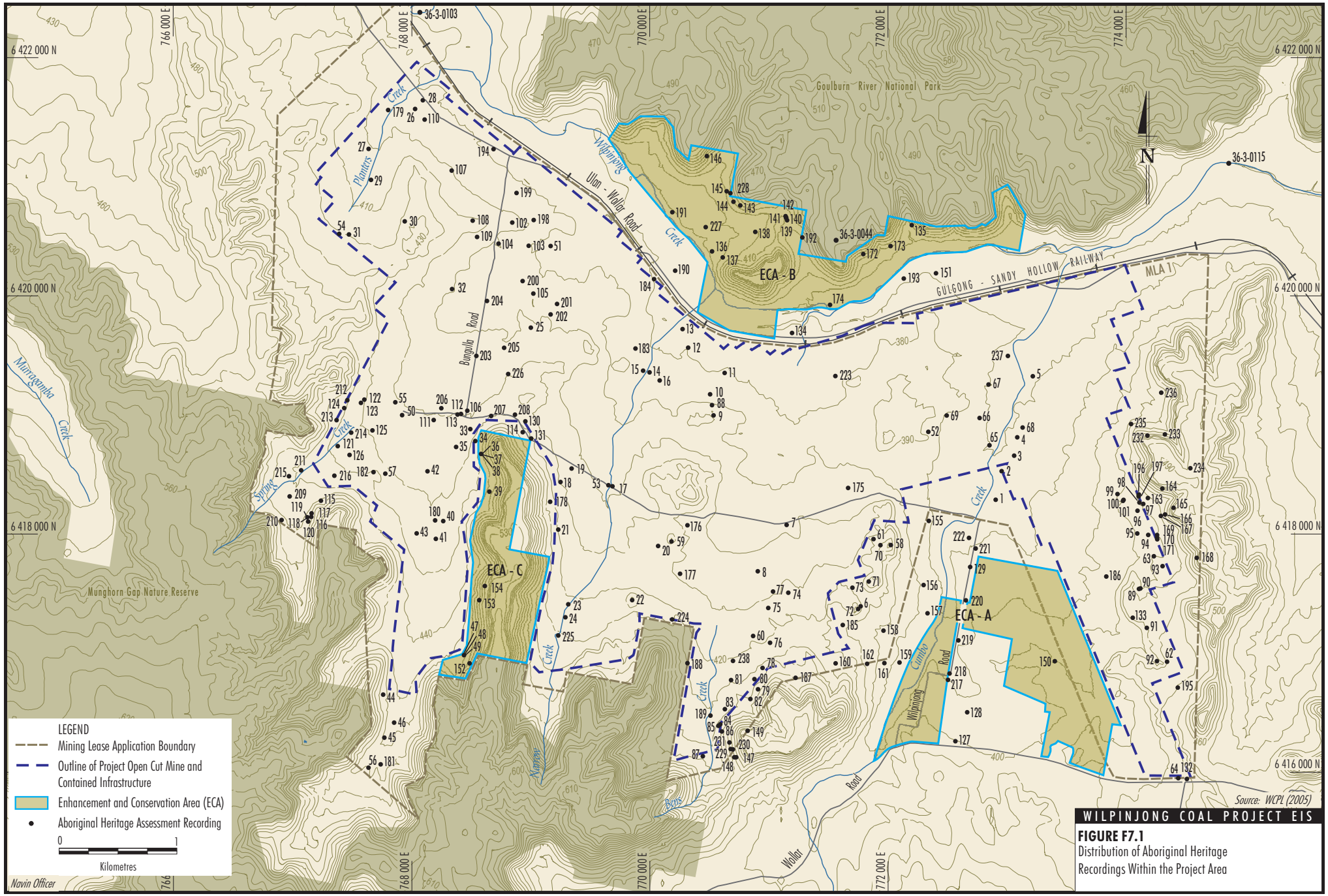


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Figure F7.2

Frequency of Recorded Surface Artefact Categories According to Broad Scale Landform Units.

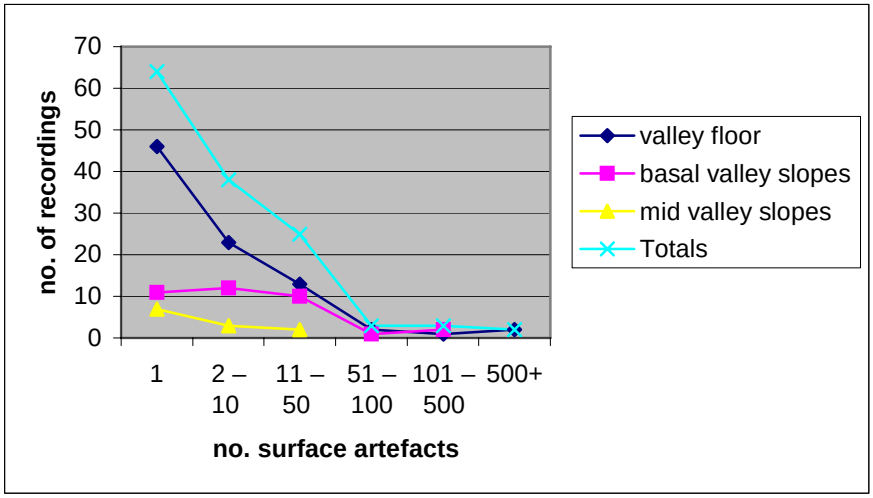


Figure F7.3

Extract from a Nineteenth Century Settlers Manual – Bark Removal Technique

(Source: Archer 1996:69).

Figure F7.4

Length Versus Width of Original Scar Dimensions

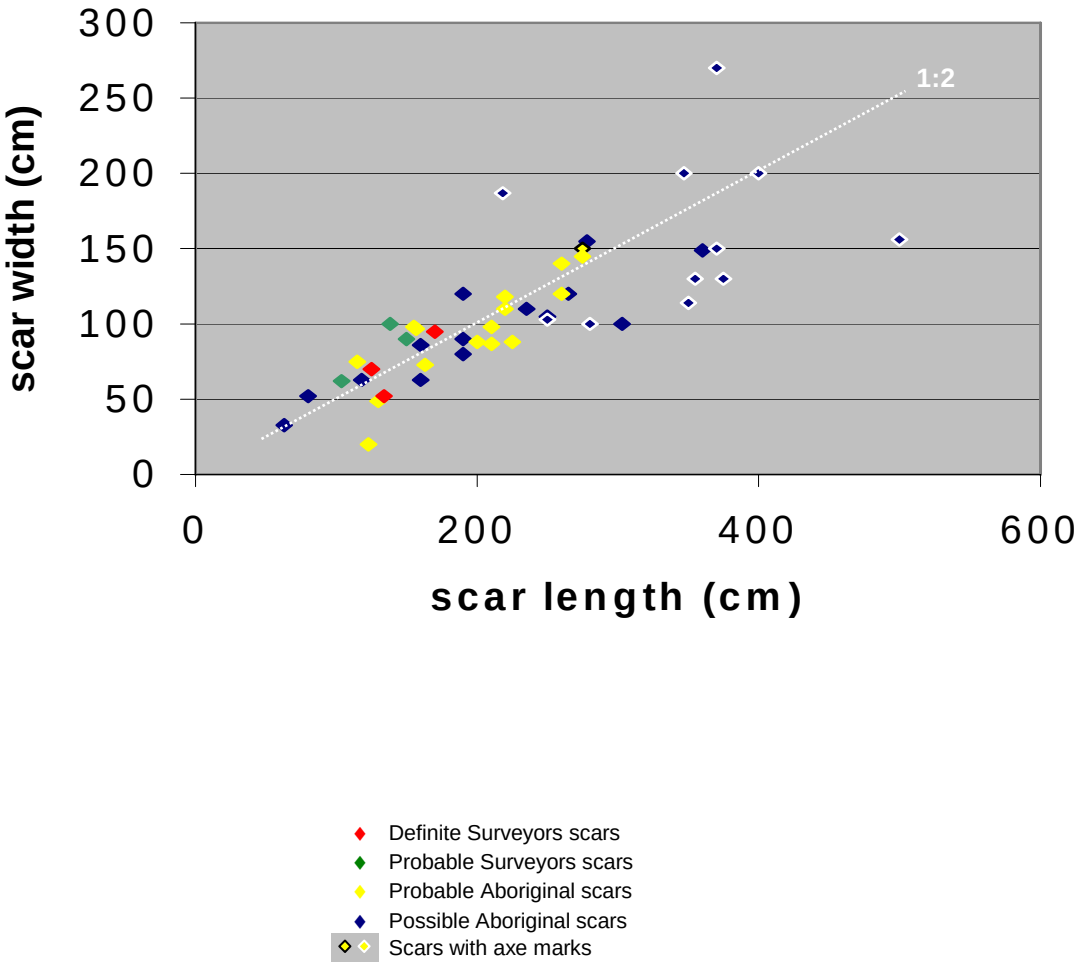
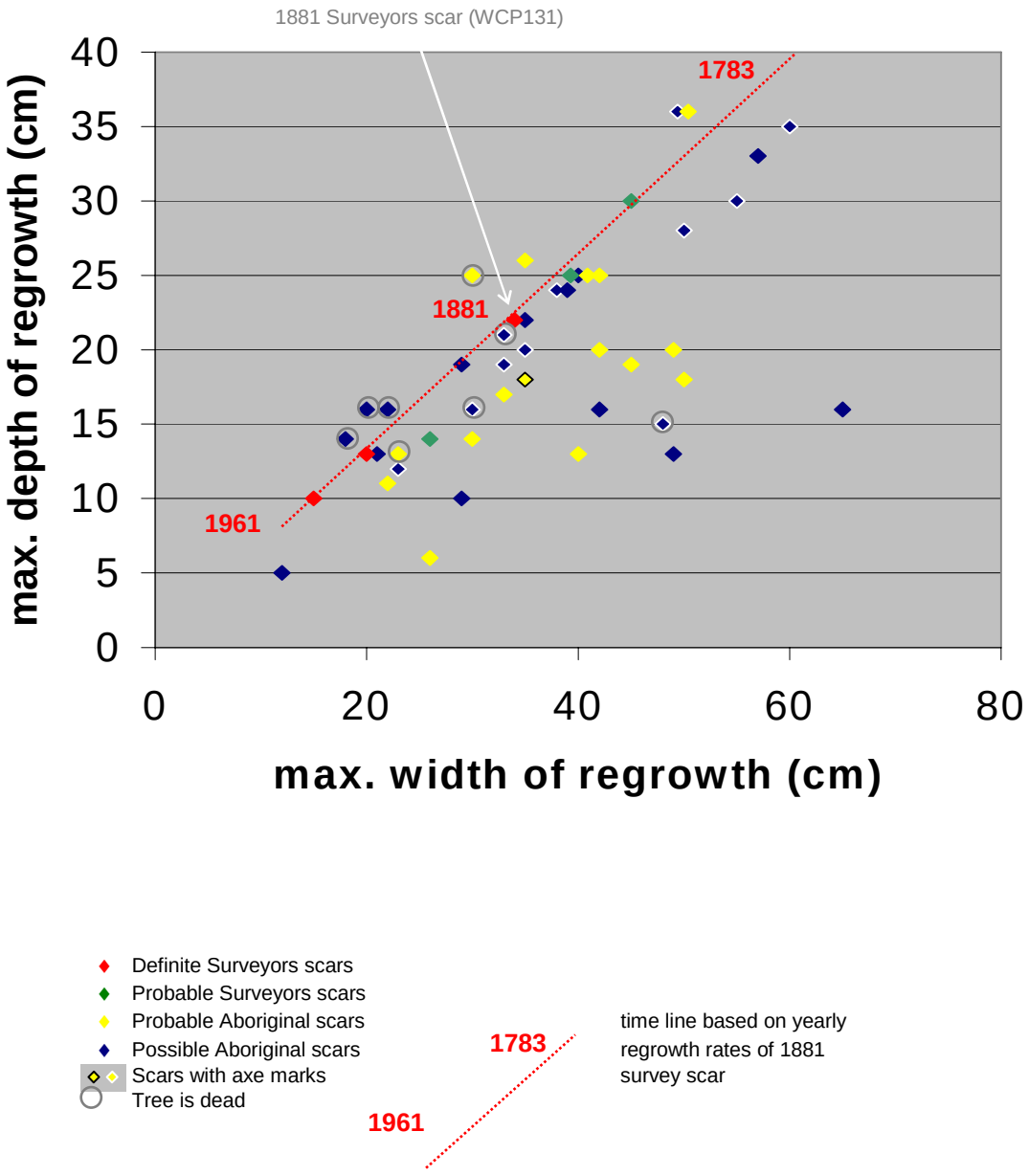


