Mt Arthur Coal

proposed

Mt Arthur
UNDERGROUND PROJECT



Volume 3

Appendix 7

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JANUARY 2008

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Mt Arthur
UNDERGROUND PROJECT

Appendix 7



Aboriginal Archaeological Assessment

Mt Arthur Coal

Mt Arthur Underground Project, Aboriginal Archaeological Assessment

December 2007



Umwelt
Environmental Consultants

Mt Arthur Underground Project, Aboriginal Archaeological Assessment

Prepared by

Umwelt (Australia) Pty Limited

on behalf of

Mt Arthur Coal

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Report No.	2051/R03/Final	Date:	December 2007

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Executive Summary

Mt Arthur Coal Pty Limited (Mt Arthur Coal), a wholly owned subsidiary of BHP Billiton Hunter Valley Energy Coal, operates the Mt Arthur Coal open cut coal mine south of Muswellbrook in the upper Hunter Valley of NSW (refer to **Figure 1.1**). Mt Arthur Coal has three existing operations and now propose to develop an underground coal mine in the Bayswater No. 3 mining lease (ML) and the adjacent Exploration Licence 5965 (EL) held since 1996. This project is known as the Mt Arthur Underground Project (the Underground Project). As part of the Environmental Assessment (EA) for the proposed Mt Arthur Underground Project, Umwelt (Australia) Pty Limited (Umwelt) was commissioned to prepare an Aboriginal Archaeological Assessment.

The comprehensive Aboriginal archaeological assessment was undertaken in consultation with relevant Aboriginal stakeholder groups for the area. The assessment and consultation was undertaken in accordance with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*, July 2005 and the Department of Environment and Climate Change's (DECC's) *Interim Community Consultation Requirements for Applicants* 2004. The purpose of this assessment was to gain an understanding of Aboriginal occupation patterns and site distribution in the areas proposed for impact by mine subsidence and infrastructure construction and also in adjacent areas that may have potential as Aboriginal Cultural Heritage Conservation Areas.

Consultation Process

Aboriginal community involvement is an essential component of the Aboriginal heritage process. Aboriginal stakeholders are the primary determinants of the significance of their heritage. Therefore, Aboriginal stakeholder consultation is integral to Aboriginal heritage assessment. The consultation and assessment process reflects the recognition of the importance of Aboriginal stakeholder groups in the assessment and management of their heritage. A total of 19 Aboriginal groups registered their interest throughout the life of the consultation program for the project. These groups included Upper Hunter Heritage Consultants (UHHC), Wanaruah Local Aboriginal Land Council (WLALC), Upper Hunter Wonnarua Council Inc (UHWC), Giwiirr Consultants (GC), Ungooroo Aboriginal Corporation (UAC), Wonnarua National Aboriginal Corporation (WNAC), Wattaka Wonnarua CC Service (WWCCS), Hunter Valley Aboriginal Corporation (HVAC), Yarrawalk (Y), Hunter Valley Cultural Consultants (HVCC), Aboriginal Native Title Consultants (ANTC), Valley Culture (VC), Wonnarua Elders Corporation (WEC), Wanaruah Custodians (WC), Wonnarua Culture Heritage (WCH), Lower Wonnarua Tribal Consultancy (LWTC), Muswellbrook Cultural Consultants (MCC), Mingga Consultants (MC) and Wonn11-Contracting Arthur Fletcher (WC-AF).

Over the consultation period the registered Aboriginal stakeholders were involved in all facets of the assessment including consultation on the development of the survey strategy and determination of a conservation offset strategy, participation in field survey, site identification and recording, provision of information regarding cultural heritage values and review and comment on the draft report. The proposed methodology for the assessment was provided to the registered stakeholders for review and feedback from the stakeholders was incorporated into the assessment strategy. A meeting was held to discuss a revised offset and management strategy after the receipt and review of Aboriginal stakeholder groups' comments for the draft assessment report. A detailed Aboriginal consultation log is provided in **Appendix 1** and all consultation is summarised in the assessment (refer to **Sections 1.4**, **3.0**, **8.5** and **8.6**).

Mt Arthur Coal provided the opportunity for the Aboriginal stakeholder groups that registered an interest in fieldwork involvement to participate in the survey and 14 groups chose to take

part over three periods totalling 23 days in January/February, April and May 2006. A list of all Aboriginal stakeholder groups and representatives involved in fieldwork is provided in **Section 6.1**. WEC did not wish to be involved in fieldwork. MC and WC-AF were not established and did not register interest in this project until after the conclusion of the fieldwork period. MC and WC-AF were provided with a copy of the draft report for comment and were involved in the consultation program thereafter. The draft report identified objects and places of significance to the Aboriginal stakeholder groups that may be impacted, and identified culturally acceptable mitigation measures when impacts are considered unavoidable. The draft report was provided to all Aboriginal stakeholder groups for comment. The offset and management strategy presented in this Aboriginal archaeological assessment was endorsed by twelve of the fourteen registered Aboriginal stakeholder groups who provided comment. These twelve groups advised that they considered the offset and management strategy appropriate from an Aboriginal cultural heritage perspective.

DECC was also consulted (through phone conversations, correspondence, attendance at a site meeting with the Aboriginal groups and at a meeting at the DECC office in Coffs Harbour) and were involved in the development of the survey strategy, recording methodology, site definitions, determination of the management and conservation offset strategies, the Aboriginal consultation process and the finalisation of the assessment report (refer to **Section 1.5**).

Survey Results

The assessment covered a survey area of approximately 3800 hectares and covered all areas of proposed disturbance and areas within the subsidence affectation area that were outside areas previously salvaged and subject to detailed subsurface investigations as part of the currently approved Bayswater No. 3 open cut mining area.

The survey strategy for the project was designed to be consistent with that used for the proposed South Pit Extension and Mt Arthur North (MAN) Project to make the results of all surveys comparable. The survey area was traversed on foot by the team and sites were recorded using a comparable system of archaeological terrain units and environmental and cultural contexts. Areas in which artefacts were located were recorded as site loci (refer to **Sections 6.3**, **6.4** and **6.5**).

A total of 77 sites were identified within the survey area, including one scarred tree, 46 artefact scatters and 30 isolated finds. A total of 509 site loci (artefact exposures) were recorded within the 76 artefact scatter and isolated find sites. The site loci identified were primarily low frequency artefact scatters with mudstone and silcrete dominating assemblages with smaller percentages of porcellanite, quartz, chert, quartzite, hornfels, basalt, silicified sandstone, petrified wood, chalcedony, tuff and river pebbles (manuports) in site loci with larger assemblages. The major artefact category identified within site loci are flakes. The high frequency of broken flakes in assemblages was assessed as indicative of the impact trampling by cattle grazing throughout the survey area.

The majority of site loci (460) were identified on creek banks or within 50 metres of a high order watercourse. These results fit with the predictive model developed from previous archaeological work. The majority of site loci were identified in gentle drainage depressions which have a low gradient slope known to be favourable for Aboriginal occupation. In terms of distribution of archaeological material the gentle drainage depression and level to very gentle drainage depression archaeological terrain units have higher numbers of artefacts and greater areas of Potential Archaeological Deposit (PAD). The most complex assemblages were found in association with higher order watercourses, with areas of Saddlers Creek, Quarry Creek and Western Creek containing assemblages that indicate higher levels of occupation and a greater diversity of site use. Differing degrees of patination of the artefacts suggests Aboriginal occupation over an extended period of time. Evidence of Aboriginal

occupation was also found to increase in proximity of the confluence of higher order watercourses.

High frequencies of site loci were also identified on the moderate to steep drainage depression terrain unit (133 site loci). This frequency may be attributable to the use of gullies as travel routes to the top of ridge lines and to the excellent outlook at the top of these drainage depressions. The lower numbers of artefacts in the simple slope terrain unit indicate these areas generally contain only background scatters representing more transient use of the landscape. The identification of site loci on the ridge crest/ridge line is also attributable to the extensive outlook provided by this landform.

Significance Assessment

The assessment of significance of Aboriginal sites has two defined components: cultural significance, which is determined by the Aboriginal stakeholders, and archaeological/ scientific significance, which is determine by an archaeologist based on the ability of the site to contribute to the scientific understanding of Aboriginal culture. These two components are often not interrelated, with sites potentially having different cultural and scientific values.

Aboriginal Cultural Significance

Aboriginal cultural significance can only be assessed by the relevant Aboriginal stakeholders. Any comments made by the Aboriginal stakeholders participating in the field survey regarding cultural significance were recorded. Further comments were received from 12 of the Aboriginal stakeholder groups as part of their comments on the draft assessment report. A specific tour of the project area and proposed offset areas was also provided for Aboriginal elders unable to participate in the fieldwork, with recording of comments made during these tours regarding cultural significance.

The Aboriginal stakeholders' comments confirm that all sites identified during the survey were of high cultural significance. However, some groups commented that sites QC01, QC02 and SC01 were of greater importance to the Aboriginal stakeholder groups (these have been noted in the assessment report as of very high significance).

Mrs Barbara Foot provided further specific information regarding locations that she perceived to be of cultural significance in addition to the archaeological sites recorded during the survey. These locations were recorded and assessed as areas of Aboriginal cultural significance and management of these potential cultural heritage values will be undertaken as part of the Aboriginal Cultural Heritage Management Plan (ACHMP).

Archaeological/Scientific Significance

The archaeological or scientific significance of Aboriginal sites was assessed according to their potential to contribute to furthering the archaeological/scientific understanding of Aboriginal culture. Three sites within the survey area were assessed as having high archaeological significance, these being SC01 located along Saddlers Creek, QC01 located along Quarry Creek and the scarred tree, QC02. Two sites were assessed as having moderate to high archaeological significance (WC04 and WC05 located along Western Creek), three sites as having moderate archaeological significance, four sites as having low to moderate archaeological significance and 65 sites as having low archaeological significance.

Impact Assessment

The proposed Underground Project has the potential to impact on Aboriginal sites in three key ways:

- direct surface impacts associated with construction of mine infrastructure;
- impacts due to surface cracking associated with mine subsidence; and
- direct surface impacts associated with subsidence remediation works, including remediation works within drainage lines.

For the purpose of this assessment, it has been assumed that all Aboriginal sites and values identified within the areas of proposed direct impact by infrastructure will be damaged or destroyed. Impacts from subsidence are unlikely to cause damage to artefact scatters or isolated finds; however subsidence remediation works could disturb, damage or destroy artefacts, depending on the type and extent of remediation required. Approximately 680 hectares within the survey area is predicted to potentially require subsidence remediation works. Total ground disturbance will not occur within this area, with subsidence remediation works only required where significant cracking occurs. The total surface impact area has been used for impact assessment purposes to provide a conservative assessment.

Surface infrastructure will impact on site SC01 where the proposed overland conveyor crosses Saddlers Creek in the north eastern section of the survey area. Four site loci and a small section of PAD will be damaged or destroyed as a result of conveyor construction. The remainder of site SC01 will be unaffected by the project and the majority of this site is proposed for conservation.

The location of minor surface infrastructure will be determined as mining progresses and wherever possible, will be located so as to avoid sites, site loci and PAD, especially those assessed as having moderate to high or high Aboriginal cultural heritage and archaeological significance. Management protocols have been developed to guide the planning and construction of these facilities.

Subsidence remediation will potentially impact on 28 of the 77 sites identified within the survey area. This includes partial impacts within two areas assessed as having high archaeological significance (QC01 and QC02), and one area assessed as having moderate to high archaeological significance (WC04). Remediation work in the area of QC01 and WC04 has the potential to impact on multiple site loci and areas of PAD within areas assessed as having high or moderate to high Aboriginal and archaeological significance.

The scarred tree, QC02 and a second scarred tree identified by Mrs Foot as a Aboriginal cultural site are also located within an area predicted to require subsidence remediation work; however, it is unlikely that surface cracking will impact on the viability of the trees and any subsidence remediation work required in the vicinity of the trees can be managed to ensure there is no impact on them. The scarred tree, QC02 and the second scarred tree identified by Mrs Foot as an Aboriginal cultural site are not predicted to be impacted by changes to surface drainage or groundwater resulting from underground mining.

It should be noted, that all predicted impacts were discussed at length with the registered Aboriginal stakeholder groups in various forms of communication (face to face meetings, written correspondence [emails, faxes and letters], phone calls, during the survey and later site inspections) during the consultation process. Consultation also included three presentations where all registered Aboriginal stakeholder groups were afforded the opportunity to attend. The first presentation was on 22 December 2005 at the initiation of the project, the second on 12 December 2006 for the presentation of the draft Aboriginal archaeological assessment and the third on 17 July 2007 for the presentation of the revised offset and management strategy. All presentations included forums for discussion and frank and open communications throughout the day. The DECC was also afforded the opportunity to attend these presentations.

Management Strategy

A range of management options were considered when developing an appropriate management strategy for the Underground Project. These include:

- site conservation;
- site destruction with salvage and subsurface investigation;
- site destruction with salvage; and
- site destruction without salvage.

Site conservation is the preferred management option for all sites, site loci and their associated PAD located outside the predicted surface impact zone. These sites will be managed *in situ* under an ACHMP for the duration of the project, except where impacts are required for minor surface infrastructure.

In addition to the sites conserved *in situ*, Mt Arthur Coal proposes to set aside the majority of site SC01 for conservation within the Saddlers Creek Conservation Area to offset the loss of cultural heritage values elsewhere within the project area. Site SC01 was assessed as having high archaeological and cultural heritage significance, with this area also having significant ecological values. The land within the proposed conservation area is proposed to be conserved in perpetuity and the area managed under an ACHMP. Further details of the Saddlers Creek Conservation Area, which will conserve an area of approximately 295 hectares, are provided in **Section 8.2.1**. This conservation area, in conjunction with the Mt Arthur Conservation Area (approximately 100 hectares) and the three existing MAN Heritage Management Zones (approximately 400 hectares) will act to conserve a representative sample of Aboriginal sites, site types and archaeological terrain units for the project area.

Conservation of the remaining sites, site loci and PAD within the surface impact area is not predicted to be feasible due to predicted subsidence related impacts, however, their destruction will be offset by the setting aside of the proposed Saddlers Creek Conservation Area. In addition to these conservation outcomes, appropriate salvage of the site/site loci to be impacted is essential.

Surface collection and targeted subsurface investigation has been recommended for sites within the surface impact zone which have been identified as having the potential to retain a degree of integrity and/or complex subsurface assemblages. The sites recommended for salvage and subsurface investigation include areas of Quarry Creek (QC01), Saddlers Creek tributary (SC09) and Western Creek (WC04) in areas potentially impacted by subsidence remediation and for Saddlers Creek (SC01) within the proposed conveyor corridor.

Surface collection is recommended for all remaining sites within the surface impact zone. Subsurface investigation has not been recommended for sites that are located in areas of high disturbance that retain no integrity and which are assessed as having no or low potential for complex subsurface assemblages.

The impact assessment for the project has been undertaken on the worst case subsidence remediation impact predictions. Mt Arthur Coal has committed to undertaking surface collection and salvage on a longwall panel basis, so that ongoing subsidence monitoring and predictions may potentially allow the predicted subsidence remediation impact zone to be refined to a smaller area. This may allow more sites to be managed *in situ*, with reduced numbers of sites requiring salvage.

Site destruction without salvage is not seen as an appropriate management option for any of the sites within the surface impact area and has therefore not been recommended for any sites within the project area.

Mt Arthur Coal has committed to the establishment of a Management Committee including five representatives of the Aboriginal stakeholder groups to provide ongoing management of sites within the project area.

Management of Minor Surface Infrastructure

Wherever possible, minor surface infrastructure will avoid known sites, especially those assessed as having moderate to high or high Aboriginal cultural heritage and archaeological significance. The ACHMP will provide a management protocol if a known site cannot be avoided by minor infrastructure, or if the minor infrastructure impacts on a previously unknown site. This will include inspections of planned infrastructure locations. The management of these sites will be based on their Aboriginal cultural heritage and archaeological significance and Mt Arthur Coal will ensure, through consultation with the Management Committee, that site salvage is undertaken in a manner appropriate to its significance assessment.

Aboriginal Cultural Heritage Management Plan

An ACHMP will be developed in consultation with DECC and the Aboriginal stakeholder groups to facilitate ongoing management of the sites, timing and methodology for the salvage of sites, the preparation of a management strategy for sites in the proposed Saddlers Creek Conservation Area and the establishment of a Management Committee in relation to ongoing management of sites within the project area.

Offset Strategy

To offset the impacts of the proposed Underground Project on Aboriginal cultural heritage, Mt Arthur Coal has made the following commitments:

- to set aside the proposed Saddlers Creek Conservation Area to be conserved in perpetuity, comprising a total area of approximately 295 hectares;
- to manage the proposed Saddlers Creek Conservation Area under an ACHMP. The management procedures and protocols for this area will be stringent in relation to any activity that has the potential to cause ground surface disturbance;
- to provide safe access to the proposed Saddlers Creek Conservation Area. Visitors to the proposed Saddlers Creek Conservation Area will be appropriately supervised as agreed by the Management Committee and Mt Arthur Coal; and
- to review applications to undertake non-destructive research within the proposed Saddlers Creek Conservation Area which will be considered by the Management Committee and approved based on their merit.

The Saddlers Creek conservation area will be fenced and sign-posted to avoid any inadvertent damage. All stock will be removed from the fenced area to allow natural revegetation of eroded areas and avoid trampling of the artefact loci.

From an archaeological perspective the setting aside of the proposed Saddlers Creek Conservation Area is considered an adequate offset for the loss of the sites/values within the project impact area but it may not fully offset the loss of the section of Quarry Creek previously considered for conservation. In consideration of this, and in light of the comments

made by Aboriginal stakeholder groups, Mt Arthur Coal propose to provide the following additional cultural heritage management measures as part of the overall offset strategy for the project:

- Mt Arthur Coal will fund and construct a Keeping Place within the Proposed Saddlers Creek Conservation Area as part of the Aboriginal cultural heritage offset strategy. The Keeping Place will have a storage room for artefacts and a display centre for teaching/educational purposes. This Keeping Place will provide for storage of all artefacts salvaged at Mt Arthur Coal and will be staffed for 50 days (or 100 person days) per year for the duration of the Underground Project by appropriately trained Aboriginal community representatives. The Keeping Place also will be available for use as an educational facility;

- Mt Arthur Coal will fund the training of five representatives from the registered stakeholder groups to undertake 'Collections Training' at the Australian Museum (or similar training) for staffing of the proposed Keeping Place;

- Mt Arthur Coal will construct within or near to the existing fenced section of Quarry Creek west of Edderton Road, a facility suitable for use by the Aboriginal community when using the area for teaching purposes until such time as the area is impacted by subsidence in approximately year 13 of the project; and

- Mt Arthur Coal will provide training for up to one member of each of the registered Aboriginal stakeholder groups for the project in relation to site recording and artefact recording and basic analysis. The training package will be devised so that it enables these representatives to train other members of their respective groups and the broader Aboriginal community.

As discussed above, the final offset and management strategy for the Underground Project (which took into account earlier comments from the Aboriginal stakeholders on the draft offset and management strategy) was discussed with the Aboriginal stakeholder groups at a meeting on 17 July 2007. Twelve of the fourteen Aboriginal stakeholder groups that provided comment endorsed the final offset strategy.

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1.0 Introduction

Mt Arthur Coal Pty Limited (Mt Arthur Coal) operates the Mt Arthur Coal open cut coal mine south of Muswellbrook in the upper Hunter Valley of NSW (refer to **Figure 1.1**). The existing operations consist of three mining areas, the Bayswater No. 2 mining area (extraction complete), the Bayswater No. 3 mining area and the Mount Arthur North (MAN) mining area (refer to **Figure 1.2**). Mt Arthur Coal has also been investigating a potential underground coal mining resource in the Bayswater No. 3 mining area and the adjacent Exploration Licence (EL) 5965 held since 1996. These studies have identified a substantial underground mining resource and Mt Arthur Coal is seeking approval for an underground coal mining operation in this area. The proposed Mt Arthur Coal Underground Project (Underground Project) will access the coal reserve through existing open cut pits and will build on Mt Arthur Coal's existing infrastructure, including the coal handling and preparation plant (CHPP) and rail loading facility.

Umwelt has been commissioned by Mt Arthur Coal to prepare an Environmental Assessment (EA) for the Underground Project, with this Aboriginal archaeological assessment undertaken as part of the EA.

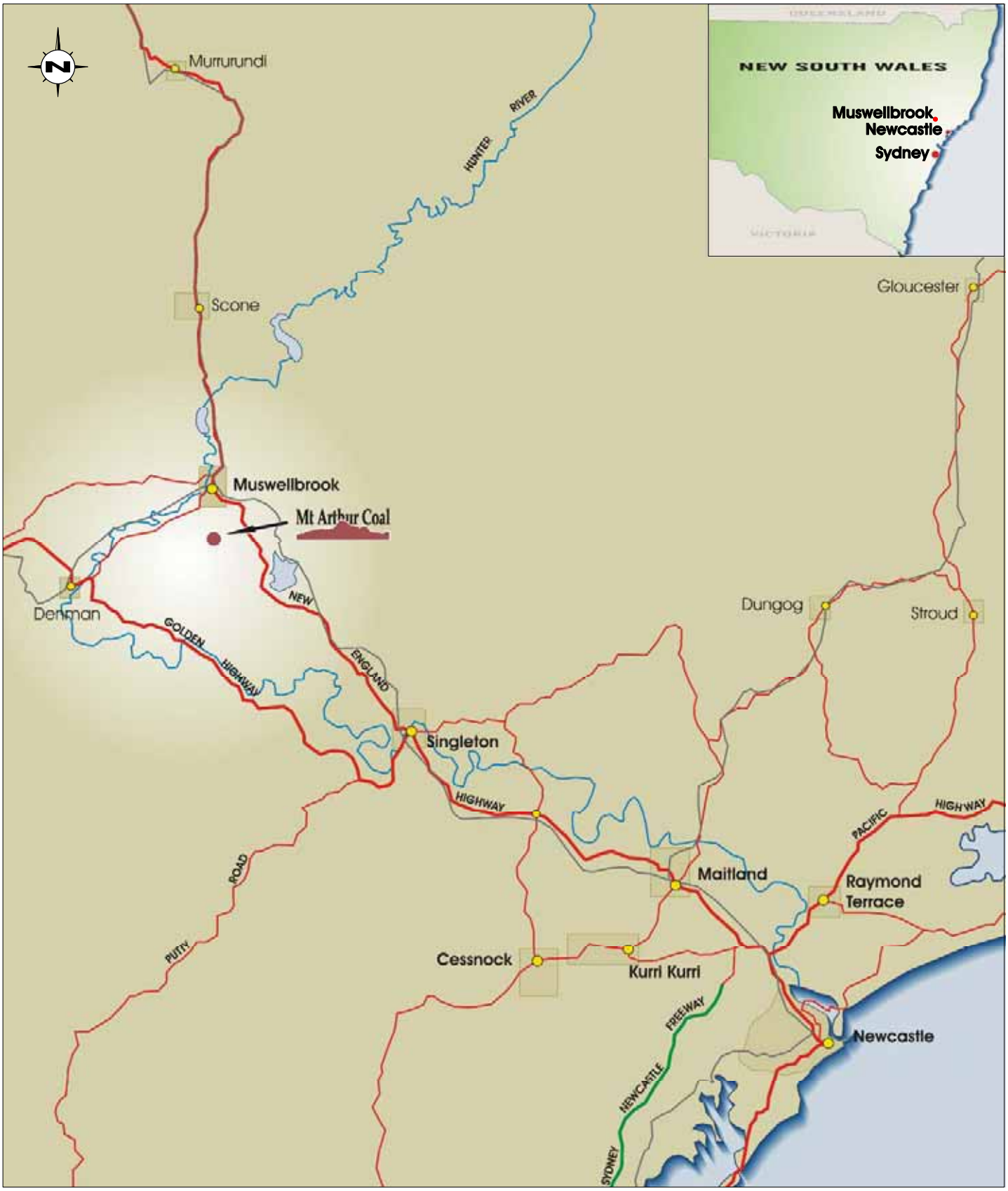
1.1 Survey Area

The project area for the Underground Project includes existing open cut mining areas, existing infrastructure areas, undisturbed areas within existing Mining Leases (MLs) and land within EL 5965. The total project area (refer to Project Application Boundary) is shown on **Figure 1.2**. Within the total project area there is land that has not been previously disturbed by mining and associated activities and which has the potential to have previously unrecorded Aboriginal sites. The project area also contains land that has been previously surveyed for the Bayswater No. 3 Environmental Impact Statement (EIS) (Resource Planning, 1994). This area was resurveyed due to the length of time that had passed since the survey for the EIS.

The Mining Affectation Area shown on **Figure 1.2** is the entire area which has the potential to be impacted by subsidence from the proposed underground mine (refer to further discussion in **Section 2**). The Aboriginal archaeological survey area (hereafter the survey area) for this project was designed to survey all parts of the project area that will be potentially impacted by the project that have not been previously surveyed and to re-survey those areas covered for the Bayswater No. 3 EIS that have not been disturbed by mining activities or salvaged ahead of approved mining. The survey area for the project is shown on **Figure 1.2** and is approximately 3800 hectares. The survey area is the land assessed within this Aboriginal archaeological assessment.

The survey area incorporates all land potentially impacted by the Underground Project, excluding previously disturbed and salvaged areas. It also includes an additional area along Saddlers Creek that was assessed as a potential conservation area (refer to **Figure 1.2** for the Saddlers Creek proposed conservation area).

The survey area also includes two areas previously considered as potentially suitable for Aboriginal cultural heritage conservation areas. These areas are the previously proposed Quarry Creek conservation area and Saddlers Creek conservation area (refer to **Figure 1.3**). These areas were originally proposed as an outcome of investigations into potential conservation areas, undertaken in accordance with conditions contained in the development consent for the Bayswater No. 3 mining area. The interactions of this project with these previously proposed conservation areas is discussed in detail in this report, with the details of the proposed revised conservation strategy included in **Sections 8** and **9**. Mt Arthur Coal

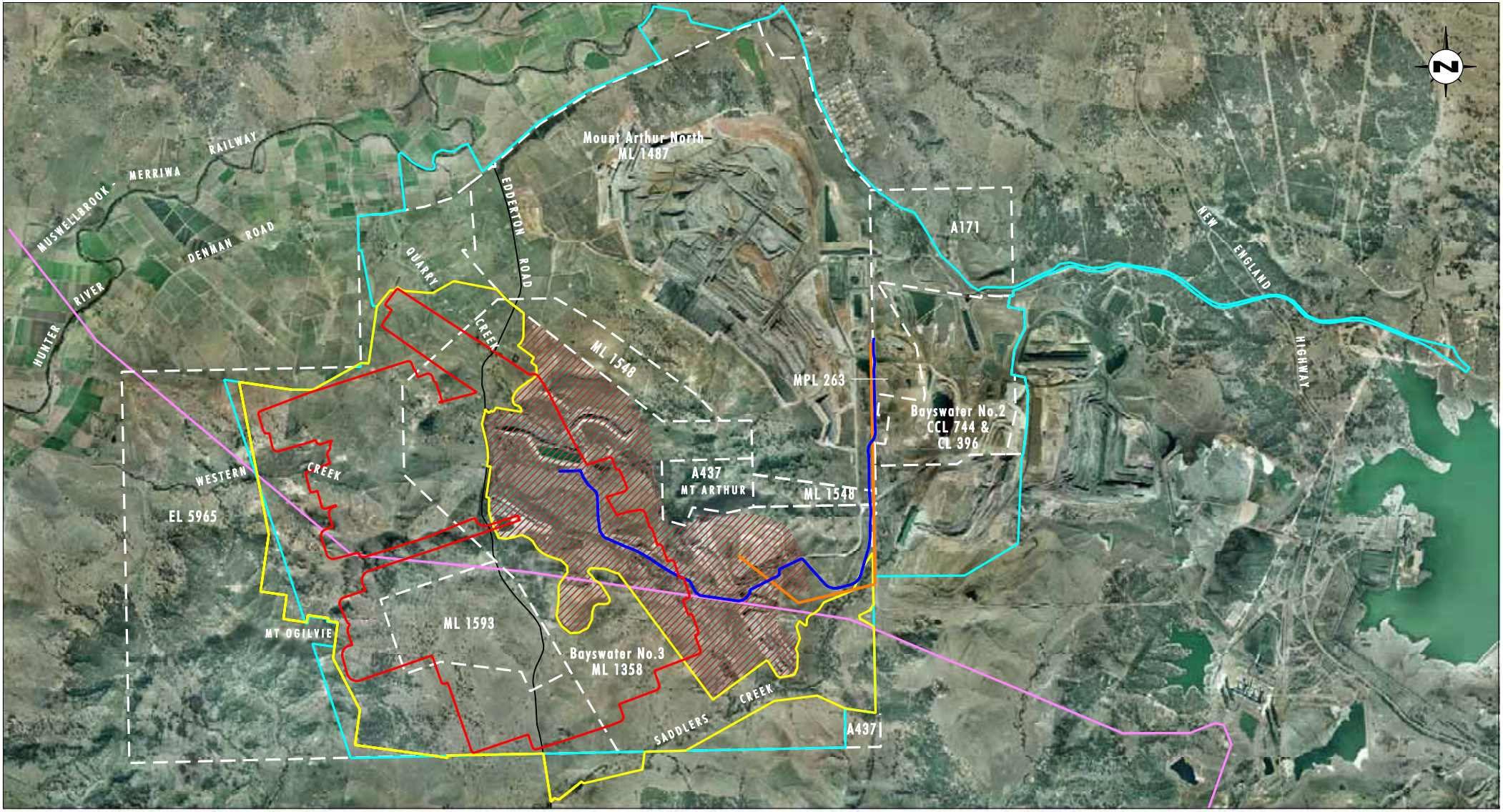


Base Source: NSW Road Directory

0 10 20 30km
1:700 000

FIGURE 1.1

Locality Plan



Base Source: Mt Arthur Coal, 2006

Legend

- Mining and Exploration Lease Boundary
- Project Application Boundary
- Survey Area
- Subsidence Affectation Area
- Bayswater No.3 Mining Area
- Mine Access Road
- Surface Conveyor
- Existing Transmission Line

FIGURE 1.2

The Umwelt Survey Area and the 2006 Aerial Photograph

File Name (A4): R03_V1/2051_155.dgn



Base Source: Mt Arthur Coal, 2006

Legend

- Mining and Exploration Lease Boundary
- Proposed Mt Arthur Conservation Area
- Previously Proposed Quarry Creek Conservation Area
- Previously Proposed Saddlers Creek Conservation Area
- Heritage Management Zones

FIGURE 1.3

Existing and Previously Proposed Conservation Areas

File Name (A4): R03_V1/2051_214.dgn

also has several Aboriginal Cultural Heritage Management Zones and the Proposed Mt Arthur Conservation Area (established in accordance with the MAN development consent) which are also shown on **Figure 1.3**.

1.2 Objectives

The key objectives of the archaeological assessment were to:

- carry out Aboriginal consultation in compliance with the Department of Environment and Conservation and Climate Change (DECC) (2004) *Interim Community Consultation Requirements for Applicants* and DECC's draft Part 3A assessment guideline *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*, July 2005 and to meet the provisions of these requirements;

- with the assistance of the registered Aboriginal stakeholder groups, undertake a cultural heritage and archaeological survey within the survey area;

- encourage active participation by the registered Aboriginal stakeholder groups in the identification, significance assessment and management decisions about Aboriginal cultural heritage sites and values within the survey area;

- gather available information about the cultural heritage values of the project area from the Aboriginal community for consideration in project planning and impact assessment; and

- fulfil the requirements of the DECC Guidelines (1997) for archaeological survey and assessment.

1.3 Statutory and Policy Framework

As this development is a 'Major Project' which will be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*, the provisions of the *National Parks and Wildlife Act 1974* do not apply. This means that Section 87 permits and Section 90 consents under the *National Parks and Wildlife Act 1974* will not be required for any investigation/salvage works undertaken as part of this project, if approved. This does not mean that the level of assessment work required or the way issues are managed changes, it mainly relates to reducing the number of separate approvals and time required to start a project once approved. Prior to granting approval for a project the Department of Planning (DoP) will consider cultural heritage issues and consult with DECC regarding the project to ensure that cultural heritage issues are appropriately considered when a decision is made about whether or not to approve a project. They will also consider what management requirements need to be implemented.

As there are no Section 87 permits or 90 consents required for an approved project, the proponent will be required to manage cultural heritage issues in accordance with the management recommendations made in the Aboriginal archaeology assessment report and with any approval conditions imposed by the DoP. This may include salvage of artefacts, subsurface works, conservation outcomes or any other management strategies. The management of cultural heritage resources within the survey area is discussed in **Section 9**.

The information presented in this report follows the *NPWS Standards and Guidelines for Archaeological Report Writing 1997* and DECC's draft Part 3A assessment guideline *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*, *July 2005.* Aboriginal consultation has been undertaken in accordance with the above

guidelines and following DECC's *Interim Community Consultation Requirements for Applicants 2004*.

1.4 Aboriginal Stakeholder Consultation and Participation

Aboriginal stakeholders are the primary determinants of the significance of their heritage; therefore, Aboriginal stakeholder consultation is integral to Aboriginal heritage assessment. The consultation and assessment process reflects the recognition of the importance of Aboriginal stakeholder groups in the assessment and management of their heritage.

Two processes of significance assessment are undertaken as part of an Aboriginal heritage assessment: the assigning of Aboriginal cultural significance, which can only be carried out by the Aboriginal stakeholders; and the assigning of archaeological or scientific significance, which is carried out by the archaeologist. The archaeologist in consultation with the Aboriginal stakeholder groups, develops appropriate management recommendations in light of both the archaeological and Aboriginal cultural significance assessments.

The consultation process for the current project has followed the DECC's (formerly Department of Environment and Conservation) recent *Interim Community Consultation Requirements for Applicants (2004)* and DECC's draft Part 3A assessment guideline *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*, *July 2005.* Aboriginal stakeholder groups were involved in all facets of the study including a presentation and open forum discussion for the development of the survey strategy and determination of a conservation offset strategy. All registered Aboriginal stakeholder groups participated in field survey and site identification and recording. All groups will also be provided the opportunity to review the draft of this report.

The consultation process was aimed at ensuring that the Aboriginal stakeholder groups had the opportunity to contribute to assessment outcomes by:

- assisting with the design of the survey strategy;
- involvement in the identification of Aboriginal heritage sites through participation in fieldwork and identification of objects and places of significance that may be impacted;
- identifying whether there are acceptable mitigation measures when impacts are considered to be unavoidable;
- influencing the assessment of cultural and scientific significance;
- providing relevant information regarding the cultural significance values of Aboriginal objects/places and the area in general;
- contributing to the development of the cultural heritage management strategy; and
- commenting on the draft assessment report prior to its submission.

Table 1.1 provides information relating to the registered Aboriginal stakeholder groups that participated in the project.

Table 1.1 - Registered Aboriginal Stakeholder Groups

	Name of Group	Primary Contact
1.	Aboriginal Native Title Consultants (ANTC)	John and Margaret Matthews
2.	Giwiirr Consultants (GC)	Rodney Matthews
3.	Hunter Valley Aboriginal Corporation (HVAC)	Trevor Griffiths
4.	Hunter Valley Cultural Consultants (HVCC)	Christine Matthews
5.	Lower Wonnarua Tribal Consultancy Pty Ltd (LWTC)	Barry Anderson
6.	Ungooroo Aboriginal Corporation (UAC)	Graham Ward
7.	Upper Hunter Heritage Consultants (UHHC)	Darryl Matthews
8.	Upper Hunter Wonnarua Council Inc (UHWC)	Victor Perry
9.	Valley Culture (VC)	Larry van Vliet
10.	Wanaruah Custodians (WC)	Barbara Foot
11.	Wanaruah Local Aboriginal Land Council (WLALC)	Barry McTaggart
12.	Wattaka Wonnarua CC Service (WWCCS)	Des Hickey
13.	Wonnarua Culture Heritage (WCH)	Joe Hampton or Joseph Griffiths
14.	Wonnarua Elders Corporation (WEC)	Rhoda Perry/Tom Miller
15.	Wonnarua Nation Aboriginal Corporation (WNAC)	Glenn Walker (recently appointed Administrator)#
16.	Yarrawalk (Y)	Scott Franks
17.	Muswellbrook Cultural Consultants (MCC)*	Brian Horton
18.	Mingga Consultants** (MC)	Clifford Matthews
19.	Wonn11 Contracting – Arthur Fletcher (WC-AF)***	Arthur Fletcher

#Robert Lester was the primary contact for WNAC for the duration of the Underground Project's Aboriginal consultation program until its recent administration. Glenn Walker (Solicitor) is the current Administrator and also the new primary contact for WNAC.

*MCC registered interest in December 2005 and has only been involved in the project's consultation program since that time.

**MC registered interest in late April 2006 and has only been involved in the project's consultation program since that time.

***WC-AF registered general interest in the Hunter Valley region in December 2006 and has only been involved in the project's consultation program since that time.

Further details regarding the extensive Aboriginal consultation program are provided in **Section 3**. A detailed Aboriginal consultation log for the duration of the project is provided in **Appendix 1**.

1.5 DECC Consultation

Initial contact for the project was made with DECC through Liam Dagg (Archaeologist, Northern Directorate, DECC). Jan Wilson (Manager Cultural Heritage, Umwelt) briefed Mr Dagg regarding the broad survey/consultation approach for the project during a telephone discussion in May 2005. Mr Dagg indicated agreement with this approach at that time.

The proposed project, draft survey strategy, intended consultation program and investigation of potential conservation outcomes for this project were discussed with Brendan Diacono (Manager Planning & Aboriginal Heritage, North East Branch, EPRD, DECC) in November 2005.

The DECC requirements for the designation of landforms and effective coverage table for this draft report were discussed with Clare Everett (Archaeologist, Northern Directorate, DECC) on 1 August 2006. The result of this discussion was to base the effective coverage table on the division of archaeological terrain units (refer to **Section 6**).

Claire Everett, DECC, attended the presentation of the draft Aboriginal archaeological assessment at a meeting at the Underground Project office on 12 December 2006 with the registered Aboriginal stakeholder groups. The presentation included the draft Aboriginal archaeological assessment report outcomes including site definition (based on archaeological terrain units, Potential Archaeological Deposit and site loci), Aboriginal consultation, draft management strategy and draft Aboriginal cultural heritage offset strategy. This meeting included a site inspection of sites with high significance (scientific) within the survey area and the proposed offset area. DECC was provided with a copy of the draft report during this meeting for review and comment.

After the review period for the draft Aboriginal archaeological assessment and receipt of Aboriginal community comments, another meeting was scheduled with Brendan Diacono and Fiona Hamilton (Aboriginal Heritage Officer, North East Branch, DECC) for 19 April 2007. The purpose of this meeting was to present a revised Aboriginal cultural heritage offset strategy for the Underground Project in light of Aboriginal community comments on the original offset package and to gain input from the DECC regarding the sufficiency of Aboriginal consultation undertaken to date for the project. John Merrell (Associate, Umwelt), Mary-Jean Sutton and Carl Bagnall (Environment & External Affairs Manager, Mt Arthur Coal) met with Brendan Diacono at the DECC Coffs Harbour and presented a summary of the survey results, Aboriginal consultation to date, significance and impact assessment, original and revised Aboriginal cultural heritage offset strategies and management strategies.

The outcome of this meeting was DECC indicated that the revised offset strategy appropriately addressed the Aboriginal community comments on the original offset strategy and also indicated that the comprehensive Aboriginal consultation undertaken for the project to date was sufficient. DECC agreed that the Aboriginal archaeological assessment could be finalised without further meetings or review by the nineteen registered Aboriginal stakeholder groups. Additional information within the existing Aboriginal archaeological assessment was requested by DECC at the meeting. This additional information included a detailed Aboriginal consultation log (refer to **Appendix 1**) and a summary table of all key comments by Aboriginal stakeholder groups and how these are addressed by the revised offset strategy as presented on 19 April 2007 to the DECC (refer to **Section 8.4**). Follow up correspondence was sent to the DECC to confirm the outcomes of the meeting on 4 May 2007 and to provide the DECC with a hard copy of the presentation provided at the meeting.

1.6 The Structure of the Report

Section 2 describes the nature of the proposal and its likely direct and indirect impacts on Aboriginal cultural heritage sites.

Section 3 presents detailed information related to the extensive Aboriginal stakeholder consultation and participation program.

Section 4 provides information about the environmental context of the project area including topography and hydrology, geology and soils, flora and fauna and the impacts of prior land use.

Section 5 provides information related to the archaeological context of the project area and discusses the ethnography, known sites and prior archaeological research. A predictive model for site location within the project area is then formulated using the information supplied in **Sections 4** and **5**.

Section 6 discusses the methodology and results of the survey undertaken within the survey area for this project.

Section 7 discusses the Aboriginal cultural heritage and archaeological or scientific significance of the sites/potential archaeological deposits (PADs) located during the survey.

Section 8 presents a discussion of management options for the sites/PADs and outlines the preferred management options from an Aboriginal cultural heritage and archaeological perspective.

Section 9 provides a management strategy for the Underground Project area.

Section 10 lists reports and publications referred to in the text.

1.7 Archaeological Project Team

Mary-Jean Sutton (Senior Archaeologist) co-ordinated the Aboriginal archaeological assessment and was the main author of this report. Background research and the archaeological context were co-authored by Mary-Jean Sutton, Kathleen Beech (Anthropologist), Emma St Pierre (Archaeologist), and Nicola Roche (Archaeologist) with some assistance by Tom Scott in the compilation of previously recorded site descriptions. Jan Wilson (Cultural Heritage Manager) reviewed and edited this assessment report, provided strategic direction for the project and provided written input into sections of the report. Emma St-Pierre (Archaeologist), Jan Wilson, Jillian Ford (Archaeologist) and Mary-Jean Sutton were involved in the fieldwork components of this project. Jillian Ford assisted in the compilation of site descriptions and survey coverage and in Aboriginal consultation throughout the life of the project.

2.0 The Proposal and Nature of its Impact

The purpose of this section of the report is to provide a description of the proposed Mt Arthur Coal Underground Project and to discuss the nature of the potential direct and indirect impacts of the project on Aboriginal cultural heritage and archaeological sites and values.

2.1 Proposed Mining Operations

The project will involve longwall mining operations in five coal seams over the initial 21 year approval life. Further resources will remain within the Underground Project area after this first 21 years of mining and Mt Arthur Coal plans to continue mining beyond this period should future approvals be granted. The five target seams for the initial 21 year period are the:

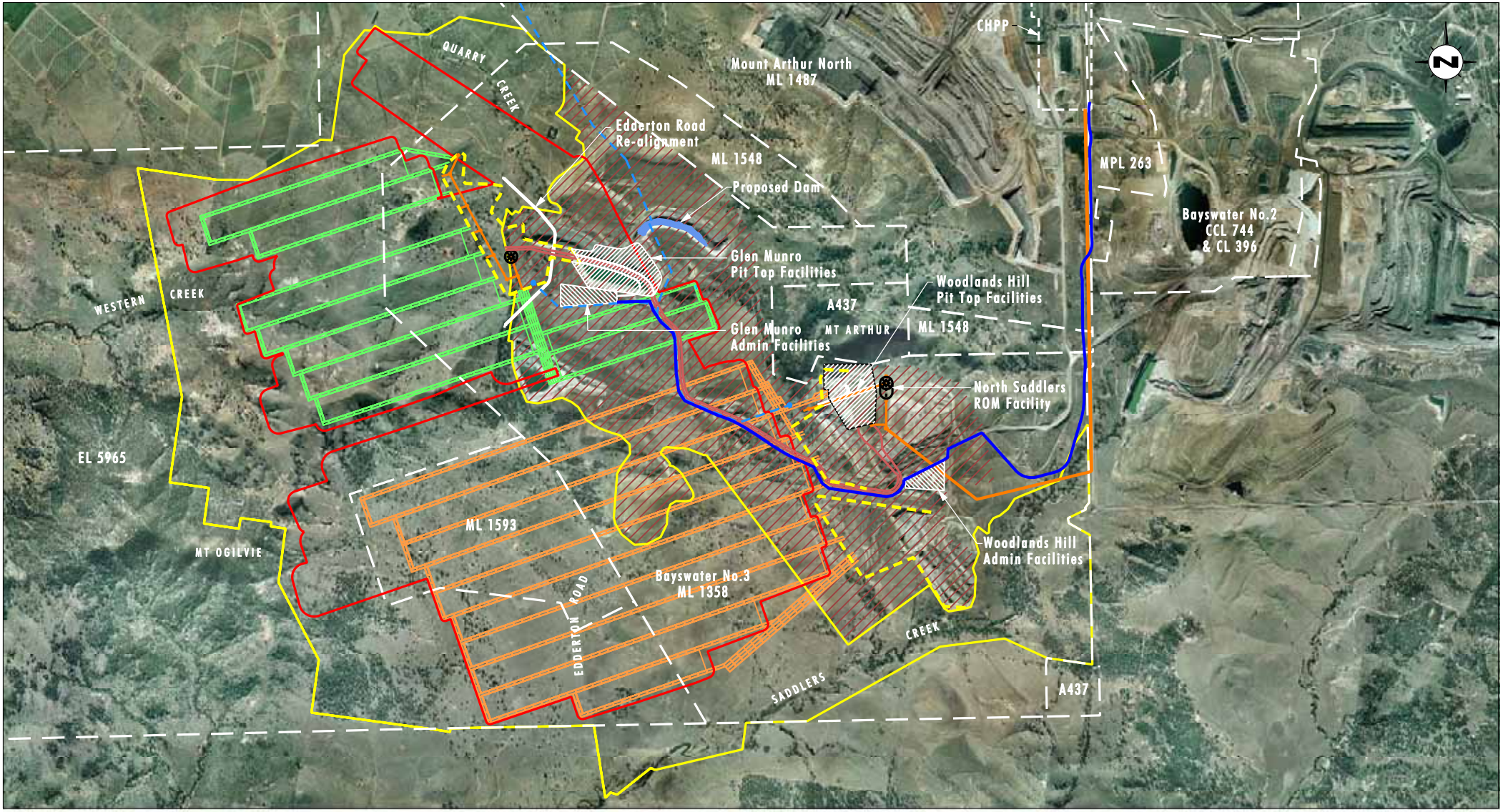
- Woodlands Hill seam;
- Glen Munro seam;
- Arrowfield seam;
- Bowfield seam; and
- Piercefield seam.

'Punch longwall' mining techniques will be the primary methods used in the Woodlands Hill and Glen Munro seams, meaning that the gate roads (mine access tunnels) for each longwall block will have access directly into the coal seam from open cut voids. Some conventional main heading (underground roadway) access will also be required from the open cut pits for the Woodlands Hill seam. Further open cut works will be required in both the Saddlers Pit and Belmont Pit in the Bayswater No. 3 mining area to set up for underground mining with these works to be completed in accordance with the Bayswater No. 3 development consent. This approved open cut area is illustrated on **Figures 2.1** to **2.2**.

The Arrowfield, Bowfield and Piercefield coal seams are deeper and cannot be accessed directly from the open cut mining pits. A drift will therefore be established from the base of the North Saddlers pit to provide access into these seams. The concept mine plans for the Woodlands Hill and Glen Munro seams are shown on **Figure 2.1**, with the concept mine plans for the Arrowfield, Bowfield and Piercefield seams shown on **Figure 2.2**.

A range of ancillary mining infrastructure will be required above the underground mining area including ventilation fan facilities, access tracks, service boreholes (power etc.), gas drainage facilities, dewatering boreholes and other similar infrastructure. The exact location of these facilities will be determined as the project progresses, depending on mining operation needs. Conceptual localities for some facilities are shown on **Figures 2.1** to **2.2**.

The 21 year concept mine plan will result in extraction of up to approximately 160 Mt of coal at a production rate of up to 8 million tonnes per annum (Mtpa). The annual production rate is expected to vary between 6 and approximately 8 Mtpa depending on the seam extracted, mining conditions and the timing of longwall panel changeovers.



Source: Mt Arthur Coal, 2006

0 1 2 3km

1:60 000

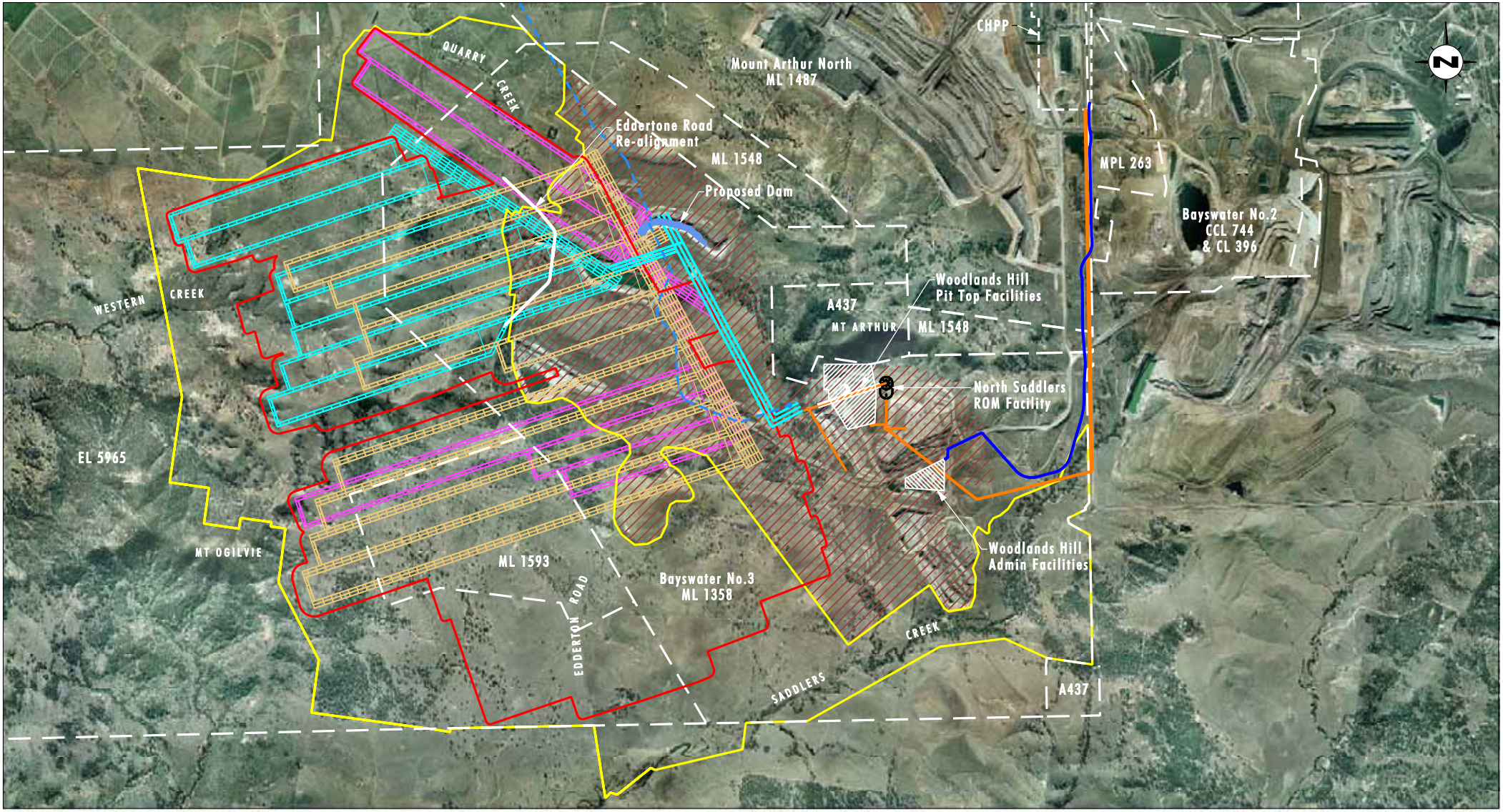
Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Subsidence Affectation Area
- Bayswater No.3 Mining Area
- Woodlands Hill Seam Concept Mine Layout
- Glen Munro Seam Concept Mine Layout
- Approved Open Cut
- Mine Access Road
- Surface Conveyor
- Haul Road
- Clean Water Supply

FIGURE 2.1

Woodlands Hill (Years 1-9) and Glen Munro (Years 7-12) Mine Plan and Surface Facilities

File Name (A4): R03_V1/2051_154.dgn



Source: Mt Arthur Coal, 2006

0 1 2 3km

1:60 000

Legend

- Mining and Exploration Lease Boundaries
- Survey Area
- Subsidence Affectation Area
- Bayswater No.3 Mining Area
- Arrowfield Seam Concept Mine layout
- Bowfield Seam Concept Mine Layout
- Piercefield Seam Concept Mine Layout
- Mine Access Road
- Surface Conveyor
- Haul Road
- Clean Water Supply

FIGURE 2.2

Arrowfield (Years 11-15), Bowfield (Years 13-18) and Piercefield (Years 14-21) Mine Plan and Surface Facilities

File Name (A4): R03_V1/2051_157.dgn

2.2 Mine Infrastructure

The Underground Project has been designed to maximise use of existing Mt Arthur Coal infrastructure including the existing CHPP and rail facility. Some upgrade works and extensions will be required to these existing facilities with some new project specific infrastructure also required.

The pit-top facilities required for the Underground Project will include office, workshop, store and bathhouse facilities. These facilities will be constructed primarily in previously mined areas as shown on **Figures 2.1** to **2.2**.

Coal from the underground mining operations will be crushed and sized at a new ROM coal facility to be constructed on previously mined land in the Saddlers Pit area as shown on **Figure 2.1**. After passing through this facility coal will be delivered by overland conveyor to the existing Mt Arthur Coal CHPP (refer to **Figure 2.1**). The CHPP will require some upgrade works, including a new plant module, additional stockpiling areas and associated handling facilities, to provide sufficient capacity for the coal from the Underground Project; however, this will not result in disturbance of any previously undisturbed land.

Coal from the Underground Project will be transported from the site via Mt Arthur Coal's existing rail facility and delivered to the Port of Newcastle for export. The existing rail loading facility will be used to load coal onto trains and will not require any major upgrade works. Although no major upgrades are required to the rail facility for the Underground Project, it is proposed to extend an existing passing lane on the Antiene rail spur to provide additional train movement capacity. The extended passing lane will be located to the east of the New England Highway near the intersection of the Antiene spur with the Main Northern Railway. The passing lane is planned to be constructed within the existing rail corridor.

Vehicular access to the Underground Project will be via the existing Mt Arthur Coal site access, with an additional section of internal access road constructed to connect this road to the Underground Project facilities. The location of this access road is shown on **Figure 2.1** Other roadworks will include the realignment of Edderton Road which is part of the currently approved Bayswater No. 3 project (refer to **Figure 2.2**).

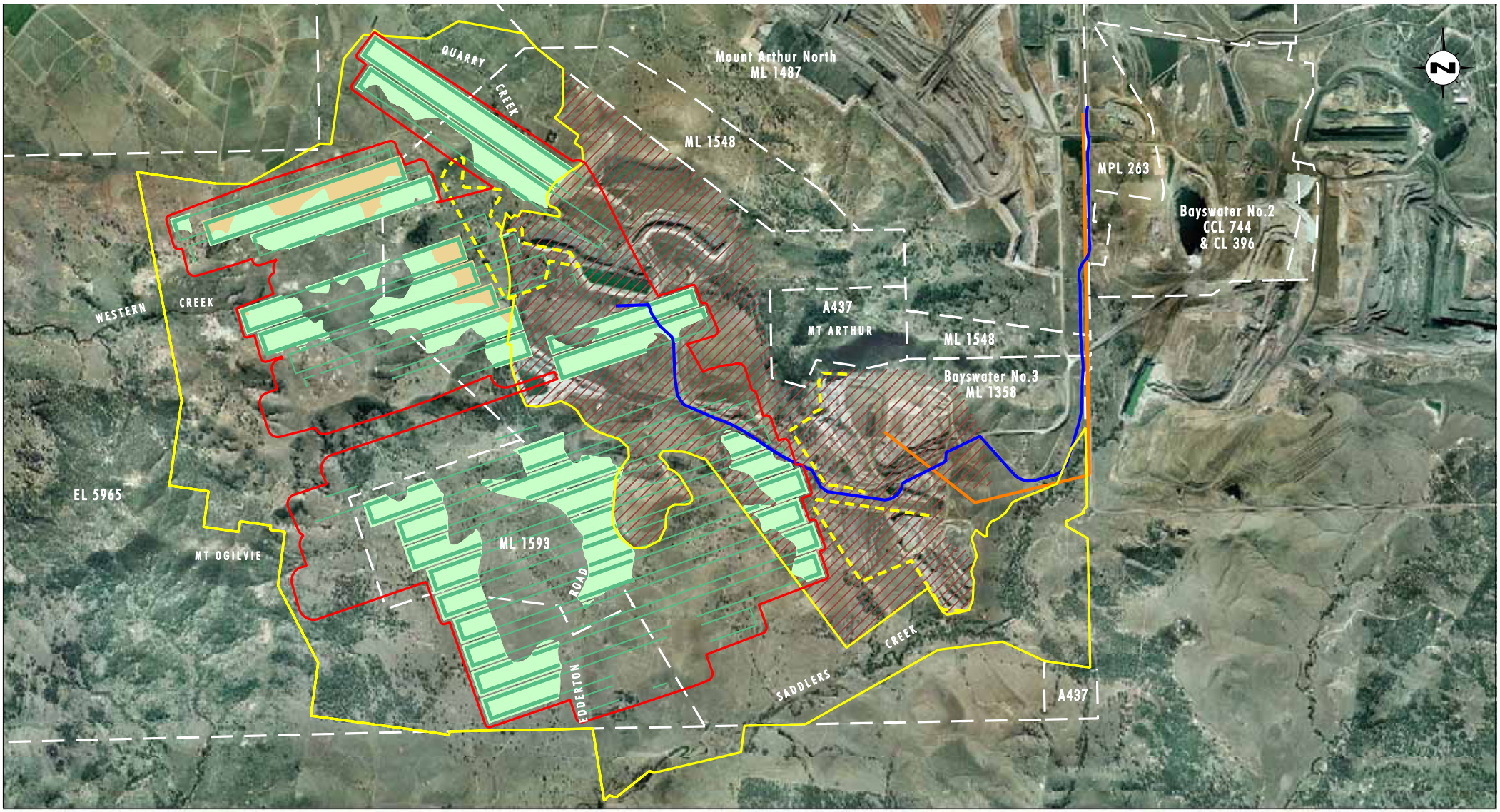
A number of other site services will also be required for the Underground Project including power lines, water pipe lines, a Hunter River water extraction point and minor internal access roads. The proposed locations of some of these services are shown on **Figures 2.1** to **2.3**, with further services to be established during the life of the project as the need arises.

2.3 Potential Impacts on Aboriginal Sites

The proposed Underground Project has the potential to impact on Aboriginal sites in three key ways:

- direct surface impacts associated with construction of mine infrastructure;
- impacts due to surface cracking associated with mine subsidence; and
- direct surface impacts associated with subsidence remediation works, including stream remediation works.

The specific aspects of the Underground Project that have the potential to impact on Aboriginal sites are discussed in further detail in **Sections 2.3.1** and **2.3.2**.



Source: Mt Arthur Coal, 2006

0 1 2 3km
1:60 000

Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Subsidence Affectation Area
- Bayswater No.3 Mining Area
- Approved Open Cut Mining Area
- Potential Subsidence Remediation Cultivation Area
- Potential Subsidence Remediation Earthworks Area
- Mine Access Road
- Surface Conveyor
- Tensile Cracking Zone

FIGURE 2.3

Surface Impact Areas

File Name (A4): R03_V1/2051_168.dgn

2.3.1 Impact Due to Mine Infrastructure

The Underground Project will lead to destruction of any Aboriginal sites identified within the footprints of the following infrastructure:

- ventilation fan facilities and downcast ventilation shafts;
- borehole facilities including dewatering boreholes, materials and service boreholes and gas drainage boreholes required above the long wall panels as mining progresses, along with their associated access tracks, power lines, gas pipelines and other services and infrastructure;
- the overland conveyor from the North Saddlers ROM Facility to the existing CHPP, including a crossing of Saddlers Creek;
- site services including power lines, potable water pipelines, mine water and ground water pipelines, a water extraction point on the Hunter River, minor access roads and other minor infrastructure; and
- drainage works around infrastructure areas and within the underground mining area.

As discussed in **Section 2.2**, the majority of surface infrastructure associated with the project will be located within areas that have been destroyed by past mining operations or that have been subject to past archaeological investigation and salvage under Section 90 Consent (refer to **Section 5**). This includes the main surface facilities for each target coal seam and the North Saddlers ROM facility.

As mentioned in **Section 2.1**, the precise location of infrastructure such as ventilation fans, borehole facilities and associated access tracks and power lines, will not be known until mining in each area has commenced. The facilities will be located as part of the detailed mine planning process for each set of panels and will consider environmental factors including the location of Aboriginal sites. Further details regarding the management process for placement of surface facilities are included in **Section 9**.

2.3.2 Subsidence and its Potential Impact on Aboriginal Sites/Sensitive Areas

This section describes subsidence and its potential impacts on Aboriginal sites and areas of sensitivity from an Aboriginal heritage perspective.

As the coal in each longwall panel is removed, the overlying rock collapses into the void (goaf) left behind resulting in the lowering of the ground surface above the goaf. This results in ground surface subsidence in areas immediately above the mined longwall panels, interspersed by areas that do not substantially subside above the chain pillars that are located along the edge of each longwall panel.

The subsidence of the ground surface occurs in a wave-like manner as mining progresses along the longwall panel. This is likely to result in cracks at the surface in areas where mining is at shallow depths of cover. These cracks generally open up as the longwall passes beneath and then close again as the subsidence wave passes. The majority of subsidence occurs within three weeks of the longwall panel being removed in any location. Surface cracking may also occur along the edge of the longwall panel between the longwall panel and the chain pillar, in the area known as the tensile zone.

Underground mining generally has a limited impact on cultural heritage resources at the ground surface. Subsidence of the ground surface alone does not necessarily disturb cultural heritage sites such as stone artefact scatters but simply lowers their elevation.

However, sites located on rock exposures/outcrops may be affected adversely by subsidence due to the cracking of the rock on which they occur. The degree of environmental impact of subsidence is generally related to the depth of cover, that is, the depth of strata between the surface and the underground mining area. Greater subsidence impacts will occur in areas of shallow depth of cover. Surface cracking will be most extensive where the depth of cover is less than 100 metres and in these areas, subsidence remediation works may be required to repair cracking. These repair works typically include cultivation or deep ripping of the soil using machinery. These subsidence remediation works have the potential to impact on cultural heritage sites.

Where low gradient drainage lines are subsided, bed gradients may reverse and water flow may be blocked so that intermittent ponding can occur. Stream remediation works are sometimes required to maintain uninterrupted water flow within affected drainage lines. If required, these works will involve cut, fill and reshaping of drainage lines. Works may also be required in creeks in shallow depth of cover areas to repair cracking of the creek bed.

It is predicted that the maximum subsidence of the ground surface in any seam will be up to approximately 2.6 metres. This has the potential to result in:

- longitudinal and transverse surface cracking of soils and any rock platforms located parallel to chain pillars and at margins of the mining area;
- the need for repair of surface cracking, where required, by cultivation or ripping affected soils;
- the need for remediation works in drainage lines including in-channel earthworks; and
- erosion control works within subsidence remediation zones.

2.3.3 Previously Approved Mining Activity in Survey Area

Part of the approved Bayswater No. 3 open cut mining that has not yet been mined occurs within the survey area for the Underground Project. The impact of mining in this area was assessed in the Bayswater No. 3 EIS and was granted development consent in 1994. The survey work for this project has, however, provided further information about the cultural heritage sites in the approved mining area and this information is discussed in the report to assist in the planned future Section 90 consent process that will be required prior to commencement of the approved mining. The same situation occurs for the realignment of Edderton Road approved as part of the Bayswater No. 3 project but not yet completed.

The approved open cut mining area and approved Edderton Road realignment are both shown on **Figure 2.2**.

2.4 Summary of Potential Impacts on Aboriginal Sites and Values

For the purpose of this assessment it has been assumed that all Aboriginal sites and values identified within the areas of proposed direct impact by infrastructure for the Underground Project (refer to **Figures 2.1** to **2.2**) will be damaged/destroyed by these impacts as summarised in **Section 2.3.1.** Proposed services and ancillary mining infrastructure such as boreholes discussed in **Section 2.3.1** for which precise locations cannot be determined at this time and which are therefore not shown on **Figures 2.1** to **2.2** will be located to avoid impacts on Aboriginal sites where possible, with appropriate management measures implemented where impacts cannot be avoided (refer to **Section 6** and management strategy **Section 9**). These potential impacts are further assessed within **Section 8** of this report.

Impacts to Aboriginal sites and objects from subsidence and/or subsidence remediation works will be dependant on the degree of subsidence and the location of the site within the landscape (including gradient of the landform and type of landform) and in relation to the longwall panels and depth of cover. The nature of the impact will also rely on the site type. For example, should any axe grinding groove sites occur on outcrops in creeklines, they may be impacted by cracking in areas of predicted subsidence. Although subsidence itself is unlikely to cause damage to artefact scatters and isolated finds, if remediation works are necessary in landforms containing sites, artefacts could be disturbed/damaged or destroyed in the process, depending on the type and extent of remediation required.

The primary areas in which subsidence remediation work may be required are the tensile zones along the edge of longwall panels, in areas of shallow depths of cover (i.e. <100 metres depth of cover) and in drainage lines where remediation works are predicted to be required. This area is the potential subsidence remediation works impact area and is shown on **Figure 2.3**. The infrastructure required as part of the project that will impact on previously undisturbed areas are also shown on **Figure 2.3**.

The approved open cut mining area south-west of Quarry Creek (referred to as the West Belmont pit) will directly impact and destroy all sites identified within this area. These sites will be subject to Section 90 under the existing approval for Bayswater No. 3 and are not subject to assessment as part of the Underground Project.

Therefore in summary, there are three ways in which Aboriginal sites may be affected by the project. These are:

- disturbance, damage and/or destruction of sites/artefacts during the construction of surface infrastructure and surface drainage works;
- damage to sites located in rocky areas caused during the subsidence process; and
- disturbance, damage or destruction of sites/artefacts caused by surface cracking and subsidence remediation works, including stream remediation works.

3.0 Aboriginal Stakeholder Consultation and Participation

A full list of the nineteen registered Aboriginal stakeholder groups consulted as part of this project is provided in **Section 1**.

3.1 Notification and Registration

Mt Arthur Coal placed an advertisement in the *Hunter Valley News* on Wednesday, 18 May 2005 seeking registration of interest for participation in the consultation program for the Aboriginal cultural heritage assessment. Muswellbrook Shire Council, New South Wales Native Title Services, WLALC and DECC were all notified by letter on 13 May 2005 about the project and asked to provide information regarding the details of known Aboriginal stakeholder groups in the locality for Aboriginal consultation.

UHHC, WLALC, UHWC, GC, UAC, WNAC, WWCCS, HVAC, Y, HVCC, ANTC and VC registered their interest in the project in response to the May 2005 advertisement. Four Aboriginal groups (WEC, WC, WCH and LWTC) known to Umwelt were also contacted and subsequently registered. No new Aboriginal groups arose from the notification and registration process, however, three new Aboriginal community groups registered interest in the project, (MCC, MC and WC-AF) later in 2005, mid 2006 and December 2006 respectively.

3.2 Consultation Regarding Survey Strategy and Cultural Heritage and Conservation Values

Umwelt, on behalf of Mt Arthur Coal, invited 17 of the Aboriginal groups listed in **Table 3.1** (MC and WC-AF did not exist at that time) to participate in the initial meeting for the project held at the Mt Arthur Coal Administration Offices, Muswellbrook on 22 December 2005. Follow up telephone contact was made with each group to ensure that they had received their invitation to the meeting and to discuss any comments or concerns prior to the meeting. Fifteen of the known registered Aboriginal community groups were represented at the meeting (WWCCS and WC did not attend).

At the initial meeting, a description of the project was presented by Mt Arthur Coal and a description of the project's history, conservation areas, previous archaeological research and the proposed survey strategy was presented by Umwelt. This presentation involved a male representative John Merrell (Associate and Project Manager for the Mt Arthur Underground Project EA) and a female representative Mary-Jean Sutton (Senior Archaeologist) from Umwelt. It also involved a male representative, Carl Bagnall (Environmental & External Affairs Manager) and a female representative, Narelle Wolfe (Community Relations Coordinator) from Mt Arthur Coal. Aboriginal stakeholder group representatives were encouraged to discuss any comments or concerns with any of the male or female representatives on the day or after the meeting if they did not wish to provide them in an open forum discussion or felt that they had gender sensitive information to provide regarding cultural heritage. No such gender specific issues or comments were raised by the Aboriginal stakeholder representatives during or subsequent to the meeting.

Discussion sessions were held with the groups regarding conservation values and the proposed survey strategy. The groups were provided with a draft survey strategy to take away for their comment. The use of two female archaeologists, Mary-Jean Sutton and Jillian Ford for the duration of the fieldwork program was discussed on the day and no problems

were seen to arise from this by the groups. A draft proforma was attached with this document to assist the groups with providing comment. A copy of the presentation provided on the 22 December 2005, the draft survey strategy and proforma are provided in **Appendix 2**. The groups were also requested to provide any information in relation to any stories or known cultural heritage sites or places (including any mythological sites/places) in the Underground Project area. It was reiterated to the groups several times during the meeting that discussion of any comments, problems, issues or cultural knowledge could be undertaken at any time with representatives from Mt Arthur Coal or Umwelt and contact details were provided on the day.

A project area site inspection was also carried out during the meeting. The purpose of the inspection was to show the Aboriginal groups, the landscape and terrain within the Mt Arthur Underground Project Area in order for them to provide informed comments on the proposed survey strategy.

3.2.1 Follow up Consultation after Presentation and Site Inspection

After compilation of Aboriginal stakeholder group input from the 22 December 2005 meeting, a revised survey strategy was sent to all Aboriginal stakeholder groups (23 December 2005). In addition to commenting on the survey strategy, the stakeholder groups were asked to comment on their preference for fieldwork participation (for example, tender process or all groups involved on a rotational basis) and in relation to conservation offsets. Comments received are summarised in **Table 3.1**. The comment period was extended from the required 21 days to close on 19 January 2006 due to the Christmas-New Year period.

Table 3.1 - Summary of Comments Made by Aboriginal Groups

Aboriginal Group	Representative	Response to Presentation
Wanaruah Custodians	Mrs Barbara Foot	Mrs Foot provided verbal comment regarding the proposed survey strategy. Mrs Foot was concerned about the location of 'The Pocket' (at Mt Arthur) and its relationship to the Mt Arthur Underground Project. Mrs Foot was also concerned that many of the representatives in the community did not have the appropriate knowledge to identify sites properly.
Upper Hunter Wonnarua Council Inc	Mr Victor Perry, Cultural Heritage Manager	UHWC stated that they agreed with the proposed survey strategy and had no preference between rotational involvement and tender process for Aboriginal stakeholder group involvement in fieldwork. UHWC had no additional comments for the survey strategy but requested further information regarding the proposed offsets and conservation zones.
Valley Culture	Mr Larry van Vliet	VC stated that they agreed with the proposed survey strategy and would prefer if all Aboriginal involvement for fieldwork was rotational and involved all Aboriginal stakeholder groups.
Aboriginal Native Title Consultants	Mr John and Mrs Margaret Matthews	ANTC stated that they agreed with the proposed survey strategy and would prefer if all Aboriginal involvement for fieldwork was rotational and involved all Aboriginal stakeholder groups.
Upper Hunter Heritage Consultants	Mr Darrel Matthews	UHHC stated that they agreed with the proposed survey strategy and would prefer if all Aboriginal involvement for fieldwork was rotational and involved all Aboriginal stakeholder groups.

Table 3.1 - Summary of Comments Made by Aboriginal Groups (cont)

Aboriginal Group	Representative	Response to Presentation
Lower Wonnarua Tribal Consultancy Pty Ltd	Mr Barry Anderson	LWTC did not provide a written or verbal comment regarding the survey strategy. Mr Anderson did state during the initial meeting that the survey should focus on creek lines, representative landforms and aim for a 100% ground cover.
Wonnarua Cultural Heritage	Mr Gordon Griffiths	WCH stated that they agreed with the proposed survey strategy and would prefer if all Aboriginal involvement for fieldwork was rotational and involved all Aboriginal stakeholder groups. WCH also commented that they agreed with the heritage conservation offsets discussed at the meeting.
Wonnarua Nation Aboriginal Corporation	Mr Robert Lester, Chairperson	WNAC put in a joint submission with Yarrawalk (Y) The written submission states that WNAC and Y oppose the suggested survey strategy because 'in its current form it fails to provide the descendants of the Traditional Owners with adequate information (or time) to supply an informed opinion on the cultural heritage of the proposed area'. The letter stated that Y and WNAC had concerns regarding the timing of the comment period for the survey strategy and also regarding the location of reputed The Pocket massacre site in relation to the Mt Arthur Underground Project.
Wattaka Wonnarua CC Service	Mr Des Hickey, Manager	WWCCS stated that they agreed with the proposed survey strategy and would prefer if all Aboriginal involvement for fieldwork was rotational and involved all Aboriginal stakeholder groups. Mr Hickey stated that he would require more time to access 'previous archaeological research reports concerning the project' and had agreed to the proposed survey strategy 'in principal'.
Yarrawalk	Mr Scott Franks, Managing Director	Y provided a joint submission with WNAC. Refer to WNAC's comments.
Hunter Valley Aboriginal Corporation	Ms Julie Griffiths	HVAC preferred that all Aboriginal community involvement in fieldwork be rotational and involve all Aboriginal community groups.
Giwirr Consultants	Mr Rodney Matthews, Manager	GC agreed with the proposed survey strategy and made no further comment.
Hunter Valley Cultural Consultants	Ms Christine Matthews	HVCC stated that they agreed with the proposed survey strategy and would prefer if all Aboriginal involvement for fieldwork was rotational and involved all Aboriginal stakeholder groups.
Muswellbrook Cultural Consultant	Mr Brian Horton	MCC stated that they agreed with the proposed survey strategy and would prefer if all Aboriginal involvement for fieldwork was rotational and involved all Aboriginal stakeholder groups.
Ungooroo Aboriginal Corporation	Mr Graham Ward CEO	UAC stated that they agreed with the proposed survey strategy.

Table 3.1 - Summary of Comments Made by Aboriginal Groups (cont)

Aboriginal Group	Representative	Response to Presentation
Wanaruah Local Aboriginal Land Council	Mr Barry McTaggart	WLALC stated that they agreed with the proposed survey strategy. WLALC stated that they were the only 'constituted body representing the Aboriginal community' and would like to be present during the survey.
Wonnarua Elders Corporation	Mrs Rhoda Perry/Mr Tom Miller	No response was received.

3.2.2 Summary

In total, 14 written and one verbal response were received from the 17 Aboriginal stakeholder groups who had registered an interest at that stage of the project. Written formal responses from the Aboriginal stakeholder groups relating to the draft survey strategy are included in **Appendix 3**. All Aboriginal stakeholder groups that provided comment agreed with the survey strategy except for WNAC and Y. Both Y and WNAC ticked the yes box for the agreed with survey strategy response but added that this was under 'duress'. Of the 14 groups who provided written comment, 11 agreed with the rotational involvement of all registered Aboriginal stakeholder groups. Y, WWCCS, WNAC and WLALC stated that they preferred fieldwork be tendered. All comments provided by Aboriginal stakeholder groups were incorporated into the final survey strategy where appropriate.

The concerns of Mrs Foot of WC, Mr Lester of WNAC and Mr Franks of Y, regarding the location of the reported massacre site, 'The Pocket' were responded to in follow up correspondence and verbal consultation (the issue was resolved over the phone in Mrs Foot's case) (refer to **Appendix 4**). The Pocket is outside the Mt Arthur Underground Project Area and within the Mt Arthur Conservation Area (refer to **Section 5.1** for further discussion). Mr Lester and Mr Franks concerns regarding the short period for survey comment was addressed by providing an additional week to the 21 day comment period for the survey strategy.

No cultural knowledge was provided during the initial comment period. No issues were raised by the Aboriginal stakeholder groups regarding the gender of the archaeologists undertaking the survey. No community representatives were identified by the stakeholder groups (outside those already contacted in **Table 3.1**) as having cultural knowledge who should be contacted as part of the Aboriginal consultation program.

3.3 Fieldwork Involvement

Based on the consultation undertaken for the draft survey strategy, fieldwork was organised to involve six Aboriginal group representatives with two archaeologists on a rotational basis over a 20 day survey period. All 16 Aboriginal stakeholder groups who registered an interest in fieldwork involvement for the project were sent an invitation (13 January 2006) to provide a submission for rotational involvement in the Aboriginal heritage survey. WEC was not invited as they had indicated that they did not wish to be involved in the survey. The submission form requested that the groups provide information in relation to the experience of the representatives they proposed for participation in the survey. There were selection criteria for participation to ensure that the survey could be carried out effectively and safely by people with appropriate experience. These selection criteria included the following:

- representatives must have appropriate experience, ability and reliability;
- the group must demonstrate they have appropriate insurance;
- the group must be able to provide each of their representatives with appropriate Personal Protective Equipment and Clothing (PPE&C) including boots, long trousers and hat;
- representatives must be physically fit, capable of walking over steep slopes and have no serious medical conditions which are likely to inhibit fitness during fieldwork;
- representatives must have demonstrated ability to work effectively in a team environment; and
- individuals can only be represented by a single head organisation for the purpose of this fieldwork.

Mt Arthur Coal also wished to extend the opportunity for Aboriginal stakeholder groups to include trainees in the survey program. The involvement of trainees was suggested for one representative with the remaining two representatives for each group nominated to be experienced fieldworkers. This offer was made to provide training opportunities for Aboriginal people as part of the fieldwork program.

Fifteen Aboriginal stakeholder groups wished to be involved in the survey and were allotted field days. LWTC did not provide a submission due to illness. Attempts (including written correspondence, faxed correspondence and telephone messages) were made to provide LWTC with field days later during the survey but no response was received. Several stakeholder groups failed to attend their field days or provide the number of representatives outlined on the submission during the fieldwork period (WNAC, WCH, UHHC, UHWC and WC). Notice was provided in most cases and fieldwork was rearranged using different stakeholder groups. Representatives involved in fieldwork are listed in **Table 6.1** in **Section 6**.

3.4 Senior Family Representatives - Site Tour

After the conclusion of the survey, an opportunity was provided for senior family representatives (elderly knowledge holders, elders), of the registered Aboriginal stakeholder groups to have a tour of the Underground Project area if desired, as these persons may not have had the physical fitness levels to participate in the field survey. The site tour was scheduled for 11 December 2006. Mrs Barbara Foot of WC was the only senior family representative to register an interest in the site tour. Mrs Foot was taken to see several sites within the survey area which had been assessed as having high scientific significance. Following review of the draft report Mrs Foot was also provided two further tours of the project area including the proposed offset area. Mrs Foot provided information regarding sites and artefacts (refer to Mrs Foot's comments in **Section 7.1**, **8.5.1.12** and in full in **Appendix 5**).

3.5 Draft Aboriginal Archaeological Assessment Review

3.5.1 Presentation of Draft Aboriginal Archaeological Assessment and Site Tour

The draft Aboriginal archaeological assessment report was provided to 16 registered Aboriginal stakeholder groups for their comment on 12 December 2006 at a meeting at

Mt Arthur Coal. Draft reports were forwarded to the remaining groups that could not attend the meeting. The meeting included a detailed presentation that outlined the results of the survey, discussed the significance assessment including any Aboriginal community comments made in the field, discussed proposed management measures and outlined the proposed cultural heritage offset package. An opportunity was provided on the day of the meeting for the Aboriginal stakeholder groups to visit the sites they had identified as significant during the survey period and to visit sections of the Proposed Saddlers Creek Offset Area. Claire Everett of the DECC also attended the meeting and site/Offset visit.

A proforma was provided to the Aboriginal stakeholder groups to assist them with providing detailed comments on the cultural heritage significance of each identified site and to gain input regarding the Proposed Saddlers Creek Offset Area and the appropriateness of the draft management and offset strategy (refer to **Section 8.4**); and the Research Design and Methodology (refer to **Section 8**).

3.5.2 Consultation during the Review Period and Finalisation of the Aboriginal Archaeological Assessment

The closing date for the Aboriginal stakeholder group comments for the draft Aboriginal archaeological assessment was Friday, 19 January 2007. During the comment period, face to face meetings and assistance with preparation of written comments was provided by Umwelt (at the request of certain Aboriginal stakeholder groups) when necessary. Additional inspections of the survey area were also undertaken as requested by Aboriginal stakeholder groups, including a further two site visits with Mrs Barbara Foot (WC – refer to **Section 3.4**).

After the Aboriginal stakeholder group comment period expired, only twelve Aboriginal stakeholder groups had provided comment. These twelve groups included WEC, WLALC, MCC, UAC, WC, UHWC, VC, WCH, GC, WWCCS, UHHC and WC-AF. WEC advised that their views were represented by UHWC's comments (Rhoda Perry pers comm. 16 January 2007). All twelve responses outlined that the project area has Aboriginal heritage significance to the Aboriginal community. Copies of all written comments provided by the registered Aboriginal stakeholder groups to date is provided in **Appendix 5** and summarised in **Table 3.2**.

All written comments by the Aboriginal stakeholder groups were reviewed by Mt Arthur Coal. These comments were addressed and revisions were made, where possible to the offset and management strategy (refer to **Section 8.4**). The revised offset and management strategy was presented (as part of an information session) to the Aboriginal stakeholder groups on 17 July 2007 at the Mt Arthur Underground Project Office, Muswellbrook. All 19 Aboriginal stakeholder groups were invited to the presentation. Fifteen Aboriginal stakeholder groups attended the information session including HVCC, HVAC, GC, VC, MCC, MC, UHHC, ANTC, WC, WC-AF, Y, UAC, WWCCS, WLALC and UHWC. All groups were provided with the opportunity to comment and discuss the revised offset and management strategy. All 15 groups that attended the meeting were presented with a copy of the PowerPoint presentation presented at the meeting and a proforma to assist them with providing detailed comments on the appropriateness of the revised offset and management strategy from an Aboriginal cultural heritage perspective. Aboriginal stakeholder groups that did not attend the meeting were posted a copy of the PowerPoint presentation and the proforma to assist them with providing comments on the revised offset and management strategy and to include them in the consultation process.

Prior to and after the closing date for Aboriginal community comments on the draft report and after the closing date for comments on the revised draft offset and management strategy, Umwelt made numerous requests for comments to the groups that had not yet provided comments. A log of these requests/reminders, which included phone calls and faxes, is included in **Appendix 1**.

3.6 Summary

Nineteen Aboriginal groups were consulted for this project in accordance with the DECC Aboriginal Cultural Heritage Guidelines (1997 - formerly NSW National Parks and Wildlife Service) and the *DECC Interim Community Consultation Requirements for Applicants* circulated by DECC in December 2004 and DECC's draft Part 3A assessment guideline *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*, *July 2005.* These groups included the WLALC, the Local Aboriginal Land Council responsible for the project area. Eighteen other registered stakeholder groups representing the Aboriginal stakeholders in the general region were also consulted. MCC were established in early December 2005. MC were not established until after the fieldwork component of the project was completed (April 2006) and thus have only been included in the latter stages of the consultation program. WC-AF registered for Aboriginal consultation in December 2006 and were consulted after this time.

Table 3.2 provides a summary of all Aboriginal consultation for the project, with further detail included in **Appendix 1**.

Table 3.2 - Summary of Consultation

Date	Form of Consultation	Aboriginal Stakeholder Groups Contacted
13 May 2005	Letters of notification were sent by Umwelt to five agencies including those indicated in DECC's guidelines for stakeholder consultation.	WLALC
18 May 2005	Advertisement in Hunter Valley News.	N/A
2 December 2005	Advertisement in Muswellbrook Chronicle.	N/A
8/9 December 2005	Umwelt sent an invitation to sixteen registered Aboriginal stakeholder groups to participate in the consultation program and a survey strategy and conservation values presentation with a site tour on 22 December 2005 at Mt Arthur Coal offices. This invitation included a request for Aboriginal stakeholder groups to provide input/knowledge on Aboriginal cultural heritage.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
8 December 2005 to 21 December 2005	Follow up telephone contact made by Umwelt to discuss proposed meeting and confirm attendance.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
19 December 2005	Invitation to Brian Horton, MCC to participate in the consultation program and a survey strategy and conservation values presentation with a site tour on 22 December 2005 at Mt Arthur Coal offices.	MCC

Table 3.2 - Summary of Consultation (cont)

Date	Form of Consultation	Aboriginal Stakeholder Groups Contacted
22 December 2005	Meeting held with Aboriginal stakeholder groups and Mt Arthur Coal that provided an introduction to the project, discussion of draft survey strategy and conservation values and potential Aboriginal cultural heritage offsets and also provided a site tour of the Mt Arthur Survey Area. This meeting included a request for Aboriginal stakeholder groups to provide information and knowledge on Aboriginal cultural heritage.	ANTC, GC, HVAC, WTC, MCC, WLALC, UAC, UHHC, WCH, WNAC and Y.
23 December 2005	Draft survey strategy was sent out to Aboriginal stakeholder groups not present at the meeting. The draft survey strategy included a request for Aboriginal groups to provide input/knowledge on Aboriginal cultural heritage.	WEC, VC, UHWC, HVCC, WC and WWCCS.
9 January to 19 January 2006	Telephone consultation with the Aboriginal stakeholder groups to integrate comments into the proposed survey strategy including written correspondence extending comment period an additional week for survey strategy review. Incorporation of comments into draft survey strategy.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
13 January 2006	Invitation sent to all Aboriginal stakeholder groups that stated they wished to be involved in fieldwork including a job package and submission form for groups to fill in for involvement in fieldwork on a rotational basis.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
13 January 2006 to 22 January 2006	Follow up telephone consultation to ensure fieldwork submissions were provided on time and all details were correctly filled out prior to evaluation of submissions.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
24 January 2006	Written acceptance of nominated representatives for fieldwork. All registered groups interested in fieldwork involvement were provided field time.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
24 January 2006 to 30 January 2006	Follow up telephone consultation with Aboriginal stakeholder groups for confirmation of field dates.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS and Y.
30 January 2006 to 10 February 2006	Fieldwork involvement with Aboriginal stakeholder groups for Stage 1. Requests were made during fieldwork to Aboriginal stakeholder representatives to provide information/knowledge on Aboriginal cultural heritage during the survey. All comments/input made by Aboriginal stakeholder groups were recorded during fieldwork.	GC, HVCC, MCC, WLALC, UAC, UHHC, UHWC, WC, WWCCS and Y.

Table 3.2 - Summary of Consultation (cont)

Date	Form of Consultation	Aboriginal Stakeholder Groups Contacted
10 February to May 2006	Telephone and fax communications for organisation of fieldwork commitments during Stages 1 and 2. Requests were made during fieldwork to Aboriginal stakeholder representatives to provide information/knowledge on Aboriginal cultural heritage during the survey. All comments/input made by Aboriginal stakeholder groups were recorded during fieldwork.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS and Y.
April to May 2006	Fieldwork involvement with all Aboriginal stakeholder groups for Stage 2.	ANTC, GC, HVAC, HVCC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH and WNAC.
11 December 2006	Inspection of significant archaeological sites and offset areas with senior family representatives (Elders). (All groups were invited, however, only one group attended the inspection). Further requests were made to Aboriginal stakeholder groups on the invitation and during the day to provide information/knowledge on Aboriginal cultural heritage values and sites within the survey area.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, MCC, MC WEC and Y were all invited to attend. WC attended the actual site inspection.
12 December 2006	Presentation of draft Aboriginal archaeological assessment report to Aboriginal stakeholder groups and site inspection of significant archaeological sites and offset areas. Further requests will be made to Aboriginal stakeholder groups to provide information/knowledge on Aboriginal cultural heritage values and sites within the survey area.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.
12 December 2006	Provision of draft Aboriginal archaeological assessment report to Aboriginal stakeholder groups for comment.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.
December 2006 to January 2007	Follow up telephone contact with Aboriginal stakeholder groups to discuss draft Aboriginal archaeological assessment report comments including a follow up fax.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.
December 2006 to April 2007	Face to face meetings (as requested), additional site inspections (as requested) and telephone and written contact to discuss draft Aboriginal archaeological assessment report and prepare comments.	WC, WHC AND MCC (as requested).

Table 3.2 - Summary of Consultation (cont)

Date	Form of Consultation	Aboriginal Stakeholder Groups Contacted
December 2006 to April 2007	Consultation (telephone and written correspondence) with Aboriginal stakeholder groups chasing up their comments for the draft Aboriginal archaeological assessment report.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.
9 July 2007	Invitation to all Aboriginal stakeholder groups to attend an information session and presentation on the revised offset and management strategy for the Aboriginal archaeological assessment for the Underground Project.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.
9-16 July 2007	Follow up telephone contact with Aboriginal stakeholder groups to confirm their attendance for the information session and presentation on the revised offset and management strategy for the Aboriginal archaeological assessment for the Underground Project.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.
17 July 2007	Information session and presentation on the revised offset and management strategy for the Aboriginal archaeological assessment for the Underground Project at the Mt Arthur Underground Project Office	ANTC, GC, HVAC, HVCC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WWCCS, MCC, MC and Y.
23 July 2007	Aboriginal stakeholder groups that did not attend the presentation on 17 July 2007 were posted a copy of the PowerPoint presentation and a proforma to assist them with their comments on the appropriateness of the revised offset and management strategy from an Aboriginal cultural heritage perspective.	LWTC, WCH, WNAC and WEC.
17 July 2007 to 7 September 2007	Follow up telephone contact with Aboriginal stakeholder groups to discuss their comments on the revised offset and management strategy. This contact included messages left on mobile phones and home phones.	HVAC, LWTC, WLALC, UAC, UHWC, WC-AF, WCH, WWCCS and WEC.
7 September 2007	Finalisation of the Aboriginal archaeological assessment report and integration of Aboriginal stakeholder group comments into the final document.	

The registered Aboriginal stakeholder groups for the project will be provided with a copy of the final version of this report.

4.0 The Environmental Context

The purpose of this section of the report is to describe the local environmental context of the survey area and where applicable, the wider Underground Project area (refer to **Figure 1.2**). The environmental context provides information about the landscape including the topography, hydrology, geology, soils and fauna and flora, all of which are important factors relating to Aboriginal resource exploitation and Aboriginal site distribution within the survey area.