Figure F7.5

Maximum Depth Versus Maximum Width of Regrowth - Human Made Scars



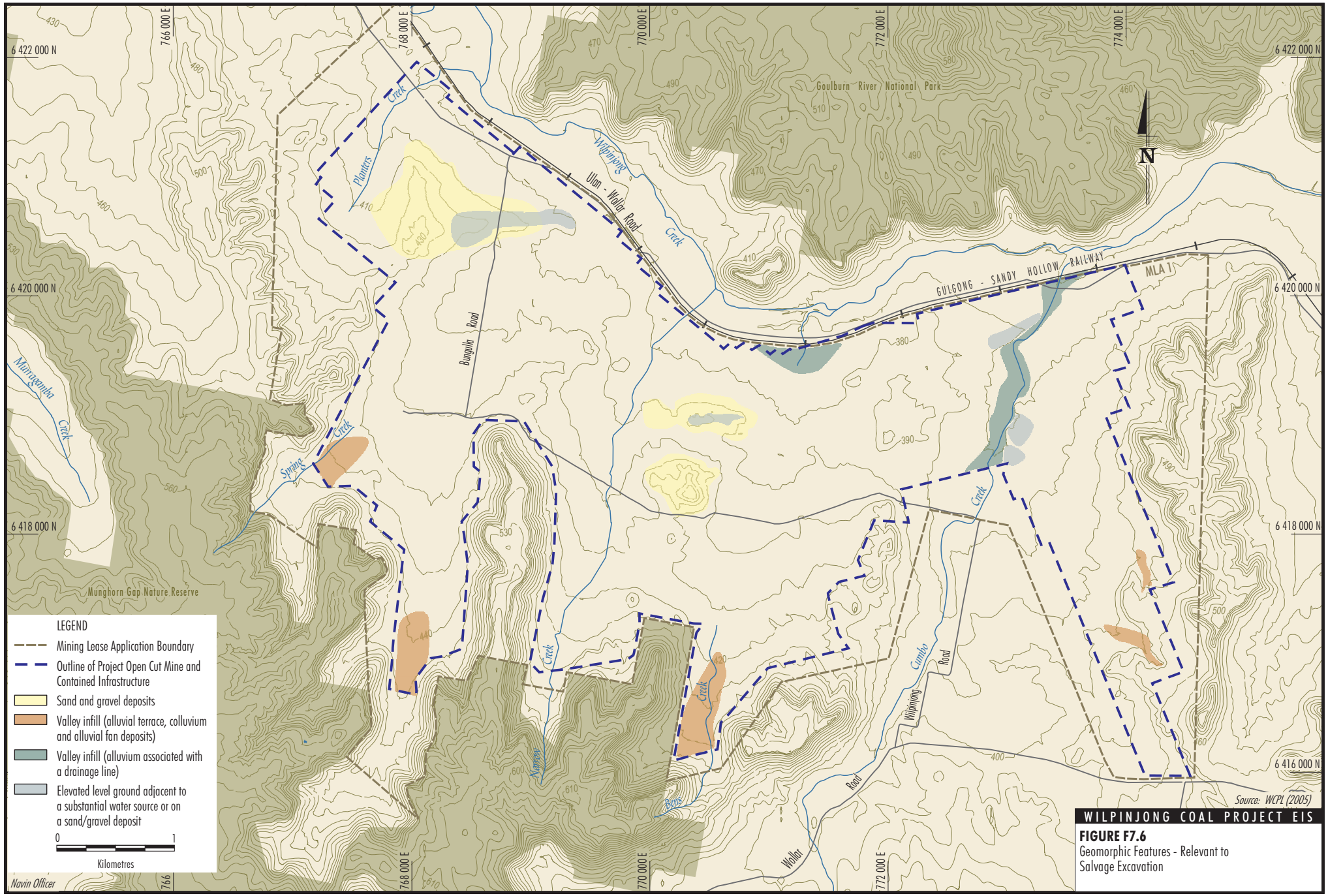


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FIGURE F7.6
Geomorphic Features - Relevant to Salvage Excavation

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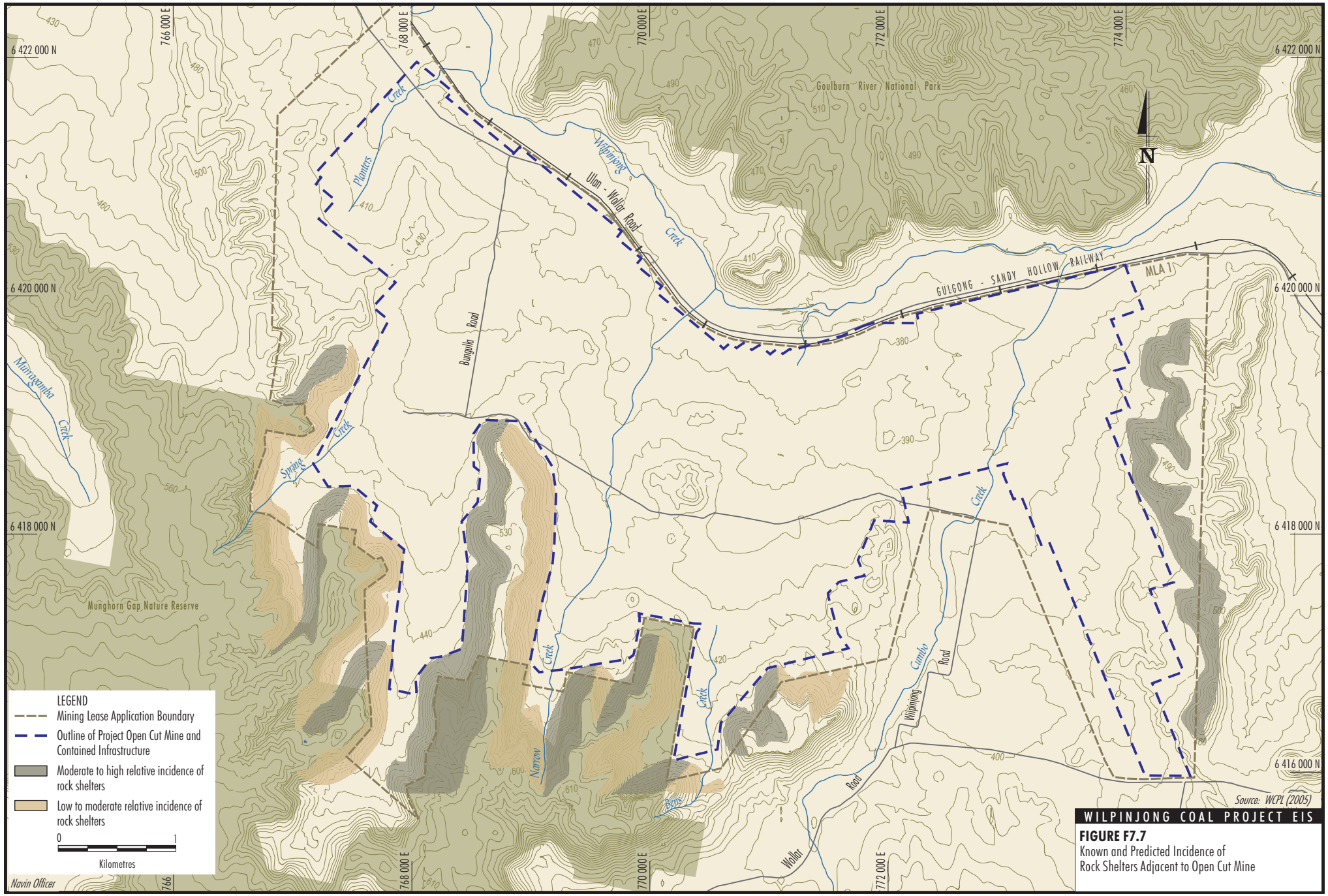