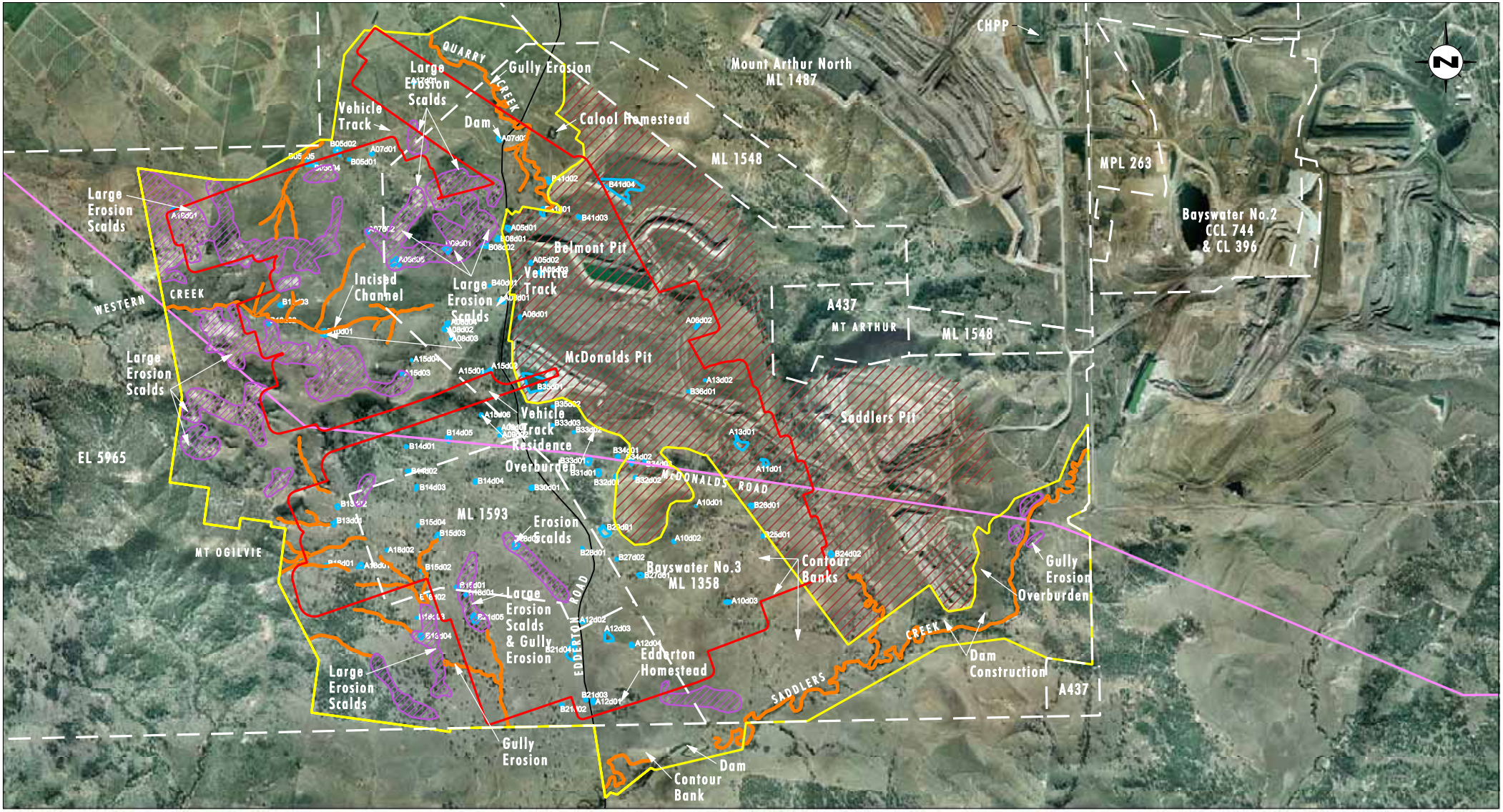
This section commences with a discussion of past European land use practices. An understanding of past land use practices is important as it provides information that assists with understanding how the survey area has changed since European settlement and how this may have affected the survival/integrity of any Aboriginal sites it may contain. The information provided in this section is used (along with the archaeological context provided in **Section 5**) to prepare a predictive model for site location and site type for the survey area (refer to **Section 5.9**).

4.1 Previous Development and Prior Land Use History

The survey area contains evidence of prior disturbance due to agricultural practices, infrastructure development and previously approved mine developments (refer to **Figure 4.1** 2006 aerial photograph and **Figure 4.2** 1967 aerial photograph).

The dominant land uses within and adjacent to the survey area are mining and grazing. As shown on the **Figure 4.1**, the land to the far east has been subject to disturbance from Saddlers Pit and associated infrastructure. Edderton Road dissects the survey area into two separate areas to the east and west. McDonalds Road runs on an east-west axis from its junction at Edderton Road through the eastern section of the survey area, passing through the McDonalds Pit and associated overburden emplacement areas and leading into the Saddlers Pit area. Numerous other graded and ungraded vehicle tracks service the eastern area, most of which were initially constructed as part of the agricultural use of the land (some of these have been upgraded and are currently maintained by the mine). Previous mine development has transformed some of the terrain, for example, areas of overburden near the edges of the eastern section of the survey area associated with McDonalds Pit (for further details refer to Modified Terrain in **Section 6, Table 6.1**).

There is evidence of previous agricultural land use within the broader survey area including dams, fencing, clearing of native vegetation and disturbance of creek morphology associated with erosion accelerated by pastoralism and agriculture. This disturbance extends back to the use of the survey area in 1967 (refer to **Figure 4.2**). Large erosion scalds are evident on Western Creek and its northern and southern banks and associated crests and slopes in the western section of the survey area (refer to **Figure 4.1**). These scalds are more extensive in 1967 and indicate the heavy impacts of grazing and clearing on the landscape during this time (refer to **Figure 4.2**). Large scalds are also visible on Saddlers Creek particularly in the section of the creek upstream of Edderton Road and also along the minor tributaries of Quarry Creek (refer to **Figures 4.1** and **4.2**) in the northern section of the survey area. Clearing associated with the large transmission line easement in the western section of the survey area appears to have resulted in massive erosion of the upper slopes and crest landform elements. Vehicle tracks have also accelerated erosion across the ridgeline/ridge crest terrain units within the western section of the survey area. Trampling and grazing by cattle has caused large erosion scours within the western section of the survey area. Alternatively, the steeper slopes of Mt Ogilvie consist of remnant vegetation which has been subject to low intensity periodic grazing.



Source: Mt Arthur Coal, 2006

0 1 2 3km
1:60 000

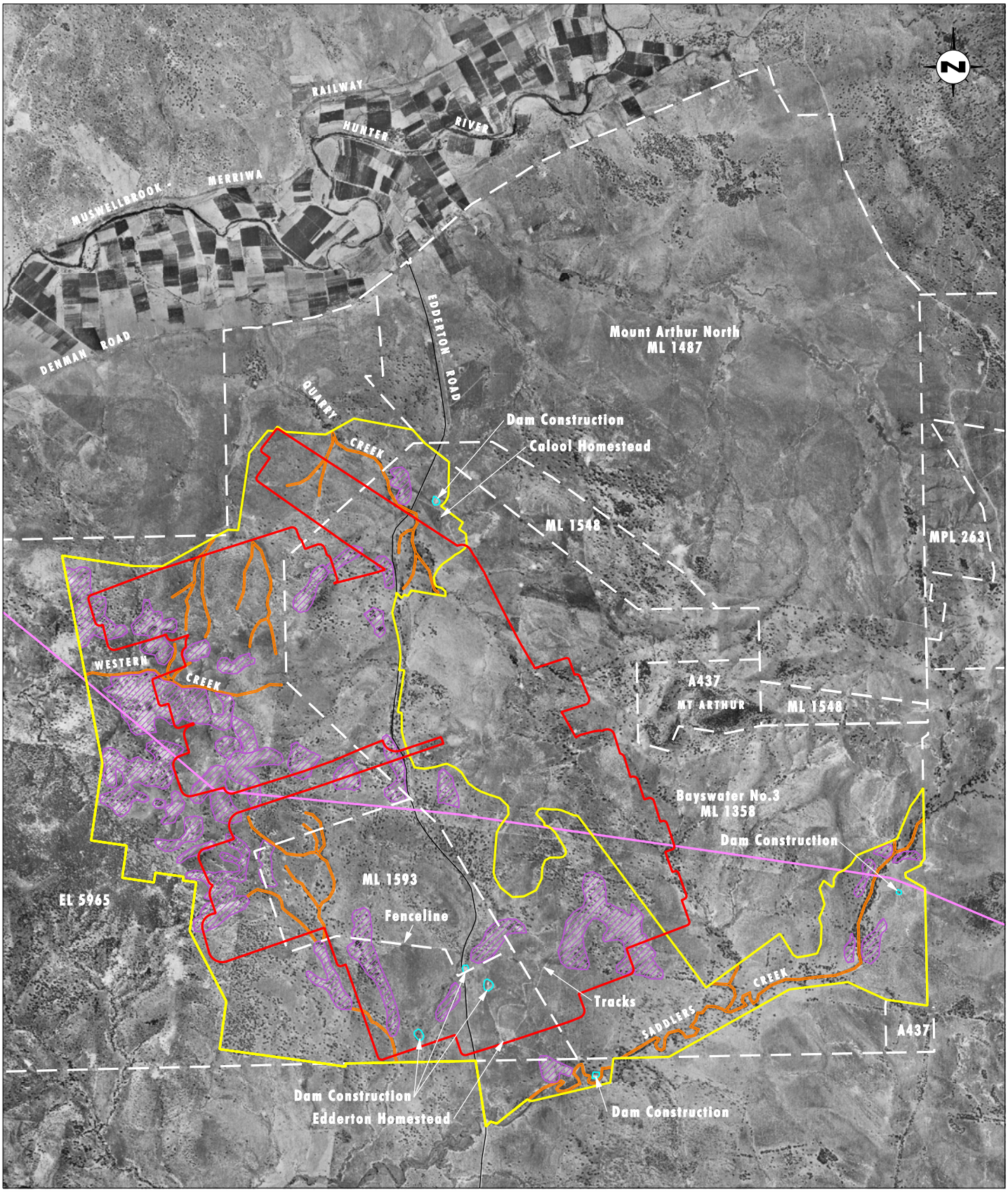
Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Subsidence Affectation Area
- Bayswater No.3 Mining Area
- Incised Channels from Erosion
- Large Areas of Advanced Erosion
- Existing Transmission Line
- Dam

FIGURE 4.1

Previous Land Use History, 2006 Aerial Photograph

File Name (A4): R03_V1/2051_179.dgn



Base Source: Land and Property Information Services

0 1 2 3km
1:65 000

Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Subsidence Affectation Area
- Existing Transmission Line
- Incised Channels from Erosion
- Large Areas of Advanced Erosion

FIGURE 4.2

1967 Aerial Photograph of the Umwelt Survey Area

To the north and north-east of the project area and outside the survey area, the more productive lands along the Hunter River are used for irrigated pasture/fodder crops, with areas also used for horse studs and dairies. A number of vineyards and olive groves also exist in this area, including Rosemount's Roxburgh Vineyard which is adjacent to the northern-western boundary of the survey area. Agricultural land use also dominates outside of the project area to the south, east and west within the general locality.

4.1.1 Implications for Aboriginal Resource Distribution/Site Location

Prior land use practices in the survey area are likely to have resulted in the following implications for Aboriginal resource distribution and site location (refer to **Section 5** for definitions of site types mentioned below):

- the removal of scarred and/or carved trees during land clearance;
- the removal of floral species that were valued resources for Aboriginal people;
- the removal of fauna species that were valued resources for Aboriginal people;
- the introduction of non-endemic flora and fauna that has replaced some native flora and fauna, making it difficult to reconstruct the pre-European Aboriginal resource base;
- a change in the hydrology of the creeks and thus in their morphology and endemic flora and fauna which could have been resources utilised by Aboriginal people;
- disturbance and potentially destruction of artefact scatters located along creek lines due to erosion and the construction of dams and creek crossings;
- an increase in the down slope movement of soil (colluvium) and any artefacts it may contain, and the mixing and reburial of artefacts from different sites and of different ages in areas where this colluvium has aggraded at the base of slopes;
- in areas of cultivation, both vertical and horizontal movement and mixing of artefacts of different ages within the soil profile;
- destruction by cultivation or stock trampling of sites such as Bora rings, stone arrangements and cairns (if they existed); and
- destruction of potential sites located in areas associated with farm infrastructure, vineyards and dairies.

4.2 Topography and Hydrology

4.2.1 Topography

The survey area lies within the Central Lowlands. Hughes (ERM 2004a) describes the Central Lowlands topography as a:

> … belt of lowlands developed on relatively weak sedimentary rocks. These lowlands continue down to the coast. While the general altitude gradually rises inland from sea level to 500 m at Murrurundi, the local relief in any given locality rarely exceeds 60 m. The landscape is undulating or gently hilly with an abrupt transition to the steep country on either side. A line of alluvial flats between 0.5 and 2.5 km wide extends along the Hunter River and its major tributaries where they flow through the lowland belt.

The topography of the locality surrounding the survey area is dominated by Mt Arthur (482 metres) which is approximately in the middle of Mt Arthur Coal's existing operational area and Mt Ogilvie (468 metres) which occurs outside the boundary of the western section of the survey area (refer to **Figure 1.2**). In the northern half of the survey area the elevation rises from the alluvial flats of the Hunter River (at an elevation of approximately 120 metres) to Mt Ogilvie with gently undulating slopes becoming progressively steeper in the vicinity of Mt Ogilvie. In the southern half of the survey area the elevation rises from the floodplain associated with Saddlers Creek (at an elevation of approximately 120 metres) north to Mt Ogilvie and Mt Arthur with gently undulating slopes that once again become progressively steeper as they approach the two mountains.

A ridge extends from the middle of the eastern boundary of the survey area (near Edderton Road) and trends approximately southwest to join Mt Ogilvie. This ridge acts as the major drainage divide in the survey area, with all land to the north draining to the Hunter River either via Quarry Creek or other north/northwest flowing tributaries, while land to the south of the ridge drains to the Hunter River via Saddlers Creek. An unnamed creek which runs in an east/west direction to the south west of Quarry Creek and forms part of the Hunter River's tributary system, is referred to as Western Creek throughout this assessment report.

4.2.2 Hydrology

This section provides a description of the major watercourses throughout the survey area.

4.2.2.1 Quarry Creek

Quarry Creek flows in a northerly direction to the Hunter River (refer to **Figure 4.1**). The catchment area of Quarry Creek is approximately 2230 hectares. This area has been reduced by the development of open cut mining pits in the upper catchment area. The land on either side of the creek is used primarily for grazing purposes.

The creek is generally in poor condition with erosion of the creek bed and banks with the majority of riparian vegetation cleared from previous land use, leaving isolated, sparse pockets of riparian vegetation scattered along the creek banks. Restrictions on stock access to the creek immediately downstream of Edderton Road implemented by Mt Arthur Coal in recent years have assisted in recovery of the creek in this area.

Quarry Creek flows into a dam to the north of the project area. This dam is located adjacent to Roxburgh Vineyard and releases water downstream via Quarry Creek to the Hunter River.

4.2.2.2 Western Creek

This unnamed creek flows in a westerly direction into the Hunter River (refer to **Figure 4.1**). The catchment is approximately 1400 hectares in area and consists primarily of land used for grazing. The catchment area shows signs of erosion with contour banks constructed on the slopes adjacent to the creek to control and assist in the remediation of surface erosion. The middle to lower reaches of the creek line and its tributaries have been impacted by significant gully and bank erosion, with the upper reaches being in a generally stable condition. A thin fringe of riparian vegetation remains along a reasonable portion of the main channel of the creek, with the majority of the tributaries heavily cleared.

4.2.2.3 Saddlers Creek

Saddlers Creek is located in the south of the survey area (refer to **Figure 4.1**). The creek flows in a south-westerly direction and is a tributary of the Hunter River. The total catchment area of Saddlers Creek is approximately 8700 hectares. The surrounding catchment area

consists primarily of agricultural grazing land. McDonalds Pit and Saddlers Pit in the Bayswater No. 3 mining area are located within Saddlers Creek catchment area. Sections of the upper tributary system of Saddlers Creek have been destroyed (and diverted) by the development of these pits. The creek has significant areas with riparian vegetation. There are significant erosion scarps caused by bank collapse along sections of the main creek channel and significant erosion of some of the banks and channels of the creek and its tributaries. The creek is intercepted by numerous dams, the most major dam immediately upstream of Edderton Road.

4.2.3 Impact of European Land Use

The availability of water is a determining factor for Aboriginal site location and it is a general expectation that larger camp sites will be located near permanent water and semi-permanent water and smaller camp sites will be located in areas where water resources are more ephemeral. As discussed in **Section 4.1**, European land use practices have changed the morphology of the watercourses within the survey area so that it is now difficult to know where water may have been available on a permanent or semi-permanent basis, particularly in minor tributaries of the main watercourses.

European land use (particularly tree clearance and grazing) has also resulted in major areas of erosion along the banks of the creeks within the survey area. This erosion is likely to have acted to damage or destroy sites located in close proximity to the creeklines in these areas.

4.2.4 Implications for Aboriginal Resource Distribution/Site Location

The topography and hydrology of an area directly impact upon the likelihood of Aboriginal occupation. For example, areas of low gradient in association with permanent or semi-permanent water are generally preferred for camp sites, and creek confluences are often the location of sites. Areas such as spur crests and ridge crests that offer broad outlooks may also be used for camp sites when there is a requirement to watch out for approaching allies/enemies, plan a hunt or take advantage of a cooling breeze. Creeklines or spur crests may provide excellent travel routes between resources; however, spur crests are generally at a distance from water and thus are only likely to contain small amounts of artefactual material related to transient use rather stays of a longer duration.

Based on the availability and reliability of water it is feasible to suggest that larger camp sites are more likely in areas of low gradient along the main channels of Saddlers Creek, Quarry Creek and Western Creek. Smaller camp sites are more likely in the upper reaches of these creeks and their associated minor tributaries in better drained areas of steeper gradient. It is also likely that there will be more sites along the main channels, which will be closer together (or may even overlap) in areas where there was reliable water; whilst the smaller sites in the upper creek and tributary systems will be low in number and more widely dispersed.

4.3 Geology and Soils

The survey area is situated within the Hunter Coal Field in the northern section of the Sydney Basin. The majority of coal seams in the survey area were formed in the Permian period and are contained within the Wittingham Coal Measures. The geological landscape for the survey area includes sections of the Branxton Formation (sandstone, siltstone and tillitic conglomerate) and parts of the Dalwood Group (sandstone, siltstone, mudstone, shale, conglomerate, tuff, basalt and erratics) (Sydney Basin Geological Mapping Sheet 1:500,000 1967).

4.3.1 Soil Landscapes

The soil types occurring within the survey area are mapped on the Singleton 1:250,000 Soil Landscapes Map Sheet (digital mapping provided by Department of Natural Resources (DNR), 2005) and described in Kovac and Lawrie (1991). Six soil landscapes occur within the survey area. These are the:

- Liddell Soil Landscape;
- Bayswater Soil Landscape;
- Brays Hill Soil Landscape;
- Ogilvie Soil Landscape;
- Dartbrook Soil Landscape; and
- Hunter Soil Landscape.

The Liddell Bayswater and Brays Hill Soil Landscapes are the dominant soil types occurring within the survey area, while the remaining three are present only in small patches. A summary of the characteristics of these soil landscapes is provided in **Sections 4.3.1** to **4.3.5**.

4.3.1.1 Liddell Soil Landscape

The Liddell Soil Landscape is dominant across the project area and across the central portion of the survey area, occurring over undulating terrain. This soil landscape is predominantly comprised of Yellow Soloths, with Yellow Solodic Soils on the upper slopes and Earthy and Siliceous Sands occurring on lower slopes with siliceous parent rock. Less abundant soil types present include the Red Soloths, Red Solodic Soils and Red Podzolic Soils. The topsoil ranges from brown sand to brown loam, while the different subsoils may include sandy clay, light clay, sandy loam and loamy sand. The depth to bedrock typically ranges from 50 centimetres to 110 centimetres.

The soils of the Liddell Soil Landscape are susceptible to minor to severe sheet erosion and minor levels of rill erosion. In drainage lines moderate levels of gully erosion up to 1.5 metres depth can occur and salting may be present. The Soloths and Solodic soils characteristically have a higher erodibility (moderate to high) than that of the Sands (low). Similarly, soil salinity is higher for the Soloths and Solodic soils (high) in comparison to the Sands (low).

The soil types within this soil landscape have a low fertility, are poorly to well drained and have a low to moderate available water holding capacity. Typical soil pH is between 6.0-6.5 and mass movement hazard is low.

4.3.1.2 Bayswater Soil Landscape

The Bayswater Soil Landscape occurs in the northern and southern portions of the survey area in association with drainage lines. Soil types present on slopes within this landscape include Yellow Solodic Soils as well as Red, Yellow and Brown Podzolic Soils. Within drainage lines, soil types include Alluvial Soils and Brown and Yellow Earths. Also present are Yellow Solodic Soil-Red-brown Earth intergrades. The depth to bedrock varies between 40 centimetres to 300 centimetres. The topsoil within this landscape is variable between the different soil types; however, it is commonly described as sandy clay loam.

Slopes occurring within the Bayswater soil landscape commonly experience moderate levels of sheet and gully erosion. Yellow Solodic Soils are highly susceptible to erosion and as such these soils are often associated with gullies up to three metres deep. The other soils within this landscape are described as having a moderate to high erodibility of both the top-soil and sub soil. Mass movement hazards are low.

The susceptibility to salinity of the different soil types within this landscape varies markedly, ranging from high to low. The fertility of all soil types is low and the pH generally ranges between 5.5 and 6.5, although the sub-soil of the Yellow Solodic soils may have a pH up to 9.5. The soils are typically well drained, with permeability described as moderate.

4.3.1.3 Brays Hill Soil Landscape

The Brays Hill Soil Landscape is typically found over undulating hills to the west of Muswellbrook and occurs over the southern portion of the western section of the survey area. Red Clays are the predominant soil type in mid to upper slopes, while the mid to lower slopes may have Black Earths, Grey Clays and Brown Clays. The lower slopes are characterised by the Yellow (orange) Solodic Soils, while Alluvial Soils occur in the drainage depressions. The topsoil and sub soils are highly variable between these soil types, but typically there is a strong clay component. The depth to bedrock ranges between 35 centimetres and 120 centimetres.

Soil erodibility is generally low to moderate; however the Yellow (orange) Solodic Soils have a moderate (subsoil) to high (topsoil) erodibility. Minor sheet erosion may result after land clearing, while drainage lines may experience moderate gullying. Minor rilling may occur in depressions where the Red and Grey Clays are present. Mass movement hazards are moderate to low.

Soil pH varies between 6.0 and 9.0 and salinity is typically low, except for the Yellow (orange) Solodic Soils where it is high. The soils have generally high fertility except for the Yellow (orange) Solodic Soils which have low fertility. The soils are moderately to highly permeable and have a low to moderate available water holding capacity.

4.3.1.4 Ogilvie Soil Landscape

This soil landscape is present in two small patches relating to the higher topographic areas of Mt Arthur and Mt Ogilvie and typically occurs over steep hills and escarpments with sandstone and conglomerate which outcrops to form cliffs. The dominant soil types present within this landscape include shallow loams and sands. The lower slopes are characterised by Brown Solodic Soils, while the Siliceous Sands and Sandy Earths occur within the drainage lines. The topsoil can be sandy loam or loamy sand. The subsoil is also sandy loam; however the Brown Solodic soils have a subsoil of medium clay. The depth to bedrock ranges from 15 centimetres to 90 centimetres.

The majority of this soil landscape group has low to moderate erodibility; however, the Brown Earths have a moderate to high erodibility. Erosion behaviour includes some minor sheet erosion. Mass movement may be seen where there have been road cuttings. Mass movement hazards are typically low.

The pH of this landscape group ranges from 5.0 to 6.5 and salinity and fertility levels are low. The soils are typically highly permeable and available water holding capacity is low.

4.3.1.5 Dartbrook Soil Landscape

The Dartbrook Soil Landscape occurs to the north and west of the survey area. Within the region, this soil landscape is generally found over smooth undulating rises and low hills, forming the Brays Hill Soil Landscape at higher elevations. The characteristic soil types present include the Brown Clays and Black Earths on the upper to mid slopes, Euchrozems and Non-calcic Brown Soils on mid to lower slopes and Prairie Soils on the alluvial flats. The topsoil and subsoil of these different soil types are highly variable, but most have a light to medium clay component. The depth to bedrock for these soils is between 50 centimetres and 100 centimetres.

Soil erodibility is low (topsoil) to moderate (subsoil) and minor to moderate sheet erosion may be experienced on some hill slopes. Mass movement hazards are low.

Soil pH varies between 6.0 and 9.0 and the soils are typically moderately permeable and moderately well drained with high available water holding capacity. Most of the soils have a low salinity and a moderate fertility; however the fertility of the Black Earths is high.

4.3.1.6 Hunter Soil Landscape

The Hunter Soil Landscape occurs on the floodplains of the Hunter River and its tributaries and occurs to the north of the survey area. Soils present on old stream channels and tributary flats include Brown Clays, Black Earths and Chernozems, while Red Podzolic Soils and Lateritic Podzolic Soils are present on old terraces. Alluvial Soils (including loams and sands) are present on levees and flats adjacent to the present river channel. Non-calcic Brown Soils and yellow Solodic Soils are present in some drainage channels. The topsoil and subsoil characteristics are highly variable between these different soil types, but are commonly light medium clay or brown silty clay in the topsoil, and medium clay or light to light medium clay in the subsoil. The depth to bedrock ranges between 40 centimetres and 300 centimetres.

Soil erodibility is generally moderate and given that this soil landscape occurs in alluvial areas, erosion features are associated with water movements. Minor erosion of stream banks is typical, while adjacent terraces may experience minor sheet and gully erosion. Mass movement hazard is generally low.

Soil pH ranges between 5.5 and 7.5 and most of the soils have a moderate to high fertility, however, alluvial soils are typically lower in fertility. The soils are moderately permeable, and most are moderately well drained, however, the Alluvial Soils are generally rapidly drained. The available water holding capacity is typically high; however, the Alluvial Soils differ, having a low available water holding capacity.

4.3.2 Impact of European Land Use Practices

European land use practices such as pastoralism, agriculture and the establishment of settlements within the survey area have led to an increase in erosion of the topsoil along creeklines and on slopes and ridges, and the deep entrenchment and gullying of the watercourses.

4.3.3 Implications for Aboriginal Resource Distribution/Site Location

Aboriginal people often used sandstone outcropping along the beds of creeks or along creek banks for the grinding of sharp edges on stone axes or for sharpening the points of fire hardened spears. Therefore, it is possible that grinding grooves may be present within the survey area if sandstone associated with the Branxton Formation or the Dalwood Group is

located exposed along and within the creek channels (and was exposed prior to European settlement). Deposition of sediments eroded from upstream, however, may act to partially or totally bury these exposures making grinding grooves difficult or impossible to locate without subsurface investigation. It is predicted that the majority of the sandstone exposed will be in the base of the deeply eroded creek channels the entrenchment of which is the product of European land use practices. Grinding grooves are highly unlikely in these areas.

The geology also indicates that ochre quarries or quarries used for the extraction of stone for stone implement manufacture are highly unlikely in the survey area.

As documented in **Section 4.3.1**, soil erosion has the potential to have damaged or destroyed sites such as artefact scatters. Also of importance in relation to soils is that ecotones (areas where one soil landscape meets another; for example where alluvium overlays and abuts other soil landscapes), offer a broader array of plant, and thus prey animal species in a restricted area. These areas were often targeted by Aboriginal hunter-gatherers due to this species diversity and may be expected to contain camp sites, especially if they are located near semi-permanent or permanent water. In relation to the survey area, sites related to ecotones could be located along Saddlers Creek and Quarry Creek and also along the lower reaches of Western Creek.

The soil pH varies from slightly acidic to alkaline. Those areas with neutral soils (pH 7) will have greater potential for the preservation of organic materials (such as bones) than those of an acidic or highly alkaline nature.

4.4 Flora

The flora survey undertaken for the Underground Project EA found that the floristic diversity of the survey area is low, with the area having been subject to clearing and degradation from past grazing activity and also some mining related disturbances (in the Bayswater No. 3 ML). Despite the generally disturbed nature of the vegetation of the survey area, some areas of woodland/forest vegetation remain and the floristic diversity (although generally low) is considered representative of similar disturbed woodlands and grasslands occurring widely across the Hunter Valley. The survey identified six vegetation communities within the survey area: Hunter Floodplain Red Gum Woodland Complex; Central Hunter Bull Oak Regeneration; Central Hunter Box Ironbark Forest; Narrabeen Footslopes Slaty Box Woodland; Hunter Valley Weeping Myall Woodland; and Derived Grassland. Many plant species exist within these vegetation communities which are documented in the broader ethno-historical record of NSW and the ethno-historical record of the Upper Hunter, as Aboriginal resource plants. **Table 4.1** provides a list of these plant species.

Table 4.1 - Aboriginal Economic Plants

Common and *Scientific* Name	**Use**	**Reference**
amulla *Eremophila debilis* (previously *Myoporum debile*)	Food plant	MacDonald and Davidson 1998
Australian bindweed *Convolvus erubescens*	Food plant	Zola and Gott 1992: 47
berry saltbush *Einadia hastata*	Food plant	Low 1989: 129
blue flax lily *Dianella* sp. and *Dianella caeruleaa*	Food and economic plant	Low 1989: 8

Table 4.1 - Aboriginal Economic Plants (cont)

Common and *Scientific* Name	**Use**	**Reference**
boree *Acacia pendula*	Food and economic plant	Stewart and Percival 1997:8
broad-leaved cumbungi *Typha orientalis*	Food plant	Zola and Gott 1992:6
mistletoe *Amyema* sp.	Food plant	Low 1989: 14
climbing saltbush *Einadia nutans*	Food plant	Low 1989: 129
cooba *Acacia salicina*	Economic plant	Hurst (1942)
eucalypts *Eucalyptus sp.*	Economic plant	MacDonald and Davidson 1998
false sarsaparilla *Hardenbergia violacea*	Medicinal plant	Low 1989: 210
fan wattle *Acacia amblygona*	Food and economic plant	Stewart and Percival 1997:8
fishweed *Einadia trigonos*	Food plant	Low 1989:129
grass trees *Xanthorrhoea glauca* and *Xanthorrhoea johnsonii*	Food and economic plant	MacDonald and Davidson 1998
grey box *Eucalyptus moluccana*	Economic plant	MacDonald and Davidson 1998
hairy panic *Panicum effusum*	Food plant	Low 1992:85
head-ache vine *Clematis glycinoides* var. *glycinoides*	Medicinal plant	Low 1989: 151
hickory wattle *Acacia implexa*	Food and economic Plant	Stewart and Percival 1997:8
kangaroo grass *Themeda australis*	Food and economic plant	Greenway 1910:16 MacDonald and Davidson 1998 Zola & Gott 1992:58
kangaroo thorn *Acacia paradoxa*	Food and economic plant	Stewart and Percival 1997:8
kurrajong *Brachychiton polulneus*	Food, medicinal and economic plant	Zola and Gott 1992:36
many-flowered mat-rush *Lomandra multiflora*	Economic plant	Zola and Gott 1992:59
mistletoe *Amyema* spp. *Amyema congener* subsp. *congener*	Food plant	MacDonald and Davidson 1998 Zola and Gott 1992:30
narrow-leaved geebung *Persoonia linearis*	Food plant	Low 1989: 43-44

Table 4.1 - Aboriginal Economic Plants (cont)

Common and *Scientific* Name	**Use**	**Reference**
narrow-leaved ironbark *Eucalyptus crebra*	Economic plant	pers. comm. various Aboriginal people from the Dubbo Region (2000) and shields etc. pers. obs. of scarred trees and NPWS Site cards
native flax *Linum marginale*	Food and economic plant	Low 1992:93
native geranium *Geranium* sp. *Geranium solanderi* var. *solanderi*	Medicinal plant	Zola & Gott 1992:47, 56
native pennyroyal *Mentha satureioides*	Medicinal plant	Low 1990:
native raspberry *Rubus rosifolius*	Food plant	MacDonald and Davidson 1998
native willow *Acacia salicina*	Economic plant	MacDonald and Davidson 1998
nightshade *Solanum* sp.	Food plant	Low 1992:7
panicum grass *Panicum* spp.	Food plant	MacDonald and Davidson 1998
plantains *Plantago debilus*	Food plant	MacDonald and Davidson 1998
ploughshare wattle *Acacia gunnii*	Food and economic plant	Stewart and Percival 1997:8
rough-barked apple *Angophora floribunda*	Medicinal plant	Low 1990:140
saltbush *Atriplex* sp.	Medicinal plant	Low 1992:20-21
silver stemmed wattle *Acacia parvipinnula*	Food and economic plant	Stewart and Percival 1997:8
slender rats tail grass *Sporobulus creber*	Economic plant	Cribb and Cribb 1986
rushes and sedges *Juncus & Cyperus* sp. including sticky sedge *Cyperus fulvus,* a sedge *Cyperus gracilis,* sharp rush (*Juncus acutus* subsp. *acutus, Juncus homalocaulis* and *Juncus usitatus*),	Food and/or economic plants	Low 1989:105; Zola & Gott 1992:60
swamp dock *Rumex brownii*	Food plant	Low 1989: 28, 30, 153-154
tufted bluebell *Wahlenbergia communis* and *Wahlenbergia* sp. in general	Food plant	Zola and Gott 1989.
umbrella sedge *Cyperus eragrostis*	Economic plant	MacDonald and Davidson 1998
western grey-box *Eucalyptus microcarpa*	Economic plant	NPWS site cards.

Table 4.1 - Aboriginal Economic Plants (cont)

Common and *Scientific* Name	**Use**	**Reference**
western golden wattle *Acacia decora*	Food and economic plant	Stewart and Percival 1997:8
wombat berry *Eustrephus latifolius*	Food plant	Low 1992:17 Stewart and Percival 1997:8
Yadbila grass *Panicum queenslandicum*	Food plant	MacDonald and Davidson 1998
yellow box *Eucalyptus melliodora*	Medicinal and economic plant	Stewart and Percival 1997:8
grey box *Eucalyptus moluccana*	Medicinal and economic plant	Stewart and Percival 1997:8

4.4.1 Impact of European Land Use Practices

Although there are many Aboriginal resource plants still growing within the survey area, European land use practices have had a significant impact on their distribution and density. This impact is most apparent along the valley floors associated with sections of Saddlers Creek and its tributaries (mostly within the western section of the survey area), Western Creek and Quarry Creek where vegetation clearance, grazing and in some areas cultivation has led to the loss of many of the Aboriginal resource species that would normally have grown in these areas.

4.4.2 Implications for Aboriginal Resource Distribution/Site Location

It is difficult to evaluate the suite of Aboriginal food plants that would have been available within the survey area due to the degree of vegetation clearance.

It is likely that Aboriginal people would have been able to gather and process aquatic plants such as the bulrushes, water ribbons, spike rush and sedges that would have been available in slow moving water and pools within the lower reaches of all the creeklines within the survey area including Saddlers Creek, Quarry Creek and Western Creek. Areas such as these would have been able to support longer term Aboriginal occupation. Longer term Aboriginal occupation results in the discard of more cultural material, making these areas more obvious archaeologically than areas subject to transient use, where few artefacts are discarded.

4.5 Fauna

Numerous Aboriginal prey species were noted during fauna surveys undertaken of the survey area for the Underground Project EA. **Table 4.2** lists the species identified within the survey area which are known to have been hunted by Aboriginal people.

Table 4.2 - Aboriginal Prey Species

Common Name	***Scientific Name***
stubble quail	*Coturnix pectoralis.*
black swan	*Cygnus atratus*
wood duck	*Chenonnetta jubata*
black duck	*Anas superciliosa*
teal	*Anas gracilis*
hardhead duck	*Aythya australis*
Australasian grebe	*Tachybaptus novaehollandie*
dusky moorhen	*Gallinula tenebrosa*
Eurasian coot	*Fulica atra*
masked lapwing	*Vanellus miles*
crested pigeon	*Ocyphaps lophotes*
lace monitor	*Varanus varius*
red-naped snake	*Furina diadema*
red-bellied black snake	*Pseudechis porphyriacus*
turtles	*Chelodina* sp.
sugar glider	*Petaurus breviceps*
squirrel glider	*Petaurus norfolcensis*
common ringtail possum	*Pseudocheirus peregrinus*
common brushtail possum	*Trichosurus vulpecula*
eastern grey kangaroo	*Macropus giganteus*
common wallaroo	*Macropus robustus*
red-necked wallaby	*Macropus rufogriseus*
brush-tailed rock wallaby	*Petrogale penicillata*
swamp wallaby	*Wallabia bicolor*
eels	*Anguilladae* sp.

Table 4.2 indicates that a diverse range of prey species inhabit the survey area. Overall, the entire area would have provided a diverse faunal resource base for Aboriginal hunter-gatherers, with some areas such as Saddlers Creek, Quarry Creek and Western Creek providing aquatic species (birds, fish, and eels) in greater abundance and for longer periods than the more ephemeral creeklines. Local landholders report large numbers of eels in pools in Quarry Creek directly west of Edderton Road up until the late 1990s. Eels were also observed during fieldwork in dams in Saddlers Creek.

4.5.1 Impact of European Land Use Practices

Historical records suggest that there were large numbers of Aboriginal prey species in the Hunter Valley especially in the 'open undulating country and on the flood plains of the Hunter and Goulburn Rivers' (ERM 2004:34). John Gould observed many waterfowl on the wetlands of the Hunter River from Singleton to Scone (Albrecht 2000:12 cited from ERM 2004:36). Other smaller animals mentioned as occurring in abundance by Albrecht (2000:10-12) included bandicoot, long-nosed potoroo, native cat, fruit bats, wonga wonga and other pigeons, doves, and many other unnamed species of birds. Fish are also mentioned in Brayshaw (1986) as having occurred in abundance in the Hunter River (namely perch) during the early stages of European settlement.

Allan Cunningham (1825 in Brayshaw 1986:19) described the wildlife of the Denman area:

> Kangaroos and Emus particularly the former are abounding in every part of our Route but were too swift for our dogs, having fared rather sumptuously of late were in no disposition to exert themselves to catch the game, that was bounding about us in all parts of the timbered land.

Of Patrick Plains near Singleton, Peter Cunningham (1827:152-3 in Brayshaw 1986:19) wrote:

> These plains are the great resort of our wild turkeys, which you will see here stalking majestically about, and which afford an excellent and most delicate repast.

Fawcett (1898:153 in Brayshaw 1986:79) described how the Wonnarua sometimes caught kangaroos, wallabies and emus with nets. He noted that these were particularly useful in wooded areas where they were fixed amongst the trees in semi-circles. He also suggested that fire was used to aid the hunting of kangaroos and wallabies:

> The grass in certain districts was first burnt off, and about a month afterwards, when the young grass had sprung again, these animals all congregated there to eat the sweet young pasturage.

Hunting by early European settlers and habitat change brought about by agricultural practices has acted to diminish species diversity and at the same time to allow some species to proliferate (for example grey kangaroos which exist in larger numbers due to farm dams providing a constant water supply) across the Hunter Valley and within the survey area.

4.5.2 Implications for Aboriginal Resource Distribution/Site Location

The relatively diverse number of prey species present within the survey area suggests that it would have been used for hunting with different areas being targeted at different times for specific resources. It is unlikely that these hunting activities would have resulted in the discard of sufficient material evidence to be archaeologically visible. It is more likely that the base camps used by the hunters before and after hunts will be located during survey and that these will contain evidence of implements manufactured for hunting and butchering and discarded after use. These sites are most likely to be found in association with areas of low gradient close to permanent or semi-permanent water sources including Saddlers Creek, Quarry Creek and Western Creek.

4.6 Summary

The environmental context of the survey area indicates that it was an area that provided a diverse array of habitats for Aboriginal floral and faunal resources and that the entire area would have been utilised by Aboriginal hunter-gatherers during their daily foraging activities.

Based on the environmental context, the most likely areas to locate significant concentrations of material evidence of Aboriginal occupation in the survey area are:

- areas of low gradient associated with permanent (Saddlers Creek, Quarry Creek and Western Creek) to semi-permanent water, especially near creek confluences; and
- near ecotones (for example where alluvial/colluvial deposits overlap the footslopes along Saddlers Creek, Quarry Creek and Western Creek).

The previous land use in the area has the potential to have destroyed or at least damaged the integrity of Aboriginal sites that were/are located in the area. Erosion of the creeklines whilst having the potential to destroy sites also has the potential to uncover artefacts making them visible during survey.

Based on the environmental context, site types assessed as unlikely within the survey area are:

- rockshelters with art or engravings (due to the nature of the geology and topography);
- sites that retain stratigraphic integrity (due to erosion and soil disturbance resulting from European land use practices); and
- scarred and carved trees (due to vegetation clearance).

5.0 The Archaeological Context

This section presents the known archaeological context of the survey area and draws upon information recorded by early ethnographers and prior archaeological research. The information provided in this section is used (along with the environmental context) to prepare a predictive model for site location and site type within the survey area (refer to **Section 5.9**). The archaeological context summarises the extensive work that has been undertaken in the locality including surveys and salvage investigations for Bayswater Archaeological Research Project (Davidson, James and Fife 1993; Curran 1994; Wilson 1995; MacDonald and Davidson 1998, 2005) and the MAN ML Area (Kuskie 1999; and Kuskie and Clarke 2004).

5.1 Ethnographic References

The survey area lies in the Central Lowlands of the Hunter Valley which is the country of the Wonnarua[1] people. Due to the violent and rapid invasion of the Hunter Valley by Europeans there is very little detailed information available about the Aboriginal way of life prior to the arrival of the colonists (Davidson and Lovell-Jones, 1993: Ch 4). Reliance must be placed on what Davidson and Lovell-Jones call the 'salvage' work of secondary sources such as Curr (1887), Brayshaw (1966; 1986), Miller (1985) and Wood (1972). It should be noted that there are many problems with the use of these ethnographic references, for example Miller (1985:88) argues that ethnographers such as Howitt, Fawcett, Breton, Dawson, Matthews and Curr were not trained anthropologists or archaeologists and their records are an interpretation of the Wonnarua who they believed to be a dying race of 'an almost extinct culture'. These interpretations are therefore biased and ethnocentric. Miller (1985:88) also points out that some sources such as Howitt, had 'never travelled to the Hunter Valley and relied on letters from an informant who lived in the area as did Curr'.

Early European observers recorded the lives of the Wonnarua as intensely religious and constrained by strictly enforced laws (Ridley 1864 in Brayshaw 1986). The traditional lives of the ancestral Wonnarua focused on the Hunter Valley and were structured around a schedule of social interactions designed to take advantage of seasonal availability of resources; meaning that people moved often, but not at random. Before the arrival of the Europeans the Wonnarua was a large grouping of individual family units and bands which occasionally came together for religious and ceremonial functions (Davidson and Lovell-Jones, 1993:3). People travelled freely within the broad area of responsibility of their own group. Social responsibilities and obligations meant that people also travelled beyond their own territories to attend ceremonies with neighbours, to trade and to develop social networks that linked people across extensive areas. The Wonnarua are recorded as having had social links from the coast to the western plains of NSW (Brayshaw 1986a: 38-41).

Ancestral Aboriginal people often lived and travelled in small groups of less than 20 people, but regularly met relations and neighbours for ceremonies where hundreds and sometimes thousands of people gathered for weeks at a time. Events like this were scheduled when and where seasonal resources were plentiful. Successive gatherings were rotated between a number of sites to allow the local environment to fully recover from periods of intensive exploitation. These gatherings were an opportunity to trade a wide range of goods from ceremonial songs and dances to stone axes, spears and native tobacco (Mulvaney 1986). Different groups sometimes specialised in producing high quality trade goods.

[1] The Wonnarua have variously been called: Wanaruah, Wonaruah, Wanarua and Wonnah-Ruah. Wonnarua is the spelling which will be used in this report except where a direct quote from another source is cited.

Most of the time, Aboriginal people were recorded as living in small groups moving regularly from camp site to camp site, living on local resources. There is little ethnographic evidence about where Aboriginal people camped; however, there is mention of the importance of fresh water. Also of importance when determining the location of camp sites, was the suitability of a site as a vantage ground in the case of enemy attack (Fawcett 1989:152 in Davidson and Lovell-Jones, 1983:5). While camping at a particular site, people would travel each day through the surrounding country to gather plant foods and to hunt or to visit areas that provided other required resources (for example stone, ochre, bark and resin). The daily foraging area was generally within a day's walk of camp (usually within about five kilometres).

There are several reports that describe the country as having extensive grasslands with few trees and extensive floodplains (Breton 1833, Cunningham 1827, Howe 1819). These grasslands are thought to have occurred because Aboriginal people were continually burning the countryside as part of their responsibility to look after the land and as a hunting strategy. Fire stick farming was a major economic activity of the Wonnarua (Davidson and Lovell-Jones, 1993:5). Burning cleared the undergrowth and fresh growth produced green shoots that attracted prey animals. Fawcett (1898) refers to the use of fire by the Wonnarua; and other early accounts (Cunningham 1827, Mitchell in ERM 1999) also report the use of fire in the area.

Kangaroos, emus, possums and fish were recorded as plentiful (Breton 1833, Cunningham 1827, Dawson 1830), and mention was made of an abundance of food on the flatter ridges and plains that supported large populations of kangaroos (Cunningham 1827: 157). Breton (1833) and Eyre (1859) noted suitable trees were also available to provide bark for shelters and wooden implements such as shields.

Most of the archaeological evidence for Aboriginal occupation in the Hunter Valley comes from stone implements (generally termed artefacts). Unfortunately, there is little ethnography concerning the production and use of stone implements. The only known mention is in regard to the use of quartz as a barb on spears and of the use of stone hatchets (Brayshaw 1986a: 66, 68).

European arrival in the Hunter Valley began with the discovery of coal at Newcastle in 1797. By 1801 the Valley was reserved by the Crown as both a new convict settlement (a penal settlement was established in the Newcastle area in 1804) and for its resources in coal and timber (particularly Cedar) (Davidson and Lovell-Jones, 1993:8). This reservation placed on the region by the Crown effectively 'restricted or alienated free settlement to the area' (Davidson and Lovell-Jones, 1993:8). However, by 1819 the demand for grazing land and land for rural settlement increased beyond the current bounds of the colony's free settlement area and in 1821 Henry Dangar was commissioned to undertake a survey of the Hunter area to assess its suitability for settlement and farming.

Davidson and Lovell-Jones state that within months of Dangar reporting the Hunter Valley as suitable for settlement, claims for purchase and leasehold were being made from selectors in Sydney. 'By 1825 both sides of the Hunter River and associated brooks had been claimed' (Davidson and Lovell-Jones, 1993:8). The rapid settlement in the area disrupted the Aboriginal economy and, in a very short time, the Aboriginal population was substantially affected by a combination of starvation, introduced diseases and massacres.

First contact between the Wonnarua and the settlers may have been cordial (see citations in Davidson and Lovell-Jones, 1993:10) but rapidly turned hostile and violent with the Aboriginal community actively resisting the colonisation and appropriation of their land and resources, and the European landholders and their stockmen implementing 'widespread and indiscriminate' violence against Aboriginal people. This violence escalated significantly after

1826 and was fuelled in particular by the institutionalised violence by the Mounted Police (Davidson and Lovell-Jones, 1993:14-15, MacDonald and Davidson, 1998:60).

Documentary evidence suggests that by 1830 (only nineteen years after the first European settlers arrived in the Hunter) 'all armed resistance by local Aborigines' had ceased (Davidson and Lovell-Jones, 1993:17) and the traditional use of the land by the Wonnarua and their social structure and interactions had dramatically been affected – all within one generation. On the other hand, there are also some accounts of cultural ceremonies being conducted decades later, such as a ceremony held at Bulga in 1852, noted by Blyton et al. (2004:9); and a ceremony held at the junction of the Page and Isis Rivers at Gundy reported in the 1870s (McDonald 1878:255-258).

Since European settlement the Hunter Valley landscape has undergone radical changes. European colonisation saw the establishment of pastoral holdings, small towns and villages. Blyton et al. (2004:9) argue that the European pattern of settlement and land use rapidly became the normative occupation pattern 'replacing traditional Aboriginal communities' (Blyton et al., 2004:9). Davidson and Lovell-Jones (1993:17) also argue that shortly after European settlement all that remained were isolated family groups of Wonnarua existing 'on the fringes of towns and on properties trying as best they could to survive in a European modified environment'.

There is evidence in primary historical documents suggesting that many of the locations in which Europeans first settled (homestead locations) and/or areas later designated as reserves for Aboriginal people (such as St Clair, also referred to as 'Mount Olive', and 'Glennies Creek' and Redbourneberry Hill Reserve) near Singleton, were actually pre-European camp sites (refer to accounts referring to Ogilvies Hill and Dart Brook in ERM 2004a:121:123 and Table 4.5:129-134; Maitland Mercury 1851; Blanket returns reported in Singleton Argus 1879 cited in ERM 2004a:99; The Singleton Times, 31 May 1862 cited in ERM 2004a:109). This conclusion was based on the assumption that the location of Aboriginal camp sites at first contact with Europeans was where they camped prior to this time.

Wonnarua descendants such as the Millers, who are active in Aboriginal cultural heritage in the Hunter today, continued to live in these areas up to the twentieth century despite European settlement (see Miller 1985:157; Singleton Times Newsletter 1992:3-4). European settlement and encroachment on resources and traditional camping groups restricted Aboriginal occupation and dramatically affected Aboriginal communities, but it did not completely destroy connections to traditional camping grounds. There is a continuation of cultural connection and in some cases occupation of these places such as St Clair and Redbourneberry Hill (near Singleton) that date well into the twentieth century. Redbourneberry Hill Reserve and St Clair are registered Aboriginal places on the DECC AHIMS database.

There are specific ethnographic investigations relating to The Pocket or Little Pocket, a narrow valley on the south western side of Mount Arthur where a group of Aboriginal people are believed to have been massacred over 170 years ago (Davidson and Lovell-Jones 1993:3). Davidson and Lovell-Jones report (1993:3):

> …that a group of approximately 300 Wanaruah people were either camping in, or were pushed into, The Pocket by the Mounted Police. The story goes on to say that the Wanaruah people, who were thought to be the last survivors in the district, were all shot to death, men, women and children, by the mounted police from on top of The Pocket. No one could tell me what had happened to the bodies.

The reported location of 'The Pocket' is approximately 3.5 kilometres to the east of the survey area (refer to **Figure 5.1**). It is part of the Proposed Mt Arthur Conservation Area and will not be impacted by mine development. Davidson and Lovell-Jones (1993:4) found that many people in the European and Aboriginal community had been told of the massacre by elder family members and different stories existed as to why the massacre happened and the specific location of the massacre. The area of 'The Pocket' is considered as having 'special significance to the community' (Davidson 2005:3). This significance was reiterated in comments provided by the Aboriginal stakeholder groups during the consultation program (refer to **Section 3** and WNAC, Y and WC's comments).

The Aboriginal stakeholders were requested to provide any relevant cultural history during the consultation program and fieldwork. No specific information has been provided to date that relates to the cultural history/mythological information/stories within the survey area. General comments provided during fieldwork regarding sites are provided in **Appendix 6**. Some general information concerning 'The Pocket' and some cultural sites identified by Mrs Foot (WC) is provided and outlined where relevant throughout this report (refer to Mrs Foots comments in full in **Appendix 5**).

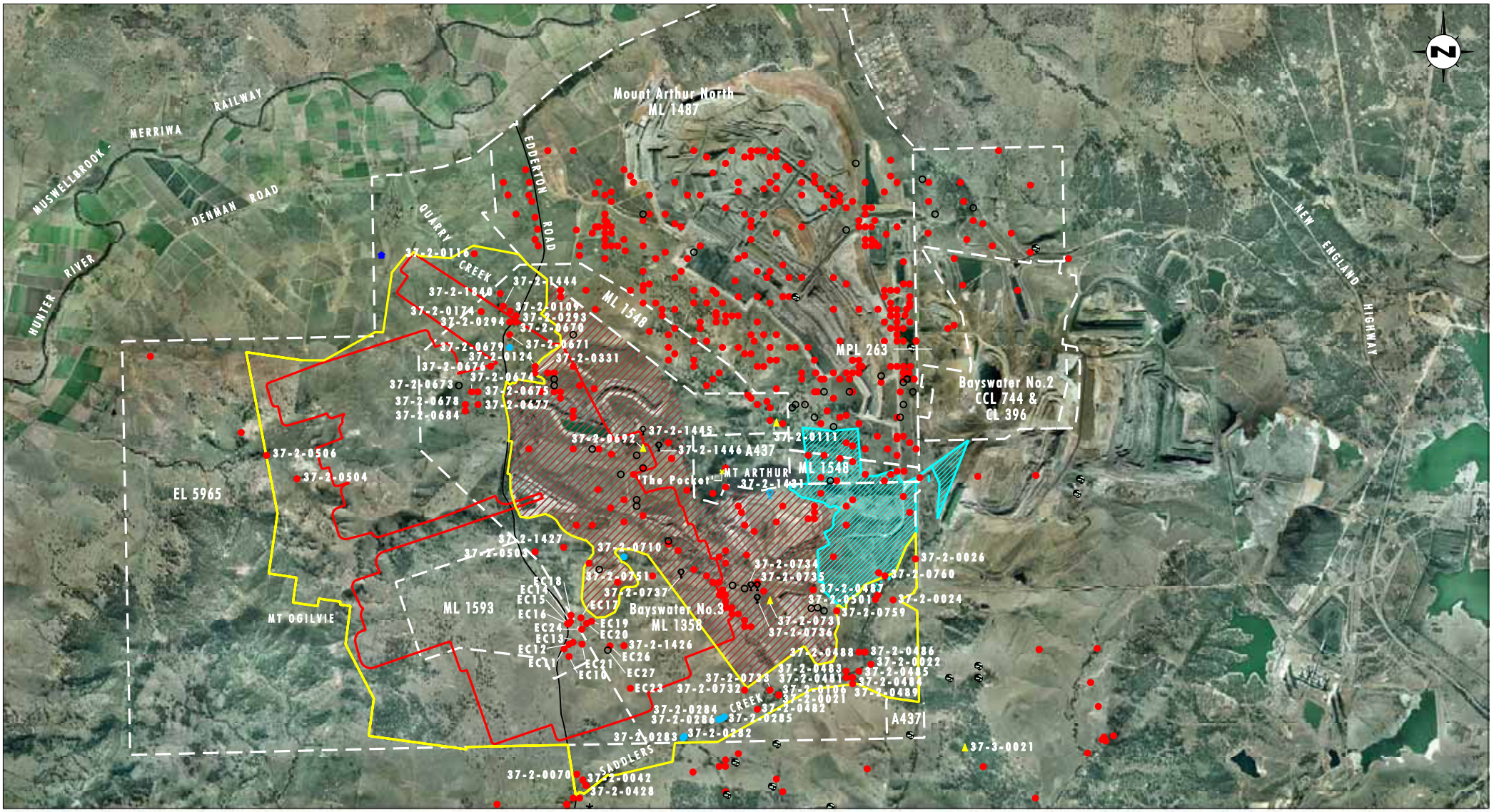
5.1.1 Implications for Aboriginal Resource Distribution/Site Location

The ethnography for the Hunter Valley region indicates that:

- the availability of fresh water was a determining factor in the location of Aboriginal camp sites;
- locations that provided good vantage points were also favoured as camp sites;
- Aboriginal people had a main camp site from which they dispersed during the day to hunt and gather food plants and other resources. Thus there should be one main camp site surrounded by smaller satellite sites which were used as day time camps (lunch time camps and butchery sites);
- Aboriginal people removed bark from trees to make containers and shields and evidence of bark removal may be exhibited by mature native trees if they survived European land clearance;
- there is no ethnographic evidence to suggest the survey area was used for ceremonial purposes despite these being observed elsewhere in the Hunter Valley;
- camp sites are likely in the same areas initially targeted for homesteads by Europeans. These are usually where there is a good freshwater supply; and
- post-contact sites (sites that contain evidence suggesting they were used after European settlement) are likely to be rare due to the rapid destruction of the Aboriginal population.

5.2 Site Types

In accordance with the DECC Guidelines for archaeological report writing (NPWS 1997), this section provides definitions of the various types of Aboriginal sites known from the archaeological record of the broader Hunter region. It should be noted that many of these site types are not relevant to the survey area; however, reference is made to them in the following subsections to provide information to justify why such sites are not considered relevant for the survey area.



Base Source: Mt Arthur Coal, 2006

Legend

- Mining and Exploration Lease Boundaries
- Subsidence Affectation Area
- Survey Area
- Bayswater No.3 Mining Area
- South Pit Sites (Umwelt 2000)
- Artefact Scatter
- Isolated Find
- Axe Grinding Grooves
- Scarred Tree
- Shelter with Deposit
- Artefact
- Reputed Massacre Site 'The Pocket' (not on DECC Sites Register)
- Site Cards Stamped Destroyed

FIGURE 5.1

Location of Previously Recorded Aboriginal Sites within the vicinity of the Survey Area

File Name (A4): R03_V1/2051_153.dgn

The most common site types located by archaeologists during survey in the Hunter are sites that contain scatters of stone artefacts. Stone artefacts are pieces of stone modified for, or by, human use. Stone artefacts are robust and preserve well in the archaeological record when other forms of evidence of Aboriginal exploitation are lost due to preservation biases (wooden implements, food remains).

Aboriginal archaeological sites can be divided roughly into secular (concerned with worldly things) and non-secular (concerned with secret, sacred, ceremonial and ritual things) site types. This division is not made by archaeologists; it is strictly drawn from Aboriginal ideologies (manners of thinking, systems of belief). The division is not always clear cut as some site types may be secular in some circumstances and non-secular in others. The secular or non-secular nature of each of the site types is indicated below. Sites that are non-secular in nature generally have much higher Aboriginal cultural heritage significance than sites of a secular nature.

Isolated Find/Artefact

The site type described as an 'isolated find' or 'isolated artefact' consists of a single stone artefact. The vast majority of stone artefacts were tools used in day to day activities and were therefore were secular in nature. There are some stone artefacts, however, that were used in special rituals/ceremonies that were non-secular in nature (for example ceremonial axes, tjuringa [engraved or decorated stones] and stone knives used in cicatrisation and circumcision). Isolated finds may represent lost or discarded artefacts, but may also be the surface expression of a larger scatter of artefacts in a sub-surface context.

Artefact Scatter or Open Camp Site

An artefact scatter or open camp site refers to areas (in the open landscape, not in a rockshelter or cave), that contain two or more stone artefacts, generally located within the same landform unit. In general, artefact scatters are secular in nature. Artefact scatters may result from the activities of a single person or a group of people. They may reflect a single occupation episode, or multiple episodes of occupation of a single place.

Rock Art Site

The term 'rock art site' generally refers to Aboriginal ochre paintings or ochre or charcoal drawings located on a rock slab (generally in a sheltered place like the floor of a cave or rockshelter), boulder, cliff-face, cave or rockshelter wall or roof, or wall of a rock overhang. The majority of rock art sites are found in positions that are sheltered from the elements. This observation, however, is probably biased to some extent, as rock art would not preserve well in open positions. Rock art sites are generally believed to be non-secular in nature.

Engraving Site

The term 'engraving site' refers to places where Aboriginal people have incised (using techniques such as pecking or abrasion) some form of motif into rock. The engravings may be on a rock outcrop, rock slab, boulder, cliff-face, rock overhang, or in a cave or rockshelter. Engraving sites are not necessarily located in sheltered positions, but are most often located on softer rock types (like sandstone). Engraving sites are generally believed to be non-secular in nature.

Rockshelter Sites

The term 'rockshelter site' refers to rockshelters/rock overhangs that contain evidence such as stone artefacts and/or bones and/or plant remains (from meals eaten at the site) and/or

hearths (fireplaces). Most rockshelter sites are secular in nature, however, those that also contain rock art or engravings are often believed to be non-secular in nature.

Precontact Burial Sites

The term 'precontact burial site' refers to Aboriginal skeletal material dating to a time before white settlement. The skeletal material may be buried, interred in a cave/rockshelter/under a ledge, in a tree hollow, or exposed on a platform in a tree. Burial sites are generally believed to be non-secular in nature by contemporary Aboriginal people.

Stone Arrangements

Stone arrangements may take the form of single or multiple cairns, upright standing stones, lines or rings of stones or even stones arranged into figurative designs such as snakes or turtles. The location of many of the recorded stone arrangements suggests that they were related to ceremonial grounds and in particular initiation grounds (McBryde 1974:31-42), while others appear to mark tribal boundaries (Leney 1907:72-77). Stone arrangements it would appear can be either secular or non-secular depending on their purpose.

Shell Middens

Middens are accumulations of shells that have been discarded after human (Aboriginal) meals. Midden sites are commonly located along the coast and estuaries and less often located in inland areas in association with waterways and lakes. Middens sometimes contain burials, but are most often simply domestic waste and as such are generally secular in nature.

Grinding Grooves

Grinding grooves are grooves on rock surfaces that have been manufactured by the sharpening of stone axe heads, stone chisels or fire hardened wooden spear points. Grinding grooves are commonly located on sandstone ledges that outcrop in creek and river beds, as the availability of water enhances the speed with which grinding proceeds. Less commonly, grinding grooves are located on rock surfaces away from water and on stone types other than sandstone. Grinding grooves appear to be secular in nature.

Pot Holes

Pot holes are deep (arm's length), steep sided, generally rounded depressions located on sandstone ledges that outcrop in creek and river beds. The pot holes have been ground out by Aboriginal people to store water. They are generally natural depressions that have been enlarged and deepened by grinding. Pot holes often have grinding grooves radiating from them; or may have a rock placed over them to keep the water safe from animals and clear of debris. Pot holes appear to be secular in nature.

Grinding Bowls

Grinding bowls are rounded depressions on rock surfaces that have been manufactured by the grinding of ochre, seeds, nuts and other plant resources. Grinding bowls are commonly located on sandstone ledges that outcrop in creek and river beds, as water is often added during the grinding process to form a paste. Less commonly, grinding bowls are located on rock surfaces away from water and on stone types other than sandstone. Grinding bowls appear to be secular in nature.

Stone Quarries

Stone quarries are places where Aboriginal people have sourced raw material for the manufacture of tools. Quarries may be cobble beds in rivers or on beaches, or they may be rock outcrops. When outcrops are exploited the quarrying activity may take the form of the flaking of rock from the outcrop, or scree from below the outcrop may be used instead. In some areas the stone may be dug from beneath the earth as Aboriginal stone knappers often preferred rock which had not been dried out by exposure to the elements (Tindale 1965: 140; Jones and White 1988:61-62). Stone quarries can be either secular or non-secular in nature depending on the Dreaming with which they are associated (Jones and White 1988).

Ochre Quarries

Ochre quarries are places where Aboriginal people sourced ochre (hydrated iron oxides and iron hydroxides - Whitten and Brooks 1972:269) which they used for body decoration, implement decoration and rock art. Ochre quarries can be either secular or non-secular in nature depending on local belief systems.

Ceremonial Grounds

In the Hunter region the main type of ceremonial ground recorded was the Bora. Bora grounds generally consisted of two earthen rings or two rings outlined with stones. The Bora ground was used during male initiation ceremonies (Fife 1995). Bora grounds are believed by many contemporary Aboriginal people to be non-secular in nature, however, the literature suggests that generally only the viewing of the smaller of the two rings was restricted to initiated males (for a summary of the data recorded about Bora grounds see Fife 1995).

Scarred and Carved Trees

Aboriginal people often removed the bark from the trunks of trees to make toe holds (to aid in climbing to extract honey or possums from tree hollows), bowls, shields, spear throwers, coolamons, canoes and/or for roofing material for shelters. The bark removal leaves scars on the tree trunk which indicates the Aboriginal use of an area. Other trees were carved with designs. These carved trees were used to mark ceremonial grounds and burials (Etheridge 1918:84; McBryde 1974:126). Scarred trees are generally secular in nature while carved trees are always non-secular.

Post-contact Burial Sites

This term refers to burials/interments that have taken place since European settlement and that are not located in a recognised cemetery and are not documented. If they are documented then they are considered Aboriginal historic sites and not Aboriginal archaeological sites. They may be secular or non-secular depending on the status/position of the deceased.

Missions/Reserves/Contact Sites

These places are where Aboriginal people lived in post-European settlement. They are often documented in historical literature as being places of a shared history of interaction between Aboriginal people and non-Aboriginal people.

Waterholes/Wells

These are generally natural rock waterholes that contain water used for drinking or for special ritual purposes. Sometimes these holes are made larger by grinding out the sides

and base and sometimes they are protected by placing large stones over the hole to keep out animals and to prevent the water from evaporating. These may be either secular or non-secular in nature.

Massacre Sites

This term refers to an area known from the Aboriginal oral history, or from local history, to have been the location of an Aboriginal massacre. Most Aboriginal massacres occurred during the early European settlement period.

5.3 Antiquity

Few studies in the Hunter region have been able to contribute detail on the chronological sequence of Aboriginal occupation. Thus, areas that contain sites that have the potential to add to our knowledge of the longevity and changing nature of the Aboriginal occupation of the area are highly significant.

The predominant site types recorded in the Hunter Valley are the artefact scatter or open camp site. These sites are discovered due to the exposure of the artefacts by erosion processes. The erosion processes that reveal the sites also destroy their ability to retain artefacts in a stratified and dateable context that could provide evidence of changes in landscape use over time. The artefacts exposed on the ground surface may result from a single visit or from discard events from repeated visits, which could span time periods of 10s, 100s or even 1000s of years. Even when artefact assemblages are located in the landscape (open sites) in a sub-surface context, disturbance to the soil profile (through both human agency and natural geomorphic processes) mean these assemblages lack any stratigraphic integrity. These problems led researchers to endeavour to use various artefact types, such as backed blades, Bondi points and eloueras as temporal markers to date elements of surface scatters, or in the case of sub-surface assemblages, to use the geomorphic history of the soil profile to provide a maximum date for the artefacts it contains.

For example, the presence of backed artefacts (backed blades and Bondi points) in a site has often been used as a temporal marker, given that these artefacts were long considered to date to the last 4000 years (Kuskie and Kamminga 2000:526). This approach is problematic for two reasons; the first is that the appearance of this technology is now thought likely to be older than the commonly used date (refer Hiscock and Attenbrow 1998) and to extend back around 7000 years; and the second is that in the context of a conflated surface site these artefacts provide neither a minimum nor maximum age for the rest of the assemblage. Even taking into account the percentage of the assemblage that can be recognised as being a product of blade production (approximately 3 to 8 per cent of most assemblages) this still generally leaves more than 90 per cent of the assemblage without any chronological control. In these cases it is generally assumed that the upper or 'A' horizon of the texture-contrast soils located throughout the Hunter Valley date to the last 5000 to 6000 years (Dean-Jones and Mitchell 1993). Thus the artefacts they contain should also date from this time period.

Kuskie and Clarke (2004) developed a temporal occupation model which is relevant to the locality surrounding the MAN ML including the survey area. This model included five phases of occupation and was based on a dating program from sub-surface investigations for the MAN ML. Kuskie and Clarke (2004:459) retrieved eleven samples of charcoal from excavated hearths and potential hearths during sub-surface salvage investigations throughout the MAN ML. Six samples were dated by standard radiometric dating and the remaining five were dated by Accelerator Mass Spectrometry (2004:459). All samples retrieved were from sites investigated along Whites Creek. Dating was also carried out for

an Aboriginal burial identified while undertaking grader scrapes on Whites Creek. Information about the burial is compiled as part of a report by Donlon and Kuskie (2003). The burial was also dated. The key conclusions inferred from Kuskie and Clarke (2004)'s dating program which are reiterated in the temporal occupation model are summarised below:

- over the last 1,400 years there have been 'multiple episodes of human occupation, at least four and probably many more' at MAN;
- the earliest date for occupation at MAN was from a hearth at Whites Creek which had a maximum age of 1,350 calBP (600AD); and
- based on historical accounts of settlement, the presence of one glass artefacts and dated occupation on MAN, Aboriginal people occupied MAN immediately prior and at the same time as non-Indigenous people (2004:468).

Kuskie and Clarke argue that for the last 1400 years Aboriginal people continued to live a traditional lifestyle right up to the 'time of non-indigenous settlement of the upper Hunter Valley in the early 1800s…within the MAN area' (2004:469). Kuskie and Clarke (2004:606) suggest that there is evidence of occupation of the Upper Hunter Valley predominantly 'within the mid to late Holocene (i.e. past 4,000 – 5,000 years), although very sporadic occupation of the upper Hunter Valley may have extended as far back as 30,000 to 40,000 years'.

The Bayswater Archaeological Research Project (MacDonald and Davidson 2005:368) carried out three attempts at radiocarbon dating using Accelerator Mass Spectrometry from fluvial sediments in the Macdonald Road South area and of several suspected hearths identified during hand excavations. MacDonald and Davidson concluded that the dates obtained were not reliable and that one of the 'big disappointments of the project is that we cannot give a reliable date for the occupation of the project area' (2005:368).

Where older dates have been recorded in the Upper Hunter Valley it has been where geomorphic processes have acted to bury and protect soil surfaces from subsequent disturbance. For example, Pleistocene occupation evidence was located by Koettig (1986, 1987) at Glennies Creek (Falbrook) north of Singleton. The dated material came from a hearth feature located on a buried alluvial terrace within the Unit B of a solodized solonetz soil at a depth of approximately one metre (Koettig 1986: 11). Dates obtained from the Glennies Creek excavations range between 13020±360 and 34580 ±650 BP (with regard to the 34580 ±650 BP date, Koettig (1987: 34) suggests that dates from such contexts are best used to provide 'an order of magnitude general age' as opposed to a direct date for occupation).

A second Pleistocene date has been reported by Kuskie (in Kuskie and Kamminga 2000:215) for artefacts identified in a clay horizon at Wollombi Brook (west of Singleton) that were confirmed by a geomorphologist to be late Pleistocene in age (between 18,000 and 30,000 years). These terrace dates are generally consistent with the ages quoted for terrace deposits in Nanson et al. (2003) and Hughes and Sullivan (1997). A third Pleistocene date of 14,750 BP (uncalibrated) was taken from a fragment of charcoal in the base of a dune at Moffats Swamp near Medowie (close to Port Stephens).

Rockshelters are often targeted for excavation as they 'were frequently inhabited and often contain a record of human activities over a considerable period of time' (Witter, 2003:24). Rockshelters have the potential to contain artefacts in a stratified deposit and thus provide better dating opportunities than open sites. Few rockshelters with deposit are currently recorded in the Hunter Valley. This is attributable in large part to a lack of development requiring archaeological survey and assessment in areas around the margins of the valley

where suitable geology exists for the formation of rockshelters. The oldest date presently known from the excavation of a rockshelter in the Hunter is 7750±120BP from Bobadeen (Moore 1970) near Cassilis. Overall, analysis of rockshelters in the Upper Hunter region indicates that dates of occupation generally span the early mid to late Holocene period (ERM 2004a:71); however, this information comes from a very limited number of rockshelter sites and the results are likely to be biased by this small sample size.

Other Pleistocene dates in neighbouring regions include Lime Springs on the Liverpool Plains, Capertee in the Blue Mountains and Mangrove Swamp, south-east of the Hunter Valley. All of these sites indicate that Aboriginal occupation was present during the Pleistocene and spans a period of at least 20,000 years (ERM 2004a:73). Thus it can be predicted that Aboriginal occupation of the Hunter Valley will be found to have similar antiquity when suitable sites are located for sub-surface investigation, such sites will have high archaeological significance due to their research potential.

5.4 Models of Occupation

There are a number of theories regarding how Aboriginal people used and affected the landscape in which they lived. These theories attempt to explain or interpret the location and nature of the archaeological record in any region. It is generally assumed that the environment, and implicitly resource distribution, was a major factor influencing Aboriginal movement and camp site location. Socio-cultural and demographic factors probably also influenced patterns of occupation.

Kuskie and Clarke (2004) formulated a model of occupation for the MAN locality based on the results of sub-surface investigations for the MAN ML. This model is summarised below:

- occupation focused where multiple resource zones were present, particularly along the Hunter River (referred to by Kuskie and Clarke as a primary resource zone). The larger and more reliable the resource base in an area lead to ‘stays of longer duration and more frequent episodes of occupation than in other areas’ (2004:604);

- outside of primary resource zones such as the Hunter River, occupation became more sporadic and focused within 50 metres of higher order watercourses and associated level to very gently inclined valley flats (what is termed secondary resource zones) (Kuskie and Clarke 2004:605). These areas were more likely to be utilised seasonally and camp sites were occupied ‘by small groups of people for varying lengths of time (but of typically short duration)’ (2004:605);

- occupation outside of the primary (e.g. Hunter River) and secondary resource zones (e.g. higher order tributary watercourses such as Whites Creek) ‘tended to involve hunting and gathering activities by small parties of men and/or women and children, along with transitory movement between locations and procurement of stone materials’ (Kuskie and Clarke 2004:605). These areas included landforms such as simple slopes, ridge crests, spur crests and lower order watercourses. The incidence of occupation of these landforms is reflected by their distance to permanent water courses; and

- there is evidence shown by the Aboriginal burial at Whites Creek that there was ‘access to and the use of the coastal zone’ (Kuskie and Clarke 2004:604). This evidence is discussed in a report by Donlon and Kuskie (2003) which is not available for public review.

The Bayswater Archaeological Research Project (final report, MacDonald and Davidson 2005) provides detailed information regarding the results and analysis of artefact

analysis for salvage assemblages and surveyed sites. It provides no summary or attempt at the development of a model of occupation for the locality or survey area.

Kuskie (2000:33-34) summarised five models of occupation for the Central Lowlands of the Hunter Valley. These models are introduced below:

- Koettig (1994) argues that the location of camps and the patterning within them was determined by rules based on the location of water sources, the demographics of the group and length of stay. The number of occupational episodes may therefore be interpreted through the spacing and distribution of features within a camp. The frequency of these episodes was probably influenced by the availability of resources.

- Witter (NPWS Workshop 1995) argues that the long-term base camps were located on the Hunter River and its major tributaries, and other open campsites in the region were peripheral to these.

- Haglund (1992) postulates that sites on Doctors Creek and Sandy Hollow Creek are the result of small groups of people visiting the area many times to utilise the rich resources located there.

- Dean-Jones and Mitchell (1993) suggest that various landforms were used to avoid climatic extremes and associated problems, to take advantage of resource-rich areas, and for ease of travel through the landscape. They also suggest that the saline groundwater associated with Permian Coal Measures may have influenced the seasonality of occupation in some areas and so the pattern of archaeological evidence.

- Rich (1995) argues that technological strategies enabled people to manage resources in the landscape and social strategies enabled management of the uncertainty and risk involved in hunting and gathering. Within the Bayswater catchment, to the south-east of the present survey area, Rich (1992) established a model of archaeological site location which states that the major evidence of Aboriginal occupation of the area, are stone artefact scatters which are most densely identified along major stream valleys. Site densities decrease uphill away from the streams, in minor tributaries and other terrain units including slopes, crests and hilltops. Additionally, sites close to major watercourses contain a greater number of functionally specific features such as knapping floors and heat treatment areas compared to other terrain units.

These models of occupation will be used to assist with the formulation of a predictive model for site location in the survey area (refer **Section 5.8**).

5.5 Previous Archaeological Research

This section presents information relating to sites listed on DECC's Aboriginal Heritage Information Management System (AHIMS) Register and sites known to be within or in close proximity to the survey area.

A review of a number of relevant studies from areas not immediately adjacent to the survey area has been included in **Appendix 7**. Although not in the immediate vicinity of the survey area, these studies provide important contextual information for the purposes of significance assessment and evaluation of the pattern of Aboriginal occupation and use of the general area.

The identification and study of Aboriginal cultural heritage sites in the Upper Hunter area has mainly evolved from the legislative requirement to undertake environmental impact

assessments prior to mining and other developments. Such assessments have resulted in the identification of more than 3586 Aboriginal sites in the region. A large proportion of these sites occur in the area between Singleton and Muswellbrook where coal mines and their associated infrastructure are concentrated. This bias in site location results from the fact that archaeological investigation in the Hunter tends to occur only in relation to mine proposals or other industrial development (MacDonald and Davidson 1998:3; ERM 2004: 6.2).

MacDonald and Davidson also note that the development of the Hunter Valley mining industry 'has resulted in the destruction of more than 70 per cent of the sites recorded in the region' (MacDonald and Davidson, 1998:3-4). On the other hand, Hughes argues (cited in ERM 2004) that many sites in the upper Hunter Valley would have been destroyed by natural flooding, European settlement (land use practices such as rural and urban settlement, infrastructure construction, erosion from and salinity associated with pastoralism and agriculture) and the general passage of time (for example certain types of sites such as shell middens, burials and scarred and carved trees would not preserve over extended periods of time). Many sites have been destroyed without investigation and less than 1 per cent of the sites have been recorded in any detail (MacDonald and Davidson, 1998:3-4). The loss and destruction of so many sites has increased the Aboriginal and archaeological significance of those that remain.

5.6 DECC Aboriginal Heritage Information Management System (AHIMS) Site Search

Prior to undertaking fieldwork, several searches were conducted of the AHIMS Register for any sites recorded within a 0.5 kilometre radius of the boundary of the survey area (it should be noted that the DECC advise that the register of Aboriginal sites cannot be guaranteed to be free from error and currently has a program of site verification underway to address some of these inaccuracies). The total search area was limited due to the number of sites recorded locally and the reluctance of DECC to provide information about a larger area without a data licence agreement. The search parameters included sites recorded on the Muswellbrook 9033-11-N and Jerrys Plains 9033-11-S 1:25,000 Topographic Sheet within the AMG reference range from 287000E to 304000E and from 6411000N to 6422000N. Recorded sites within the survey area are summarised in **Appendix 8**. A total of 618 sites were registered on the AHIMS database within this search area (refer to **Figure 5.1**). Another 27 sites were identified from work in Edderton Catena by the Bayswater Archaeological Research Project. Ten of these sites are mapped on **Figure 5.1**, however no site records exist at AHIMS for these sites and the remaining 13 sites cannot be mapped (refer to **Appendix 7** for description of these sites). All of these sites were recorded as part of surveys associated with proposed coal mines including early work within the Mt Arthur *ML*s by Dyall (1976, 1980, 1981), for Bayswater Coal Company by Hughes, Koettig and Silcox (1982) and Koettig (1984) and the Bayswater Archaeological Research Project (BARP) by Davidson, James and Fife (1993), James (1993), Curran (1993, 1994), Purcell (1995), Wilson (1995a and b), Pursche (1996), UNE staff and students (1993) and Dagg (1997). Later work for the Mt Arthur North *ML* area was conducted by South East Archaeology (1999); which includes sites recorded by Kuskie (1999), Carter (1999), Schmidt (1999) and Barber (1999). Other site cards were also registered by Sites Officers for DECC including Cook (1981) and Moore (1987).

The results of the AHIMS site searches indicate that artefact scatters (92 per cent) are the most common site type identified in the vicinity of the survey area, reflecting the findings for the Hunter Valley in general. Isolated finds (6 per cent) are the second most common site type in the AHIMS site search results followed by scarred trees (1 per cent), axe grinding grooves (0.5 per cent), and shelter with deposit (0.5 per cent).

Further sites identified within the survey area that are not listed on the DECC AHIMS database are discussed in **Section 5.7**.

5.7 Previous Archaeological Survey and Assessment

The distribution of sites previously recorded within and in the vicinity of the survey area is shown on **Figure 5.1**. Sites within the Underground Project area are identified by the DECC/AHIMS site number. Some of the sites within the project area have been destroyed under Section 90 consent, however, the DECC database has not yet been updated. As part of the preparation of the predictive model for site type/location and the preparation of the survey methodology, a review was undertaken of several reports prepared for archaeological assessments undertaken within the survey area or within the immediate vicinity of the survey area. An overview of relevant data contained in these reports is presented in this section and detailed summaries of the reports are provided in **Appendix 7**.

Extensive sub-surface investigations and surveys were undertaken in the MAN ML (Kuskie 1999; Kuskie and Clarke 2004) and in the Bayswater No. 3 ML as part of the Bayswater Archaeological Research Project (BARP) (Davidson, James and Fife (1993), ERM (1994), Wilson (1995), MacDonald and Davidson (1998, 2005). A summary of the extensive investigations carried out by Kuskie and Clarke (2004) is provided in **Table 5.1**.

Table 5.1 - Summary of the Kuskie and Clarke (2004) Excavation Program

Phase	Description of Phase	Area Investigated
1	This phase consisted of mechanical test scrapes where earthmoving machinery was used to carefully remove the grass cover and upper centimetres of soil to identify concentrations of sub-surface archaeological deposits, such as artefacts and other features (e.g. hearths). The main objectives were to identify the basic pattern of artefact distribution, characterising the nature and variety of archaeological evidence and to select locations for broad area excavation.	Approximately 15.5 hectares with artefacts collected in 5 by 5 metre units. An additional 23 hectares scraped and collected for Whites Creek Extra scrape variation around the Aboriginal burial located adjacent to Whites Creek.
2	Excavation by hand using trowel and spade. These areas typically measured 2 x 40 m and were excavated in 0.5 x 0.5 m square units with several small extensions of the trench around features that emerged during the course of the investigation.	Six open area hand excavations totalling 497.75 m^2 in area.
3	Controlled broad area hand excavations involving more extensive mechanical scrapes.	Not reported.
4	Series of small, localised hand excavations focusing on features and activity events revealed by the scrapes conducted in Phases I and III.	A total of 38 hand excavations totalling 282 m^2 in area were excavated during this phase and all of the relevant objectives were achieved.

Table 5.2 provides information of investigations carried out by BARP over its duration. Investigations carried out by 1995 for the MacDonald Pit and Dump Site and Saddlers Pit and Extension relate to the survey area.

Table 5.2 - A Summary of Work Carried Out by the BARP (Cited from Table 6.1, MacDonald and Davidson 1998:165)

Year	Archaeologist	Locality of Work	Area Surveyed (m^2)	Excavated (m^2)	Number of Sites	Number of Artefacts
1993	Iain Davidson, Rosalind James, Ray Fife	Bayswater Lease Area	1,120,000		91	831 recorded
1994	John Appleton (salvage)	Bobagul Hills 2	50,000	21.5 hand excavated 600 grader		349 collected 1,397 excavated
1994	Noeleen Curran (salvage)	Lease Area	190,000	114 backhoe		112 excavated
1994	Ray Fife (salvage)	LFG Site Complex	175,000	17.3 hand excavated		617 collected 278 excavated
1995	Jan Wilson (salvage)	MacDonald Pit and Dump Site, Saddlers Pit and Extension	600,000 4,500,00	21.1 hand excavated 66 backhoe	7	2,160 collected 945 excavated
1995	Jan Wilson (salvage)	Saddlers Pit 1	Resurvey	51.4 hand excavated 1.2 shovel pits 2,152 grader		1,299 recorded
1996	Katrina McDonald (research)	Bobagul Hills, MacDonald Road South, Quarry Creek Area (Er2)	500,000 2,250,000 5,000,000	-	-	1,299 recorded
1997	Katrina McDonald (research)	Edderton Road 2 (Er2), MacDonald Road South, Edderton Cantina	(re-survey) (re-survey) 1,840,000	28.1 hand excavated 17.3 shovel test pits 120 backhoe	28	4,500 collected 2,097 excavated 1,200 recorded
Total			**11,725,000**	**3,209.9**	**126**	**21,636**

Other archaeological investigations were also carried out in the survey area and immediate locality either on a smaller scale or during a much earlier time period. These investigations are summarised in detail in **Appendix 7** and the results of these assessments are analysed in **Section 5.8**.

Further reports were also assessed for areas at a greater distance to provide further information for incorporation into the predictive model. These reports are also summarised in

Appendix 7. Areas previously surveyed by archaeologists in the survey area and adjoining areas are shown on **Figure 5.2**.

5.8 Summary and Analysis of Information from Previous Archaeological Survey and Assessment

Sections 5.8.1 to **5.8.4** summarise the information derived from previous archaeological survey and assessment reports and the AHIMS Register search results that are within approximately 0.5 kilometre of the survey area boundary, in relation to site location, site type and site contents. This information is then used to formulate the predictive model presented in **Section 5.9**.

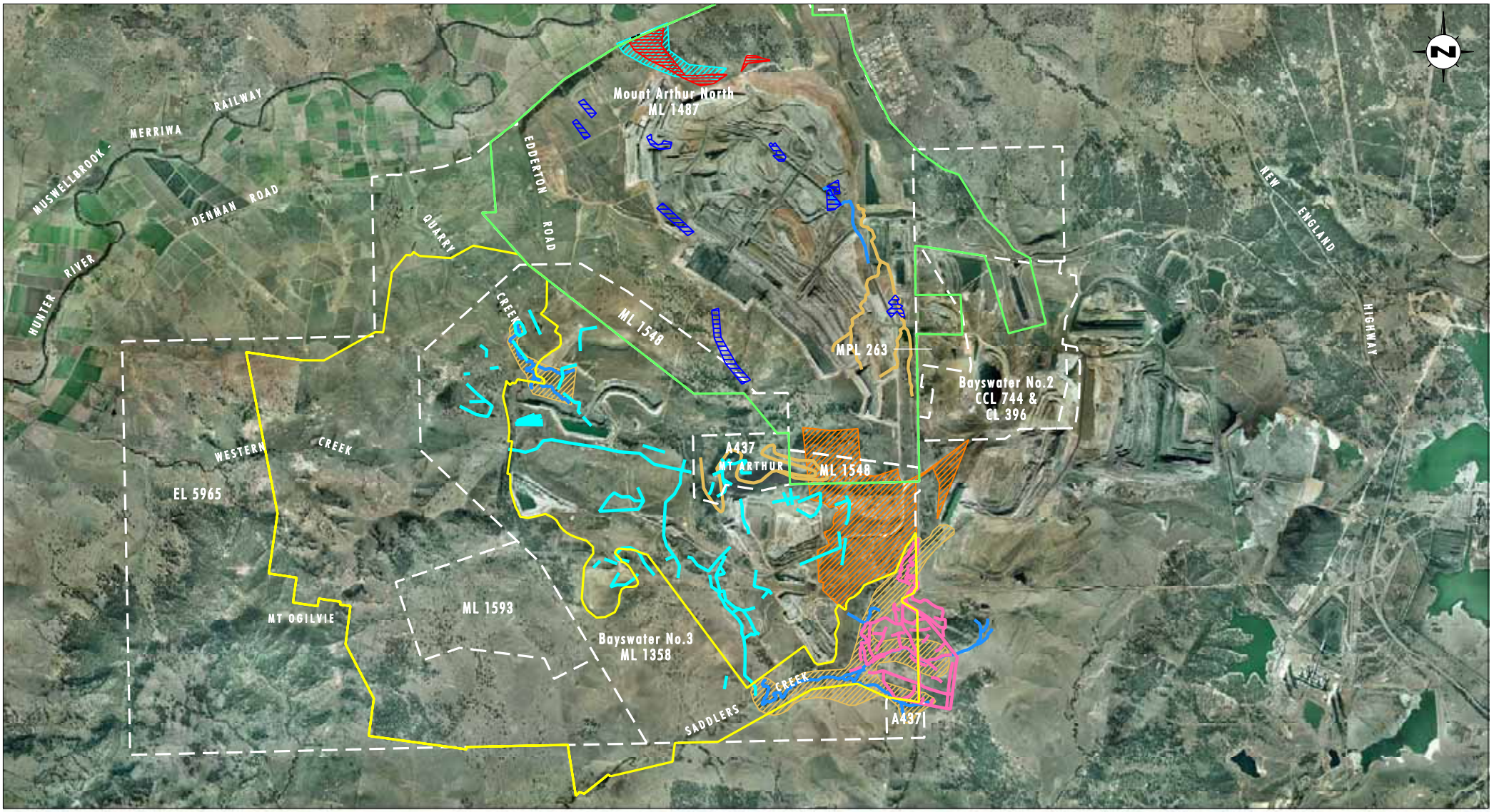
5.8.1 Site Distribution

Table 5.3 indicates the distribution within the landscape of all previously recorded sites within and in close proximity of the current survey area (less than half a kilometre from the survey area boundary based on the results of DECC/AHIMS searches. Please note that these tables do not include sites which are not registered on the DECC database derived from previous archaeological work). The table incorporates an analysis of 153 sites and lists the location of the sites in relation to general landform elements derived from the archaeological literature review including:

- foot slopes/creek banks;
- alluvial terraces;
- lower to upper slopes;
- spurs;
- ridge crests;
- floodplains; and
- modified landforms including dams and roads.

Table 5.3 - Distribution of Previously Recorded Sites in the Landscape

Previous Archaeological Study	Foot Slopes and Creek Banks	Alluvial Terraces	Lower to Upper Slope	Spur	Ridge Crest	Flood plain	Modified (Dams and Roads)
Dyall 1976, 1980, 1981	22	2	1	0	0	0	0
Cook, 1981	0	0	1	0	0	0	0
Hughes, Koettig and Silcox, 1982	1	0	0	0	0	0	0
Schmidt, 1999 (as part of Kuskie 1999)	0	0	1	0	1	1	0
Koettig 1984	27	0	3	4	0	0	0



Base Source: Mt Arthur Coal, 2006

0 1 2 4km
1:85 000

Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Umwelt (2005)
- Umwelt (2006)
- Dyall (1980, 1981)
- Koettig and Hughes (1995) Koettig (1984)
- Bayswater Archaeological Research Project (1993-2005)
- Dagg (1997)
- Kuskie (1999)
- Kuskie and Clarke (2004)

FIGURE 5.2

Previous Archaeological Investigation in the Locality

File Name (A4): R03_V1/2051_180.dgn

Table 5.3 - Distribution of Previously Recorded Sites in the Landscape (cont)

Previous Archaeological Study	Foot Slopes and Creek Banks	Alluvial Terraces	Lower to Upper Slope	Spur	Ridge Crest	Flood plain	Modified (Dams and Roads)
Barber, 1999 (as part of Kuskie 1999)	1	0	0	0	0	0	0
Moore, 1987	2	0		0	0	0	0
Kuskie, 1999	3	0	0	0	0	0	0
James, 1993 and 1994	40	0	5	0	2	2	4
Wilson, 1995	1	0	2	0	1	0	0
Purcell, 1995	0	0		1	1	0	0
Curran, 1994	7	0	10	0	1	0	0
UNE staff and students	1	0	0	0	0	0	0
Pursche 1996	0	0	1	0	1	0	0
Carter, 1999 as part of Kuskie 1999	0	0	1	0	0	0	0
No name recorded on site card	2	0	0	0	0	0	0
Totals	**107**	**2**	**25**	**5**	**7**	**3**	**4**

Table 5.4 presents the distance of the sites from the nearest watercourse.

Table 5.4 - Distance to Nearest Watercourse of Previously Recorded Sites

Previous Archaeological Study	<30 metres	30-100 metres	100-200 metres	>200 metres
Dyall 1976, 1980, 1981	24	1	0	0
Cook, 1981	0	1	0	0
Hughes, Koettig and Silcox, 1982	1	0	0	0
Schmidt, 1999 (as part of Kuskie 1999)	1	1	1	0
Koettig 1984	27	3	4	0
Barber, 1999 (as part of Kuskie 1999)	1	0	0	0
Moore, 1987	2	0		0
Kuskie, 1999	3	0	0	0
James, 1993 and 1994	42	3	4	4
Wilson, 1995	1	0	0	3
Purcell, 1995	0		1	1

Table 5.4- Distance to Nearest Watercourse of Previously Recorded Sites (cont)

Previous Archaeological Study	<30 metres	30-100 metres	100-200 metres	>200 metres
Curran, 1994	7	10	0	1
UNE staff and students	1	0	0	0
Pursche 1996	0	0	2	0
Carter, 1999 as part of Kuskie 1999	0	0	1	0
No name	2	0	0	0
Totals	**112**	**19**	**13**	**9**

The tables indicate that the majority of the sites are close to watercourses. Landform elements such as the footslopes, creek banks and lower slopes which lead down to watercourses have the highest frequency of identified sites. The specific watercourses include the main channel and tributaries of Saddlers Creek, Quarry Creek, Whites Creek, Fairford Creek and McDonalds Creek (refer to **Figure 5.1**). This result reflects the bias of previous work which focused on creeklines.

5.8.2 Site Types/Artefact Types

Table 5.5 summarises the site type and site contents of the previously recorded (artefact scatter and isolated find) sites within and in close proximity to the survey area.

Table 5.5 - Summary Site Type and Site Contents of Previously Recorded Sites

Previous Archaeological Study	No. of Sites	Grinding Grooves	Scarred Tree	Isolated Artefacts	Artefact Scatters	Dominant Artefact Type
Dyall 1976, 1980, 1981	25	0	0	0	25	Flakes
Cook, 1981	1	0	0	0	1	Flake, Core
Hughes, Koettig and Silcox, 1982	1	0	0	0	1	Flake
Schmidt, 1999 as part of Kuskie 1999	3	0	0	0	3	Broken Flakes
Koettig 1984	34	0	0	0	34	Flakes
Barber, 1999	1	0	0	1	0	Broken Flake
Moore, 1987	2	0	0	0	2	Flakes
Kuskie, 1999	3	0	0	1	2	Broken Flakes
James, 1993 and 1994	53	2 (both have an artefact scatter)	1	0	50	Flakes
Wilson, 1995	4	0	0	0	4	Flakes
Purcell, 1995	2	0	0	0	2	Flakes
Curran, 1994	18	0	0	4	14	Flakes

Table 5.5 - Summary Site Type and Site Contents of Previously Recorded Sites (cont)

Previous Archaeological Study	No. of Sites	Grinding Grooves	Scarred Tree	Isolated Artefacts	Artefact Scatters	Dominant Artefact Type
UNE staff and students	1	0	0	0	1	Flakes
Pursche 1996	2	0	2	0	0	-
Carter, 1999 as part of Kuskie 1999	2	0	0	0	2	Flakes
No name	1	0	0	0	1	Flakes
Total	**153**	**2**	**3**	**6**	**142**	**Flakes**

The table indicates that artefact scatters are the most common site type, making up 93 per cent of the sites recorded within, or in close proximity to the survey area. Isolated finds, scarred trees and grinding grooves are also known for the area but are relatively uncommon. In relation to isolated finds this result probably reflects the large areas of erosion recorded during prior surveys which allowed for the exposure and identification of numerous artefacts at specific locations rather than single artefacts as often found in areas with minimal exposure.