WILPINJONG COAL PROJECT EIS

FIGURE F7.7
Known and Predicted Incidence of Rock Shelters Adjacent to Open Cut Mine

WIL-04-01 AbHer_009D

PLATES

Plate F4.1
General View of the Lees Pinch Soil Landscape

Showing upper plateau level, sandstone escarpment, steep debris slope (in trees), and the lower slopes with scattered large boulders. The boulder in the right foreground is shown again in Plate F4.4.

Location: View from the edge of Pit 3 to the east.

Plate F4.2
View of Fallen Sandstone Boulders

In the middle of the steep debris slope below the cliffs. These blocks are each about 4 x 7 x 3 m and lie with different bedding plane orientation on the slope. The cavity between them is small but would provide reasonable shelter if required.

Location: North of the Project - below the National Park escarpment and in ECA B.

Plate F4.3
Another View of Fallen Boulders

Gully erosion has exposed a previously buried boulder in some 5 m of alluvial/colluvial material.

Location: North of the Project - below the National Park escarpment and in ECA B.

Plate F4.4
Close Up of the Rock Fall Boulder Seen in Plate F4.1.

Note that the bedding is vertical and that there appears to be two ages of fretting of the sandstone surface. This block is 3 x 6 x 9 m and it is estimated that it is buried about 1.5 to 2 m.

Location: Outside of the Project disturbance area to the east of Pit 3.

Plate F4.5
Typical Hill Slope in Permian Sedimentary Rocks

Prominent bench of Marrangaroo Conglomerate exposed on the stepped slope above Cumbo Creek (Barigan Creek soil landscape).

Location: Outside of Project disturbance area, southeast of Pit 2.

Plate F4.6
Typical Hill Slope in Permian Sedimentary Rocks

Sheet eroded slope on shale with a thin stony red podzolic (texture contrast) soil profile on the foot slope. Any artefacts found on such a slope would not be in their original location and if present in the soil would be at the base of the biomantle.

Location: Eastern margin of Pit 2.

Plate F4.7
Typical Texture Contrast (Duplex) Soil on the Hill Slopes on Permian Rocks in the Project Area

The hard-setting biomantle (A-horizon) can be shown to be a separate stratum blanketing the slope where it overlies different subsoil materials. Where artefacts occur within the biomantle, they will tend to be concentrated in the stone layer at the interface between the biomantle and the subsoil.

Location: Pit 1, in Project disturbance area.

Plate F4.8
Rounded Pebbles of Quartz, Rhyolite, Chert and Quartzite with Mean Diameter of 15-35 mm

The larger brown block is composed of the same material secondarily cemented with iron oxides. These gravels cap the round knoll at an elevation of 400 m.

Location : Centre of Pit 1.

Plate F4.9
Yellow Ochre Occurring on Cobbles of Ironstone

These cobbles have been collected into piles by European farmers.

Location: Northern portion of Pit 5.

Plate F4.10
View Upstream of the Confined Valley near the Head of Spring Creek

This is a flat valley floor at an elevation of 500 m without a defined channel and a 3 m high alluvial terrace on the left (southern bank).

Location: Well outside of Project disturbance area, south of Pit 5.

Plate F4.11
The Same Valley Floor Shown in Plate F4.10 with a Half Buried Rock Fall Boulder

Note the vertical bedding planes. Behind the boulder is the pair of the terrace seen in Plate F4.10.

Location: Well outside of Project disturbance area – south of Pit 5

Plate F4.12
A Texture Contrast Soil with a Well Developed Biomantle and a Stone Layer.

The higher ground in the background is the intersection of an alluvial terrace and the steep debris slope with fallen boulders.

Location: In Project disturbance area - southern Pit 5

Plate F4.13
A Large Waterhole on Cumbo Creek Adjacent to Wilpinjong Road Looking Downstream

This waterhole would usually be a permanent water source. The higher ground above the west (left) bank is Permian bedrock (Barigan Creek soil landscape). The east bank is probably alluvium.

Location: Outside of Project open cut mining area – south of Pit 4.

Plate F4.14
Northern bank of Wilpinjong Creek near Cumbo Homestead

The background is a steep debris slope and cliff of Lees Pinch soil landscape. The bedded alluvium on the valley floor is in a low terrace and includes at least two buried soil profiles as shown in Plate F4.15.

Location: North of the Project disturbance area - on the southern boundary of ECA B.

Plate F4.15
Buried Soil Profiles Evident in the Wilpinjong Creek Bank Shown in Plate F4.14

Plate F7.1
Surveyor's Reference Tree, WCP131

The scar on this tree was made in 1881 by a licensed surveyor, James Granter, to mark the SW corner of portion 124, Parish of Cumbo.

Plate F7.2
A Possible Aboriginal Scarred Tree, WCP114, now Fallen and Dead

This scar displays a line of 'criss-crossed' axe marks across its upper end, a feature which may suggest a European origin.

Plate F7.3
Detail of 'Criss-crossed' Axe Marks on WCP114

Plate F7.4
An Example of a Possible Aboriginal Scarred Tree, WCP95

With paired rows of axe marks across the base and top of the scar.

Plate F7.5
Detail of Double Row of Axe Marks along Base of Scar on WCP95

Plate F7.6
Example of a Probable Aboriginal Scarred Tree, WCP64

Plate F7.7
An Example of a Rock Tor Complex Situated on Basal Slopes Adjacent to the Valley Floor

Plate F7.8
An Example of a Rock Shelter with Deposit Formed within an Isolated Tor (WCP141)

Plate F7.9
General View of WCP153, Rock Shelter with Stencilled Rock Art

The form of this rock shelter is typical of sites on the upper and mid slopes of the debris slope extending down from the major escarpment.

Plate F7.10
Detail of the Three Hand Stencils on the Back Wall of Site WCP153

Note the two child-sized hands on right hand side.

Plate F7.11
General View of WCP152, Rock Shelter with Art Motifs

Note the level sediment floor classed as a potential archaeological deposit.

Plate F7.12
Detail of 'Trident' Motifs from WCP 152

Plate F7.13
Detail of a Trident Shaped Motif from WCP152

With two paired central longitudinal elements.

Plate F7.14
General View of a Large Rock Shelter with Rock Art and Archaeological Deposit, WCP72

This is one of the few escarpment rock shelters with evidence of Aboriginal occupation from the local area.

Plate F7.15
View of Internal Surfaces of Rock Shelter with Rock Art WCP72

Note thick layer of animal dung on floor which acts as a source of dust which then settles on the rock surfaces.

Plate F7.16
Typical Example of a Back Wall Art Panel at Site WCP72

Note clear hand stencil in upper margin, and opaque layers of dust obscuring stencils on lower surfaces.

Plate F7.17
Some of the Largest Open Artefact Scatters within the Project Area are Situated on the Northern and Southern Banks of Wilpinjong Creek

WCP174 on the left, and WCP 134 on the right.

Plate F7.18
Examples of Artefacts from a Large Artefact Scatter, WCP227

Stone types are dominated by Quartz and Tuff.

Plate F7.19
Example of a Ground Edge Stone Hatchet (or 'axe') Made from a Fine Grained Volcanic Rock (WCP139).

Plate F7.20
Example of a Microblade Core Made from Tuff (WCP87)

Plate F7.21
Example of a Bottom Grindstone Located in a Rock Shelter with Archaeological Deposit, WCP47.

ATTACHMENT F1

RECORDS OF ABORIGINAL FIELD SURVEY PARTICIPATION AUGUST 2004

Record of Aboriginal Representative Participation*

Project Name: **Wilpinjong Coal Project EIS** (Aboriginal Heritage Assessment)

Aboriginal Organisation **Warrabinga Native Title Claimants Aboriginal Corporation**

Client Name & Address *Make all invoices out to:* Wilpinjong Coal Pty Ltd, PO Box H287 Australia Square, Sydney NSW 1215

But send them via: Josh Hunt, Resource Strategies, PO Box 1842, Milton QLD 4064 ph 07 3871 3144

Archaeologist(s): name & address Kelvin Officer Navin Officer Heritage Consultants, Unit 4, 71 Leichhardt St Kingston ACT 2604 ph 02 6282 9415

Name of Representative	Date	Type of Participation	Start time	Finish time
Lance Syme	10/8/04	Induction & survey	8:30	5:30
Wendy Lewis	10/8/04	Induction & survey	8:30	5:30
Lance Syme	11/8/04	survey	8:30	5:40
Wendy Lewis	11/8/04	survey	8:30	5:40
Lance Syme	12/8/04	survey	8:30	6:00
Wendy Lewis	12/8/04	survey	8:30	6:00
Lance Syme	13/8/04	survey	8:30	5:15
Wendy Lewis	13/8/04	survey	8:30	5:15
Lance Syme	14/8/04	survey	8:30	5:40
Wendy Lewis	14/8/04	survey	8:30	5:40
Lance Syme	15/8/04	survey	7:30	1:10

Issues raised T.B.A

Signed *(archaeologist)*: ..... *(Aboriginal representative)*: ..... Date 23/8/2004

..... *(Aboriginal representative)*: ..... Date .....

..... *(Aboriginal representative)*: ..... Date .....

< TOC Home >

Record of Aboriginal Representative Participation*

Project Name **Wilpinjong Coal Project EIS** (Aboriginal Heritage Assessment)

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Name of Representative	Date	Type of Participation	Start time	Finish time
Wendy Lewis	15/8/04	survey	7:30	1:10
Lance Syme	19/8/04	survey	8:30	5:30
Wendy Lewis	19/8/04	survey	8:30	5:30
Lance Syme	20/8/04	survey	8:30	5:00
Wendy Lewis	20/8/04	survey	8:30	5:00
Lance Syme	21/8/04	survey	8:30	5:30
Martin DeLaney	21/8/04	survey	8:30	5:30
Lance Syme	22/8/04	survey	8:30	5:20
Martin DeLaney	22/8/04	survey	8:30	5:20
Lance Syme	23/8/04	survey	8:30	5:30
Martin DeLaney	23/8/04	survey	8:30	5:30

Issues raised T.B.A.

Signed *(archaeologist)* Kelvin Officer *(Aboriginal representative)*: Date 23/8/04

(Aboriginal representative): Date

(Aboriginal representative): Date

Record of Aboriginal Representative Participation*

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Archaeologist(s): name & address Kelvin Officer Navin Officer Heritage Consultants, Unit 4, 71 Leichhardt St Kingston ACT 2604 ph 02 6282 9415

Name of Representative	Date	Type of Participation	Start time	Finish time
Lance Syme	24/8/04	survey	8:30	5:40
Martin DeLauney	24/8/04	survey	8:30	5:40
Lance Syme	25/8/04	survey	8:30	3:30
Martin DeLauney	25/8/04	survey	8:30	3:30

Issues raised: T.B.A.

Signed *(archaeologist)*: Kelvin Officer *(Aboriginal representative)*: Date 25/8/04

(Aboriginal representative): Date

(Aboriginal representative): Date

Record of Aboriginal Representative Participation*

Project Name: **Wilpinjong Coal Project EIS** (Aboriginal Heritage Assessment)

Aboriginal Organisation: **Murong Gialinga Aboriginal and Torres Strait Islander Corporation**

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Archaeologist(s): name & address: Kelvin Officer Navin Officer Heritage Consultants, Unit 4, 71 Leichhardt St Kingston ACT 2604 ph 02 6282 9415

Name of Representative	Date	Type of Participation	Start time	Finish time
Eli Kennedy	10/8/04	Induction & survey	8:30 am	5:30 pm
Rosie Pye (volunteering)	10/8/04	Induction & survey	8:30 am	5:30
Rosie Pye	11/8/04	survey	8:30	5:40
Eli Kennedy	11/8/04	survey	8:30	5:40
Lavinia Flick	12/8/04	survey	8:30	6:00
Eli Kennedy	12/8/04	survey	8:30	6:00
Larry Flick	13/8/04	survey	8:30	5:15
Eli Kennedy	13/8/04	survey	8:30	5:15
Rosie Pye	14/8/04	survey	8:45	5:45
Eli Kennedy	14/8/04	survey	8:45	5:45
Rosie Pye	15/8/04	survey	7:30	2:00

Issues raised: To be advised.

Signed *(archaeologist)*: Kelvin Officer *(Aboriginal representative)*: D Hayward Date 25/8/04

(Aboriginal representative): Date

(Aboriginal representative): Date

Record of Aboriginal Representative Participation*

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Lavinia Flick	19/8/04	survey	8:30	5:30
Eli Kennedy	19/8/04	survey	8:30	5:30
Nathan Flick	20/8/04	survey	8:30	5:00
Eli Kennedy	20/8/04	survey	8:30	5:00
Rosie Pye	21/8/04	survey	8:30	5:30
Eli Kennedy	21/8/04	survey	8:30	12:45
Rosie Pye	22/8/04	survey	8:30	5:20
Nathan Flick	23/8/04	survey	8:30	5:30
Rosie Pye	23/8/04	survey	8:30	5:30
Rosie Pye	24/8/04	survey	8:30	5:40

Issues raised To be advised

Signed *(archaeologist)* ..... *(Aboriginal representative)*: D L Maynard Date 25/8/04

..... *(Aboriginal representative)*: ..... Date .....

..... *(Aboriginal representative)*: ..... Date .....

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Client Name & Address *Make all invoices out to:* Wilpinjong Coal Pty Ltd, PO Box H287 Australia Square, Sydney NSW 1215

But send them via: Josh Hunt, Resource Strategies, PO Box 1842, Milton QLD 4064 ph 07 3871 3144

Archaeologist(s): name & address Kelvin Officer Navin Officer Heritage Consultants, Unit 4, 71 Leichhardt St Kingston ACT 2604 ph 02 6282 9415

Name of Representative	Date	Type of Participation	Start time	Finish time
Rosie Pye	25/8/04	survey	8:30	4:00

Issues raised To be advised

Signed *(archaeologist)*: Kelvin Officer *(Aboriginal representative)*: D J Maynard Date 25/8/04

(Aboriginal representative): Date

(Aboriginal representative): Date

Record of Aboriginal Representative Participation*

Project Name: **Wilpinjong Coal Project EIS** (Aboriginal Heritage Assessment)

Aboriginal Organisation **Mudgee Local Aboriginal Land Council**

Client Name & Address *Make all invoices out to:* Wilpinjong Coal Pty Ltd, PO Box H287 Australia Square, Sydney NSW 1215

But send them via: Josh Hunt, Resource Strategies, PO Box 1842, Milton QLD 4064 ph 07 3871 3144

Archaeologist(s): name & address Kelvin Officer Navin Officer Heritage Consultants, Unit 4, 71 Leichhardt St Kingston ACT 2604 ph 02 6282 9415

Name of Representative	Date	Type of Participation	Start time	Finish time
Lavinia Flick	10/8/04	Induction & survey	8:30 am	5:30 pm
Larry Flick	10/8/04	Induction & survey	8:30	5:30
Nathan Flick	10/8/04	Induction	8:30	11:00?
Christine Maynard	10/8/04	Induction & survey.	8:30	12:35
David Maynard	10/8/04	Induction & survey	8:30	5:30
David Maynard	11/8/04	Survey	8:30	5:40
Nathan Flick	11/8/04	Survey	8:30	5:40
Larry Flick	12/8/04	survey	8:30	6:00
David Maynard	12/8/04	survey	8:30	6:00
Rosie Pye	13/8/04	survey	8:30	5:15
Christine Maynard	13/8/04	survey	8:30	5:15
David Maynard	13/8/04	survey (volunteering)	1:00pm	5:15

Issues raised To be advised

Signed *(archaeologist)* Kelvin Officer *(Aboriginal representative)*: D J Maynard Date 25/8/04

(Aboriginal representative): Date

(Aboriginal representative): Date

Record of Aboriginal Representative Participation*

Project Name: **Wilpinjong Coal Project EIS** (Aboriginal Heritage Assessment)

Aboriginal Organisation: **Mudgee Local Aboriginal Land Council**

Client Name & Address: *Make all invoices out to:* Wilpinjong Coal Pty Ltd, PO Box H267 Australia Square, Sydney NSW 1215

But send them via: Josh Hunt, Resource Strategies, PO Box 1842, Milton QLD 4064 ph 07 3871 3144

Archaeologist(s): name & address: Kelvin Officer Navin Officer Heritage Consultants, Unit 4, 71 Leichhardt St Kingston ACT 2604 ph 02 6282 9415