The artefacts within previously recorded assemblages generally consist of flakes, broken flakes, retouched flakes, flaked pieces and cores. The dominant raw material is generally indurated mudstone and silcrete with porcellanite, silicified sandstone, hornfels, basalt, quartz, quartzite and chert commonly making up a minor component of the assemblages, particularly larger assemblages on watercourses such as Saddlers Creek, Whites Creek, Fairford Creek, MacDonalds Creek and Quarry Creek.

Both axe grinding groove sites are outside the current survey area. Axe grinding groove site LDF4 (37-2-0692 – refer to **Figure 5.1**) was recorded by James (1994) as part of the BARP. The site was recorded as incorporating Aboriginal axe grinding grooves as well as an artefact scatter. Five sets of grinding grooves were recorded at this site on sandstone outcropping within the creek bed below a vehicle track. These grinding grooves have since been removed and are stored away for collection by the WLALC. A second grinding groove site LGH06 (37-2-0731 – refer to **Figure 5.1**) was also recorded by James (1993). This site also has an associated artefact scatter and was recorded as having 10 noticeable grinding grooves in 1993. LGH06 is within an area that has existing development approval and Section 90 Consent has previously been granted for this site. The associated surface scatter was collected and a sub-surface salvage was undertaken on the western bank of the creek directly above the grooves. The Section 90 Consent has subsequently lapsed, and as the grinding grooves have not been destroyed they are once again afforded protection under the NPW Act (1974). Mt Arthur Coal is currently managing this site to ensure that it is not damaged by mining operations. It is possible that this grinding groove site could have further grinding grooves based on the descriptions on the site card, which states that sedimentation and vegetation obscured much of the surface of the sandstone outcrops.

The three scarred trees identified include one site LSC04 (37-2-0737) recorded by James (1993) and two sites; Quarry Creek Scarred Tree 1 (37-2-1445) and Quarry Creek Scarred Tree 2 (37-2-1446) recorded by Pursche (1996) as part of the Bayswater Archaeological Research Project. All three scarred trees were mature grey boxes with scars estimated to be over 200 years of age. The locations of these sites are shown on **Figure 5.1**.

Table 5.6 indicates the number of artefacts in the sites within and in close proximity to the survey area.

Table 5.6 - Site Size (Artefact Numbers) - Previously Recorded Sites

Previous Archaeological Study	No. of Sites with <10 Artefacts	No. of Sites with 10<20 Artefacts	No. of Sites with 20<50 Artefacts	No. of Sites with 50<100 Artefacts	No. Sites with >100 Artefacts	No. of Counts Made	Total
Dyall 1976, 1980, 1981	0	1	6	10	6	2	25
Cook, 1981	1	0	0	0	0	0	1
Hughes, Koettig and Silcox, 1982	0	0	0	0	0	1	1
Schmidt, 1999 as part of Kuskie 1999	0	2	0	0	1	0	3
Koettig 1984	2	2	11	9	4	6	34
Barber, 1999	1	0	0	0	0	0	1
Moore, 1987	2	0	0	0	0	0	2
Kuskie, 1999	2	0	0	0	1	0	3
James, 1993 and 1994	21	6	4	10	7	4	52
Wilson, 1995	2	0	0	0	1	1	4
Purcell, 1995	2	0	0	0	0	0	2
Curran, 1994	15	1	1	0	1	0	18
UNE staff and students	0	0	0	0	0	1	1
Pursche 1996	0	0	0	0	0	0	0
Carter, 1999 as part of Kuskie 1999	0	0	0	0	1	0	1
No name recorded on site card	1					1	2
Totals	**1**	**12**	**22**	**29**	**22**	**16**	**150**

Overall, artefactual material was found to occur in highest numbers and greatest density along banks and terraces of Saddlers Creek and Quarry Creek and associated tributaries. The majority of sites (32 per cent) had assemblages of less than ten artefacts. The second highest frequency was for sites with greater than 50 and less than 100 artefacts in their assemblage (19 per cent). The recording of three scarred trees is not included in the site total of **Table 5.4** as no artefacts were recorded at these sites.

Ridgelines, ridge crests and spurs tend to have low densities of artefactual material. Site Mt Arthur Spur 1 (MAS1) (recorded by Wilson 1995) is the exception with 256 artefacts. These areas generally have a bias due to vegetation causing poor detectability for artefact

scatters. The view of the landscape in these areas of elevated ground may have made them an important part of the landscape and a focus of occupation (refer to **Section 6.7** for discussion of areas of good outlook). However, current archaeological research (Kuskie 1999:88) suggests that although 'frequented to some extent', ridgelines and spurs 'may not have been the major focal points of activity that resulted in evidence being discarded'.

5.8.3 Knapping Methods and Reduction Strategies Utilised Within and In Close Proximity of the Survey Area

Analysis of stone artefact reduction strategies have been utilised by previous researchers to discuss aspects of occupation of the Mt Arthur area including duration of occupation, and the distribution of stone artefact resources. Based on the results of previous archaeological research, freehand percussion was the most common knapping method, as is typical throughout the Hunter Valley. Other knapping methods, often recorded but only as minor contributors to assemblages, include bipolar reduction and pressure grinding of surfaces has also been recorded in relation to axe sharpening and food preparation (grindstones).

A link between raw material and reduction strategy was identified by Koettig and Hughes (1985) at Saltwater Creek (outside the survey area but in locality) where the percentage of backed artefacts was considerably higher amongst porcellanite and chert artefacts when compared to the more common raw materials of mudstone and silcrete. Koettig and Hughes (1985:27) suggested that this may be because porcellanite and chert were the preferred materials for the manufacture of backed artefacts.

This trend was not repeated in assemblages studied by Koettig and Hughes (1985) at Mt Arthur South or Mt Arthur North. Dagg (1997:54) also found that chert was disproportionately highly represented amongst backed artefacts whilst mudstone was more commonly backed than silcrete, even in instances where silcrete was the dominant artefact raw material.

Wilson (1995:192) noted that the majority of raw materials within the Bayswater No. 3 lease were heavily reduced but that, of the two most common raw materials, mudstone was typically reduced to a greater extent than silcrete in both surface and subsurface assemblages. It was argued that the extent of artefact reduction was indicative of the lack of local sources of high quality raw materials and the continued reduction of stone resources during lengthy periods of site occupation (Wilson 1995:117).

There is little discussion of knapping methods within the current BARP draft report (MacDonald and Davidson 2005). MacDonald and Davidson (2005:5) state that the majority of artefacts (over 40 per cent) were snapped flakes. The high representation of snapped flakes in the Bayswater assemblages was argued to result from 'post-depositional trampling by cattle, or through deliberate snapping by Aboriginal people'. Wilson (1995:104) suggested that intentional transverse breakage of elongated flakes (as evidenced by conchoidal scarring or positive or negative bulbs of percussion at the break location) may have been undertaken during the manufacture of backed artefacts. There is no further discussion of this issue provided in the MacDonald and Davidson (2005) report.

Kuskie and Clarke (2004) identified a total of 43 types of stone artefacts during their sub-surface investigations for the MAN Coal Mine Lease. Their basic categories of activities or reduction strategies included discussions related to microblade production (2004:6). Kuskie and Clarke (2004:6) argued that many of the artefact categories 'represent debris from stone knapping with production of backed artefacts the most common activity'. This focus on backed artefact production was identified within the MAN ML sub-surface investigations due to a 'total sieve retrieval methodology, as well as the nature of fracture of materials'. The

most common form of retouched flakes identified within the retrieved assemblage was backed artefacts (Kuskie and Clarke 2004:441-442).

Kuskie and Clarke (2004) found that bipolar knapping predominantly was restricted to quartz with the exception of one quartzite, one porcellanite and two silcrete artefacts. Quartz is found generally in the Mt Arthur North Coal Mine Lease as 'small nodules' and for this reason it is argued, it is flaked using the bipolar knapping method (Kuskie and Clarke 2004:433). A single chert bipolar core was also recorded at Site MAN16 (Koettig and Hughes 1985:41).

5.8.4 Heat Treatment

The use of heat treatment techniques has important archaeological implications in terms of occupation patterns and raw material curation. The controlled heating of stone can considerably enhance the flaking qualities of raw material (refer to Kuskie and Kamminga 2000 for a discussion). The construction and use of heat treatment pits requires a considerable investment of time and expertise and artefacts bearing definitive evidence of heat treatment are not typically represented at high rates within Hunter Valley assemblages. Wilson (1995:209) recorded a relatively low incidence of heat treated artefacts (versus heat affected artefacts) within the assemblage from McDonalds Pit in the Bayswater No. 3 Mining Area and suggested that this may be a reflection of the availability of high quality raw materials that did not require heat treatment. Wilson (1995:211) suggested that the incidence of heat treatment of artefacts could be expected with an increase of distance from the raw material source.

Approximately nine percent of the total assemblage recorded by Kuskie and Clarke (2004) in the MAN ML bore signs of having been affected by heat. This was due to artefacts being affected either on top of the surface through bush fires or camp fires; or below the surface from burning tree roots or superimposed camp fires. No heat treatment pits were identified, although it is argued to be 'highly possible that this practice occurred within the study area' (Kuskie and Clarke 2004:6).

5.9 The Predictive Model

The formulation of a predictive model is undertaken to indicate where sites are most likely to be located, what types of sites these are likely to be, and what they are likely to contain. It should also contain information in relation to where sites are likely to have survived both natural destruction processes (for example, creek migration, erosion, bioturbation) and European land use practices. Also of importance, the predictive model suggests where sites should not be found and what types of sites should not be found. Such atypical sites/site types will be of increased archaeological significance due to their rarity (refer to **Section 7** for a definition of rarity).

Predictive models are also used to formulate an appropriate methodology for survey as the model pinpoints those areas that are the most archaeologically sensitive and that must be surveyed. This does not mean that the rest of the area can be ignored as an adequate sample of each landscape unit must be surveyed in order for the predictive model to be tested and refined. Otherwise all predictive models will be self-fulfilling with sites only being found in those areas predicted.

The formulation of the following predictive model combines the information drawn from the previous archaeological research as summarised in this section (and detailed in **Appendix 7**) and viewed in the light of the environmental data (refer to **Section 4**).

The following predictions have been made in relation to the Mt Arthur Underground Aboriginal archaeology survey area based on the background archaeological research carried out within the locality and the results of AHIMS site searches carried out within a 0.5 kilometre radius of the survey area (refer to **Figure 5.1**):

- the predominant site type likely to be identified will be artefact scatters followed by isolated artefacts;
- the majority of sites will be located within or near watercourses;
- the majority of these sites will be within 50 metres of these watercourses, particularly third or fourth order streams (following Strahler 1969). Sites will be predominantly within the very gentle to level drainage depression archaeological terrain unit (refer to **Section 6**);
- the main watercourses where sites have been previously identified and which are known to be sensitive include Saddlers and Quarry Creeks. The confluences of Saddlers Creek and Quarry Creek and major and minor tributaries are likely to contain large numbers of sites or areas of PAD with large artefact densities;
- sites will more commonly be located (due to visibility) along the ephemeral tributaries that drain the slopes rather than on the floodplains of the major creeklines as alluvial deposition in these landforms will bury sites making them more difficult to detect;
- grinding grooves are likely to occur in the survey area based on the geology and the distribution of known sites in the immediate locality. Grinding grooves may be found where suitable geology (i.e. sandstone outcrops) is present in creeklines particularly in major watercourses such as Saddlers Creek and Quarry Creek. These sites may be difficult to detect if infilling of creeks with sediment has occurred. Grinding grooves may be identified in association with rock shelters;
- based on previous archaeological research sites with more than 100, and up to 1000 artefacts, may be located near more permanent water sources (third and fourth order streams and above). Their archaeological visibility will be dependent on the percentage of exposure in these areas;
- there will be a marked decrease in artefact density between 50 metres to 100 metres from third order and fourth order watercourses;
- simple slopes near third and fourth order streams may also contain considerable artefact densities (based on Kuskie 1999);
- artefact densities will be generally lower on ridge crests and spur crests than near watercourses and within simple slope terrain units;
- scarred trees/carved trees are unlikely to be found in the survey area due to heavy clearance of mature trees associated with previous land use;
- stone arrangements are a rare site type unknown in the general area and are unlikely to be identified in the survey area due to disturbance from previous land use;
- rockshelter sites are rare in the Hunter Valley and located only where the geology is suitable for shelter formation; such as in areas with a sandstone or conglomerate geology outcropping as steep cliff lines. The geology and topography of the survey area suggests that they are highly unlikely within the survey area but more likely on Mt Arthur and Mt Ogilvie outside the survey area;

- contact sites such as massacre sites or glass artefact scatters are difficult to identify in the field. These sites may be found in the survey area as the locality of Mt Arthur is mentioned in ethnographical information as being a place where Aboriginal people were subject to violence by Europeans (refer to **Section 5.1**) and Aboriginal occupation extended into the early contact period. It is important to note that Mt Arthur and the reported massacre site 'The Pocket' is outside the survey area and in a conservation area managed by Mt Arthur Coal;

- silcrete and indurated rhyolitic tuff (also known as indurated mudstone) will be the dominant raw materials discarded in the survey area. Other raw materials such as porcellanite, silicified sandstone, hornfels, basalt, quartz, quartzite and chert will make up a minor component of the larger assemblages;

- the silcrete could be sourced from various sources including the western portion of Mt Arthur bordering the Hunter River floodplain (Kuskie 1999), from the quarry located within the Bengalla Mine area (Rich 1993) or from the Hunter River gravel beds;

- the source of the rhyolitic tuff will predominantly be the Hunter River gravel beds;

- the source of the porcellanite will be to the of east of Edderton Road and perhaps within the eastern section of the survey area, particularly the area near the Drayton ML (where there is a known porcellanite source);

- artefacts are also likely to be manufactured from pebbles from the local conglomerate within the survey area;

- the dominant artefact types will be flakes followed by broken flakes and flaked pieces;

- evidence of microblade manufacture may be common;

- retouched and or utilised flakes will commonly be located in the larger assemblages but always as a minor component of the assemblage. Tuff or indurated mudstone will be the material predominantly used for artefacts with these attributes;

- the majority of retouched flakes will be backed artefacts;

- bipolar reduction will be rare but when identified is likely to be more frequently used for quartz; rarer artefact types that may be identified within the survey area include flaked or ground edge axes, remnants of grindstones, eloueras and geometric microliths;

- freehand percussion will be the dominant knapping method. There will be no evidence of rationing of stone materials for knapping due to the abundance of local raw materials;

- burials could be found in contexts where soil is deep and easy to dig such as valley fills and near creeks and watercourses. Burials and ceremonial sites (including carved trees), whilst known in the Hunter Valley are exceedingly rare site types due to their poor survival in the archaeological record (Witter, 2003:10). A burial was identified during the MAN ML excavation program by Kuskie and Clark (2005). This burial is outside the survey area and identified on Whites Creek. Burials are extremely rare site types; however, and it is highly unlikely a burial will be found in the survey area; and

- ceremonial Bora rings are historically documented in the Hunter Valley at Castle Rock near Wybong, Gundy near Scone and at Booragul near Lake Macquarie. There are no historically documented ceremonial bora rings within the survey area. Ceremonial bora

rings are extremely rare site types; however, and it is highly unlikely they will be found in the survey area.

5.9.1 Predicted Site Integrity

The following predictions are made for site integrity within the survey area:

- the ridges and associated crests, spurs and saddles will have low to moderate integrity for artefact scatters/isolated finds based on the previous land use history including tracks, clearing, grazing and clearing for transmission lines which have disturbed the integrity of these landforms;

- artefact scatters/isolated finds located in deeper alluvial deposits may retain integrity below the plough zone;

- artefacts within the plough zone have been subject to vertical and horizontal displacement during cultivation and thus will be without integrity and will have no relationship to artefacts below them and beneath the plough zone;

- artefact scatters/isolated finds associated with ephemeral creeks are unlikely to retain integrity due to shallow soils, erosion and stock trampling and also due to the steep gradient (as downslope movement of the soils will have acted to redistribute and mix artefacts); and

- artefact scatters on slopes will have been affected by the downslope movement of soils causing the redistribution of the artefacts down the slope and their remixing and reburial down slope.

6.0 Survey

This section provides details of the fieldwork carried out as part of the Aboriginal archaeological assessment. Discussions are provided in relation to the survey methodology, the results of the survey, the effective coverage and the Aboriginal sites identified.

6.1 Field Team

The survey team consisted of two archaeologists accompanied by six representatives from the Aboriginal stakeholder groups on any given survey day. The survey strategy was prepared in consultation with the relevant stakeholder groups (refer to **Section 2.4**). The initial survey strategy comprised a survey period of 20 field days. Due to a number of factors including weather conditions, attendance of Aboriginal representatives and the number of sites identified within the survey area; the number of field days was increased to 23 to ensure effective survey coverage. The field team also included trainees from the Aboriginal stakeholder groups. Due to the use of trainees survey time had to be increased to recover survey ground on some field days to ensure it was covered adequately.

Fieldwork for the survey area was undertaken over three field survey periods. The survey periods were from 30 January to 10 February 2006 (10 field days), 3 April to 6 April 2006 (3 field days) and 26 April to 9 May 2006 (10 field days). **Table 6.1** provides a list of the Aboriginal stakeholder groups and representatives involved in the fieldwork.

Table 6.1 - Aboriginal Community Representation during Fieldwork

Representatives	Aboriginal Community Group
Mr John Matthews Mrs Margaret Matthews Mr Darrel Matthews	Aboriginal Native Title Council
Ms Michele Stair Mrs Colleen Stair Ms Donna Horton	Giwiirr Consultants
Mr Steven Boney Ms Shelly (Michelle) Morris Mr Trevor Griffiths	Hunter Valley Aboriginal Corporation
Ms Christine Matthews Mr Trevor Archbold Mr Jeffery Stewart Mr Chris Allen	Hunter Valley Cultural Consultants
Mr Brian Horton Mr Jason Stanely Mr Michael Norris	Muswellbrook Cultural Consultants
Mrs Rhonda Ward Ms Dahlene Hall Mr Allan Paget Ms Samantha Hall	Ungooroo Aboriginal Corporation
Mr Justin Matthews Ms Melissa Newman Mr Mark O'Heir	Upper Hunter Heritage Consultants

Table 6.1 - Aboriginal Community Representation during Fieldwork (cont)

Representatives	Aboriginal Community Group
Ms Georgina Berry Ms Tracey Skene Miss Jessica Skene Mr Mark Skene	Upper Hunter Wonnarua Council
Mr Mick Matthews Mr James Howard Mrs Bev Van Vliet	Valley Culture
Mr Barry French Mr Tony Matthews Ms Kylie Griffiths	Wanaruah Local Aboriginal Land Council
Mr Stan Ardler Mr Des Hickey Mr Graeme Wootten	Wattaka Wonnarua CCS
Mr Jo Griffiths Mr Shannon Griffiths	Wonnarua Culture Heritage
Mr Robert Lester Mr Mark Hickey Mr Luke Hickey	Wonnarua Nation Aboriginal Corporation
Mr Thomas Franks Mr Danny Franks Mr James Hayes	Yarrawalk

WC and LWTC did not participate in the survey as they could not attend on their allotted days due to illness. MCC registered in early December 2005 but were included in the survey. MC and WC-AF was not established and did not register interest in this project until the conclusion of the fieldwork period. WEC did not wish to be involved in fieldwork.

6.2 Survey Strategy

A draft survey strategy was presented to all 17 registered Aboriginal stakeholder groups for comment at a meeting on 22 December 2005 (refer to **Section 2.4**). This survey strategy was then circulated to the groups and finalised following an extended 28 day comment period. The areas that Aboriginal stakeholders suggested for survey coverage included:

- coverage of Saddlers Creek and its tributaries;
- coverage of all watercourses;
- representative coverage of all landforms including focus on 100 per cent ground surface coverage within the survey area by pedestrian survey similar to that carried out by Kuskie (1999) for the MAN ML; and
- large exposures such as tracks which would provide ground surface visibility.

Aboriginal stakeholder group comments were integrated into the final survey strategy where possible. However, it was discussed during the presentation and it is reiterated again that

100 per cent ground surface coverage is not possible for any Aboriginal archaeological survey due to the presence of long grass and vegetation which inhibits artefact detection. Kuskie (1999) did not cover 100 per cent ground surface coverage during the Aboriginal archaeological survey of the MAN ML. Kuskie (1999) focused on coverage of representative landforms and inspection of all ground surface exposures within the MAN ML. Kuskie (1999) states that some exposures were driven to and that not all transects were walked. The key objective of Kuskie's (1999) survey methodology was outlined in the draft survey strategy presented to the registered Aboriginal stakeholder groups. These objectives included:

- …sample all different environmental contexts within the study area, not simply the watercourses…
- …maximise productivity through focusing, where possible, on ground surfaces with higher archaeological visibility;
- …inspect mature trees for evidence of Aboriginal scarring, stone outcrops for evidence of extraction and sandstone bedrock for evidence of grinding grooves; and
- …inspect any places specifically requested by the Aboriginal community (Kuskie 1999:65).

The final survey strategy for the survey area was formulated to ensure that the information recorded during the fieldwork was comparable to earlier information recorded by Kuskie (1999) for the MAN ML. For example, the strategy for the survey area included:

- a similar definition of archaeological terrain units;

- the division of the entire study area into archaeological terrain units based on landform and environmental variables;

- each archaeological survey area was based on one archaeological terrain unit. However, unlike Kuskie (1999) mapping of precise survey transects was undertaken as it is considered impossible for any archaeological team to cover 100 per cent of an entire terrain unit;

- each survey transect area was assigned a unique reference number, however, this reference number was not based on the recorder's initials. Numbers were generated using a GIS program (Mapinfo) which changed every time a terrain unit changed in the landscape;

- different types of surface exposure were recorded separately (vehicle tracks, erosion scour) to match Kuskie's (1999) separate components and each component was recorded separately in field notes;

- artefact locations were recorded as site loci using an approach consistent with Kuskie (1999). Site loci are defined by Kuskie (1999:65) as 'spatially separated locations of heritage evidence within a survey area'. This separation would also occur for discrete events such as knapping floors within a survey area. Site loci were given different labels to the transect data. However, sites were not defined by archaeological terrain unit but were defined according to the extent of surface artefacts including the predicted extent of PAD within the terrain unit related to that site;

- similar to Kuskie (1999) a system of archaeological terrain units was used to classify the survey area and understand site patterning across the landscape. Archaeological terrain units used in this assessment have similar definitions and classifications to those used by Kuskie (1999);

- survey recording forms were completed for each archaeological survey area inspected and details about the environment were recorded (e.g. natural resources, soil, geology, disturbance, visibility and erosion);

- a site recording form was filled out for each Aboriginal site identified. Each locus identified had a separate Aboriginal heritage site recording form;

- a detailed stone artefact recording form was filled out for Aboriginal sites of less than 10 artefacts. This recording form included recording details about provenance, stone material, artefact type, size class, cortex and other relevant attributes; and

- summary counts of raw material and artefact type were made for all sites. Field maps of artefact distribution were produced and photographs taken of flagged artefacts (including close ups of artefacts).

The Kuskie (1999) survey criteria and site recording criteria used in the Umwelt 2006 survey are outlined in **Appendices 1** and **6**.

Other important information recorded during the survey included:

- the nature of the landforms and vegetation;

- the nature of drainage lines and the effects of erosion on bank stability and surface exposure;

- the effects of erosion and disturbance on the area as a whole;

- the aesthetic values of the area and outlooks available from the area;

- the availability of Aboriginal resources;

- potential for archaeological deposits;

- significance of the area to the Aboriginal stakeholder groups (for example, based on information brought forward by representatives during the survey);

- diversity of archaeological sites within the area; and

- the presence and condition of Aboriginal archaeological sites.

The survey methodology ensured that:

- all different environmental contexts within the survey area were sampled;

- the survey focused on exposures when identified in the field and all ground surfaces with high ground surface visibility were inspected;

- all mature trees were inspected for evidence of Aboriginal scarring or carving;

- all stone outcrops were inspected for evidence of quarrying;

- rock outcrops and platforms associated with watercourses were inspected for evidence of grinding grooves or engravings; and

- any additional places specifically requested by the Aboriginal stakeholders during the survey were inspected.

Areas such as the majority of the main channel of Saddlers Creek, which is outside the proposed impact area and thus has potential as a conservation area for Aboriginal cultural heritage, had the following additional information recorded:

- ease of access;
- similarity to the area proposed for development impact;
- aspects related to visitor safety; and
- the potential benefits of the area for education about Aboriginal cultural heritage.

This information is important to assess the suitability of an area for Aboriginal cultural heritage conservation, from the perspective of allowing for effective management of the sites they contain, whilst allowing for visitation in a safe environment by the Aboriginal community and the broader community if applicable.

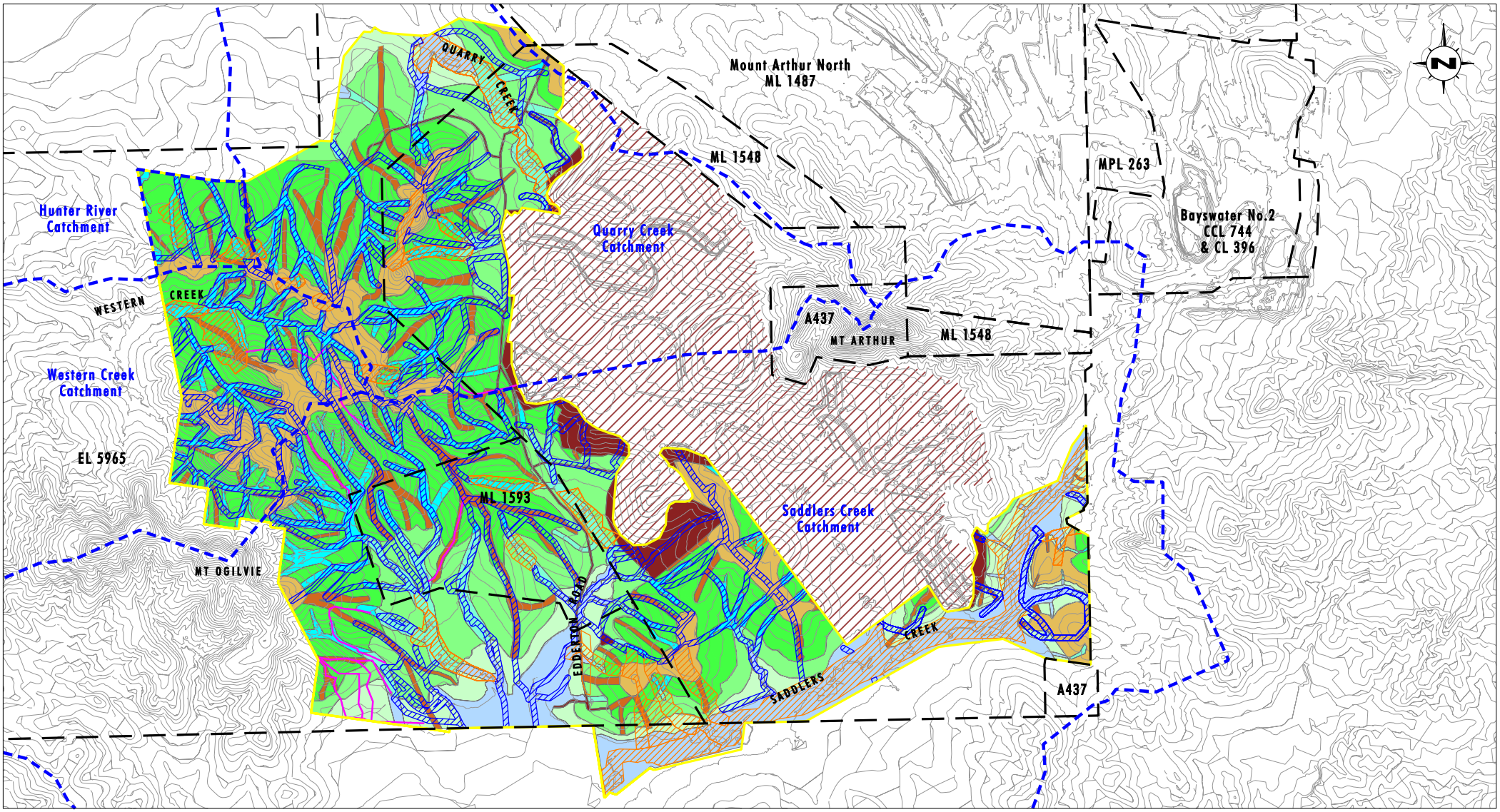
6.3 Defining Sites

The majority of sites located during the survey were artefact scatters and isolated finds. Defining the limits of an artefact scatter/isolated find site is problematic because ground surface exposure has such a strong influence on artefact visibility. Excavations have shown that surface evidence is not a good indicator of the extent of a site and that commonly, the majority of artefacts present are still buried in the soil's A horizon (Koettig 1994).

Therefore, site boundaries were defined by identified loci (artefact exposures), where there is material evidence of Aboriginal occupation on the ground surface, together with the area of PAD associated with the identified loci, where the archaeologist considered further archaeological deposits may exist. (Please note that the term 'PAD' is used to imply the likelihood of further artefactual material in a sub-surface context; it does not imply that the deposits will have archaeological integrity).

Sites were numbered according to catchment. The survey area can be divided into four main catchments, defined by the main watercourses in the area; Saddlers Creek, Western Creek, Quarry Creek and also part of the direct Hunter River catchment. The catchments are shown on **Figure 6.1**.

Kuskie (1999) had previously defined the boundary of an Aboriginal site as the boundary of the archaeological terrain unit. This approach was not adopted for this assessment as classification of a site by archaeological terrain unit meant large areas would be classified as a site where it could be demonstrated that there were no surface artefacts and no potential for subsurface artefacts (for example, there were areas surveyed within terrain units that had no artefactual material despite excellent ground surface visibility and erosion advanced to a level where artefacts would be visible if they were present). These areas do not contain Aboriginal artefacts and thus were not classified as sites or parts of sites. In a similar manner to Kuskie (1999), however, the visible extent of each artefact scatter/isolated find was defined as a site loci. Each site locus was mapped during fieldwork. Where appropriate, loci were included as part of a broader site when it was assessed that there was a potential for subsurface artefacts (PAD) between two or more loci. Where the artefact scatter/isolated find at a loci was thought to represent the limit of the archaeological material in that area, the loci was defined as the site. Loci were split into separate components when



Base Source: Mt Arthur Coal

Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Bayswater No.3 Mining Area
- Catchment Boundary
- Disturbed
- Drainage Depression (gentle)
- Drainage Depression (moderate to steep)
- Drainage Depression (level to very gentle)
- Ridge Crest/Ridge Line
- Simple Slope (gentle)
- Simple Slope (level to very gentle)
- Simple Slope (moderate to steep)
- Spur Crest
- Pedestrian Corridors (60m approximate width)
- Pedestrian Areas of Coverage
- Vehicle Transects (10m approximate width)

FIGURE 6.1

Survey Area, Archaeological Terrain Units, Catchments and Survey Coverage

File Name (A4): R03_V1/2051_181.dgn

exposures were split into clusters due to site vegetation. This approach also led in some cases to sites including more than one archaeological terrain unit as the area of PAD and distribution of artefacts was across more than one unit.

6.4 Archaeological Terrain Units

A system of archaeological terrain units was used by Kuskie (1999) to assist with analysis of the landscape. The same archaeological terrain units were used for the current survey to allow comparability with the Kuskie (1999) survey results. Definitions of the archaeological terrain units are provided in **Table 6.2**. These were defined using McDonald et al. (1998) as a reference. This reference is referred to as an acceptable reference for definition of landforms and terrain units by DECC guidelines for archaeological assessments (NPWS 1997). The distribution of archaeological terrain units within the survey area is mapped on **Figure 6.1**.

Table 6.2 - Archaeological Terrain Units

Archaeological Terrain Unit	Definition
Modified Terrain	Modified terrain refers to a landform which has been completely transformed by non-Aboriginal land use such as roads, overburden emplacement areas and mining pits.
Simple Slope – level to very gentle	Simple slopes which can be defined as level to very gently inclined slopes of less than 3 per cent. This archaeological terrain unit can include, footslope, lower slope, mid slope and upper slope landform elements outside the level to very gentle drainage depression terrain unit. This may in some cases include a bench or hillock landform element.
Simple Slope – gentle	Simple slopes which can be defined as gently inclined slopes greater than 3 per cent and less than 10 per cent. This archaeological terrain unit can include, footslope, lower slope, mid slope and upper slope landform elements outside the gentle drainage depression terrain unit. This may in some cases include a bench or hillock landform element.
Simple Slope – moderate to steep	Simple slopes which can be defined as moderately inclined to steep slopes greater than 10 per cent. This archaeological terrain unit can include footslope, lower slope, mid slope and upper slope landform elements outside the moderate to steep drainage depression terrain unit. This may in some cases include a bench or hillock landform element.
Drainage Depression – level to very gentle	Drainage depressions which are defined as level to very gently inclined slopes of less than 3 per cent. This terrain unit includes associated flat, floodplain, creek bank, alluvial terrace, footslope and creek line landform elements.
Drainage Depression – gentle	Drainage depressions which are gently inclined and are greater than 3 per cent and less than 10 per cent in gradient. This terrain unit includes associated flat, floodplain, creek bank, alluvial terrace, footslope and creek line landform elements.
Drainage Depression – moderate to steep	Drainage depressions which are defined as moderately inclined to steep and are greater than 10 per cent in gradient. This terrain unit includes associated creek bank and creek line landform elements.

Table 6.2 - Archaeological Terrain Units (cont)

Archaeological Terrain Unit	Definition
Ridge Crest/Ridge line	Ridge crest is defined as a 'narrow crest with short adjoining slopes, the crest length being greater than the width of the landform element' (McDonald et al 1984:19). This ridge crest is defined as having adjoining gently inclined slopes greater than 3 per cent and less than 10 per cent. The ridge lines consist of crests and saddles within the survey area.
Spur Crest/Spur	Spur crest refers to an elongated crest which runs from a ridge crest. This spur crest has slopes which are moderately inclined to steep slopes greater than 10 per cent. This terrain unit includes spur, secondary spur and spur crest landform elements.

The terrain units were used prior to the survey to develop the draft survey strategy (which drew upon the predictive model – refer to **Section 5.9**). The use of archaeological terrain units also ensure the possibility of comparison of the results of the survey with the survey and salvage results of other areas in the Upper Hunter. Effective coverage was calculated by the division of the landscape into archaeological terrain units.

6.5 Landform Elements

Survey notes also recorded the landscape by a more specific classification that is by landform elements. The division of the landscape into landform elements and the recording of landform elements in the field is important for gaining an understanding of archaeological site patterning and Aboriginal occupation across the landscape of the survey area. It also aids when comparing and interpreting evidence of Aboriginal occupation of the survey area with evidence of Aboriginal occupation in the general locality and the Upper Hunter Valley region in general.

Records taken in the field regarding landforms are tabulated in **Appendix 6**. **Table 6.3** provides definitions for the landform elements utilised during fieldwork.

Table 6.3 - Landform Elements

Landform Element	Definition
Ridgeline Crest	A crest is a smoothly convex landform that stands above almost all points in the adjacent terrain. A ridge line comprises a narrow crest with short adjoining slopes; crest length is greater than crest width. The ridge lines within the survey area consist of crests and saddles (refer below).
Spur/saddle	A smoothly convex landform that stands above all or almost all points in the adjacent terrain and runs off a ridge line. A saddle is an area which occurs between two higher points (crests) along the spur.
Spur (secondary)	A spur which runs off a spur.
Spur Crest	Spur crest refers to an elongated crest which runs from a ridge crest.
Ridgeline Saddle	A saddle on a ridge line is an area which occurs between two higher points (crests) on the ridge line.

Table 6.3 - Landform Elements (cont)

Landform Element	Definition
Upper Slope	Slope element adjacent to and below a crest. This landform is not buried by colluvial deposit and is above the mid slope.
Moderate Slope	Slope element below upper slope and above lower slope.
Lower slope	Waning slope, below moderate mid slope and above a footslope.
Footslope	Slope element adjacent to and above a floodplain and includes in some cases what is referred to in site notes and previous archaeological research as creek bank. This footslope landform element is part of the simple slope archaeological terrain unit when it is more than 30 metres from the creek bank. It is within the drainage depression terrain unit when it is within 30 metres of the creek bank.
Floodplain	Flat or gently inclined area associated with a stream channel. There may be active erosion and/or aggradation by channelled and overbank stream flow.
Modified	An area which has been significantly altered by human effort. For example a road or quarry
Creek line	Creek line refers to the channel of the creek/watercourse.
Bench	A short, gently or very gently inclined minimal mid slope element eroded or aggraded by an agent.
Hillock	A compound landform element comprising a narrow crest and short adjoining slopes, the crest length being less than the width of the landform element.
Flat	A planar landform element that is neither a crest nor a depression and is level or very gently inclined (less than 3 per cent tangent approximately).
Alluvial terrace	A former floodplain on which erosion and aggradation by channelled and over-bank stream flow is barely active or inactive because deepening or enlargement of the stream channel has lowered the level of flooding. A pattern that has both a former floodplain and a significant active floodplain, or that has former floodplains at more than one level, becomes terraced land.

1: Please note that many of these landform elements were classified using McDonald et al. 1998 as a reference as per DECC's guidelines for Aboriginal Cultural Heritage reporting (NPWS, 1997).

6.5.1 Aboriginal Resource Richness

To evaluate the Aboriginal resource richness of the landscape within the survey area a number of environmental attributes were assessed during the intensive surveys of the sub-catchments. These were:

- outlook;
- suitable overhangs for shelters;
- availability of economic plants;
- occurrence of faunal prey species;

- suitability for camping (areas of gentle gradient);
- fresh water availability;
- availability of stone resources; and
- location of a creek confluence.

The results of the evaluation will be discussed in detail in **Section 6.6**.

6.6 Results of the Survey

This section provides a summary of the results of the survey including sites identified, erosion/disturbance and ground surface visibility and an evaluation of the survey results against the predictive model in **Section 5**.

6.6.1 Erosion/Disturbance and Ground Surface Visibility

Ground surface visibility was high in the eastern sections of the survey area (east from Edderton Road) due to recent bushfires along Saddlers Creek and its associated slopes and lower tributaries. This resulted in higher detection of archaeological materials within archaeological terrain units in this part of the survey area. In comparison, ground surface visibility was considerably poorer in the slope landform elements (foot slope, lower slope, moderate slope, upper slope) in the western sections of the survey area (west from Edderton Road) due to the density of vegetation and grass cover. This area had been less affected by fire and site detection is lower in these landforms except where large erosion scalds were present. Large erosion scalds were present on many crests and slopes and were observable on aerial photographs (refer to **Figure 4.1** and **Plates 1** and **2**). Visibility on roads and tracks along ridge crests and upper slopes was high due to the grading of tracks. Very few vehicle tracks were covered in gravel.

Ground surface visibility was greatest in areas of gully erosion and scalding associated with the creeklines and their tributaries within the survey area. These creeklines included Western Creek, Saddlers Creek, Quarry Creek and their associated minor tributaries (refer to **Plates 3** and **4**). Artefact scatters were often located in association with ants' nests, scalds near creeklines and on the gullies produced by advanced erosion. Parts of Saddlers Creek, Western Creek (mostly the eastern sections) and Quarry Creek and their associated tributaries, which were not actively eroding, or were areas of soil aggradation, did not contain large scalds or gullies and were far less likely to exhibit evidence of exposed archaeological material. Therefore site detectability is likely to have been biased by the low ground surface visibility and lack of exposures along these drainage depressions in these specific areas. It is notable that in areas of large ground surface exposure, particularly in the north-western tributaries of Saddlers Creek which branch up towards Mt Ogilvie, that large ground surface exposures were present with no artefactual material detected.

As known and predicted from previous archaeological research in the locality, artefact scatters were the predominant site type identified during the field survey. The artefact scatters were detected due to erosion which exposed the artefacts on the ground surface. Gullying, rill and sheet erosion were the most common forms of erosion in the survey area and heightened the detection of Aboriginal sites within drainage depression archaeological terrain units and in the higher terrain units such as moderate to steep slope, spur crest and the ridge crest/ridgeline terrain units in specific areas in the west of the survey area. Erosion was accelerated by previous land use practices. Tree clearance from pastoralism, ploughing



PLATE 1

Facing southeast, high ground surface visibility due to recent bushfire on upper slopes associated with Saddlers Creek in the eastern section of the survey area



PLATE 2

Facing northwest, large erosion scalds on slopes and crests associated with Western Creek



PLATE 3

Facing northwest, large erosion scald on Quarry Creek in western section of the survey area. Pink flags show artefact distribution in Site QC01



PLATE 4

Facing east, large erosion scald on Saddlers Creek in eastern section of the survey area. Pink and yellow flags show artefact distribution in Site SC01

and grazing has adversely affected the A horizon soils within the survey area leading to a loss of site integrity.

Ground surface visibility was lower in the very gentle to flat and gentle simple slope archaeological terrain units due to vegetation.

6.6.2 Effective Coverage and Survey Coverage

Survey coverage of archaeological terrain units is shown on **Figure 6.1**. **Table 6.4** provides survey coverage areas for archaeological terrain units within the survey area. **Table 6.4** also provides a summary of total archaeological terrain unit coverage by the survey. Coverage was calculated using a GIS mapping program to calculate area of survey coverage of each archaeological terrain unit crossed by the survey. The GIS program calculated 922 survey units. Due to the large number of survey units an effective coverage table is not provided within this report's main text. Detailed information recorded during the survey concerning archaeological visibility, disturbance, artefact detection and exposure (which are part of the DECC guidelines for archaeological survey reporting for effective coverage) are provided in **Appendix 6**.

Table 6.4 - Effective Coverage of Archaeological Terrain Units

Archaeological Terrain Unit	Total Area within the Umwelt Survey Area 2006 (Hectares)	Survey Area of Transects Combined (Hectares)	Percentage of Total Terrain Unit surveyed within Umwelt (2006) Survey Area
Drainage Depression Very Gentle to Level	390.3	244.8	62.7
Drainage Depression Gentle	166.6	111.0	66.7
Drainage Depression Moderate to Steep	369.9	251.9	68.1
Spur Crest	237.5	75.9	32
Ridge Crest/Ridge line	438.2	126.1	28.8
Simple Slope Moderate to Steep	1165.9	214.3	18.4
Simple Slope Very Gentle	253.7	77.3	30.4
Simple Slope Gentle	594.1	105.4	17.7
Modified Terrain (by roads and previous mining)	156.4	26.5	16.9
Total	**3772.6 ha**	**1233.2 ha**	**32.7%**

The total survey coverage for the survey area is 32.7 per cent. This percentage of survey coverage includes all well vegetated areas with low to zero ground surface visibility as well as all available exposure within the survey area. As shown in **Table 6.4**, survey coverage is lower in terrain units (including Simple Slope Moderate to Steep, Simple Slope Gentle) which were thickly vegetated with low ground surface visibility. Terrain units which had high ground surface visibility and large exposures were the drainage depression very gentle to level, gentle and moderate to steep terrain units, which is reflected in their high percentages for effective coverage in **Table 6.4**. The Modified terrain unit has low percentage of survey coverage (16.9 per cent) due to the high level of disturbance within these areas due to road construction and previous mining practices and the low likelihood of Aboriginal sites remaining. Exposures in all archaeological terrain units were targeted for survey.

6.6.3 Previously Recorded Sites in the Survey Area

Table 6.5 provides a list of previously recorded sites in the survey area. These sites have been incorporated into larger sites as part of this survey and assessment. **Table 6.5** indicates the names of the sites when initially recorded and the new name given to the larger site. Thus the old sites have become artefact loci within the larger sites. The specific descriptions of these previously recorded sites within the survey area are provided as part of **Section 5**.

Table 6.5 - Previously Recorded Sites and New Sites Names

AHIMS Site Number	Original Site Name	Rerecorded as part of Umwelt Site
37-2-0021	Upper Saddlers Creek	SC01
37-2-0022	Upper Saddlers Creek	SC01
37-2-0024	Upper Saddlers Creek	SC01
37-2-0026	Upper Saddlers Creek	SC01
37-2-0042	Upper Saddlers Creek	SC01
37-2-0070	Saddlers Creek	SC01
37-2-0106	Upper Saddlers Creek	SC01
37-2-0109	Quarry Creek	QC01
37-2-0116	Quarry Creek (Whites Creek)	QC01
37-2-0124	Quarry Creek	QC01
37-2-0174	Quarry Creek	QC01
37-2-0282	Saddlers Creek	SC01
37-2-0283	Saddlers Creek	SC01
37-2-0284	Saddlers Creek	SC01
37-2-0285	Saddlers Creek	SC01
37-2-0286	Saddlers Creek	SC01
37-2-0293	MAN93	QC01
37-2-0294	MAN92	QC01
37-2-0331	MAN87	QC01
37-2-0428	MAN93	QC01
37-2-0481	MAS129	SC01
37-2-0482	MAS128	SC01
37-2-0483	MAS130	SC01
37-2-0484	MAS131	SC01
37-2-0485	MAS132	SC01
37-2-0486	MAS133	SC01
37-2-0487	MAS134	SC01

Table 6.5 - Previously Recorded Sites and New Sites Names (cont)

AHIMS Site Number	Original Site Name	Rerecorded as part of Umwelt Site
37-2-0488	MAS135	SC01
37-2-0489	MAS136	SC01
37-2-0501	BMP2	SC01
37-2-0503	BMP4	SC05
37-2-0504	BMP5	WC05
37-2-0506	BMP6	WC04
37-2-0670	LBD1	QC01
37-2-0671	LBD2	QC01
37-2-0673	LCC1	QC05
37-2-0674	LCC3	QC05
37-2-0675	LCC4	QC05
37-2-0676	LCC5	QC06
37-2-0677	LCC6	QC05
37-2-0678	LCC7	QC05
37-2-0679	LCD1	QC01
37-2-0684	LDC1	QC05
37-2-0732	LHH01	SC01
37-2-0733	LHH02	SC01
37-2-0760	HR11	SC01
37-2-1426	McDonalds Pit 2	SC05
37-2-1444	Edderton Rd 2	QC01
37-2-1840	No Name Creek	QC01

The following sites listed above were surface collected by Dyall (1980-1981); 37-2-0021, 37-2-0022, 37-2-0024, 37-2-0026, 37-2-0042, 37-2-0070, 37-2-0106, 37-2-0116, 37-2-0124, 37-2-00174, 37-2-00282 to 37-2-0286. Dyall (1980) also states that land owners had collected artefacts from eroded areas along Saddlers Creek and Quarry Creek. As there are still visible artefacts in these areas they were recorded as part of site SC01 and QC01.