Name of Representative	Date	Type of Participation	Start time	Finish time
Lavinia Flick	14/8/04	survey	8:45 am	5:45 pm
David Maynard	14/8/04	survey	8:45	5:45
Nathan Flick	15/8/04	survey	7:30	2:00
David Maynard	15/8/04	survey	7:30	2:00
Nathan Flick	19/8/04	survey	8:30	5:30
David Maynard	19/8/04	survey	8:30	5:30
Rosie Pye	20/8/04	survey	8:30	5:00
David Maynard	20/8/04	survey	8:30	5:00
Nathan Flick	21/8/04	survey	8:30	12:45
David Maynard	21/8/04	survey	8:30	5:30
Nathan Flick	22/8/04	survey	8:30	5:20

Issues raised: To be advised

Signed *(archaeologist)*: Kelvin Officer *(Aboriginal representative)*: D Maynard Date 25/8/04

(Aboriginal representative): Date

(Aboriginal representative): Date

Record of Aboriginal Representative Participation*

Project Name: **Wilpinjong Coal Project EIS** (Aboriginal Heritage Assessment)

Aboriginal Organisation **Mudgee Local Aboriginal Land Council**

Client Name & Address *Make all invoices out to:* Wilpinjong Coal Pty Ltd, PO Box H287 Australia Square, Sydney NSW 1215

But send them via: Josh Hunt, Resource Strategies, PO Box 1842, Milton QLD 4064 ph 07 3871 3144

Archaeologist(s): name & address Kelvin Officer Navin Officer Heritage Consultants, Unit 4, 71 Leichhardt St Kingston ACT 2604 ph 02 6282 9415

Name of Representative	Date	Type of Participation	Start time	Finish time
David Maynard	22/8/04	survey	8:30	5:20
David Maynard	23/8/04	survey	8:30	5:30
David Maynard	24/8/04	survey	8:30	5:40
David Maynard.	25/8/04	survey.	8:30	4:00

Issues raised To be advised.

Signed *(archaeologist)* Kelvin Officer *(Aboriginal representative)*: D Maynard Date 25/8/04

(Aboriginal representative): Date

(Aboriginal representative): Date

ATTACHMENT F2

DESCRIPTIONS OF ABORIGINAL SITE TYPES

Aboriginal Scarred Tree

An Aboriginal scarred tree is a tree, or its remains, which contains a scar indicating the removal of bark (and sometimes wood) in the past by Aborigines. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed as a consequence of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting or bark removal.

Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any particular example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal in origin can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginals for both their own purposes and for roofing on early European houses. Consequently the distinction between European and Aboriginal scarred trees may not be clear.

Background Scatter

Is a term used generally by archaeologists to refer to artefacts which cannot be usefully related to a place or focus of past activity (except for the net accumulation of single artefact losses).

There is however no single concept for background discard or 'scatter', and therefore no agreed definition. The definitions in current use are based on the postulated nature of prehistoric activity, and often they are phrased in general terms and do not include quantitative criteria. Commonly agreed is that background discard occurs in the absence of 'focused' activity involving the production or discard of stone artefacts in a particular location. An example of unfocussed activity is occasional isolated discard of artefacts during travel along a route or pathway. Examples of 'focussed activity' are camping, knapping and heat -treating stone, cooking in a hearth, and processing food with stone tools. In practical terms, over a period of thousands of years an accumulation of 'unfocussed' discard may result in an archaeological concentration that may be identified as a 'site'. Definitions of background discard comprising only qualitative criteria do not specify the numbers (numerical flux) or 'density' of artefacts required to discriminate site areas from background discard.

Bora Ground

A Bora ground functioned as a prepared stage for initiation and other ceremonial activities which held a key role in the teaching and maintenance of the complex religious and social framework within southeast Australian Aboriginal society. Bora grounds consist mostly of one or more circular rings defined by mounded earth, sand and/or rocks. There may also be an associated depression within the ring. A pathway generally connected two rings and was often many hundreds of metres long. Typically one ring was associated with more public ceremonies and the second with restricted and sacred information. Carved trees and incised or mounded ground sculptures were a feature of the ground. All of the features of a Bora ground were transient and fragile and few have survived the impact of time, vegetation clearance and agricultural practice. Bora grounds are consequently a rare site type and may be known only from remnant traces of the rings, or simply from written or oral records. Bora grounds are most often located on river flats and low ridges.

Burials

Burials are generally found in soft sediments such as aeolian sand, alluvial silts and rock shelter deposits. In valley floor and plains contexts, burials often occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of subsurface sediments or where some erosional process has exposed them. Burial sites which have been reported from the Mudgee region consist of stone cairns and mounds (pers. com. David Maynard Jan. 2005)

Carved trees

Carved trees consist of some form of Aboriginal design carved onto the surface of a tree. Designs were carved either directly into the bark or onto the exposed cambian layer following bark removal. The latter technique was more durable and lasted longer than the former. Carved trees were frequently created at ceremonial or burial grounds and characteristically include figurative and non-figurative motifs. Carved trees are a rare site type and few survive *in situ* on standing trees in NSW.

'Contact' Sites

‘Contact Sites’ are sites which contain evidence of Aboriginal occupation during the period of early European occupation in a local area. The term 'contact' refers to the often poorly documented period when traditional Aboriginal society made initial social and economic contact with European society. This period is often characterised by increasingly rapid changes in Aboriginal social, economic and occupational patterns in response to European incursion. Evidence of this period of 'contact' could potentially be Aboriginal flaked glass, burials with historic grave goods or markers, and debris from 'fringe camps' where Aborigines who were employed by, or who traded with, the White community may have lived or camped. The most likely location for contact period Aboriginal occupation sites would be camp sites adjacent to permanent water, and located away from the focus of European town occupation or private landuse.

Fresh Water Middens

Fresh water middens are defined as a concentration of artefactual debris that includes a significant percentage of freshwater shell. They may be the result of an individual's meal or larger interim or base camp activity and are normally situated within riparian zones characterised by relatively permanent water. They may occur in open contexts or in rock shelters. Within the Sydney Basin fresh water middens are rare, but are most likely to occur adjacent to the large permanent rivers.

Grinding grooves

Grinding grooves are the by-product of the manufacture of ground edge tools. These were generally made of stone, however bone and shell were also ground to fine points. Most grinding groove sites in the Sydney Basin are the result of grinding to create or maintain the bevelled edge on stone hatchets. The location of sites with grinding grooves was dependent on the presence of a suitable rock type, usually a fine-grained homogeneous sandstone, and an accessible, but not necessarily permanent, water source. Grinding groove sites may consist of a single isolated groove, or a large number commonly arranged in groups. They commonly occur as an open site but may also occur on rock surfaces within rock shelters. In the latter case they generally form one of several features of a rock shelter with evidence of occupation.

Isolated find

An isolated find is defined as a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a radius of 60 metres. Isolated finds may be indicative of: random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or sub-surface artefact scatter.

Except in the case of the latter, isolated finds are considered to be constituent components of the *background scatter* present within any particular landform.

Open Artefact Scatter

Open artefact scatters are defined as two or more artefacts, not located within a rock shelter, and located no more than 60 metres away from any other constituent artefact. This site type may occur almost anywhere that Aborigines have travelled and may be associated with hunting and gathering activities, short or long term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools, but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations that relate to activity areas.

	Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of ‘background scatter’ rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'. Artefact scatters commonly occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands.
Potential Archaeological Deposit,	A potential archaeological deposit or PAD, is defined as any location where the potential for subsurface archaeological material is considered to be moderate or high, relative to the surrounding study area landscape. Archaeological potential is assessed using criteria developed from the results of previous surveys and excavations relevant to the region. Potential deposits are, usually associated with actively aggrading landform features or rock shelter deposits and are identified by their context within, or association with, a landscape feature that was likely to have been exploited in prehistory.
Quarry Sites and Procurement Sites	Quarry sites (also known as procurement sites) typically consist of exposures of a geological raw material where evidence for human collection, extraction and/or preliminary processing has survived. Typically these involve the extraction of siliceous or fine grained igneous and meta-sedimentary rock types for the manufacture of artefacts, or the removal of ochre. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations and ochre sources.
Rock Engravings	Rock engravings are any Aboriginal mark produced in rock using an extractive technique which is not the result of food or other material processing. Rock engravings commonly occur on flat rock faces in either exposed locations or less commonly, within rock shelters. Domestic processes which create marks that could be confused with engravings include tool sharpening and food grinding or preparation. `Engraving' in this terminology is used in a general sense and can refer to direct and indirect percussion, and varying types of abrasion. The location and preservation of engraving sites is dependent on local rock types and their weathering characteristics.
Stone Arrangements	Stone arrangements are defined as any arrangement of placed rocks that can be reasonably assigned to Aboriginal activity. Typically these include rock cairns and alignments of single or grouped stones. This site type is often located on high ridges and spurs but are difficult to predict and often limited in distribution. A European origin must first be discounted before identifying an Aboriginal site.

Rock Shelter Sites

Rock shelter sites consist of any form of rock overhang which contains one or more Aboriginal artefacts either on its floor, within its deposit, or executed on its rock surfaces. Common archaeological features of rock shelter sites are: surface artefacts, occupation deposit such as stone artefacts, bone, shell and charcoal, rock art in the form of drawings, paintings or engravings, potential archaeological deposit, and grinding features such as grooves or slightly concave worked areas. Rock shelter sites in the Upper Hunter Valley may occur wherever suitable sandstone outcrops occur, commonly at the base of escarpments or dislodged tors.

ATTACHMENT F3

FORMAL RESPONSES FROM ABORIGINAL STAKEHOLDER GROUPS

WARRABINGA

NATIVE TITLE CLAIMANTS ABORIGINAL CORPORATION

525 PHEASANTS NEST ROAD
PHEASANTS NEST NSW 2574
MOBILE: 0409 966 163 OR 0409 966 371
FAX: 02 4677 0454

Peter Doyle
Project Manager
Wilpinjong Coal Pty Ltd
Levewl9, 1 York Street
Sydney, NSW 2000

Wednesday, 9 February 2005

RE: WILPINJONG COAL PROJECT

Mr Doyle,

Thankyou for providing Warrabinga Native Title Claimants Aboriginal Corporation (WNTCAC) with the opportunity to participate in the Indigenous Cultural heritage Assessment for the Wilpinjong Coal Project and for allowing WBNTCAC to comment on the outcomes of this assessment.

Wilpinjong Coal was maintained open and honest communication with WNTCAC since the projects early stages. Our organisation was represented during the three periods of archaeological field survey completed for the project to date, and the views expressed by our representatives were continually taken onboard and incorporated into the methodology.

WNTCAC is satisfied that appropriate levels of survey coverage have been achieved from the field surveys currently undertaken, especially when consideration is given to the preliminary stage the development is currently at in the approval process.

On 15 January 2005, members of the elders committee and youth members of WNTCAC attended a meeting at Wilpinjong and given the opportunity to discuss the findings of the field survey and its progress to date and to identify appropriate management strategies for particular sites. Individually the Aboriginal sites present within the project area have minimal significance, however when considered as an inter-related complex of sites there significance is increased. Careful management and research in association with selective impact will both allow the development to proceed as well as maintain and in some cases enhance this level of significance.

WNTCAC appreciates the need for development to occur and that in some instances S87 and S90 Heritage Impact Permits are required. WNTCAC will consider all S87 and S90 application on a case by case basis and will endorse those permits it deems appropriate.

Whilst it is important to accurately record the location of Indigenous heritage sites and provide this data to DEC for inclusion in AHIMS, WNTCAC would like references to the locations of particular sites, including maps removed from all publicly available documents pertaining to the indigenous cultural heritage of the Wilpinjong Coal Project.

WARRABINGA

NATIVE TITLE CLAIMANTS ABORIGINAL CORPORATION

525 PHEASANTS NEST ROAD
PHEASANTS NEST NSW 2574
MOBILE: 0409 966 163 OR 0409 966 371
FAX: 02 4677 0454

WNTCAC looks forward to being involved in the Wilpinjong Coal Project in an ongoing capacity with regard to all elements of Aboriginal cultural heritage, including participation in the developement of an Aboriginal Cultural Heritage Management Plan (ACHMP) for the project and implementation and completion of works outlined in the ACHMP.

WNTCAC would like to begin working towards a formal native title agreement with Wilpinjong Coal similar to those already in place with Ulan Mine and Invincible Colliery.

Wilpinjong Coals commitment to the conservation and protection of Indigenous cultural heritage sites is also shown by their willingness to establish a number of heritage offset areas within the project. Strategies for the management and utilisation of these areas in a cultural sensitive manner will be detailed in the ACHMP.

Yours sincerely,

Lance Syme
Warrabinga Native Title Claimants Aboriginal Corporation

WARRABINGA

Native Title Claimants Aboriginal Corporation
525 Pheasants Nest Road
Pheasants Nest NSW 2574
MOBILE: 0409 966 163 or 0409 966 371
FAX: 02 4677 0454

Kelvin Officer
Navin Officer Heritage Consultants
102 Jervis Street
Deakin ACT 2600

Monday, 25 October 2004

RE: Preliminary Survey Wilpinjong Coal Project

Dear Kelvin,

Firstly thanking t for invitation members of the Warrabinga Native Title Claimants Aboriginal Corporation to participate in the field survey for the Wilpinjong Coal Project EIS.

The results of the first series of field assessments conducted throughout August 2004 have been discussed amongst those members of our organization with the necessary knowledge and/or skills to understand the project and the intended impacts.

At this preliminary stage of the project we recognise the need to provide broad recommendations for management and any future mitigative works to be conducted. Warrabinga has a responsibility to protect all episodes Aboriginal heritage within the boundaries of the clans, which form our group.

Recommendations:

- Most sites identified within the preliminary field survey can be definitively defined as Aboriginal sites. However, a small number were identified where there remains some uncertainty about their nature. Further investigation will be required to clarify the nature of these sites.
- Conduct preliminary field investigations over the remainder of the project area. There is a responsibility to survey all areas over the Wilpinjong Coal have control over, otherwise the perception that surveys are only required within impact areas evolves. Appropriate management of the cultural heritage resource within the non-impact areas of the project is essential.
- All extraction zones are to have further more intensive field surveys conducted prior to the commencement of any extraction of coal or clearing of topsoil. Aboriginal heritage sites may still be present within the landscape and remain unidentified at this stage.
- Wilpinjong Coal may wish to consider commissioning a local history study of the Wilpinjong/Wollar area. Some local residents may have family stories

WARRABINGA

Native Title Claimants Aboriginal Corporation
525 Pheasants Nest Road
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relating to Aboriginal activities carried out in the area since contact. These stories may clarify the nature of some of the Aboriginal sites identified. Warrabinga would like to be involved in any such project, should it eventuate.

- No photos of Aboriginal sites are to be reproduced without the permission of our organization. The locations of Aboriginal sites remain confidential and should not become general knowledge.
- Visitation to Aboriginal sites within the study area should be restricted to essential purposes only. Visitation should only occur in the company of a member of our organization.
- Monitoring programs should be commenced on Aboriginal art sites on the periphery of the exaction zones. The process of extracting the coal may lead to damage to the structure of the site.

Warrabinga Native Title Claimants Aboriginal Corporation would also like to clarify the need for Marongalinga Aboriginal Corporation to be involved in any on going consultation. MAC does not have any legislative support for its involvement. MAC is not a Land Council, Tribal Council, Elders Corporation, Custodian Group or Native Title Group. The membership of MAC that are descendants of Aboriginal people are entitled to membership of the Mudgee Local Aboriginal Land Council and therefore have an avenue for comment available to them. Organisations similar to MAC in other areas of the state i.e. Aboriginal organisations responsible for community and social services do not get involved in cultural heritage management.

Again thankyou for involving Warrabinga Native Title Claimants Aboriginal Corporation in the preliminary field survey for the Wilpinjong Coal Project. We look forward to working with you further as the project progresses.

Regards,

Lance Syme

Mudgee Local Aboriginal Land Council

C/O PO Box 1050
Mudgee NSW 2850
Ph: 02 63723511 Fax: 63720332

Peter Doyle
Wilpinjong Coal Pty Limited
Level 9, 1 York Street
Sydney NSW 2000

28/02/05

RE: WILPINJONG COAL PROJECT - ABORIGINAL CULTURAL HERITAGE ASSESSMENT.

Dear Peter,

Meetings with representatives of Wilpinjong Coal Pty Limited (WCPL) were conducted at the Mudgee Local Aboriginal Land Council (MLALC) office on the 9th and 28th of February 2005 to discuss the Aboriginal Cultural Heritage Assessment.

Unfortunately sufficient members were not present to pass a formal motion with respect to the Aboriginal Cultural Heritage Assessment conducted for the Wilpinjong Coal Project on the 28th February 2005. However, the issue was discussed and the general consensus of those present was as follows:

- The MLALC is satisfied with the approach taken by WCPL in the assessment of Aboriginal Heritage at the Wilpinjong Coal Project site, including the level of consultation and survey methodologies.
- The MLALC is satisfied with the Aboriginal Heritage management measures proposed by WCPL and the development of the Aboriginal Cultural Heritage Management Plan.
- The MLALC supports the development of the three Enhancement and Conservation Areas proposed by WCPL, and is satisfied with them.
- The MLALC would like to work closely with the WCPL in the development of the Aboriginal Cultural Heritage Management Plan and in the management of Aboriginal Cultural Heritage at the project site.
- MLALC would like further investigation into the creation of Aboriginal Employment Initiatives such as Apprenticeships / Traineeships at WCPL.

Please do not hesitate to contact me if you have any further queries.

Yours Sincerely

Larry Flick
Chairperson

Mudgee Local Aboriginal Land Council

PO Box 1098
Mudgee NSW 2850
Ph: 02 63722624

Resource Strategies Pty Ltd
Josh Hunt
PO Box 1842
Milton QLD 4064

Dear Josh,

In response to your fax dated 15/02/05 please be advised of the following.

1. The letter from Mudgee LALC on the 7/12/04 was not formally ratified and does not accurately reflect the views of Mudgee LALC.

2. The Mudgee LALC is generally satisfied with the consultation and assessment to date and will be discussing the project in more detail on the 28/2/05. We will forward a formal letter after this meeting to inform you of the decisions of Mudgee LALC re the project.

Please do not hesitate to contact me if you have any further queries on 02 63723511.