Sites 37-2-282 to 37-2-286 had ‘site destroyed’ stamped on their DECC site cards. Similarly sites 37-2-679 and 37-2-710 have ‘site destroyed’ stamped on their DECC site cards, these sites were recorded as part of the BARP. As there are still visible artefacts in these areas they were recorded as part of site SC01.

6.6.4 Sites Recorded as Part of Survey

A total of 77 sites (containing 509 site loci) were identified within the survey area. Of these 77 sites, one scarred tree, 46 artefact scatters and 30 isolated finds were recorded within the survey area.

Full descriptions of all 509 site loci (split by component) recorded in the field are provided in **Appendix 6**. **Appendix 6** also includes the site loci contents and the detailed descriptions of integrity, extent of site loci, soil descriptions, exposure and erosion extent, type and its impact on the condition of the site loci. Artefact counts were made for the number of artefacts identified in each site. At large sites of over 300 artefacts, counts were estimated to the closest 50 artefacts. This section provides an overview of the grouping of these loci

within site boundaries by catchment area (refer to **Figure 6.2** for the location of sites and site loci and components). Plates are provided for representative sites within each catchment area.

6.6.4.1 Hunter River Catchment Sites

Three sites were identified within the Hunter River Catchment (one artefact scatter HR01 [with 14 loci] and two isolated finds, HR02 and HR03). The location of these sites and the extent of associated PAD are shown on **Figure 6.2**. **Table 6.6** provides a summary of these sites and their associated loci, their total area, extent of PAD (as predicted during the survey) and the site contents. Site HR01 is shown on **Plates 5** and **6**.

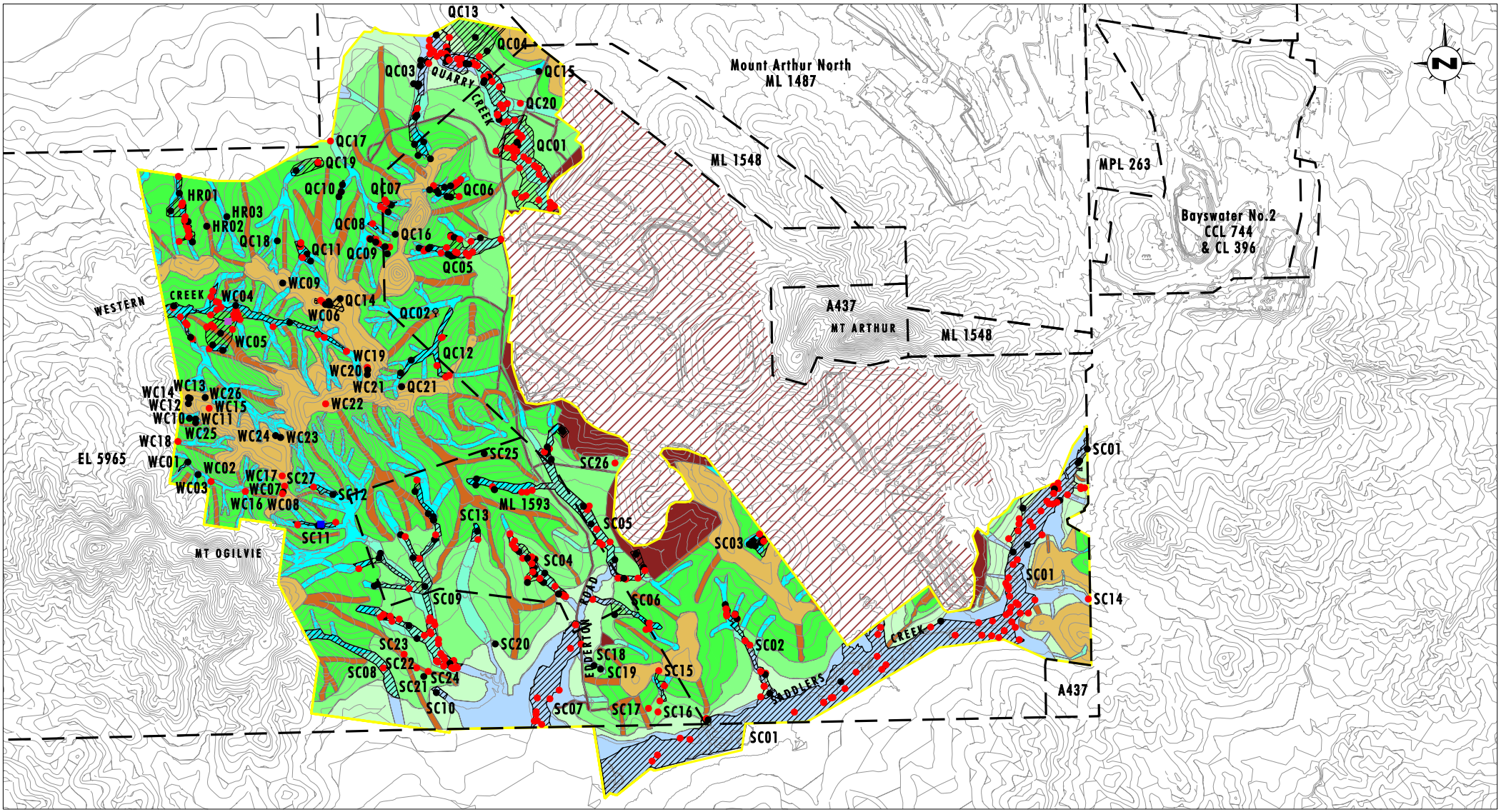
Table 6.6 - Summary of Sites Recorded within the Hunter River Catchment

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain Units within Site	Description of Site Contents
HR01	Artefact Scatter	1/1 to 14/1*	Yes	Mostly Moderate to Steep Drainage Depression with some Moderate to Steep Simple Slope.	The total number of artefacts for all loci is 82. The site assemblage is predominantly mudstone. Silcrete, quartz, porcellanite and petrified wood were also recorded. Artefacts are mostly flakes with high frequencies of broken flakes. Backed blades were recorded at 4/1. Cores were recorded at loci 3/2, 8/1 and 10/1. Some of the mudstone appears to be heat affected, it is not clear whether or not it has been heat treated.
HR02	Isolated Find	1/1	No	Spur Crest.	The site consists of 1 silcrete core with 20 per cent cortex.
HR03	Isolated Find	1/1	No	Moderate to Steep Drainage Depression.	The site consists of 1 silcrete flake.

*Please note the first number refers to loci, the second number of component of that loci if there were more than one.

6.6.4.2 Quarry Creek Catchment

Twenty-one sites were identified within the Quarry Creek Catchment (14 artefact scatters, six isolated finds and one scarred tree, QC02 (refer to **Plate 7** for site QC02). The location of these sites and the extent of associated PAD are shown on **Figure 6.2**. **Table 6.7** provides a summary of these sites and their associated loci, their total area, extent of PAD (as predicted during the survey) and the site contents. QC01 is shown on **Plates 3** and **8**.



Base Source: Mt Arthur Coal

0 1 2 3km

1:60 000

Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Bayswater No.3 Mining Area
- Disturbed
- Drainage Depression (gentle)
- Drainage Depression (moderate to steep)
- Drainage Depression (level to very gentle)
- Ridge Crest/Ridge Line
- Simple Slope (gentle)
- Simple Slope (level to very gentle)
- Simple Slope (moderate to steep)
- Spur Crest
- Archaeological Site Boundary
- Artefact Scatter loci
- Isolated Find loci
- Scarred Tree
- Rock Shelter
- Sandstone Outcropping

FIGURE 6.2

Archaeological Sites Recorded by Umwelt (2006) and Archaeological Terrain Units

File Name (A4): R03_V1/2051_182.dgn



PLATE 5
Facing north, overview of Site HR01 Locus 3/1



PLATE 6
Closeup of a selection of silcrete, mudstone and burnt porcellanite artefacts (from Site HR01 Locus 3/1)



PLATE 7
Closeup of scar on Aboriginal Scarred Tree, Site QC02



PLATE 8
Closeup of a selection of petrified wood, silcrete, basalt, mudstone and other materials identified within Site QC01 Locus 1/1

Table 6.7 - Summary of Sites Recorded within the Quarry Creek Catchment

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain Units within Site	Description of Site Contents
QC01	Artefact Scatter	1/1 to 45/1	Yes	Gentle Drainage Depression and Level to Very Gentle Drainage Depression, Gentle and Level to Very Gentle Simple Slope and Modified.	The total number of artefacts for all combined loci is 2768. The dominant raw material identified was mudstone followed by silcrete. Other raw materials identified included quartz, petrified wood, jasper, porcellanite, quartzite, siltstone, sandstone, chert, basalt and hornfels. The dominant artefact type was flakes followed by broken flakes. Cores, heat shatter and flaked pieces made up smaller percentages of assemblages. Bondi Points were recorded at 1/1 and 19/2. Basalt hand axes were recorded at 3/1 and 45/1. Backed blades and backed artefacts were recorded at 8/1 and 14/1. A grindstone was recorded at 23/1. Siltstone with worked edges was recorded at 26/2 and 29/3. A quartzite hammerstone was recorded at 29/1. The highest artefact density in loci was 1/1 which had approximately 1500 artefacts in area of 60 metres by 30 metres.
QC02	Scarred Tree	1/1	No	Spur crest.	No artefacts were identified at this site.
QC03	Artefact Scatter	1/1 to 15/1	Yes	Level to very gentle simple slope, Ridgeline/ridge crest, Moderate to steep drainage depression, Level to very gentle drainage depression, gentle drainage depression and moderate to steep simple slope.	The total number of artefacts for all combined loci is 54. The predominant raw material recorded was mudstone followed by silcrete. Chert and petrified wood were also recorded at this site. The predominant artefact type was flakes. Broken flakes and cores were also recorded. A Bondi point was also recorded at 8/1.

Table 6.7 - Summary of Sites Recorded within the Quarry Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD associated with Site (yes/no)	Archaeological Terrain Units within Site	Description of Site Contents
QC04	Artefact Scatter	1/1 to 2/1	Yes	Gentle simple slope.	The total number of artefacts for all combined loci is 101. The dominant raw material was silcrete followed by lower percentages of mudstone and quartz. The dominant artefact type was flakes. Cores and broken flakes were also recorded at this site. Quartz was also knapped using bipolar reduction.
QC05	Artefact Scatter	1/1 to 14/1	Yes	Moderate to Steep Simple Slope, Gentle Drainage Depression, Gentle Simple Slope and Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 255. Silcrete was the dominant raw material identified followed by mudstone. Other raw materials recorded included chert, quartz, petrified wood, hornfels, basalt and quartzite. Backed blades were recorded at 2/1, 5/1, 9/1 and 10/1. A horseshoe core and eroded knapping floors with microliths were recorded at 9/1. Many of the silcrete and mudstone artefacts showed evidence of weathering and patination. There was also evidence of heat treatment (colour changes and greasy lustre) in artefact assemblage.
QC06	Artefact Scatter	1/1 to 11/1	Yes	Moderate to Steep Simple Slope and Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 27. The dominant raw materials were silcrete and mudstone. Other raw materials recorded included hornfels, basalt, petrified wood and quartz. The dominant artefact type recorded were flakes followed by broken flakes and cores. Backed blades were recorded at 6/1. A basalt axe head was recorded at 9/1.
QC07	Artefact Scatter	1/1 to 4/2	Yes	Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 12. The dominant raw material was mudstone followed by silcrete. The dominant artefact type was flakes followed by smaller frequencies of broken flakes, cores and some heat shatter.

Table 6.7 - Summary of Sites Recorded within the Quarry Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD associated with Site (yes/no)	Archaeological Terrain Units within Site	Description of Site Contents
QC08	Artefact Scatter	1/1	Yes	Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 10. The dominant raw material was mudstone followed by silcrete. Flakes were the dominant artefact type followed by broken flakes and heat shatter.
QC09	Artefact Scatter	1/1 to 6/2	Yes	Moderate to Steep Simple Slope and Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 22. The dominant raw material was mudstone followed by silcrete, basalt and quartzite. The dominant artefact types were retouched flakes followed by broken flakes and heat shatter.
QC10	Artefact Scatter	1/1 to 3/1	Yes	Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 3. The dominant artefact types were flakes followed by broken flakes and cores. Equal percentages of mudstone, silcrete, chert and quartzite were recorded.
QC11	Artefact Scatter	1/1 to 4/3	Yes	Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 18. The dominant artefact types were flakes followed by heat shatter and cores. The dominant raw material identified was silcrete followed by mudstone.
QC12	Artefact Scatter	1/1 to 7/1	Yes	Moderate to Steep Drainage Depression and Ridgeline/Ridge crest.	The total number of artefacts for all combined loci is 24. The dominant raw material identified was mudstone followed by silcrete and quartzite. The dominant artefact type was broken flakes followed by flakes, heat shatter, flaked pieces and cores.
QC13	Isolated Find	1/1	Yes	Gentle Simple Slope.	One silcrete broken flake was identified at this site.

Table 6.7 - Summary of Sites Recorded within the Quarry Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD associated with Site (yes/no)	Archaeological Terrain Units within Site	Description of Site Contents
QC14	Artefact Scatter	1/1 to 3/1	Yes	Ridgeline/Ridge crest.	The total number of artefacts for all combined loci is 22. The dominant raw material identified was mudstone followed by basalt and silcrete. A retouched basalt hand axe was identified at 2/1. The dominant artefact type was flakes followed by cores.
QC15	Isolated Find	1/1	No	Moderate to Steep Drainage Depression.	One mudstone flake was identified at this site.
QC16	Isolated Find	1/1	No	Moderate to Steep Simple Slope	One mudstone flake was identified at this site.
QC17	Artefact Scatter	1/1	No	Gentle Drainage Depression.	The total number of artefacts for all combined loci is 7. The predominant raw materials were mudstone and silcrete. The predominant artefact type was flakes followed by heat shatter. A basalt broken axe was identified.
QC18	Isolated Find	1/1	No	Moderate to Steep Drainage Depression.	One basalt flake was identified at this site.
QC19	Artefact Scatter	1/1 to 3/1	No	Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 4. The dominant raw material was silcrete followed by mudstone and quartz. The dominant artefact type was flakes followed by broken flakes and a core.
QC20	Artefact Scatter	1/1	No	Gentle Drainage Depression.	The total number of artefacts for all combined loci is 4. The dominant raw material was silcrete followed by quartzite. The dominant artefact type was broken flakes followed by flakes, a blade and a flaked piece.
QC21	Isolated Find	1/1	No	Ridgeline Crest/Ridgeline.	One silcrete flake was identified at this site.

An additional two cultural locations (not considered to be archaeological sites) were identified by Mrs Barbara Foot of WC. These two locations are discussed further in **Section 7.1**.

6.6.4.3 Saddlers Creek Catchment Sites

Twenty seven sites were identified within the Saddlers Creek Catchment (seven isolated finds and twenty artefact scatters). The location of these sites and the extent of associated PAD are shown on **Figure 6.2**. **Table 6.8** provides a summary of these sites and their associated loci, their total area, extent of PAD (as predicted during the survey) and the site contents. SC01 is shown on **Plates 4** and **9**. SC09 is shown on **Plates 10** and **11**.

Table 6.8 - Summary of Sites Recorded within the Saddlers Creek Catchment

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain units within Site	Description of Site Contents
SC01	Artefact Scatter	1/1 to 58/2	Yes	Predominantly level to very gentle drainage depression with some level to very gentle simple slope, gentle drainage depression and gentle simple slope.	The total number of artefacts for all combined loci is 1670. The dominant raw material identified was mudstone followed by silcrete, porcellanite, quartz, chert, hornfels, quartzite, petrified wood, basalt, silicified sandstone, river pebbles and chalcedony. Artefact types recorded included flakes predominantly, followed by broken flakes, cores, flaked pieces, heat shatter, flakes used as cores, backed blades, blades, microliths, hammerstone, grindstones, choppers and an axe head. A sandstone anvil was recorded at 13/1. Backed blades were identified at 18/1, 20/1, 40/1, 41/1, 46/1, 47/1 and 55/1. Thumbnail scrapers, and several partially eroded knapping floors were recorded at 20/1 and 21/1. A hammerstone and grindstone were recorded at 20/1. Choppers and an axe head were identified at 21/1. An ochre cake was identified at 48/1. Artefacts showed a mixture of weathering and patination with more recently knapped materials. Heat treatment was most obvious through colour change and greasy lustre in many of the artefacts.



PLATE 9
Closeup of basalt axehead with retouch and flake identified within Site SC01, Locus 21/1



PLATE 10
Facing northwest, overview of main tributary at Site SC09



PLATE 11
Closeup of artefacts within assemblage of Site SC09 Locus 39/1



PLATE 12
Facing northwest, overview of Site WC05 looking towards the confluence of Western Creek and its tributaries. Mt Dangar can be seen in the distance

Table 6.8 - Summary of Sites Recorded within the Saddlers Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain units within Site	Description of Site Contents
SC02	Artefact Scatter	1/1 to 12/1	Yes	Gentle drainage depression, level to very gentle drainage depression, moderate to steep drainage depression and level to very gentle simple slope.	The total number of artefacts for all combined loci is 118. The raw material identified predominantly was mudstone followed by silcrete and smaller percentages of basalt, quartz, sandstone and quartzite. The predominant artefact type were broken flakes followed by flakes, cores, heat shatter, flaked pieces, hammerstones and axe heads. A broken quartzite hammerstone that appeared crushed was identified at 1/1. Another hammerstone was identified at 6/1. Two retouched basalt axe heads were identified at 4/1 and 10/2.
SC03	Artefact Scatter	1/1 to 3/4	Yes	Moderate to Steep Simple Slope and Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 13. The dominant raw material was mudstone followed by silcrete. The dominant artefact types were flakes followed by broken flakes.
SC04	Artefact Scatter	1/1 to 6/2	Yes	Predominantly Gentle Drainage Depression with also sections of Level to Very Gentle Drainage Depression, Level to Very Gentle Simple Slope and Gentle Simple Slope.	The total number of artefacts for all combined loci is 127. The dominant raw material was mudstone followed by silcrete with smaller percentages of quartz, chert and petrified wood. The dominant artefact types were flakes followed by broken flakes, cores, backed blades and heat shatter. Backed blades were recorded at 3/7 and 3/14.
SC05	Artefact Scatter	1/1 to 19/1	Yes	Predominantly Gentle Drainage Depression with Moderate to Steep Drainage Depression, Level to Very Gentle Drainage Depression, Gentle Simple Slope, Level to Very Gentle Simple Slope, Moderate to Steep Simple Slope and Modified.	The total number of artefacts for all combined loci is 386. The dominant raw material was mudstone followed by silcrete with smaller percentages of quartz, basalt, petrified wood and tuff. The dominant artefact types were broken flakes, followed by flakes, cores, heat shatter, flaked pieces, blades and edge ground axes. Two basalt edge ground axes were identified at 3/1 and 3/2 respectively. Blade manufacture was identified at 6/2.

Table 6.8 - Summary of Sites Recorded within the Saddlers Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain units within Site	Description of Site Contents
SC06	Artefact Scatter	1/1 to 6/3	Yes	Predominantly Moderate to Steep Drainage Depression with some gentle simple slope and gentle drainage depression.	The total number of artefacts for all combined loci is 18. The dominant raw material was mudstone followed by silcrete and smaller percentages of petrified wood and siltstone. The dominant artefact types were flakes followed by broken flakes and some cores, heat shatter, flaked pieces and flakes used as a core.
SC07	Artefact Scatter	1/1 to 9/1	Yes	Predominantly Level to very gentle drainage depression with small percentage of modified terrain.	The total number of artefacts for all combined loci is 385. The dominant raw material was mudstone followed by silcrete with smaller percentages of porcellanite, petrified wood, chert and quartz. The dominant artefact types were flakes followed by cores, broken flakes, flaked pieces, blades, backed blades and heat shatter. Backed blade manufacture was recorded at 7/1.
SC08	Artefact Scatter	1/1	Yes	Predominantly Level to very gentle drainage depression.	Two mudstone broken flakes were identified at this site.
SC09	Artefact Scatter	1/1 to 44/1	Yes	Gentle Drainage Depression, Moderate to Steep Drainage Depression, Moderate to Steep Simple Slope.	The total number of artefacts for all combined loci is 1175. The predominant raw material was mudstone followed by silcrete, porcellanite, petrified wood, chalcedony, hornfels, basalt, quartz, chert and tuff. The predominant artefact type was flakes followed by broken flakes, cores, blades, heat shatter, choppers, flaked pieces, hammerstones and Bondi points. Choppers and hammerstones and four partially eroded knapping floors were recorded at 39/1. Bondi points were recorded at 9/5.
SC10	Isolated Find	1/1	Yes	Level to very gentle drainage depression.	One silcrete broken flake was identified at this site.

Table 6.8 - Summary of Sites Recorded within the Saddlers Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain units within Site	Description of Site Contents
SC11	Artefact Scatter	1/1 to 4/1	Yes	Moderate to steep drainage depression.	The total number of artefacts for all combined loci is 11. The dominant raw material was mudstone followed by silcrete. The dominant artefact type was flakes followed by broken flakes.
SC12	Artefact Scatter	1/1 to 2/1	Yes	Moderate to steep drainage depression.	The total number of artefacts for all combined loci is 40. The dominant raw material was mudstone followed by silcrete, basalt and quartzite. The dominant artefact type was flakes followed by broken flakes, cores and a hammerstone. The hammerstone was basalt and polished and identified at 2/1.
SC13	Artefact Scatter	1/1 to 1/2	Yes	Gentle drainage depression.	The total number of artefacts for all combined loci is three. The raw materials used were mudstone and quartz. The artefacts identified included a quartz core, a mudstone flake and flake used as a core.
SC14	Artefact Scatter	1/1	Yes	Level to very gentle drainage depression.	Two mudstone flakes, one with retouch the other was a primary flake were identified at this site.
SC15	Artefact Scatter	1/1, 2/1 and 3/1	Yes	Ridge crest/ridge line.	Three loci were recorded which consisted of eight artefacts. One basalt axe head was identified at this site.
SC16	Isolated Find	1/1	No	Gentle simple slope.	One mudstone primary flake was identified at this site. The flake had 30% cortex and was heat treated (it exhibited greasy lustre).
SC17	Artefact Scatter	1/1	No	Moderate to steep simple slope.	One mudstone core with 70 per cent cortex was recorded and one mudstone retouched flake.
SC18	Isolated Find	1/1	No	Gentle drainage depression.	One mudstone broken flake was identified at this site.
SC19	Isolated Find	1/1	No	Gentle drainage depression.	One hornfels flake was identified at this site.
SC20	Isolated Find	1/1	No	Level to very gentle simple slope.	One mudstone flake was identified at this site.
SC21	Isolated Find	1/1	No	Gentle simple slope.	One red/yellow mudstone primary broken flake was identified at this site.
SC22	Artefact Scatter	1/1	No	Spur crest.	Five broken mudstone flakes were recorded and one silcrete core was identified at this site.

Table 6.8 - Summary of Sites Recorded within the Saddlers Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain units within Site	Description of Site Contents
SC23	Artefact Scatter	1/1	No	Spur crest.	The total number of artefacts for all combined loci is 22. The dominant raw material identified was silcrete followed by mudstone and quartz. The dominant artefact type was broken flakes. A core was also recorded with 20 per cent cortex.
SC24	Isolated find	1/1	No	Spur crest.	The total number of artefacts is 15. The dominant artefact type is flakes followed by broken flakes and cores. The dominant raw material is mudstone.
SC25	Isolated Find	1/1	No	Moderate to steep drainage depression.	One mudstone core rejuvenation flake was recorded.
SC26	Artefact Scatter	1/1	No	Gentle simple slope.	Four mudstone broken mudstone flakes recorded which are likely to be conjoins and one silcrete flake.
SC27	Artefact Scatter	1/1	No	Ridge crest/ridge line.	The total number of artefacts for all combined loci is 12. The dominant raw material was mudstone followed by silcrete and quartz. The dominant artefact type was flakes and heat shatter.

6.6.4.4 Western Creek Catchment Sites

Twenty-seven sites were identified within the Western Creek Catchment (18 isolated finds and eight artefact scatters). The location of these sites and their extent of associated PAD are shown on **Figure 6.2**. **Table 6.9** provides a summary of these sites and their associated loci, their total area, extent of PAD as predicted during the survey and the site contents. Site WC05 is shown on **Plates 12** and **13**. Site WC04 is shown on **Plate 14**.

Table 6.9 - Summary of Sites Recorded within the Western Creek Catchment

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain units within Site	Description of Site Contents
WC01	Isolated Find	1/1	Yes	Moderate to Steep Drainage Depression.	One mudstone retouched flake was recorded.
WC02	Isolated Find	1/1	Yes	Moderate to Steep Drainage Depression.	One quartzite broken axe head was recorded.



PLATE 13
Closeup of artefacts found within Site WC05



PLATE 14
Facing east, overview of Western Creek's main channel and associated footslopes which includes site WC04

Table 6.9 - Summary of Sites Recorded within the Western Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain units within Site	Description of Site Contents
WC03	Artefact Scatter	1/1	Yes	Moderate to Steep Drainage Depression.	The total number of artefacts for all combined loci is 20. The dominant raw material was mudstone followed by smaller percentages of chert and silcrete. The dominant artefact type was flakes followed by cores.
WC04	Artefact Scatter	1/1 to 24/1	Yes	Moderate to Steep Drainage Depression and Moderate to Steep Simple Slope.	The total number of artefacts for all combined loci is 1239. The dominant raw material type was mudstone followed by silcrete. Smaller percentages of porcellanite, basalt, chert, white quartz, rose quartz, quartzite, hornfels, silicified sandstone, petrified wood and chalcedony, struck river pebble, blades cores, backed The dominant artefact type was flakes. Other artefact types recorded included broken flakes, blades, flaked pieces, struck river pebbles, cores, backed blades, retouched flakes and Bondi points. Backed blade production was identified at 1/1, 3/1, 10/1 and 17/2. Bondi points were identified at 4/1. Loci 10/1 has several eroded knapping floors and is at the confluence of several minor tributaries associated with Western Creek's main creek line.
WC05	Artefact Scatter	1/1 to 6/1	Yes	Spur Crest, Moderate to Steep Drainage Depression and Moderate to Steep Simple Slope.	The total number of artefacts for all combined loci is 418. The raw material was mudstone followed by basalt, silcrete, quartzite, petrified wood and hornfels. The dominant artefact type was flakes followed by broken flakes. The other artefact types were flaked pieces, heat shatter, blades, backed blades, cores and horseshoe cores.

Table 6.9 - Summary of Sites Recorded within the Western Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain units within Site	Description of Site Contents
					Backed blades were identified at 1/1, 3/1, and 3/2. A large (approximately 400) number of artefact types and raw materials were identified at loci 3/2. This site is predominantly on the crest and slopes overlooking Western Creek's main channel (WC04) which drains into the Hunter River. It also includes the confluence of a nearby tributary which has good integrity and PAD.
WC06	Artefact Scatter	1/1 to 3/1	No	Ridge line/Ridge crest.	The total number of artefacts for all combined loci is 13. The dominant raw material was mudstone with smaller percentages of silcrete and quartz. The dominant artefact type was flakes followed by broken flakes and cores.
WC07	Isolated Find	1/1	No	Ridge crest/ Ridge line.	One silcrete flake was identified at this site.
WC08	Artefact Scatter	1/1	No	Ridge crest/ Ridge line.	Two mudstone flakes were identified at this site.
WC09	Isolated Find	1/1	No	Ridge crest/ Ridge line.	One mudstone manuport was recorded.
WC10	Isolated Find	1/1	No	Moderate to steep simple slope.	One mudstone retouched flake was identified at this site.
WC11	Isolated Find	1/1	No	Moderate to Steep Drainage Depression.	One mudstone retouched flake (heat effected) was identified at this site.
WC12	Isolated Find	1/1	No	Ridge crest/ Ridge line.	One chert core with pebble cortex was identified at this site.
WC13	Isolated Find	1/1	No	Ridge crest/ Ridge line.	One mudstone flake was identified at this site.
WC14	Isolated Find	1/1	No	Ridge crest/ Ridge line	One mudstone flake was identified at this site.
WC15	Artefact Scatter	1/1	No	Ridge crest/ Ridge line.	One silcrete broken flake and one mudstone core were identified at this site.
WC16	Artefact Scatter	1/1	No	Moderate to steep drainage depression.	The total number of artefacts recorded was six. The dominant raw material was mudstone followed by silcrete. The dominant artefact type was flakes followed by cores.

Table 6.9 - Summary of Sites Recorded within the Western Creek Catchment (cont)

Site Name	Site Type	Site Loci and Components within Site	PAD Associated with Site (Yes/No)	Archaeological Terrain units within Site	Description of Site Contents
WC17	Artefact Scatter	1/1	No	Ridge crest/ Ridge line.	The total number of artefacts is seven. The predominant raw material was mudstone followed by silcrete. The predominant artefact type was flakes with one core also recorded.
WC18	Artefact Scatter	1/1	No	Moderate to steep drainage depression.	The total number of artefacts for all combined loci is five. The predominant raw material was mudstone followed by silcrete and chert. The predominant artefact type was flakes followed by broken flakes, core and one retouched flake.
WC19	Artefact Scatter	1/1	No	Ridge crest/ Ridge line.	Two silcrete broken flakes and one mudstone flake was recorded in total. The mudstone flake was retouched and showed weathering.
WC20	Isolated Find	1/1	No	Ridge crest/ Ridge line.	One mudstone core was identified at this site.
WC21	Isolated Find	1/1	No	Ridge crest/ Ridge line.	One silcrete flaked piece was identified at this site.
WC22	Artefact scatter	1/1	No	Ridge crest/ Ridge line.	The total number of artefacts for all combined loci is four. The dominant raw material was mudstone followed by hornfels and silcrete. The dominant artefact type was flaked pieces followed by broken flake and flake.
WC23	Isolated Find	1/1	No	Ridge crest/ Ridge line	One silcrete flake was identified at this site.
WC24	Isolated Find	1/1	No	Ridge crest/ Ridge line	One mudstone flake was identified at this site.
WC25	Isolated Find	1/1	No	Moderate to Steep Simple Slope	One mudstone flake was identified at this site.
WC26	Isolated Find	1/1	No	Ridge crest/Ridge Line	One mudstone flake was identified at this site.

Three sites (AHIMS Sites 37-2-0507, 37-2-04090 and 37-2-1624) were rerecorded outside of the survey area during access to the survey area. These sites were re-identified in the field.

These sites are all previously registered sites with DECC. Site cards will be forward to DECC with the additional recording information carried out during fieldwork.

6.6.4.5 Summary

As shown in **Tables 6.6** to **6.9** sites SC01, SC05, QC01, SC09, WC04 and WC05 have the most complex assemblages (a wide variety of artefact types and raw material types, sometimes in dense concentrations). The densest concentrations were in QC01 Loci 1/1, 3/2, 19/2, 26/2, 29/1 and 45/1, at SC01 at Loci 20/1 and 21/1, at SC05 at Loci 3/1, 3/2 and 6/2, at SC09 at Loci 39/1, at WC04 at Loci 10/1, and WC05 at Loci 3/2.

All of these sites were identified on higher order watercourses (defined following Strahler, 1961) (WCO5 is predominantly moderate to steep simple slope and spur crest terrain unit, however, it does take in some of the confluence and associated tributary which runs into the main channel of Western Creek (refer to **Figure 6.3**)). SC01, QC01 and WC04 are on the main channels of Saddlers Creek, Quarry Creek and Western Creek respectively. The loci within these sites show repeated and consistent evidence of Aboriginal occupation over a long period of time. It is possible that SC01, QC01 and SC05 are travel routes to Mt Arthur and its associated spurs and ridgelines and SC09 to Mt Ogilvie based on the level of gradient of these watercourses compared to others throughout the survey area. It was suggested in the field by some Aboriginal group representatives that WC04 was a travel route between Mt Dangar and Mt Arthur.

One scarred tree was identified, site QC02. Further discussion of the site results and how they compare to the predictive model is provided in **Section 6.7**.

6.6.5 Site Integrity and Sub-surface Deposits

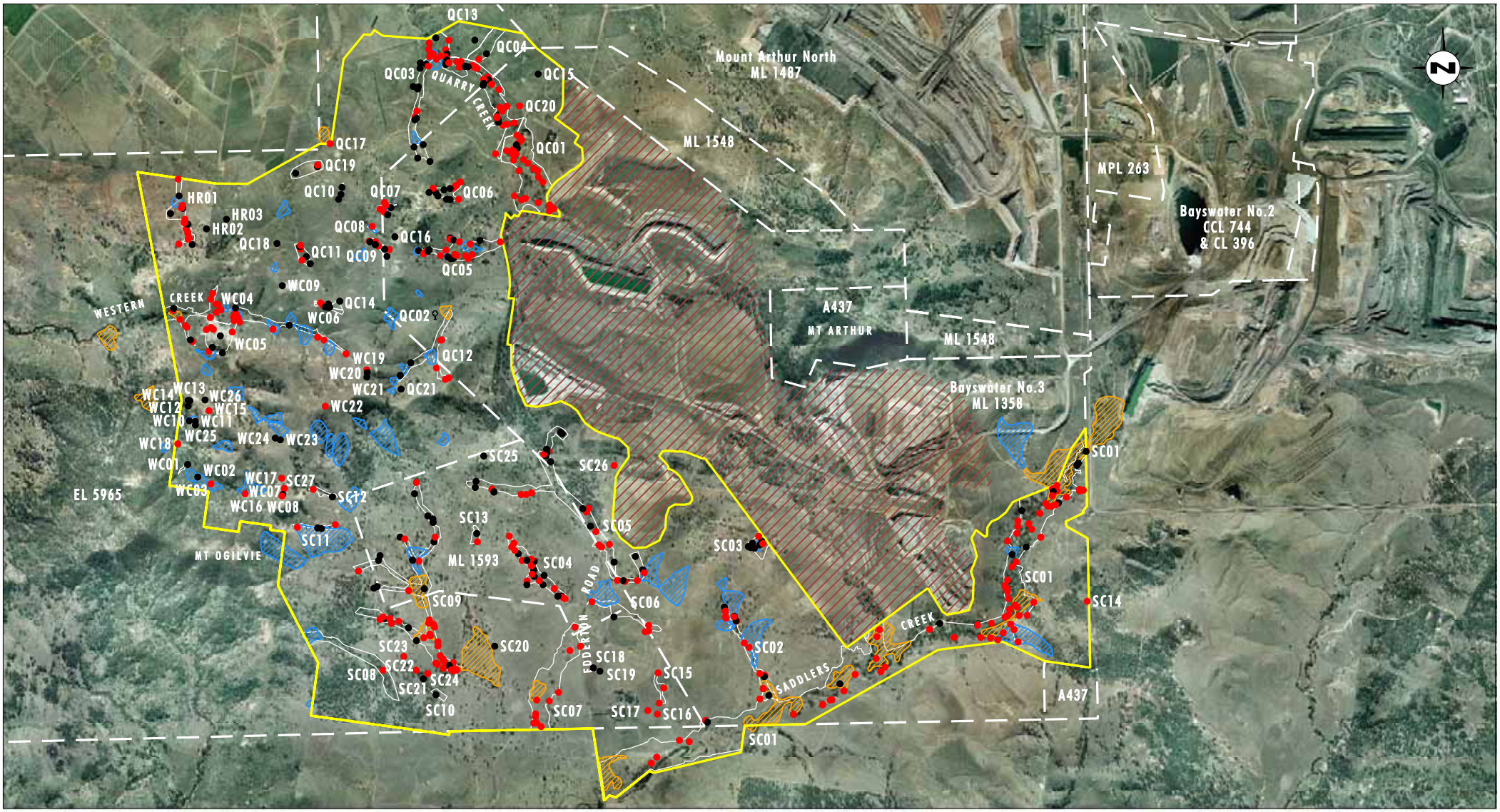
Site integrity was generally found to be low to moderate. There were no sites/PADs assessed as having high integrity within the survey area due to the high impact of previous land use history, particularly erosion accelerated by pastoralism. The extent of sub-surface artefacts (PAD) within sites is mapped on **Figure 6.2** (as the areas between site loci within the site boundary). Specific reference to site integrity is provided in **Appendix 6** for each survey area. The assessment of the integrity of each site and its related PAD is provided in **Section 7** in **Table 7.1**.

6.6.6 Site Location and Artefact Numbers

Site location focused on the level to very gentle and gentle drainage depression archaeological terrain units. Most sites were within 50 metres of a creek line. This fits with the predictive model formulated in **Section 5.9**. The location of large sites is also related to creek confluences (refer to **Figure 6.3**) and in some cases extensive outlook (refer to **Figure 6.4**). Site WC05 is located on the spur crest and steep slopes overlooking Western Creek and several minor confluences. Site WC04 has loci consistently identified at its minor confluences along the main channel of Western Creek. Sites SC09 and SC01 both encompass major confluences of Saddlers Creek and its higher order stream tributaries (third order and above).

6.6.7 Aboriginal Resource Richness

Pebbles of quartz and igneous rocks suitable for knapping were noted in the main tributary and minor tributaries of Saddlers Creek, predominantly within the level to very gentle drainage depression archaeological terrain unit. Siltstone was noticeable throughout the survey area in outcrop. A porcellanite source is believed to be located on the Drayton's ML to the far east of the survey area boundary. A silcrete quarry is located on the Bengalla ML



Base Source: Mt Arthur Coal, 2006

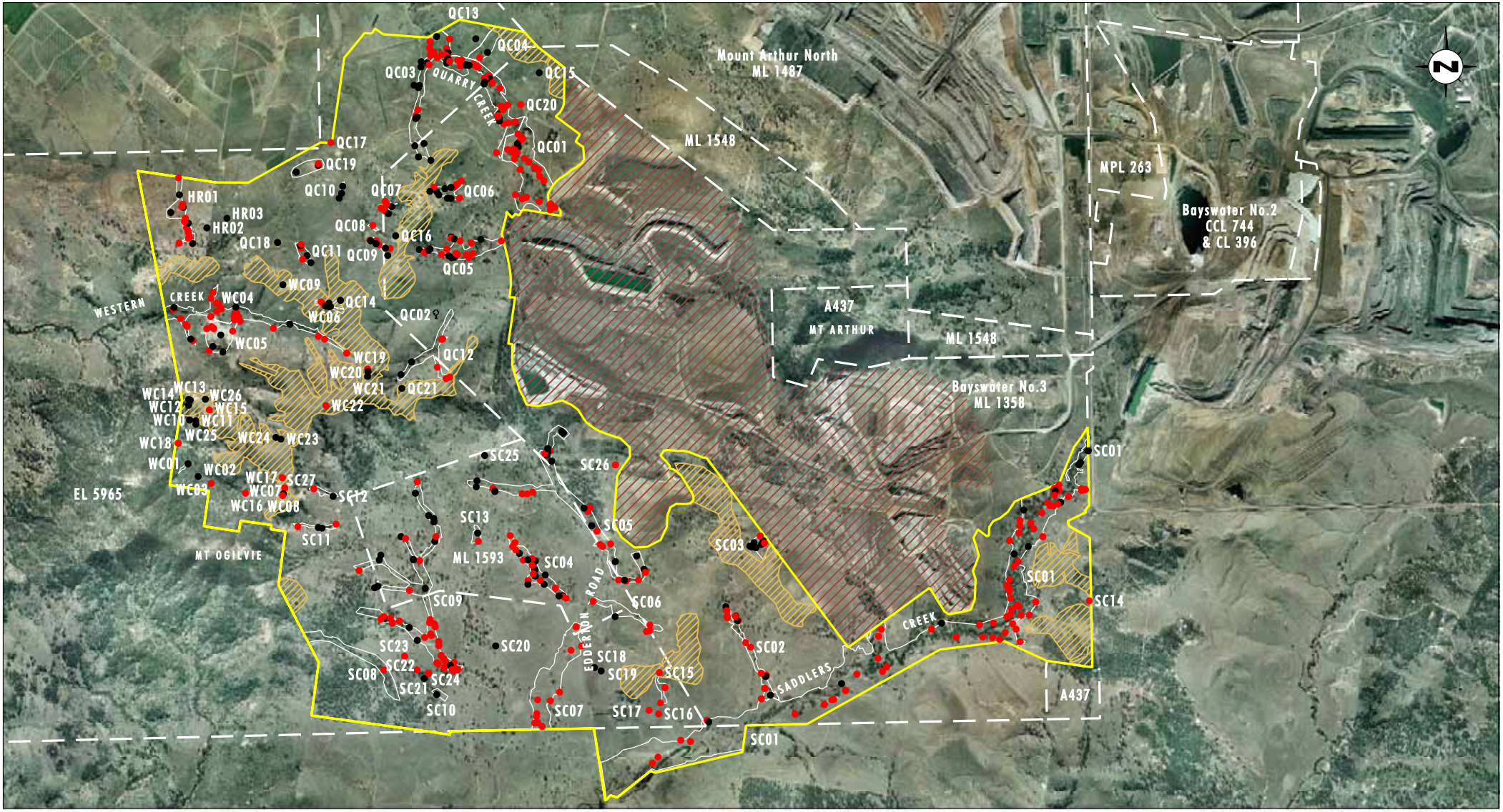
Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Bayswater No.3 Mining Area
- Archaeological Site Boundary
- Artefact Scatter
- Isolated Find
- Scarred Tree
- Minor Confluence
- Major Confluence

FIGURE 6.3

Association of Creek Confluences within and nearby the Survey Area to Recorded Sites

File Name (A4): R03_V1/2051_166.dgn



Base Source: Mt Arthur Coal, 2006

0 1 2 3km
1:60 000

Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Bayswater No.3 Mining Area
- Archaeological Site Boundary
- Artefact Scatter
- Isolated Find
- Scarred Tree
- Ridge Crest/Ridge Line

FIGURE 6.4

Areas which provide an Extensive Outlook within the Survey Area

File Name (A4): R03_V1/2051_183.dgn

(documented in Rich, 1993) (refer to **Section 6**). No sources for silcrete or porcellanite were identified in the survey area.

A small sandstone shelter with a large grass tree was identified on a minor tributary of Western Creek associated with Mt Ogilvie. This shelter had no occupation deposit or evidence of artefactual material. There was no art or evidence of grinding grooves or burning in the shelter. The location of the shelter in the channel of the creek suggests that it was not suitable for occupation. This feature is located outside the mining disturbance area for the project (refer to **Figure 6.1**).

The north eastern sections of Saddlers Creek and the main creek lines of Western Creek and Quarry Creek had resources such as Typha and eels which are Aboriginal food resources. The north eastern sections of Saddlers Creek also contained a large variety of plant resources which are known Aboriginal food and economic plants (refer to **Section 4**).

Sandstone outcropping was noticeable throughout the survey area but no evidence of Aboriginal axe grinding grooves was identified. This result however could be biased by the build up of sediment in creek lines which could have acted to bury and cover previously exposed sandstone outcrops. It is also possible that some of these outcrops were not present prior to European occupation and have been exposed by erosion since this time. Only one area was identified with potential for Aboriginal axe grinding grooves that may be obscured by sediment. This area is outside the mining disturbance area and is in the upper reaches of Western Creek's main tributary.

An ochre cake was identified on the banks of Saddlers Creek (site SC01) at loci 48/1. Ochre is an important resource and its identification in Saddlers Creek is not unexpected; ochre was also reported within the proposed South Pit Extension Area further north of the survey area boundary on the Mt Arthur spur leading down to Saddlers Creek (refer to **Section 5** and Umwelt 2006).

Evidence of Aboriginal occupation was focused on the main tributaries of Saddlers Creek, Western Creek and Quarry Creek and associated minor tributaries. This is as predicted shows that Aboriginal people camped close to more permanent water which is an essential resource.

6.7 Interpretation of Results and Assessment of Predictive Model

Tables 6.10 to **6.13** tabulate the results of the Umwelt survey in terms of understanding the location of evidence of Aboriginal occupation within the landscape. The tables also summarise the information in a manner that allows easy comparison with the predictive model (refer to **Section 6.8**).

Table 6.10 - Site Loci and their Distance to Nearest Watercourse

Distance to Watercourse	<50 m	50-100 m	>100 m
Number of site loci	406	64	39

Table 6.11 - Distribution of Site Loci in Archaeological Terrain Units

Archaeo-logical Terrain Unit	Modified Terrain	Simple Slope - Very Gentle	Simple Slope – Gentle	Simple Slope – Moderate/ Steep	Drainage Depression -Very Gentle to Level	Drainage Depression – Gentle	Drainage Depression Moderate/ Steep	Ridge Crest/ Ridge line	Spur Crest
No. of site loci	11	9	18	29	109	164	133	29	7

Table 6.12 - Site Loci Type and Site Contents

No. of site loci	Isolated Finds	Artefact Scatters	Scarred Trees	Major Category of Artefact	Major Raw Material
	157	351	1	Flake	Mudstone

Table 6.13 - Assemblage Size

No. of site loci with <10 artefacts	No. of site loci with 10<20 artefacts	No. of site loci with 20<50 artefacts	No. of site loci with 50<100 artefacts	No. of site loci with 100-250 artefacts	No. of site loci with 250-500 artefacts	No. of site loci with 500-1000 artefacts
387	48	38	12	10	11	3

The results of the Umwelt survey fit with the predictive model developed from previous archaeological work. The results show that the most common site loci type recorded were artefact scatters located less than 50 metres from high order watercourses (following Strahler 1961). Mudstone is the dominant raw material and the flakes the dominant artefact type in assemblages. The majority of site loci were identified in gentle drainage depressions which have a low gradient slope known to be favourable for Aboriginal occupation. However, what is unexpected is that the terrain unit with the second highest frequency of loci is the moderate to steep drainage depression unit. In terms of distribution of archaeological material the gentle drainage depression and level to very gentle drainage depression terrain units have higher numbers of artefacts and greater areas of PAD.

The high frequency of site loci in the moderate to steep drainage depression terrain unit may be due to the use of gullies as travel routes to the top of ridge lines. It may also be attributed to the excellent outlook at the top of these drainage depressions. The areas of steeper gradient including the moderate to steep drainage depression terrain unit and the moderate to steep simple slope terrain unit have lower artefact densities. The lower numbers of artefacts in the simple slope terrain units indicate these areas are background scatter rather than a high frequency of sites across the landscape. The frequency of site loci on the ridge crest/ridge line is also attributable to the extensive outlook provided by this landform.

The majority of site loci are low frequency artefact scatters. However, there is a higher frequency of scatters with assemblages of over 50 artefacts identified during the survey than expected in the predictive model. Artefact scatters have been identified in the landforms most disturbed from erosion associated with pastoralism, i.e. gentle, level to very gentle and moderate to steep drainage depressions (this is also considering the higher ground surface visibility for Saddlers Creek on the eastern side of the survey area). Areas with generally low archaeological visibility such as the gentle, level to very gentle and moderate to steep simple slope archaeological terrain units had lower frequencies of archaeological evidence and archaeological site loci identified during the survey.

The ridgeline/ridge crest and spur crest terrain unit has large areas of excellent visibility due to erosion scalds within the western part of the survey area and areas of high visibility due to bushfires in the eastern part of the survey area. This high visibility did not significantly increase the detection of artefacts within the spur crest terrain unit except for the location of WC05. WC05 is a large site predominantly within the spur crest terrain unit overlooking WC04. It is also nearby several creek confluences associated with Western Creek and has extensive outlook over the survey area (refer to **Figures 6.2** and **6.3**).

Evidence of Aboriginal occupation increases with higher order watercourses (following Strahler 1961, third order and above) and the proximity of the confluence of higher order watercourses (refer to **Figures 6.2** and **6.3**).

The major artefact category identified within site loci are flakes. The high frequency of broken flakes in assemblages is indicative of the impact of cattle grazing throughout the survey area on artefacts.

7.0 Significance Assessment

Cultural heritage significance is a measure of the relative value or importance of heritage sites. Significance is assessed according to principles outlined originally in Australia in the Burra Charter (1979), which was adapted from the UNESCO sponsored ICOMOS (International Council for Monuments and Sites) Venice Charter. The assessment of significance assists in the determination of appropriate cultural heritage management procedures for sites/artefacts that may be threatened by development activities. Assessing the significance of Aboriginal archaeological sites is an extremely complicated process that must take into account the interests of many parties.

The Burra Charter defines cultural significance as the 'aesthetic, historic, scientific or social value for past, present or future generations' of a place. The DECC Guidelines (NPWS, 1997) provide further discussion on the assessment of cultural significance for Aboriginal sites, and for artefact scatter sites in particular. Categories of significance relevant to Aboriginal archaeological sites include Aboriginal significance, archaeological/scientific significance, and aesthetic significance, tourism potential and educational significance. *The NSW NPWS Guidelines for Archaeological Report Writing* (1997: 25) states:

> *While Aboriginal sites and places may have educational, tourism, and other values to groups in society their principle values are likely to be in terms of their cultural/social significance to Aboriginal people and their scientific significance to archaeologists. It is thus possible to identify two main streams in the overall significance assessment process: the assessment of cultural/social significance to Aboriginal people and the assessment of scientific significance to archaeologists.*

Therefore, within this report the significance of the sites within the survey area will be assessed in relation to their Aboriginal significance and their scientific significance. The criteria for assessing each type of 'significance' will be detailed in the sections to follow. The scientific significance assessment of the sites recorded during the survey for this project and those previously recorded will be discussed and justifications for the significance ranking provided. Descriptions of the sites are provided in **Appendix 6** and the location of the sites is shown on **Figure 6.2**

7.1 Aboriginal Cultural Significance

This section of the report was completed once the draft report was reviewed by the nineteen Aboriginal stakeholder groups. Comments from twelve of the Aboriginal stakeholder groups regarding the draft assessment report, including some comments on the Aboriginal cultural significance of the survey area were received.

Table 7.1 was provided in a pro-forma to the Aboriginal stakeholder groups during the presentation of the draft Aboriginal Archaeological Assessment for the Mt Arthur Underground Project to allow the groups to rate the cultural significance of each site and to provide comments on each site. **Table 7.1** was revised after receipt of group comments after the review period has ended (refer to **Appendix 5** and **Section 8.4**).

Nearly all Aboriginal stakeholder group comments (except GC, UHHC) stated that all sites identified during the survey are of 'high cultural significance'. However, some groups' commented that sites QC01, QC02 and SC01 were of great importance to the Aboriginal stakeholder groups and required continued 'conservation and management' (refer to groups comments in **Appendix 5**). Mrs Barbara Foot (WC) stated that scarred tree, QC02 'was an important Aboriginal cultural site' and site QC01 (specifically the area within the previously proposed Quarry Creek Conservation Area) was 'a big camp site, a large and important

Aboriginal cultural heritage site of high significance' (refer to Mrs Foot's comments in **Appendix 5**). Similar comments regarding the cultural significance of these specific sites are reiterated in comments by VC and WCH.

Two locations of cultural importance were also identified by Mrs Barbara Foot (WC) in addition to the archaeological sites recorded during the survey. These two locations included one tree with an associated line of siltstone stones and a hill which has another line of stones. The tree has a scar which Mrs Foot identified as an Aboriginal scarred tree. The tree is near a line of siltstone stones which Mrs Foot felt pointed to a hill with another line of siltstone stones. Mrs Foot identified the hill, the line of stones and the tree as part of 'an important women's site' based on her feelings and her interpretation of the landscape (refer to Mrs Foot's comments and Plates 1 and 2 in **Appendix 5**). These locations were not recorded during the archaeological survey as they did not have recognisable features that would warrant their recording as archaeological sites and they were not identified by Aboriginal participants in the survey. These locations have been identified by Mrs Foot only, as important based on her perception of their cultural derivation. In recognition of Mrs Foot's input, the tree with a scar and the line of rocks and the hill were recorded and assessed within this report as areas of Aboriginal cultural significance and not as archaeological sites (refer to **Figure 7.1**). The management of these locations is discussed in **Section 8** and **9** of this report.

Some of the Aboriginal stakeholder group's comments also referred to the high cultural significance of the historically documented massacre site, 'The Pocket'. This site is outside the project area and within the proposed Mt Arthur Voluntary Conservation Area. This site will be protected and conserved in perpetuity (refer to **Figure 5.1** for location of 'The Pocket'). Cultural information about this site provided by Mrs Foot is included in **Appendix 5**).

Table 7.1 - Aboriginal Significance of Sites

Site Number	Site Type	Number of Artefacts	Aboriginal Cultural Significance
Hunter River Catchment			
HR01	Artefact Scatter	82	High
HR02	Isolated Find	1	High
HR03	Isolated Find	1	High
Quarry Creek Catchment			
QC01	Artefact Scatter	2768	*Very High
QC02	Scarred Tree	0	*Very High
QC03	Artefact Scatter	54	High
QC04	Artefact Scatter	101	High
QC05	Artefact Scatter	255	High
QC06	Artefact Scatter	27	High
QC07	Artefact Scatter	12	High
QC08	Artefact Scatter	10	High
QC09	Artefact Scatter	22	High
QC10	Artefact Scatter	3	High
QC11	Artefact Scatter	18	High
QC12	Artefact Scatter	24	High
QC13	Isolated Find	1	High



Base Source: Mt Arthur Coal, 2006

Legend

- Mining and Exploration Lease Boundary
- Subsidence Affectation Area
- Grey Box Tree identified by Barbara Foot as an Aboriginal scarred tree
- The siltstone rocks identified by Barbara Foot as "pointing stones"
- A hill identified as an Aboriginal women's site by Barbara Foot
- Shaft/well within "The Pocket" historically documented Aboriginal massacre site and location of isolated mudstone primary flake

FIGURE 7.1

Location of Aboriginal cultural importance identified by Barbara Foot (Wanaruah Custodians)

Table 7.1 - Aboriginal Significance of Sites (cont)

Site Number	Site Type	Number of Artefacts	Aboriginal Cultural Significance
QC14	Artefact Scatter	22	High
QC15	Isolated Find	1	High
QC16	Isolated Find	1	High
QC17	Artefact Scatter	7	High
QC18	Isolated Find	1	High
QC19	Artefact Scatter	4	High
QC20	Artefact Scatter	4	High
QC21	Isolated Find	1	High
Saddlers Creek Catchment			
SC01	Artefact Scatter	1670	*Very High
SC02	Artefact Scatter	118	High
SC03	Artefact Scatter	13	High
SC04	Artefact Scatter	127	High
SC05	Artefact Scatter	386	High
SC06	Artefact Scatter	18	High
SC07	Artefact Scatter	385	High
SC08	Artefact Scatter	2	High
SC09	Artefact Scatter	1175	High
SC10	Isolated Find	1	High
SC11	Artefact Scatter	11	High
SC12	Artefact Scatter	40	High
SC13	Artefact Scatter	3	High
SC14	Artefact Scatter	2	High
SC15	Artefact Scatter	8	High
SC16	Isolated Find	1	High
SC17	Artefact Scatter	2	High
SC18	Isolated Find	1	High
SC19	Isolated Find	1	High
SC20	Isolated Find	1	High
SC21	Isolated Find	1	High
SC22	Artefact Scatter	5	High
SC23	Artefact Scatter	22	High
SC24	Artefact Scatter	15	High
SC25	Isolated Find	1	High
SC26	Artefact Scatter	5	High
SC27	Artefact Scatter	12	High
Western Creek Catchment			
WC01	Isolated Find	1	High
WC02	Isolated Find	1	High
WC03	Artefact Scatter	20	High
WC04	Artefact Scatter	1239	High
WC05	Artefact Scatter	418	High
WC06	Artefact Scatter	13	High

Table 7.1 - Aboriginal Significance of Sites (cont)

Site Number	Site Type	Number of Artefacts	Aboriginal Cultural Significance
WC07	Isolated Find	1	High
WC08	Isolated Find	1	High
WC09	Isolated Find	1	High
WC10	Isolated Find	1	High
WC11	Isolated Find	1	High
WC12	Isolated Find	1	High
WC13	Isolated Find	1	High
WC14	Isolated Find	1	High
WC15	Artefact Scatter	2	High
WC16	Artefact Scatter	6	High
WC17	Artefact Scatter	7	High
WC18	Artefact Scatter	5	High
WC19	Artefact Scatter	3	High
WC20	Isolated Find	1	High
WC21	Isolated Find	1	High
WC22	Artefact Scatter	4	High
WC23	Isolated Find	1	High
WC24	Isolated Find	1	High
WC25	Isolated Find	1	High
WC26	Isolated Find	1	High

*Several groups including WCH, WC and VC stressed the significance and the protection of these sites (refer to groups comments in Appendix 5).

7.2 Archaeological/Scientific Significance Assessment

The archaeological or scientific significance of Aboriginal sites was assessed according to their value to contribute to furthering of the archaeological/scientific understanding of Aboriginal culture (their archaeological research potential). Six criteria were assessed for each site to deduce its archaeological research potential from a local and regional perspective. These criteria were:

- rarity;
- representativeness;
- integrity;
- connectedness;
- complexity; and
- potential for archaeological deposit.

7.2.1 Ranking of Criteria for Evaluating Archaeological Significance

Table 7.2 indicates how the sites were evaluated in relation to each of the six criteria to assess their overall archaeological research potential. Following the table, the criteria are discussed and justification is provided for the assessment of particular levels of significance for each of the sites. The sites were afforded a numerical value for each significance criterion so that an overall significance assessment could be quantified. The values for each criterion were scored as follows:

- low significance was afforded a score of 1;
- moderate significance was afforded a score of 2; and
- high significance was afforded a score of 3.

Overall significance was scored as follows:

- low significance 12-15;
- low to moderate significance 16-19;
- moderate significance 20-23;
- moderate to high significance 24-27; and
- high significance 27+.

If a site was assessed to have low local significance (when compared to other sites discussed as part of **Section 5** and summarised in **Appendices 6** and **7**) for any criterion then this aspect of the site was also deemed to be low at the regional level. If, however, the site was assessed as having moderate or high archaeological significance on a local scale, it was then assessed against other sites known from the literature in the broader Hunter Valley area. In most cases this resulted in the site having lower significance on a regional level.

Table 7.2 - Criteria Used in Evaluating Archaeological Significance

Criterion	Low (Score of 1)	Moderate (Score of 2)	High (Score of 3)
Rarity	The location of the site within the landscape, its type, integrity, contents and/or potential for sub-surface artefacts, are common within the local and regional context.	The location of the site within the landscape, its type, integrity, contents and/or potential for sub-surface artefacts, are common within the regional context but not the local context.	The location of the site within the landscape, its type, integrity, contents and/or potential for sub-surface artefacts, are rare within the local and regional context.

Table 7.2 - Criteria Used in Evaluating Archaeological Significance (cont)

Criterion	Low (Score of 1)	Moderate (Score of 2)	High (Score of 3)
Representativeness	This site, when viewed in relation to its type, contents, integrity and location in the landscape, is common within a local and regional context and sites of similar nature (or in better condition) are already set aside for conservation within the region.	This site, when viewed in relation to its type, contents, integrity and location in the landscape, is uncommon within a local context but common in a regional context and sites of similar nature (or in better condition) are already set aside for conservation within the region.	This site, when viewed in relation to its type, contents, integrity and location in the landscape, is uncommon within a local and regional context and sites of similar nature (or in better condition) are not already set aside for conservation within the locality or region.
Integrity	Stratigraphic integrity of the site has clearly been destroyed due to major disturbance/loss of topsoil. The level of disturbance is likely to have removed all spatial and chronological information.	The site appears to have been subject to moderate levels of disturbance, however, there is a moderate possibility that useful spatial information can still be obtained from sub-surface investigation of the site, even if it is unlikely that any useful chronological evidence survives.	The site appears relatively undisturbed and there is a high possibility that useful spatial information can still be obtained from sub-surface investigation of the site, even if it is still unlikely that any useful chronological evidence survives. (In cases where both spatial and chronological evidence is likely to survive the site will gain additional significance from high scores for rarity and representativeness).
Connectedness	There is no evidence to suggest that the site is connected to other sites in the local area or the region through: • their chronology (rarely known); • their site type (e.g. connectedness could be argued between an axe quarry, a nearby set of axe grinding grooves and an adjacent site exhibiting evidence of axe reduction);	There is some evidence to suggest that the site is connected to other sites in the local area or the region through one of the following: • their chronology (rarely known); • their site type (e.g. connectedness could be argued between an axe quarry, a nearby set of axe grinding grooves and an adjacent site exhibiting evidence of axe reduction);	There is good evidence to support the theory that the site is connected to other sites in the local area or the region through two or more of the following: • their chronology (rarely known); • their site type (e.g. connectedness could be argued between an axe quarry, a nearby set of axe grinding grooves and an adjacent site exhibiting evidence of axe reduction);

Table 7.2 - Criteria Used in Evaluating Archaeological Significance (cont)

Criterion	Low (Score of 1)	Moderate (Score of 2)	High (Score of 3)
Connectedness (cont)	• by the use of an unusual raw material, knapping technique/reduction strategy; • similar designs/motifs in the case of art sites and engravings; and/or • information provided by Aboriginal oral history.	• by the use of an unusual raw material, knapping technique/reduction strategy; • similar designs/motifs in the case of art sites and engravings; or • information provided by Aboriginal oral history.	• by the use of an unusual raw material, knapping technique/reduction strategy; • similar designs/motifs in the case of art sites and engravings; and/or • information provided by Aboriginal oral history.
Complexity	The site does not exhibit and is not predicted to contain either of the following in a sub-surface context: • a complex assemblage of stone artefacts in terms of artefact types and/or raw materials (including use of local and imported raw materials) and/or knapping techniques/reduction strategies; and/or • features such as hearths or heat treatment pits, activity areas.	The site exhibits or can be predicted to contain one of the following in a sub-surface context: • a complex assemblage of stone artefacts in terms of artefact types and/or raw materials and/or knapping techniques/reduction strategies and/or use of local and imported raw materials; and/or • features such as hearths or heat treatment pits, activity areas.	The site exhibits or can be predicted to contain both of the following in a sub-surface context: • a complex assemblage of stone artefacts in terms of artefact types and/or raw materials and/or knapping techniques/reduction strategies and/or use of local and imported raw materials; and • features such as hearths or heat treatment pits, activity areas.

Table 7.2 - Criteria Used in Evaluating Archaeological Significance (cont)

Criterion	Low (Score of 1)	Moderate (Score of 2)	High (Score of 3)
PAD	The site does not have nor has only a low potential to contain sub-surface archaeological material that has stratigraphic integrity or is of a nature that suggests its sub-surface investigation would assist with answering questions of contemporary archaeological interest or that indicate it should be preserved for its future research potential.	The site has a moderate potential to contain sub-surface archaeological material that has stratigraphic integrity or is of a nature that its sub-surface investigation would assist with answering questions of contemporary archaeological interest or that indicate it should be preserved for its future research potential.	The site has a high potential to contain sub-surface archaeological material that has stratigraphic integrity or is of a nature that its sub-surface investigation would assist with answering questions of contemporary archaeological interest or that indicate it should be preserved for its future research potential.

7.2.1.1 Rarity

The scientific significance of a site is assessed as higher if it is perceived as unique or rare within the local area and/or within the region. This rarity may relate to the type of site, the age of the site, the location of the site in the landscape, the preservation of the site (undisturbed sites are rare), the nature of the site contents (it may contain artefact types or reduction strategies that are unknown or not well represented in other sites; it may contain raw material types or mixes of raw material types that are not usually found in sites or are unusually informative of Aboriginal resource use in that area, it may contain hearths or other features rarely preserved in sites).

The majority of artefact scatters and isolated finds (HR02, HR03, QC03, QC15 to QC21, SC02 to SC04, SC06 to SC08, SC10 to SC13, SC14 to SC27, WC01 to WC03, WC06 to WC26) recorded within the survey area are assessed as having low archaeological significance for rarity in a local and regional context. This assessment was based on the following factors:

- they are artefact scatters and/or isolated finds which are the most common site types in the local area and the region;
- they contain similar artefact types and raw material types to other sites in the local area and the region;
- their location within the landscape (along watercourses) is typical of sites in the local area and the region;
- their poor condition (due to a mix of land clearance, pastoralism, ongoing erosion and bioturbation) is typical of the sites in the local area and the region; and
- similar sites are presently conserved within existing Conservation Areas or Heritage Management Zones in the Upper Hunter (for example the Loders Creek Conservation Areas (Bulga Open Cut Mine), the Bulga Underground Mine Conservation Area (Bulga

Underground Mine), the MacLeans Hill, Edderton 1 and 2 Heritage Management Zones (MAN), Mt Arthur Voluntary Conservation Area (MAN) and the Yorks Creek Conservation Area (Mt Owen Mine).

Artefact scatters and isolated finds QC05 to QC12, QC14 and SC05 were assessed as having moderate archaeological significance for rarity within a local context and low archaeological significance for rarity within a regional context. These assessments are based on the following factors:

- the sites are located within archaeological terrain units which less commonly have sites in the local context; and/or
- they are assessed as retaining a slightly higher degree of integrity (as they are less disturbed by European land use activities) than the majority of the sites locally; and/or
- they contain rarer artefact types such as axes, grindstones, choppers and backed blades.

Isolated find with PAD, QC13 is assessed as having high archaeological significance for rarity in a local context and low archaeological significance for rarity on a regional context. These assessments are based on the following factors:

- QC13 and its associated PAD is located within moderate to steep, gentle and level to very gentle simple slope and ridge line/ridge crest terrain units associated with Quarry Creek which retain a level of integrity and that is rare in the local context.

Artefact scatters and isolated finds, QC04, SC09, WC04 and WC05 are assessed as having high archaeological significance for rarity in a local context and moderate archaeological significance for rarity in regional context. These assessments are based on the following factors:

- they are a much larger sites in terms of their areal extent and assemblage size than predicted as occurring within their respective terrain units (WC04 and WC05); and/or
- they have the potential for a higher density artefact scatter in a sub-surface context than predicted (SC09, WC05); and/or
- they have potential to show evidence of travel routes (WC04 was assessed by Aboriginal group representatives as being on a travel route from Mt Dangar to Mt Arthur); and/or
- they exhibit evidence of knapping techniques other than freehand percussion that are rarer in the local and regional context (QC04 contains evidence of bipolar knapping of quartz pebbles for artefact manufacture); and/or
- they exhibit a more complex assemblage than other sites in the local and regional context (WC04, WC05, and SC09 have a large number of artefact types and raw materials and have evidence of eroded knapping floors for several raw material types including mudstone, silcrete, basalt, hornfels, porcellanite); and/or
- their assemblages (WC04, WC05, and SC09) also exhibit a range of raw material types that have differing levels of patination and weathering indicating multiple uses of the site areas over an extended period of time.

QC01 and SC01 are assessed having high archaeological significance for rarity on both a local and regional scale. These assessments are based on the following factors:

- they are very large sites in terms of their areal extent and assemblage size in the local and regional context; and

- there are sections of the sites that retain areas of higher integrity which is rare in the local and regional context; and

- they have the potential for a high density artefact scatter in a sub-surface context, which is rare in the local and regional context; and

- there are some areas within the sites that could retain sub-surface artefacts and features that retain spatial integrity, which is rare in the local and regional context; and

- they have the potential to provide evidence of established travel routes with repeated occupation over a long period of time (QC01 was assessed by Aboriginal group representatives as being on a travel route to Mt Arthur, SC01 was also assessed as being on a travel route to Mt Arthur and to Mt Arthur spur); and

- they retain artefact types (broken grindstones that are rare in the local and regional context; and

- they have a large number of artefact and raw material types and have evidence of eroded and intact knapping floors for several raw material types including mudstone, silcrete, chalcedony, quartz, quartzite, chert, silicified sandstone, siltstone, basalt, hornfels, porcellanite; and

- their assemblages exhibit a range of raw material types that have differing levels of patination and weathering indicating multiple uses of the site area over an extended period of time.

QC02 is a scarred tree and has been assessed as having high archaeological significance for rarity on both a local and regional scale. Scarred trees are rare and threatened heritage sites within the locality and region. This scar and tree are in good condition with no obvious signs of decay or disease. There are no other known scarred trees within the current survey area and no other scarred trees were identified during the survey.

7.2.1.2 Representativeness

One of the aims of cultural heritage management is to ensure that a representative sample of sites is preserved for future generations. The objective is to preserve a sample of every type of site in the range of landscapes in which they occur to provide for future research that may have different research agendas than those of the contemporary Aboriginal and archaeological community.

Isolated finds and artefact scatters, HR02, HR03, QC03, QC15 to QC21, SC02 to SC08, SC10 to SC13, SC14 to SC27, WC01 to WC03 and WC06 to WC26 are assessed as having low archaeological significance for representativeness within a local and regional context. This assessment is based on the following factors:

- they are common site types;

- they are located in terrain units where sites are common;

- the disturbed nature of many of the sites and the disturbed nature of their environs precludes artefacts occurring in a stratigraphic context; and

- similar sites are presently conserved within existing Conservation Areas or Heritage Management Zones in the Upper Hunter (for example the Loders Creek Conservation Areas (Bulga Open Cut Mine), the Bulga Underground Mine Conservation Area (Bulga Underground Mine), the MacLeans Hill Heritage Management Zone (MAN ML) and the Yorks Creek Conservation Area (Mt Owen Mine).

Isolated finds and artefact scatters QC05 to QC12 and QC14 are assessed as having moderate archaeological significance for representativeness in a local context and low archaeological significance within a regional context. This assessment is based on the following factors:

- they are located in archaeological terrain units where sites are not common locally; and

- the sites exhibit contents and a level of integrity unusual for sites within the same archaeological terrain unit (QC05 to QC12 and QC14); and

- the sites indicate a representative sample of Aboriginal occupation across the local landscape in archaeological terrain units where ground surface visibility was poor (there was poor ground surface visibility in the moderate to steep drainage depression archaeological terrain unit where QC05 to QC12 and QC14 were identified, however the steep gradient of these drainage depressions is also a contributing factor); and

- similar sites are conserved in similar terrain units in conservation areas and heritage management zones within the region.

Artefact scatters QC04 and SC09 were assessed as having moderate archaeological significance for representativeness within both a local and regional context. This assessment was based on the size and complexity of their assemblages which is not common locally for their archaeological terrain unit (QC04 is located within a gentle drainage depression and simple slope archaeological terrain unit and has approximately 101 artefacts including evidence of bipolar knapping using quartz; SC09 is located within a gentle drainage depression and moderate to steep drainage depression archaeological terrain unit and has approximately 1267 artefacts.

Artefact scatter QC13 is assessed as having high archaeological significance for representativeness within a local context and low archaeological significance for representativeness within a regional context. This assessment is based on the following factors:

- its location on the moderate to steep simple slope, gentle simple and level to very gentle simple slope leading down to Quarry Creek is a rarer site location in the landscape; and

- it is assessed as having slightly greater potential for sub-surface artefacts that retain spatial integrity than other scatters identified on slopes and crests within the survey area and Quarry Creek catchment.

Artefact scatter HR01, WC04 and WC05 are assessed as having high archaeological significance for representativeness within a local context and moderate significance within a regional context. Artefact scatters, QC01 and SC01 and QC02 (scarred tree) are assessed as having high archaeological significance for representativeness within a local and regional context. This assessment is based on the following factors:

- the sites (HR01, WC04 and WC05) represent much larger sites in terms of areal extent and assemblage size than generally identified within the survey area; and/or

- the sites are assessed as having the potential for a higher density artefact scatter in a sub-surface context than generally located/predicted for their terrain unit (HR01, WCO5, QC01 and SC01); and

- they represent sites that exhibit an assemblage with a diverse array of artefact and raw material types that are not commonly found together in the local and regional context (SC01, QC01, WC04 and WC05).

Scarred tree, QC02 is assessed as having high archaeological significance for representativeness within a local and regional context. Scarred trees are a site type which is rare and threatened and not preserved intact in conservation areas within the locality.

7.2.1.3 Archaeological Integrity

The archaeological integrity or intactness of a site is important when assessing its significance and conservation value. A site that has been subject to minimal disturbance following its creation contains considerably more information about environmental change and/or cultural sequences than a similar site that has been disturbed by European land use practices, natural geomorphic processes, bioturbation and/or has been degraded by erosion.

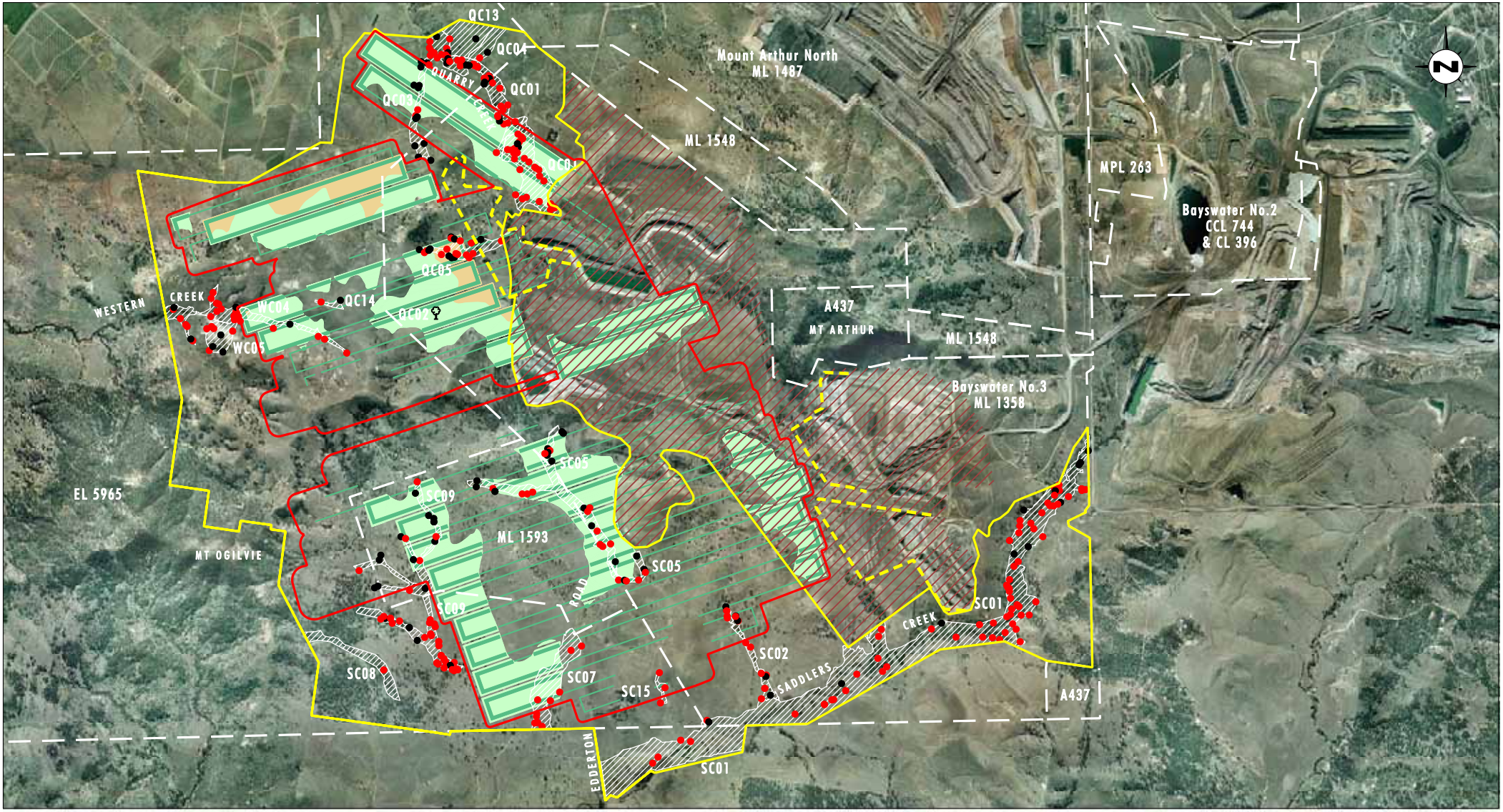
Site integrity is assessed relative to the sites located locally and to known sites within management zones and conservation areas in the broader region. Within the survey area, many of the isolated finds and artefact scatters (HR01 to HR03, QC06 to QC12, and QC15 to QC21) are assessed as having low archaeological significance for integrity within a local and regional context. This lack of integrity is due to factors such as disturbance by vegetation clearance, high levels of erosion, cultivation and construction of farm infrastructure such as dams and fences.

Isolated find with associated PAD, QC13 and artefact scatters with associated PAD (QC03 to QC05, QC14, SC02, SC05, SC07, SC09, SC15, WC04 and WC05) are assessed as having moderate significance for archaeological integrity within a local context and low archaeological significance for integrity within a regional context. In these sites the topsoil horizon was only partially eroded and though the stratigraphic integrity of the soil was likely to be disturbed it was assessed that some useful spatial information could be gathered from sub-surface investigation of these sites. When viewed in a regional context; however, there are many similar sites presently conserved in management zones and conservation areas.

Four artefact scatters with associated PAD (QC01, SC09, SC01, and SC08) are assessed as having moderate significance for archaeological integrity within a local and regional context. In these sites the topsoil horizon was only partially eroded and although the stratigraphic integrity of the soil was likely to be disturbed, it was assessed that some useful spatial information could be gathered from sub-surface investigation of the sites. Furthermore, when viewed in a regional context; there were only small numbers of similar sites presently conserved in management zones and conservation areas.

Scarred tree, QC02 is assessed as having high significance for archaeological integrity within a local and regional context because it is a healthy tree with a scar that is intact with no damage.

Figure 7.2 indicates those sites assessed as having the potential to retain a level of spatial integrity or in the case of QC02 (scarred tree), physical integrity.



Base Source: Mt Arthur Coal, 2006

0 1 2 3km

1:60 000

Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Bayswater No.3 Mining Area
- Subsidence Affectation Area
- Potential Subsidence Remediation Cultivation Area
- Potential Subsidence Remediation Earthworks Area
- Approved Open Cut Mining Area
- Archaeological Site Boundary
- Mine Access Road
- Surface Conveyor
- Tensile Cracking Zone
- Artefact Scatter
- Isolated Find
- Scarred Tree

FIGURE 7.2

Sites with Potential for Retaining Spatial Integrity

File Name (A4): R03_V1/2051_158.dgn

7.2.1.4 Connectedness

Connectedness refers to the relationship between sites within an area. Connectedness can be considered in a number of ways, at a number of scales. In its broadest sense, 'connectedness' refers to patterns linking sites within an area. Connectedness is often difficult to ascertain as the chronological sequence of use of surface sites is unknown at this stage of their assessment. Thus connectedness must be related to other features of sites and/or their assemblages. Sites may appear connected due to their location within the landscape (for example a series of sites associated with a terrain unit or landform element) or because of the nature of their assemblages (for example the use of similar raw materials and reduction sequences aimed at producing similar implement types) or the nature of features within the sites (for example heat treatment pits, hearths, knapping floors). In some cases, it may be that a series of sites within an area relates to a number of different activities which are in fact all components of a single land use system (for example a stone quarry, a camp site at which reduction of that stone takes place, a sandstone outcrop on which that stone is ground). As mentioned above, the difficulty with assessing such an aspect of connectedness arises in demonstrating that all of the sites relate to the same period of time. While it is broadly possible to assign some artefacts to limited time periods (backed blades, Bondi points, eloueras, edge ground axes), these time periods still span thousands of years and the artefacts in question generally only represent a minor component of most assemblages and thus their presence cannot be used to make statements about the majority of the artefacts within any assemblage. Thus, the use of 'artefact types' to date surface assemblages remains too broad (e.g. 4000 to 7000 years) to be useful in discussing the operation of a pattern of land use at any given time and to make judgments related to connectedness.

Within the survey area all isolated finds and artefact scatters except WC04 and WC05 are assessed as having low significance for connectedness on both a local and regional scale. The scarred tree (QC02) is also assessed as having low significance for a connectedness on a local and regional scale.

WC04 and WC05 have been identified by Aboriginal representatives as a potential travel route between Mt Dangar and Mt Arthur. WC04 and WC05 have thus been assessed as having moderate archaeological significance for connectedness on a local scale and low archaeological significance for connectedness on a regional scale.

7.2.1.5 Complexity

The complexity of a site is an indication of its ability to contribute information on the local Aboriginal culture. The complexity of a site may be indicated by the number and/or density of stone artefacts it contains, or by the range of raw materials, knapping methods, reduction strategies and/or features that occur within it. Features that may occur within a site include knapping floors, heat treatment pits, hearths or other items that do not fall within the description of a generalised scatter of flaked stone artefacts.

Isolated finds and artefact scatters HR01 to HR03, QC03, QC06 to QC21, SC02 to SC06, SC10 to SC27, WC01 to WC03, and WC06 to WC26 are assessed as having low archaeological significance for complexity within a local and regional context. This assessment is based on the following factors:

- the sites contain a very low number of artefacts and raw material types; and/or
- freehand percussion is the only knapping method present and there are too few artefacts to investigate reduction strategies; and/or

- there is little likelihood of there being sufficient artefacts in a sub-surface context to increase the complexity of the site; and/or

- the sites are so disturbed there is little or no likelihood of them retaining intact archaeological features.

Scarred tree, QC02 is also related as low for complexity as it has only one scar and cannot be directly connected to any other site.

Artefact scatter sites QC04, QC05, SC08 and SC09 are assessed as having moderate archaeological significance for complexity within a local context and low significance for complexity within a regional context. This assessment is based on the following factors:

- the surface assemblages and nature of the sites indicated that there is a potential for a medium density scatter of artefacts in a relatively undisturbed sub-surface context; and/or

- the sites appeared to contain knapping floors that can be studied to gain a greater understanding of reduction strategies (QC05 and SC09); and/or

- the sites contained more than one knapping method (bipolar reduction and freehand percussion (QC04, SC09); and/or

- the sites contained a mix of both locally and imported raw materials.

Artefact scatter sites QC01, SC01, WC04 and WC05 are assessed as having high archaeological significance for complexity within a local and regional context. This assessment is based on the following factors:

- all four sites have knapping floors of different raw materials that can be studied to gain a greater understanding of reduction strategies;

- the sites contain more than one knapping method (grinding and bipolar knapping of quartz was identified at QC01, SC01, WC04); and

- all four sites have a diversity of artefact types and raw material types; and

- all four sites have the potential to have a complex sub-surface assemblage in areas that range from having no likelihood of integrity to areas that have the potential for spatial integrity; and

- all four sites have large numbers of artefact types and raw material types. These sites also have the potential to have a complex sub-surface assemblage. These sites are also predicted to contain intact deposit below the disturbance zone that may contain large numbers of artefacts.

7.2.1.6 Potential for Archaeological Deposit

For a site to be able to contribute to an understanding of cultural sequences, it must contain distinguishable features or aspects that can be shown to have been created at different times within the context of that site or between sites. For such relationships to be possible the artefacts or features within the sites need to be located within a stratified context. It is also possible that a site may contain artefacts in a sub-surface context that may not remain in a stratified context, but that may by their investigation add to the knowledge of Aboriginal use of the landscape/resource base in a more general sense.

Isolated find and artefact scatter sites (HR01 to HR03, QC06 to QC12, and QC15 to QC21) are assessed as having low archaeological significance for PAD within a local and regional context due to the highly disturbed nature and/or eroded nature of the soil profile within the sites leading to the unlikelihood of them containing sub-surface artefacts in a stratified context.

Isolated find and artefact scatter sites QC03, QC05, QC13, QC14, SC02, SC05, SC07, SC09 and SC15 are assessed as having moderate archaeological potential for PAD within a local context and low archaeological significance for PAD within a regional context. The local moderate significance assessment is based on the potential of the sites to have sub-surface artefacts that may retain some spatial integrity. None of these sites are thought to retain the potential for moderate significance on a regional basis as many similar sites within management zones and conservation areas are assessed as having greater potential for PAD.

Artefact scatter site SC08 is assessed as having moderate archaeological significance for PAD within a local and regional context. The local moderate significance assessment is based on the potential of the site to have sub-surface artefacts that may retain some spatial integrity. .

Artefact scatter site QC04 is assessed as having high archaeological significance for PAD within a local context and moderate archaeological significance for PAD within a regional context. The higher local significance for PAD is due to the depth of deposit which may allow for sub-surface artefacts in an undisturbed context below the current disturbance zone.

Artefact scatter sites SC01 and QC01 are assessed as having high archaeological significance for PAD within a local and regional context. SC01 and QC01 were afforded the higher ranking for PAD due to the high likelihood of a complex assemblage within a sub-surface context. SC01 and QC01 also have the highest potential for retaining areas of spatial integrity. The level of spatial integrity is assessed as higher than the majority of artefact scatters currently conserved in Conservation Areas and Heritage Management Zones.

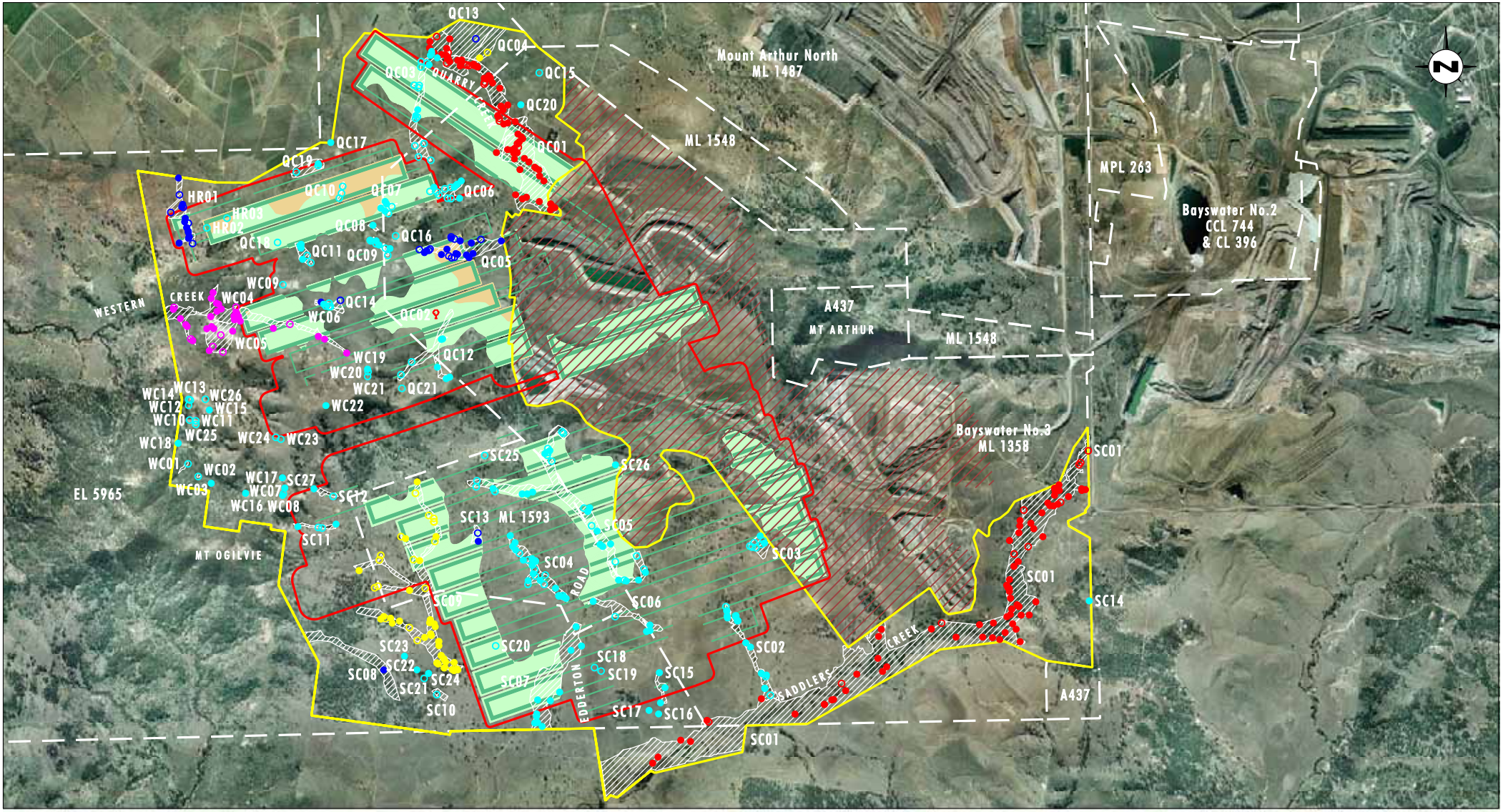
WC04 and WC05 are assessed as having some moderate potential for PAD within a local context based on the high likelihood of a complex assemblage within intact areas of soil such as the confluence of Western Creek and its minor tributary leading up towards the south western slopes surrounding site WC05.

Scarred tree, QC02 cannot be rated for potential archaeological deposit as this criterion does not apply to the assessment of scarred trees (that do not have an associated site or area of PAD).

7.3 Overall Archaeological Significance

The purpose of this section is to provide a summary of the archaeological significance (research potential) of all sites identified in the survey area.