Yours Sincerely

Larry Flick
Chairperson

ABORIGINAL LAND COUNCIL

P.O.Box 1089
MUDGEE NSW 2850
PH. 0263723511 FAX. 0263723522

Date 7.12.2004

Wilpinjong Coal Pty Lt
P.O.Box H287
Australia Square
SYDNEY NSW 1215

RE: Wilpinjong Coal Pty Ltd (Wollar)

To whom it may concern,

Mudgee Local Aboriginal Land Council being the peak body, Muronga Gailinga Aboriginal and Torres Strait Islander Corporation and Traditional Elders of the Mudgee area including the Wiradjuri Council of Elders are greatly concerned with the establishment of proposed mining operations at Wilpinjong Wollar where many of our places will undoubtedly be impacted on. Meetings have been conducted and the community support this letter to be forwarded.

The following issues have been discussed and documented and are the wishes of the Local Aboriginal People that we work together for the protection of Aboriginal Cultural Heritage Places where ever possible and for the future workings of the mining operations We are aware that mining operations will go ahead and we look to working with Wilpinjong Coal Mines Ltd so together we may be able to resolve certain issues which are paramount to the Local Aboriginal Community.

Our Heritage is of great importance to us as Aboriginal people and we need to make it a priority to preserve our culture along every avenue as a principle issue.

The Mudgee Local Aboriginal Land Council with supporting Aboriginal communities support development but the protection of our Heritage is most vital to keep our living culture alive for future generations.

The Following Issues of Concern

We are in receipt of letter and Summary of Aboriginal Cultural Heritage Site recordings identified during the resent survey conducted at Wilpinjong forwarded from Kelvin Officer Archaeologist for Wilpinjong Coal Pty Ltd dated the 10th of September 2004.

(1) Mudgee Local Aboriginal Land Council with supporting Aboriginal groups is of the opinion that the survey strategy coverage conducted by Wilpinjong Coal Pty Ltd by commissioned archaeologist was inadequate to fully appreciate the Aboriginal Heritage in the project area. There needs to be a complete comprehensive survey conducted over the whole of the lease area not just on selected areas.

With this in mind all escarpments within the lease area must be fully investigated to complement the Wilpinjong valley. We are not content with the survey coverage in the terms of transects that was conducted over the valley floor area. Conservation areas must be established in significant areas that are important to the local Aboriginal people incorporated with adequate buffer zones so that indirect impact will not occur to fragile sandstone shelters that may contain Art work, Archaeological deposits or ceremonial grounds.

(2) We appreciate the assistance offered in identifying Aboriginal Cultural Significance of identified places but feel that these issues are of Wiradjuri Aboriginal concern and any Archaeological points of view should not be brought into Wiradjuri Cultural or Spiritual values. We value the Archaeological significance inherent in the process but this should not be confuse with Aboriginal significance. It is important to remember that Archaeologist significance and Aboriginal significance will not always be the same.

(3) We acknowledge the help offered as stated in Mr Officer's summary letter but feel that the local Aboriginal groups will submit combined management plans etc. after appropriate works have been conducted in the area and that we are able to peruse the draft report from the Archaeologist to comment on where our recommendations will be forthwith.

Other Items of Concern

1. Water conservation issues need local aboriginal involvement.

2. It is recommended that work is not to recommence until concerns are resolved.

3. That opportunity be given to the local Aboriginal community to obtain restored land at the end of the life of the mining operations.

4. The possibility of setting up a foundation for the local Aboriginal communities.

5. The opportunity in working together during the life of the mining operations that a Cultural Heritage Management plan be established and set in place so that ongoing issues can be addressed concerning Aboriginal Heritage and the mining operations with quarterly meetings to address ongoing issues and involvement with all interested groups during each stage of the development.

6. That local Aboriginal Elders be fully involved.

7. Opportunity for field visits with Elders and those in the community.

8. Department of Environment & Conservation and Department of Aboriginal Affairs may be asked to advise us as necessary.

9. That all test excavations are a part of all Archaeological outcomes.

We request a meeting to discuss these issue at your earliest convenience.

Thanking You

Karen Coffee
Coordinator

ATTACHMENT F4

EXAMPLES OF FIELD DATA RECORDING FORMS

ABORIGINAL SITE FIELD DATA RECORDING FORM WILPINJONG COAL

Site Name Field code:……..Project code:.....
Recorder .....
Date .....
Photos film no. …… photo nos. .....

Map Grid Reference: circle grid type
☐ from map ..... AGD / GDA
☐ hand held GPS ..... AGD / GDA
☐ differential GPS ..... AGD / GDA

Site Type: *with:*

☐ isolated find	☐ *surface artefacts*
☐ open artefact scatter	☐ *arch'l deposit*
☐ rock shelter	☐ *potential arch'l dep.*
☐ rock art	☐ *shell*
☐ quarry/procurement site	☐ *pigment art*
☐ grinding grooves	☐ *engraved art*
☐ midden	☐ *rock surface feature*
☐ burial	
☐ potential archaeological deposit	

Site Dimensions *(area over which artefacts found)*
length:..... width: ..... depth.....
Gradient: ☐ gen.flat ☐ low ☐ mod. ☐ high
Aspect: ☐ OPEN ☐N ☐NE ☐E ☐SE ☐S ☐SW ☐W ☐ NW

Site Exposure
exposure type:.....
soil/matrix type: .....
av.exp. incidence %. av.exp. visibility..... %
area over which exp(s) occur ……x ……
visibility away from site: exp.inc……% exp.vis……%

Large scale landscape context
☐ uppr valley ☐ mid valley ☐ basal slopes ☐ valley floor
☐ coastline ☐ lake shore

Small scale landform *(tick as many as appropriate)*

☐ major ridge	☐ crest	☐ escarpment
☐ spurline	☐ break-of-slope	☐ heavy rock outcropping
☐ valley floor	☐ uppr slopes	☐ discontinuous outcrops
☐ shoreline	☐ mid slopes	☐ isolated tor/outcrop
☐ headland	☐ basal slopes	☐ rock platform(s)
☐ indeterminate	☐	talus slope
☐ knoll	☐ terrace	☐ minor stream bed/margin
☐ shoulder	☐ dune	☐ major stream bed/margin
☐ saddle	☐ sand sheet	☐ lake/wetland bed/margin
☐ alluvial flats	☐ fan	☐ estuary margin

Bedrock *(if exposed)* .....

Existing Vegetation

	Canopy:	*Height:*	
☐ forest	☐ closed	☐ >30m	
☐ woodland	☐ open	☐ 10-30m	
☐ shrubland	☐ sparse	☐ 10-4m	
☐ grassland		☐ 4-2m	☐ <2m
☐ sedge/wetland			

SITE CONTENTS

Surface artefact numbers
no. actually counted: .....
estimated no.of surface artefacts:
☐ 1-5 ☐ 16-50 ☐ 101-500
☐ 6-15 ☐ 50-100 ☐ >500

Surface artefact density
est. average (a/m^2) .....
max. (a/m^2) .....

Other features
☐ shell: {*1. isolated/sparse*
☐ bone {*2. low density*
☐ charcoal {*3. mod density*
☐ hearth {*4. high density*
☐ evidence of Ab'l quarrying
☐ other.....
Desc:.....
.....
.....

Artefact material types
(complete if site has >10 artefacts)

	✓	*no.*	*%*
quartz	☐	.....	.....
quartzite	☐	.....	.....
silcrete	☐	.....	.....
chert	☐	.....	.....
chalcedony	☐	.....	.....
rhyolite	☐	.....	.....
volcanic	☐	.....	.....
tuff	☐	.....	.....
.....	☐	.....	.....

Artefact description (generalised recording)
(complete if site has >10 artefacts)

	✓	*no.*	*percentage*
flakes	☐	.....	.....
modified flakes	☐	.....	.....
cores	☐	.....	.....
lithic fragments	☐	.....	.....
secondary flaking	☐	.....	.....
use wear	☐	.....	.....
alluvial cortex	☐	.....	.....
microliths	☐	.....	.....
backed blades	☐	.....	.....
microblades	☐	.....	.....
eloueras	☐	.....	.....
hatchet head/frag't	☐	.....	.....
microblade cores	☐	.....	.....
bipolar flake/cores	☐	.....	.....
hammerstones	☐	.....	.....
anvil stones	☐	.....	.....
grinding stones	☐	.....	.....
hearth stones	☐	.....	.....
manuports	☐	.....	.....

Archaeological Potential to:

be larger than record'd area:	☐ low	☐ mod.	☐ high	☐ can't tell
contain (more) artefacts:	☐ low	☐ mod.	☐ high	☐ can't tell
have *in situ* subsurface mat'l	☐ low	☐ mod.	☐ high	☐ can't tell

Site Condition/impacts
General rating ☐ poor ☐ good. ☐ v.good ☐ excel. ☐ can't tell

visitor/landuse impacts:	☐ low	☐ mod.	☐ high	☐ can't tell
natural impacts:	☐ low	☐ mod.	☐ high	☐ can't tell

☐ cultiv'n/plough'g ☐ vegn clearnc ☐ erosion ☐ vehicle tracks
☐ mech'l earth mov't/exc ☐ animal distnc ☐ major constn ☐ fill
☐ service easements ☐ fencing ☐ dam constn ☐ rubbish
Other/Describe:.....
.....

Abraded or Pecked features
☐ grinding grooves: no. of grooves.....
no. of groups.....
groove length: max:..... min: .....
groove width: max: ..... max: .....
☐ channels: no. .....
☐ other: .....

(***over*** *for site sketch & individual artefact descriptions)*

Artefact Descriptions

Describe the first 10 artefacts & exceptional or representative examples

no.	rock type	max. length	max. width	max. thickness	artefact type	features/comments

SITE SKETCH PLAN

Include:
north arrow;
road alignment(s)
rough scale or measurements;
adjacent features such as fenceline, dams, roads, buildings;
compass bearings to mapped features.
for rock shelters include back wall, deposit edge, extent of overhang & dripline, locn of any art.

POTENTIAL ARCHAEOLOGICAL DEPOSIT RECORD SHEET

Site Name Field code:……..Project code:……
Recorder .....
Date .....
Photos film no. ……. photo nos. .....

Map Grid Reference: : circle grid type
☐ from map .....AGD / GDA
☐ hand GPS.....AGD / GDA
☐ differential GPS .....AGD / GDA

PAD measurements
length:..... width: .....
Gradient: ☐ gen.flat ☐ low ☐ mod. ☐ high
Aspect: ☐ OPEN ☐N ☐NE ☐E ☐SE ☐S ☐SW ☐W ☐ NW

Site description
Describe soil/deposit:.....
.....
Ground surface vis.: exp.inc:……%. exp.vis'y:…….%
***Arch'l potent'l**:*
☐ low-mod. ☐ moderate ☐ mod-high ☐ high

Large scale landscape context
☐ uppr valley ☐ mid valley ☐ basal slopes ☐ valley floor
☐ coastline ☐ lake shore **Small scale landform** *(tick as many as appropriate)*

☐ major ridge	☐ crest	☐ escarpment
☐ spurline	☐ break-of-slope	☐ heavy rock outcropping
☐ valley floor	☐ uppr slopes	☐ discontinuous outcrops
☐ shoreline	☐ mid slopes	☐ isolated tor/outcrop
☐ headland	☐ basal slopes	☐ rock platform(s)
☐ indeterminate		☐ talus slope
☐ knoll	☐ terrace	☐ minor stream bed/margin
☐ shoulder	☐ dune	☐ major stream bed/margin
☐ saddle	☐ sand sheet	☐ lake/wetland bed/margin
☐ alluvial flats	☐ fan	☐ estuary margin

Bedrock *(if exposed)* .....

Sketch Plan:

(include any features which will help in refinding PAD)

ABORIGINAL SCARRED TREE RECORDING FORM

Site Name Field code:……Project code:
Recorder

Map Grid Reference: : circle grid type
☐ from map.....AGD / GDA
☐ hand held GPS .....AGD / GDA
☐ differential GPS .....AGD / GDA

The Tree

species .....
est. height.....
girth (c1.2m above ground).....

Condition/health:
☐ excel. ☐ good ☐ poor ☐ v.poor ☐ dead

☐ missing crown ☐ major crown limbs missing
☐ stock damage ☐ die back ☐ insect attack
☐ natural scars ☐ hollow ☐ unstable

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

Large scale landscape context
☐ uppr slopes ☐ mid slopes ☐ basal slopes ☐ valley floor
☐ coastline ☐ lake shore

Small scale landform *(tick as many as appropriate)*

☐ major ridge	☐ crest	☐ escarpment
☐ spurline	☐ break-of-slope	☐ heavy rock outcropping
☐ valley floor	☐ uppr slopes	☐ discontinuous outcrops
☐ shoreline	☐ mid slopes	☐ isolated tor/outcrop
☐ headland	☐ basal slopes	☐ rock platform(s)
☐ indeterminate		☐ talus slope
☐ knoll	☐ terrace	☐ minor stream bed/margin
☐ shoulder	☐ dune	☐ major stream bed/margin
☐ saddle	☐ sand sheet	☐ lake/wetland bed/margin
☐ alluvial flats	☐ fan	☐ estuary margin

Bedrock *(if exposed)* .....

The Scar

scar faces:.....
length (excl. regrowth) .....
length (incl. regrowth) .....
width (excl. regrowth).....
width (include. regrowth).....
regrowth (max. width) .....
regrowth (max. depth).....
height above ground:
base of inside scar .....
base of regrowth .....

Features:
☐ axe/hatchet marks ☐ termite activity
☐ scar surface burnt ☐ core wood missing
☐ orig'l scar surface whole/partly missing
☐ large/small borer holes/tracks

Condition:
☐ excel. ☐ good ☐ poor ☐ v.poor

Existing Vegetation

	Canopy:	*Height:*	
☐ forest			
☐ woodland	☐ closed	☐ >30m	
☐ shrubland	☐ open	☐ 10-30m	
☐ grassland	☐ sparse	☐ 10-4m	
☐ sedge/wetland		☐ 4-2m	☐ <2m

Archaeological interpretation
Checklist:
☐ tree is endemic to area
☐ tree is at least 100 ys old
☐ scar & regrowth is old enough
☐ scar does not extend to ground
☐ scar sides are parallel if extends to ground
☐ scar edges are even and regular
☐ scar outline is uniform & roughly symmetrical
☐ other natural and human origins excluded

Conclusion about Aboriginal scar origin:
☐ possible ☐ probable ☐ most likely
☐ definite

Alternative interpretations:
.....
.....
.....
.....

Date
Photos film no. …… photo nos.

Sketch of scar and tree:
(include outline of scar and your interpretation of original scar extent)
(include site location sketch if necessary, use other side if no space)

ROCK ART SUPPLEMENTARY RECORD SHEET

Site Name/code.....
Recorder.....
Date .....

Nature of Site

☐ overhang formed from cavernous weather'g
☐ overhang result of rock movement
☐ open rock platform ☐ cliff (no overhang)

Condition of art/impacts

mostly: ☐ poor ☐ good ☐ v. good ☐ excel.

☐ faded ☐ fragmentry ☐ surface water wash
☐ large area exfoliation ☐ scalar exfoliation ☐ dust
☐ insect deposits ☐ mineralisation ☐ lichen/organics
☐ animal rubbing ☐ graffiti ☐ ordnance ☐ vehicle
☐ fire blackening Other:.....
.....

Art Distribution/density

Max. ☐ isolated/sparse ☐ low (1 graphic per 1-2m^2)
Density: ☐ mod (1-5 graphics per 1m^2)
☐ high (>5 graphics per 1m^2)
☐ indeterminate
Superimpositions: ☐ none seen ☐ rare ☐ frequent
☐ very frequent
Location: ☐ art mostly near largest sheltered space
☐ art all over shelter surfaces
☐ art mostly on out-of -the-way surfaces
☐ art both near largest space and in out-of-the-way surfaces

Photos .....

notes/sketches: (if necessary use space on other side)

The Shelter Surfaces

..... ***art located on:***
area (m^2) with art: ..... ☐ *back wall* ☐ *floor*
area suitable for art:..... ☐ *ceiling* ☐ *other overh'g*
% stable surface ..... ☐ *horiz'l* ☐ *slop'g* ☐ *vert'l*
% unstable .....

☐ sandstone ☐ conglom. Other:.....

☐ honeycomb weather'g ☐ exfoliation ☐ granular decay
☐ structural crack'g ☐ mineral skins ☐ active water pores

The art asemblage *(summary recording)*

estimate of total no. of graphics .....
estimate of no. of identifiable graphics.....
estimate of no. of indeterminate graphics .....

		✓	*no.*	*percentage*
technique:	drawn (pigmented)	☐	.....	.....
	painted (pigmented)	☐	.....	.....
	'engraved'	☐	.....	.....
	pigment and 'engraved'	☐	.....	.....
	.....other	☐	.....	.....
colour (all grahics):	black	☐	.....	.....
	red	☐	.....	.....
	white	☐	.....	.....
	yellow	☐	.....	.....
	more than 1 colour	☐	.....	.....
motif types:	bird	☐	.....	.....
	anthropomorph/human	☐	.....	.....
	lizard	☐	.....	.....
	other splayed quadruped	☐	.....	.....
	macropod	☐	.....	.....
	dog	☐	.....	.....
	echidna	☐	.....	.....
	other profile quadruped	☐	.....	.....
	eel	☐	.....	.....
	other fish	☐	.....	.....
	snake	☐	.....	.....
	other long thing (no limbs/fins)	☐	.....	.....
	shield	☐	.....	.....
	boomerang	☐	.....	.....
	.....other	☐	.....	.....
	.....other	☐	.....	.....
	.....other	☐	.....	.....
	indeterminate	☐	.....	.....
form:	mostly outline only	☐	.....	.....
	outline and linear type infill	☐	.....	.....
	mostly solid	☐	.....	.....
	linear and solid	☐	.....	.....
	linear outline and solid infill	☐	.....	.....
	.....other	☐	.....	.....
	.....other	☐	.....	.....
stencilled things:	total no.	☐	.....	.....
	red	☐	.....	.....
	white	☐	.....	.....
	yellow	☐	.....	.....
	black	☐	.....	.....
object type:	hands/fingers	☐	.....	.....
	feet	☐	.....	.....
	material culture	☐	.....	.....
	animal	☐	.....	.....
	.....other	☐	.....	.....
	.....other	☐	.....	.....

.....

ATTACHMENT F5

TABULATED SITE CONTEXT AND CONTENT DATA

Access to this Attachment is restricted to the Proponent, Aboriginal stakeholder groups, statutory authorities, and other parties with the consent of the Department of Environment and Conservation.

Not included in EIS.

ATTACHMENT F6

SITE RECORDING INVENTORY AND DETAILED LOCATION MAPS

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Not included in EIS.