As mentioned in **Section 7.2**, the archaeological research potential of a site is based on an assessment of six criteria related to their rarity, representativeness, integrity, connectedness, complexity and potential for archaeological deposit. **Table 7.3** summarises the archaeological significance assessment of the 77 sites located within the survey area. **Table 7.3** summarises the archaeological significance assessment. **Figures 7.3, 7.3a** to **7.3c** indicate the overall archaeological significance of the sites. Their overall significance assessment equates to their archaeological research potential which in turn relates to their



Base Source: Mt Arthur Coal, 2006

0 1 2 3km
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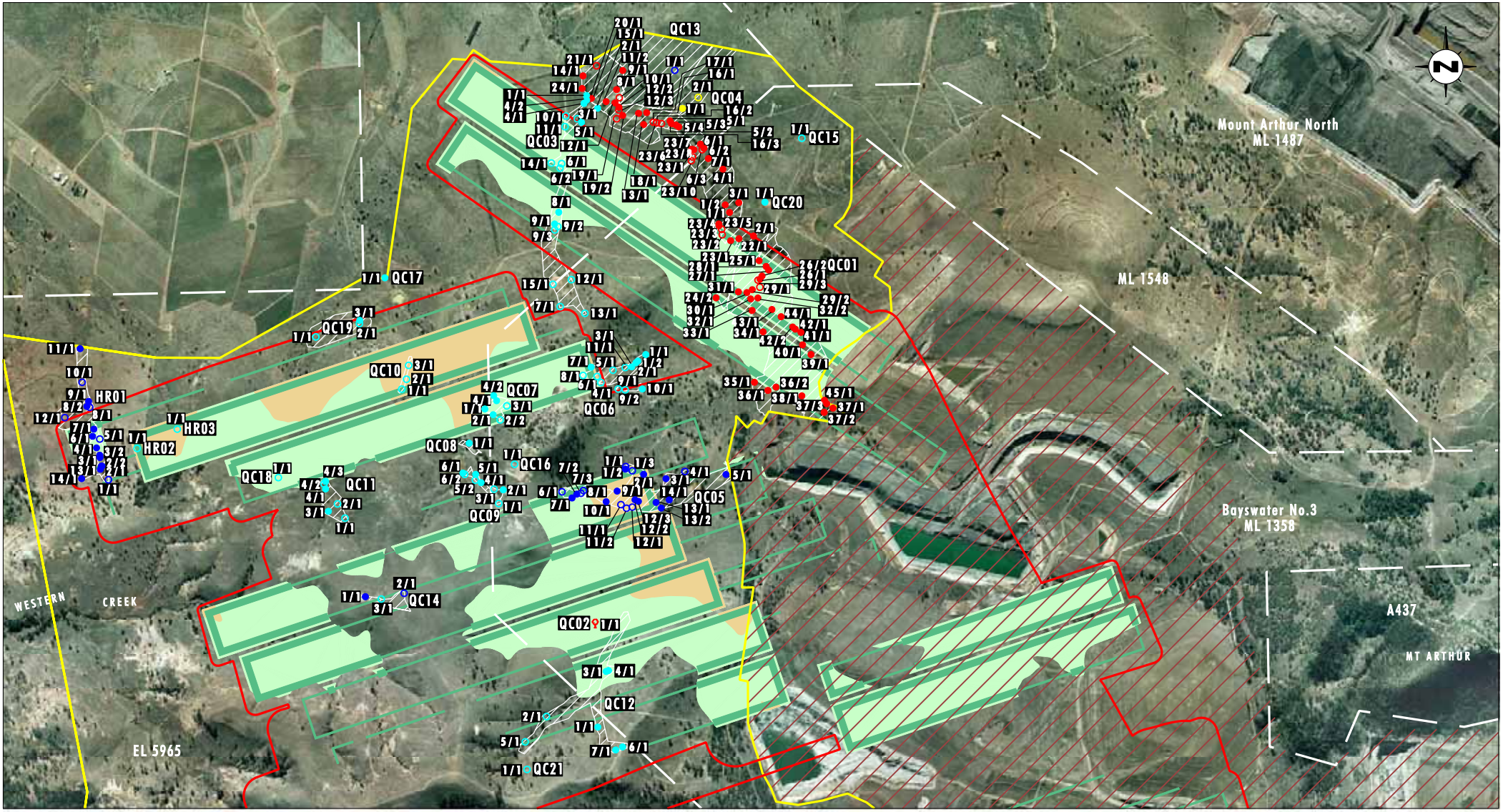
Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Bayswater No.3 Mining Area
- Subsidence Affectation Area
- Potential Subsidence Remediation Cultivation Area
- Potential Subsidence Remediation Earthworks Area
- Archaeological Site Boundary
- Tensile Cracking Zone
- Artefact Scatter
- Isolated Find
- Scarred Tree
- Low Significance
- Low to Moderate Significance
- Moderate Significance
- Moderate to High Significance
- High Significance

FIGURE 7.3

Archaeological Significance - Overview

File Name (A4): R03_V1/2051_167.dgn



Base Source: Mt Arthur Coal, 2006

0 0.5 1 1.5km

1:30 000

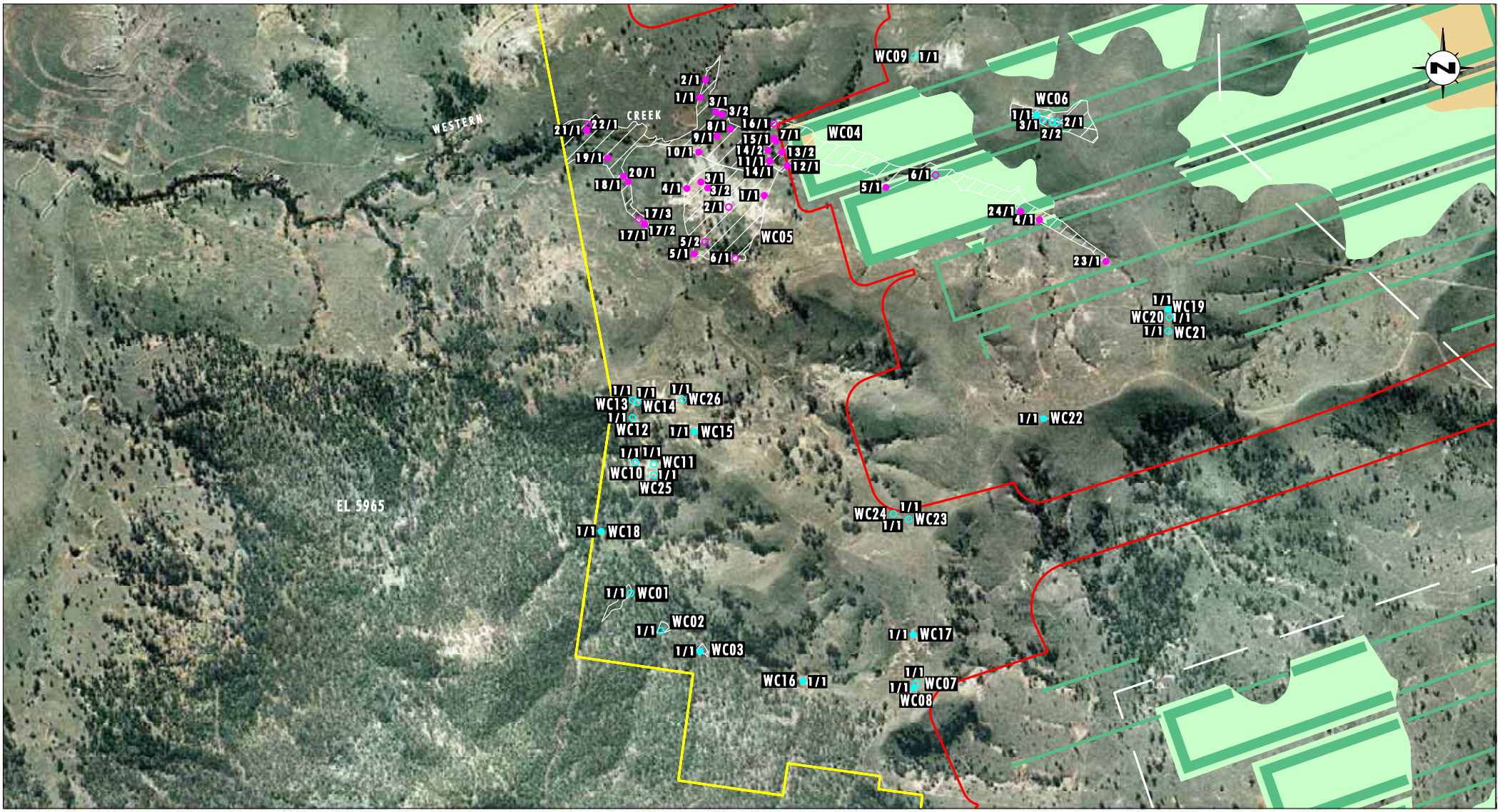
Legend

- Mining and Exploration Lease Boundary
- Survey Area
- Bayswater No.3 Mining Area
- Subsidence Affectation Area
- Potential Subsidence Remediation Cultivation Area
- Potential Subsidence Remediation Earthworks Area
- Archaeological Site Boundary
- Tensile Cracking Zone
- Artefact Scatter
- Isolated Find
- Scarred Tree
- Low Significance
- Low to Moderate Significance
- Moderate Significance
- Moderate to High Significance
- High Significance

FIGURE 7.3a

Archaeological Significance
Quarry Creek and Hunter River Catchment Areas

File Name (A4): R03_V1/2051_186.dgn



Base Source: Mt Arthur Coal, 2006

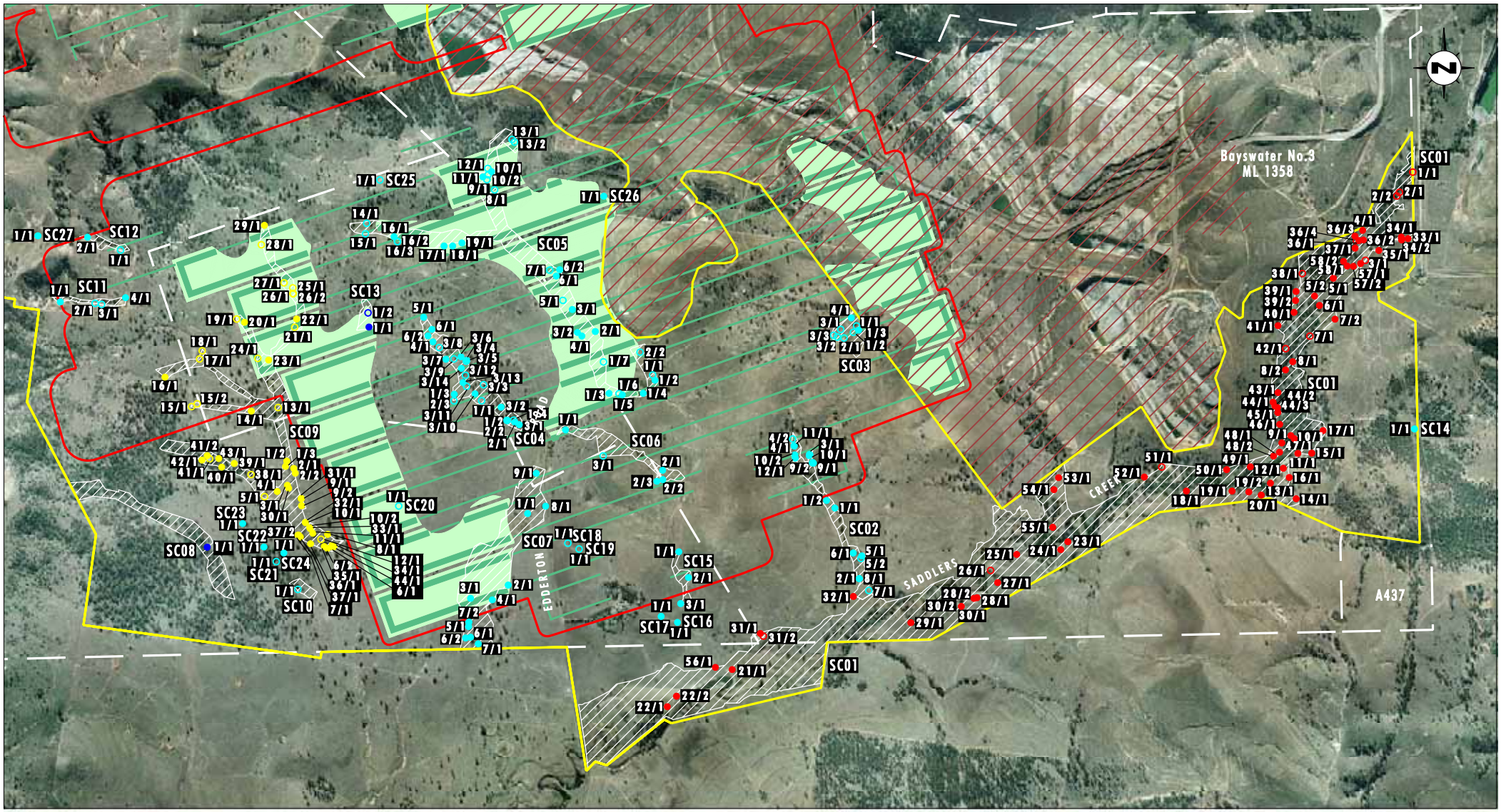
Legend

- Mining and Exploration Lease Boundaries
- Survey Area
- Subsidence Affectation Area
- Potential Subsidence Remediation Cultivation Area
- Potential Subsidence Remediation Earthworks Area
- Archaeological Site Boundary
- Tensile Cracking Zone
- Artefact Scatter
- Isolated Find
- Scarred Tree
- Low Significance
- Low to Moderate Significance
- Moderate Significance
- Moderate to High Significance
- High Significance

FIGURE 7.3b

Archaeological Significance
Western Creek Catchment Area

File Name (A4): R03_V1/2051_187.dgn



Base Source: Mt Arthur Coal, 2006

0 0.5 1 1.5km
1:35 000

Legend

- Mining and Exploration Lease Boundaries
- Survey Area
- Bayswater No.3 Mining Area
- Subsidence Affectation Area
- Potential Subsidence Remediation Cultivation Area
- Archaeological Site Boundary
- Tensile Cracking Zone
- Artefact Scatter
- Isolated Find
- Scarred Tree
- Low Significance
- Low to Moderate Significance
- Moderate Significance
- Moderate to High Significance
- High Significance

FIGURE 7.3c

Archaeological Significance
Saddlers Creek Catchment Area

File Name (A4): R03_V1/2051_188.dgn

ability to answer questions of relevance to the contemporary archaeological and Aboriginal community. Within the Hunter Valley research questions currently relate to topics such as antiquity of occupation, Aboriginal use of the landscape, how the use of the landscape was tied to resource availability and the technologies used for stone tool production.

Many of the isolated finds and the majority of the artefact scatters (HR01 to HR03, QC03, QC05 to QC21, SC02 to SC08, SC10 to SC27, WC01 to WC03 and WC06 to WC26) are assessed as having low or low to moderate potential to answer contemporary research questions. This assessment is due to a combination of the following factors:

- their disturbed nature;
- their limited potential to retain sub-surface archaeological material in a stratified context; and
- in relation to the isolated finds and artefact scatters; as they are located within terrain units and landform elements that are commonly found to contain artefacts in the Upper Hunter area (e.g. in areas of low gradient and near drainage lines) and which have already been subject to extensive sub-surface investigation locally, by Kuskie and Clarke (2004) within the adjacent MAN ML and the BARP salvage investigations (MacDonald and Davidson 2005).

QC04 and SC09 are assessed as having moderate research potential because:

- SC09 has a large and complex assemblage; however, it contains mostly low to sometimes moderate archaeological integrity; and
- QC04 has a large number of artefacts within a landform that has moderate to high archaeological integrity.

WC04 and WC05 are assessed as having moderate to high research potential because:

- both sites have large and complex assemblages; however, only low to moderate archaeological integrity;
- both sites have relatively rare artefact and raw material types within their assemblages;
- WC04 and WC05 have been identified by Aboriginal representatives as being on a travel route from Mt Dangar to Mt Arthur; and
- both sites are within a previously unresearched catchment area and should provide meaningful comparative data to sites already researched on Saddlers Creek and McDonalds Creek during the BARP project (refer to McDonald and Davidson 2005) and Whites Creek (Kuskie and Clarke 2004).

SC01 and QC01 are assessed as having high research potential because:

- both sites have a large and complex assemblage;
- both sites have knapping floors that can be conjoined to determine reduction techniques;
- both sites have multiple artefact knapping methods (freehand percussion, bipolar reduction of quartz, and grinding);
- QC01 has evidence of pressure flaking on Bondi points and geometric microliths;

- both sites have evidence of microblade production;
- both sites have high potential for a large and complex sub-surface assemblage; and
- both sites retain area of PAD that are relatively undisturbed and which can be predicted to retain at least spatial integrity.

Table 7.4 summarises the overall archaeological significance and thus research potential of each of the sites. **Table 7.4** also indicates if the sites are within or outside the areas predicted to have less than 100 metres depth of cover and which have a risk of adverse impact from subsidence and/or subsidence remediation works. **Table 7.4** also lists sites that are within areas that have potential for tensile cracking from the removal of the proposed longwall panels. It should be noted that any impact predicted is a worst case scenario as subsidence remediation works are unlikely to be required over the total extent of land with <100 metres depth of cover and therefore, not all sites within the predicated subsidence remediation impact area may be impacted by the project. In addition to these impacts, the approved West Belmont Pit near Quarry Creek (which is part of the approved Bayswater No. 3 project, refer to **Figure 7.2**) will impact on parts of sites QC01 specifically loci 35/1 and 36/1, all of site QC06 except for loci 8/1 and parts of site QC05 specifically loci 2/1, 3/1, 5/1, 13/1, 13/2 and 14/1.

The proposed overland conveyor will cross SC01 impacting on loci 3/1 and 58/2 directly and Loci, K and Y identified as part of site JF/MJS5 from the South Pit Extension Project (Umwelt 2006). The location of the proposed access road has been revised in order to avoid site SC01 and Loci U recorded as part of site JF/MJS5 from the South Pit Extension Project. **Tables 7.3** and **7.4** indicate that there are 31 sites within, or partially within the impact area and 46 sites outside the impact area but within the survey area (refer to **Section 2** for a discussion of subsidence impact). Further discussion of these site impacts and their proposed management is provided in **Section 9**.

Table 7.3 - Scientific Significance Assessment for Sites in the Mt Arthur Coal Underground Project Area

Site Name	Rarity		Represent-ativeness		Archaeological Integrity		Connectedness		Complexity		Potential for Archaeological Deposit		Overall Archaeological Significance	
	Local	Regional	Local	Regional	Local	Region-al	Local	Regional	Local	Regional	Local	Regional	Score	Significance
HR01	2	3	3	2	1	1	1	1	1	1	1	1	18	Low to Moderate
HR02	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
HR03	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
QC01	3	3	3	3	2	2	1	1	3	3	3	3	30	High
QC02	3	3	3	3	3	3	1	1	N/A	N/A	N/A	N/A	20	High
QC03	1	1	1	1	2	1	1	1	1	1	2	1	14	Low
QC04	3	2	2	2	2	1	1	1	2	1	3	2	22	Moderate
QC05	2	1	2	1	2	1	1	1	3	1	2	1	18	Low to Moderate
QC06	2	1	2	1	1	1	1	1	1	1	1	1	14	Low
QC07	2	1	2	1	1	1	1	1	1	1	1	1	14	Low
QC08	2	1	2	1	1	1	1	1	1	1	1	1	14	Low
QC09	2	1	2	1	1	1	1	1	1	1	1	1	14	Low
QC10	2	1	2	1	1	1	1	1	1	1	1	1	14	Low
QC11	2	1	2	1	1	1	1	1	1	1	1	1	14	Low
QC12	2	1	2	1	1	1	1	1	1	1	1	1	14	Low
QC13	3	1	3	1	2	1	1	1	1	1	2	1	18	Low to Moderate
QC14	3	1	3	1	2	1	1	1	3	1	2	1	20	Moderate
QC15	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
QC16	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
QC17	1	1	1	1	1	1	1	1	1	1	1	1	12	Low

Table 7.3 - Scientific Significance Assessment for Sites in the Mt Arthur Coal Underground Project Area (cont)

Site Name	Rarity		Represent-ativeness		Archaeological Integrity		Connectedness		Complexity		Potential for Archaeological Deposit		Overall Archaeological Significance	
	Local	Regional	Local	Regional	Local	Regional	Local	Regional	Local	Regional	Local	Regional	Score	Significance
QC18	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
QC19	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
QC20	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
QC21	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC01	3	3	3	3	2	2	1	1	3	3	3	2	29	High
SC02	1	1	1	1	2	1	1	1	1	1	2	1	14	Low
SC03	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC04	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC05	2	1	1	1	2	1	1	1	1	1	2	1	15	Low
SC06	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC07	1	1	1	1	2	1	1	1	1	1	2	1	14	Low
SC08	1	1	1	1	2	2	1	1	2	1	2	2	17	Low to Moderate
SC09	3	2	2	2	2	1	1	1	2	1	2	1	20	Moderate
SC10	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC11	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC12	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC13	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC14	1	1	1	1	1	1	1	1	1	1	1	1	12	Low

Table 7.3 - Scientific Significance Assessment for Sites in the Mt Arthur Coal Underground Project Area (cont)

Site Name	Rarity		Represent-ativeness		Archaeological Integrity		Connectedness		Complexity		Potential for Archaeological Deposit		Overall Archaeological Significance	
	Local	Regional	Local	Regional	Local	Regional	Local	Regional	Local	Regional	Local	Regional	Score	Significance
SC15	1	1	1	1	2	1	1	1	1	1	2	1	14	Low
SC16	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC17	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC18	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC19	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC20	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC21	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC22	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC23	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC24	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC25	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC26	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
SC27	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC01	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC02	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC03	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC04	3	2	3	2	2	1	2	1	3	3	2	1	25	Moderate to High
WC05	3	2	3	2	2	1	2	1	3	3	2	1	25	Moderate to High
WC06	1	1	1	1	1	1	1	1	1	1	1	1	12	Low

Table 7.3 - Scientific Significance Assessment for Sites in the Mt Arthur Coal Underground Project Area (cont)

Site Name	Rarity		Represent-ativeness		Archaeological Integrity		Connectedness		Complexity		Potential for Archaeological Deposit		Overall Archaeological Significance	
	Local	Regional	Local	Regional	Local	Regional	Local	Regional	Local	Regional	Local	Regional	Score	Significance
WC07	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC08	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC09	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC10	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC11	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC12	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC13	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC14	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC15	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC16	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC17	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC18	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC19	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC20	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC21	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC22	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC23	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC24	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC25	1	1	1	1	1	1	1	1	1	1	1	1	12	Low
WC26	1	1	1	1	1	1	1	1	1	1	1	1	12	Low

Table 7.4 - Archaeological Research Potential and Location in Relation to the Potential Subsidence Cracking and Remediation Works Impact Zone

Site Type	Research Potential			Low to Moderate Research Potential			Moderate Research Potential			Moderate to High Research Potential			High Research Potential		
Inside potential subsidence cracking, predicted tensile cracking and remediation impact area (<100 metres depth of cover)	In	Out	Partially impacted	In	Out	Partially impacted	In	Out	Partially impacted	In	Out	Partially impacted	In	Out	Partially impacted
Isolated Find		QC15, QC16, QC19, QC20, QC21, SC25, WC01, WC02, WC07, WC09, WC10, WC11, WC12, WC13, WC14, WC20, WC21, WC23, WC24, WC25, WC26			QC13										

Table 7.4 - Archaeological Research Potential and Location in Relation to the Potential Subsidence Cracking and Remediation Works Impact Zone (cont)

Site Type	Research Potential			Low to Moderate Research Potential			Moderate Research Potential			Moderate to High Research Potential			High Research Potential		
Artefact Scatter	HR20, HR03, QC07, QC10, QC18, SC20, SC26	QC08, QC17, SC10, SC14, SC16, SC17, SC18, SC19, SC21, SC22, SC23, SC24, SC27, WC03, WC08, WC15, WC16, WC17, WC18, WC19, WC22	QC03, QC06, QC11, QC12, SC04, SC05, SC06, SC07, SC12, SC12, QC09, SC02, SC03, SC11, SC15, WC06		SC08	HR01, QC05, SC13		QC04	SC09, QC14		WC05	WC04		SC01	QC01
Scarred Tree													QC02		
Subtotal	**7**	**42**	**16**	**0**	**2**	**3**	**0**	**1**	**2**	**0**	**1**	**1**	**1**	**1**	**1**
Total	**65**			**5**			**3**			**2**			**3**		

Note: although inside the <100 metre depth of cover area, this site is not predicted to be adversely impacted.

7.4 Sensitivity/Research Potential of Loci

Sites were assessed for research potential by the combination of information recorded for all their site loci and also by the level of integrity of any associated PAD. Some site loci with associated PAD were, however, assessed as having higher research potential than other loci within the same site. The site loci which are assessed as having higher research potential are summarised in **Table 7.5.** These loci have the most complex assemblages; often contain high frequencies of rarer artefact types within their assemblages (axes, grindstones and hammerstones), retain potential for spatial integrity and in some loci, evidence of partially eroded knapping floors.

Table 7.5 - Loci with High Significance for Research Potential within Sites of Moderate, Moderate to High and High Research Potential

Site Name	Significance of Site	Loci
QC01	High	1/1, 3/1, 4/1, 8/1, 9/1, 14/1, 22/1 and 23/1
QC04	Moderate to High	1/1
QC14	Moderate	All loci
SC01	High	20/1, 21/1, 24/1, 36/1, 39/2, 40/1, 41/1 and 55/1
SC09	Moderate to High	30/1 and 39/1
WC04	Moderate to High	4/1, 10/2, 11/1, 12/1 and 18/1.
WC05	Moderate to High	3/2

7.5 Sensitivity/Research Potential of the Archaeological Terrain Units/Landform Units

Based on previous studies the predictive model indicates that the most likely location for Aboriginal artefact scatters is in proximity to watercourses (within 30 metres). Sites located during the survey also indicate that these areas form a focus for Aboriginal occupation when associated with reliable water, suitable gradients for camping and more abundant plant and animal resources. The major watercourses (Saddlers Creek, Quarry Creek and Western Creek) and the confluences of these watercourses with their minor tributaries (which are predominantly gentle to flat in gradient) are all foci for Aboriginal occupation. As gradient increases for Moderate to Steep Drainage Depressions, the artefact densities decrease. Thus the Level to Very Gentle and the Gentle Drainage Depression archaeological terrain units (and the landform elements they encompass - floodplain, creek terrace, creek bank, foot slope, creek confluences) have high archaeological sensitivity. Sites SC01, SCO9, QC01 and WC04 (which are sites with very high artefact densities) are located within these terrain units.

Due to the high levels of ground surface visibility associated with Saddlers Creek (due to recent bush fires) and the majority of its tributaries; as well as sections of Quarry Creek; the high ground surface visibility within the ridge crest/ridgeline terrain unit, and specifically the spur crest terrain unit which leads down to Western Creek and slopes (due to bushfire and massive ground surface exposure from erosion); it is possible to confirm that artefacts are located in the highest densities within 30 metres of a watercourse and that this is not the result of visibility biases. Evidence of this can be seen at site WC04, which has high artefact densities within 30 metres of the main creek channel each side of Western Creek. Site WC05, which is located on the surrounding slopes and spur crest leading down to Western Creek, also has high artefact numbers. However, the density of artefacts at WC05 decreased as the gradient and distance from the main watercourse increases.

The Level to Very Gentle Drainage Depression archaeological terrain unit and Gentle Drainage Depression archaeological terrain unit contained sites QC01 (the main riparian corridor of Quarry Creek) and SC01 (the main riparian corridor of Saddlers Creek) which were assessed as having high archaeological significance. These Terrain Units have high artefact densities, a diversity of different artefact types; including rare artefact types such as grindstones, backed blades, axes and choppers; and also areas with the highest research potential for subsurface investigation due to their level of integrity. Their visible assemblages indicate repeated Aboriginal occupation over a long period of time (due to the variability in the degree of patination and weathering of artefacts manufactured from the same raw material in assemblages).

The Moderate to Steep Drainage Depression archaeological terrain unit included site WC04 (main riparian corridor of Western Creek) and has moderate archaeological significance for similar reasons to the Level to Very Gentle and Gentle Drainage Depression archaeological terrain units except sites within these units have less integrity. The gradient of this terrain unit is not suitable for repeated occupation which is shown by site distribution and the distribution of artefacts. Site WC04 is the exception as it is identified mostly within this terrain unit. It has also been identified by Aboriginal representatives as reflecting use of the main creek line of Western Creek by Aboriginal people as a travel route from Mt Dangar to Mt Arthur.

The Moderate to Steep Simple Slope archaeological terrain unit within the survey area was found to have very few widely dispersed, small artefact scatters. Ground surface visibility was high in these archaeological terrain units within the western sections of the survey area due to bush fires (Saddlers Creek catchment). Therefore visibility was not biasing identification of site location in this terrain unit. Those sites located indicate that this terrain unit is unlikely to have complex assemblages and retains little likelihood of archaeological integrity due to European land-use practices. Therefore the Moderate to Steep Simple Slope archaeological terrain unit has been afforded low archaeological significance and low research potential. This result is also reflected by the low number of artefact scatters within the Moderate to Steep Drainage Depression archaeological terrain unit. As slope gradients increase the identification of archaeological sites decreases in this terrain unit. Due to the high gradient of many of the minor watercourses that drain this terrain unit it is unlikely that they provided an environment favourable to Aboriginal occupation (as predicted), thus they have also been assessed as having low archaeological significance and low research potential

The Level to Very Gentle and Gentle Simple Slope archaeological terrain units generally had low numbers of artefact scatters and isolated finds unless directly associated with major watercourses such as Western Creek (artefact scatter WC05), Quarry Creek (QC01, QC04, QC05) and Saddlers Creek (SC01, SC02, SC07, SC15, SC04, SC06, SC08 and SC10). This terrain unit also had increased ground surface visibility near burnt areas of Saddlers Creek due to recent bush fires. However, generally it had low ground surface visibility across the survey area which may have affected site detection. This terrain unit was considered to have low to moderate research potential.

Finally, the Modified Terrain Unit is assessed as having low archaeological significance and research potential due to its poor physical integrity and the scarcity of archaeological evidence located within the Terrain Unit.

Table 7.6 provides a summary of the archaeological sensitivity and research potential of the archaeological terrain units.

Table 7.6 - Terrain Units: Assessed Archaeological Sensitivity and Research Potential (Overall Archaeological Significance)

Modified	Simple Slope – Level to Very Gentle	Simple Slope – Gentle	Simple Slope – Moderate to Steep	Drainage Depression – Level to Very Gentle	Drainage Depression – Gentle	Drainage Depression – Moderate to Steep	Ridge Crest/Ridge Line	Spur Crest/Spur
Low	Low	Low	Low	High	High	Moderate	Low to Moderate	Low to Moderate

7.5.1 Comparison of Sensitivity of Archaeological Terrain Units within the Survey Area to Kuskie (1999)

The gentle drainage depression (incorporating Site QC01) and level to very gentle drainage depressions (incorporating sites QC01 and SC01) were assessed as having high local scientific significance. This result is the same as the assessment by Kuskie (1999) of these terrain units. Moderate to steep drainage depressions were found to be of moderate archaeological significance in this assessment, similarly to Kuskie (1999). The survey provided different results for other terrain units in comparison to Kuskie (1999).

Kuskie's (1999) assessment of the moderate to steep simple slope archaeological terrain unit and other simple slope terrain units (gentle, level to very gentle) was of moderate to high archaeological significance in a local context. Simple slopes were assessed as having low archaeological significance due to the low number and integrity of sites located within these terrain units (refer to **Table 7.4**) in this assessment. This result was not biased by ground surface visibility as visibility was excellent in this terrain unit, particularly in the east of the survey area.

Spur crest/spur and ridge crest/ridge line archaeological terrain units were assessed as having low to moderate archaeological significance based on the current survey results. Kuskie (1999) assessed moderate ridge crests as having low archaeological significance and gentle spur crest as having moderate to high archaeological significance. The differences in these results may be due to the higher ground surface visibility for ridge crests and spur crest within the current survey area due to erosion, which indicated the real distribution of sites and took away the necessity to predict what sites may have been located in the archaeological terrain unit. These terrain units were also found to be highly disturbed in many cases due to previous land use history with little remaining topsoil and low to moderate artefact densities.

7.6 Summary of Significance

The archaeological significance and research potential of the sites, loci and archaeological terrain units located within the survey area have been summarised in **Tables 7.2** to **7.5** respectively.

As outlined in **Section 7.1**, the Aboriginal cultural significance of sites, loci and archaeological terrain units was provided by the Aboriginal stakeholders following their comments on the draft report. All sites identified within the survey area are assessed by the twelve registered Aboriginal stakeholder groups that provided comment, as having high cultural significance. Sites QC01, QC02 and SC01 were considered as having very high cultural significance by WC, WCH and VC. Two cultural locations were identified by WC and these sites are discussed in **Section 7.1**.

The Aboriginal and archaeological significance assessment for the sites and of the terrain units within which they are located will form the basis for the management options discussed in **Section 8** of this report.

8.0 Impact Assessment and Management Options

This section of the report will provide a discussion in relation to the direct and indirect impacts of the proposed development on the known Aboriginal sites, archaeological terrain units and landform elements located within the survey area. Following the impact assessment, various management options are discussed for the sites and the terrain units/landform elements and the preferred management options identified.

8.1 Impact Assessment

In **Section 2** it was concluded that Aboriginal sites within the impact area have the potential to be impacted by subsidence or damaged/destroyed by subsidence remediation works and proposed surface infrastructure. Management options for the sites which will be directly impacted are discussed in **Section 8.3**.

The direct impact of the project on the cultural landscape within the survey area and the impact area must also be considered. **Tables 8.1** and **8.2** provide a summary of the area of the archaeological terrain units within the impact area. The archaeological and cultural heritage significance/sensitivity of these areas is also shown within the tables. The nature of the management of these areas will be informed by the significance/sensitivity of the areas and the capacity of Mt Arthur Coal to offset their loss by conserving areas of similar or greater significance/sensitivity elsewhere. An area of approximately 100 hectares will be disturbed by approved open cut mining as discussed in **Section 2.4**.

Table 8.1 - Archaeological Terrain Units within the Potential Subsidence Remediation Works

Archaeological Terrain Unit	Significance	Area to be Potentially Impacted by Proposed Subsidence Remediation Works (Hectares)
Modified Terrain (by roads and previous mining)	Low	23
Drainage Depression (gentle)	High	61.9
Drainage Depression (moderate to steep)	Moderate	79.7
Drainage Depression (level to very gentle)	High	49
Ridge Crest/Ridge Line	Low to Moderate	10.4
Simple Slope (level to very gentle)	Low	39.2
Simple Slope (moderate to steep)	Low	190.5
Simple Slope (gentle)	Low	182.2
Spur Crest	Low to Moderate	42
Total Area		**677.9**

Table 8.2 - Archaeological Terrain Units within the Impact Area for the Proposed Overland Conveyor

Archaeological Terrain Unit	Significance	Area to be Potentially Impacted by Proposed Subsidence Remediation (Hectares)
Simple Slope (level to very gentle)	Low	0.4
Simple Slope (gentle)	Low	0.08
Drainage Depression (level to very gentle)	High	0.74
Total Area		**1.22**

8.1.1 Mitigation of Direct Impacts

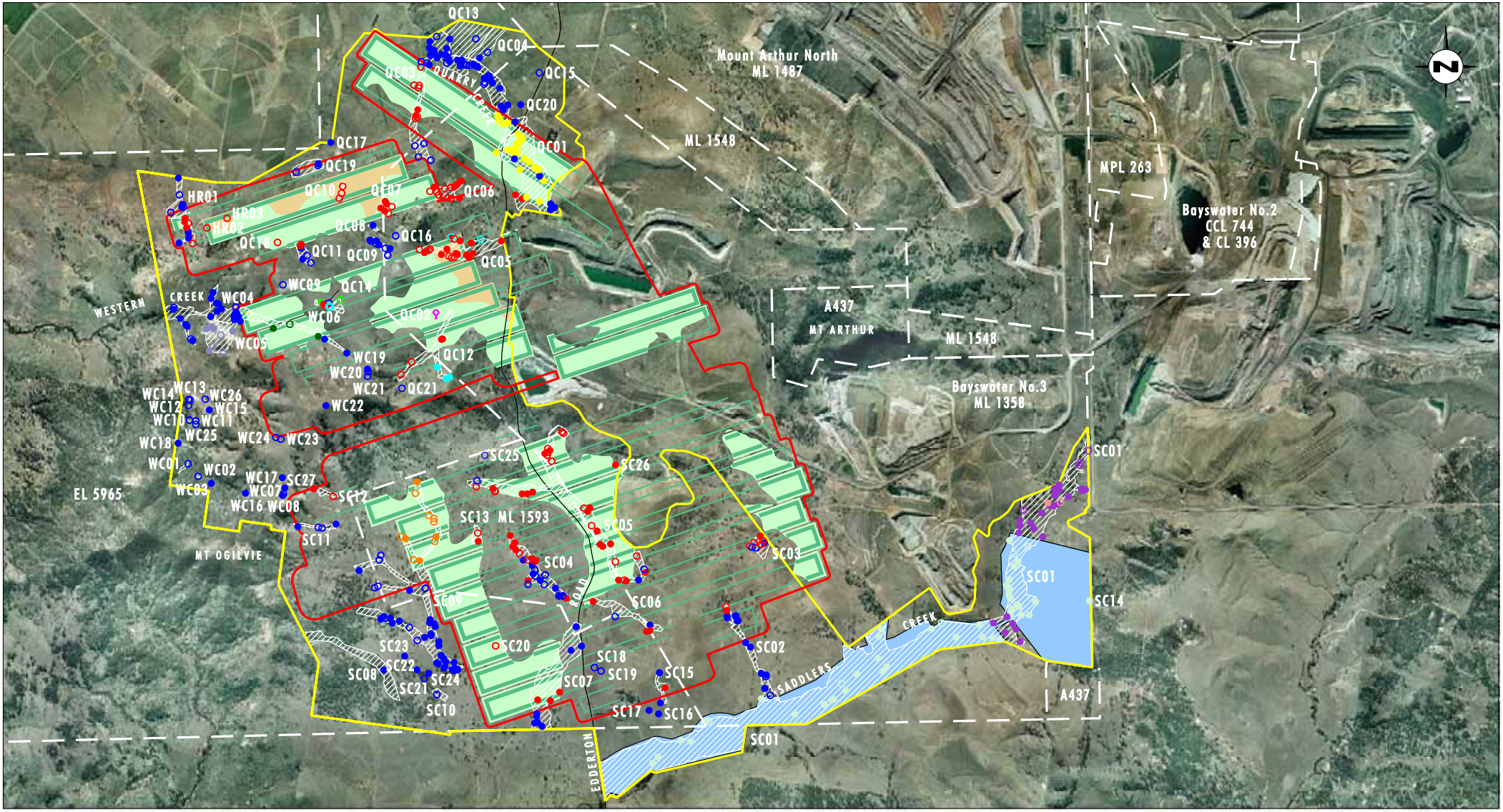
From the outset of the Aboriginal consultation program for the Underground Project, Mt Arthur Coal has accepted that the most appropriate mitigation for loss of Aboriginal cultural heritage sites and values, particularly those in the previously proposed Quarry Creek conservation area, would be to provide an appropriate alternative conservation area that would conserve similar sites and values outside the areas of the project impact area.

Mt Arthur Coal already has in place Edderton Road 1 and 2, and MacLeans Hill Cultural Heritage Management Zone and the Mt Arthur Conservation Area which are being managed for conservation in accordance with the existing development consent for the MAN mining area (refer to **Figure 1.3**).

Based on an evaluation of criteria (outlined in **Table 8.3**) previously discussed with DECC and the registered Aboriginal stakeholder groups during the draft survey strategy presentation on 22 December 2005, the only potentially available area that was assessed as being a suitable offset for the loss of Aboriginal cultural heritage sites and values within the project area was the proposed Saddlers Creek conservation area. The proposed Saddlers Creek conservation area is shown on **Figure 8.1**. This area includes sections of the main channel of Saddlers Creek and several minor tributaries and associated foot slopes and floodplain. This area is dominated by the Level to Very Gentle and the Gentle Drainage Depression archaeological terrain units and their associated landform elements. These archaeological terrain units have both been assessed as having high Aboriginal and archaeological significance/sensitivity and high research potential (refer to **Section 7.5**).

Table 8.3 - Evaluation of the Proposed Saddlers Creek Conservation Area and Values Nominated by the DECC

Values of Proposed Conservation Areas Nominated by the DECC	Evaluation
Proposed conservation areas should contain sites of high Aboriginal and archaeological significance.	The proposed Saddlers Creek conservation area contains artefact scatter site loci that have the potential to have sub-surface artefactual material below the current disturbance zone which will retain at least spatial integrity. However, in comparison to the previously proposed Quarry Creek Conservation Area, it is predicted to have lower surface artefact densities based on survey results to date.



Base Source: Mt Arthur Coal, 2006

0 1 2 3km

1:60 000

Legend

- Mining and Exploration Lease Boundaries
- Survey Area
- Subsidence Affectation Area
- Proposed Saddlers Creek Conservation Area
- Potential Subsidence Remediation Cultivation Area
- Potential Subsidence Remediation Earthworks Area
- Archaeological Site Boundary
- Tensile Cracking Zone
- Artefact Scatter
- Isolated Find
- Scarred Tree

Management Measures (Refer to Table 9.1)

- Management Measure 1
- Management Measure 2
- Management Measure 3
- Management Measure 4
- Management Measure 5
- Management Measure 6
- Management Measure 7
- Management Measure 8
- Management Measure 9
- Management Measure 10
- Management Measure 11
- Management Measure 12

FIGURE 8.1

Preferred Management Options for Aboriginal Heritage in the Survey Area including Proposed Saddlers Creek Conservation Area

File Name (A4): R03_V1/2051_185.dgn

Table 8.3 - Evaluation of the Proposed Saddlers Creek Conservation Area and Values Nominated by the DECC (cont)

Values of Proposed Conservation Areas Nominated by the DECC	Evaluation
Proposed conservation areas should have the potential to have sub-surface archaeological material in an area that has some archaeological integrity.	The proposed Saddlers Creek conservation area contains artefact scatter site loci that have the potential to have sub-surface artefactual material below the current disturbance zone which will retain at least spatial integrity. However, in comparison to the previously proposed Quarry Creek conservation area, it is predicted to have lower surface artefact densities based on survey results to date.
Proposed conservation areas should have similar sites, within similar archaeological terrain units/landform elements to the areas being impacted by the development.	The proposed Saddlers Creek conservation area does have similar sites in similar archaeological terrain units/landform elements as within the impact area. The proposed Saddlers Creek conservation area represents mainly a high order watercourse with associated slopes. The proposed Saddlers Creek conservation area does not have similar ratios of archaeological terrain units/landform elements to the impact area but it does contain a sample of all of the archaeological terrain units/landform elements present and contains a higher proportion of high significance areas. There were no scarred trees recorded during the survey of the proposed Saddlers Creek conservation area. This site type is represented by only one site within the survey area and this scarred tree will not be adversely impacted by the project. The scarred tree will be managed *in-situ* under an Aboriginal Cultural Heritage Management Plan (ACHMP) and therefore an offset is not required. There will be more individual sites impacted within the impact areas than conserved within the Proposed Saddlers Creek conservation area; however, when considering the overall conservation package currently in place/proposed by Mt Arthur Coal (including the Mt Arthur Conservation Area) there is a large and representative number of sites protected.
Proposed conservation areas should contain a wide variety of Archaeological Terrain Units/landform elements that would have provided a wide variety of resources of value to Aboriginal people living a hunter-gatherer lifestyle.	The proposed Saddlers Creek conservation area has a relatively wide variety of Archaeological Terrain Units/landform elements. The proposed Saddlers Creek conservation area includes a high order watercourse with several of its tributaries and associated slopes and floodplains that currently provide a wider variety of Aboriginal resources such as aquatic plants and animals, food, medicine and fibre plants and prey animals than the proposed impact area.

Table 8.3 - Evaluation of the Proposed Saddlers Creek Conservation Area and Values Nominated by the DECC (cont)

Values of Proposed Conservation Areas Nominated by the DECC	Evaluation
Proposed conservation areas should retain areas of remnant vegetation.	The proposed Saddlers Creek conservation area has been subject to selective clearing prior to mining. There are large numbers of remnant mature Eucalypts and Eucalypt Woodland regrowth is well established along the main watercourse and on the more southerly of the two ridges in the north-east of the area. Significant native regeneration has occurred since cattle have been controlled in these areas. The diversity of remnant vegetation is higher within the proposed Saddlers Creek conservation area than along Quarry Creek.
Proposed conservation areas should have no major erosion problems or problems with rubbish dumping, noxious weeds, feral animals or stock.	Erosion within the proposed Saddlers Creek conservation area is less severe in most areas of the creek line and slopes than in the impact area. Removal of stock and keeping of vehicular traffic to the previously constructed access tracks/new access track will help alleviate erosion problems, with Mt Arthur Coal having implemented management systems to address these issues over the past few years. The noxious weed Mother-of-Millions (*Bryophyllum delagoense*) grows in colonies along the main channel of the creek line. Mt Arthur Coal have committed to management of this weed by a spraying or manual (hand) removal program.
Proposed conservation areas should be connected and not be set aside as isolated pockets of land.	The majority of the proposed Saddlers Creek conservation areas are connected. However, due to the coal resources in the far south within land not owned by Mt Arthur Coal the proposed Saddlers Creek conservation area has to include an approximately 200 metre wide easement for potential access to this resource. This easement has expanded in width since the review of the draft Aboriginal archaeological assessment by the nineteen registered Aboriginal stakeholder groups. Mt Arthur Coal has indicated that the actual disturbance width within the easement will be less than 200 metres in width; however, they require the wider easement set aside to allow sufficient scope for any infrastructure required. A 'right-of-access' will be provided across this gap to ensure people can move between the two sections of the conservation area.

Table 8.3 - Evaluation of the Proposed Saddlers Creek Conservation Area and Values Nominated by the DECC (cont)

Values of Proposed Conservation Areas Nominated by the DECC	Evaluation
Proposed conservation areas should have easy access for community groups (Aboriginal and non-Aboriginal).	Easy access is available to the area from Edderton Road and will also be available from the Underground Project access road should the project be approved. Access may need to be upgraded from Edderton Road. Sufficient area in the roadside reserve should enable more than one car to safely pull off the road and wait while the entry gate is opened. Given the close proximity to mining, controls on access will be required, primarily for safety and security purposes, during the life of mine.

For comparative purposes (with the areas of proposed impact) the areas of the archaeological terrain units and landform elements within the proposed Saddlers Creek conservation area are presented in **Table 8.4**.

Table 8.4 - Archaeological Terrain Units within the Proposed Saddlers Creek Conservation Area

Archaeological Terrain Unit	Significance	Total Area within Proposed Saddlers Creek Conservation Area (Hectares)
Drainage Depression (gentle)	High	1.82
Drainage Depression (Moderate to Steep)	Moderate	0.2
Drainage Depression (Level to Very Gentle)	High	202.97
Ridge Crest/Ridge Line	Low to Moderate	48.81
Simple Slope (Level to very gentle)	High	32.12
Simple Slope (Moderate to Steep)	Low	3.89
Simple Slope (gentle)	Low	1.13
Spur Crest	Low to Moderate	2.98
Total Area		**293.9**

Tables 8.1 to **8.4** indicate that the proposed Saddlers Creek conservation area is comparable to the impact area, in that the various archaeological terrain units and landform elements are similar in nature, although not in total area. It should be noted, however, that as the project involves underground mining, there will not be total disturbance of the existing archaeological values of the land within the predicted subsidence remediation works zone. It should also be noted that whilst the proposed Saddlers Creek conservation area does not provide for the conservation of similar sized archaeological terrain units to those within the impact area, it does contain a higher proportion of highly significant terrain units compared to the project impact area.

It is considered that the proposed Saddlers Creek conservation area adequately conserves the archaeological terrain units (Level to Very Gentle and Gentle Drainage Depression) and site loci with high Aboriginal cultural significance and archaeological significance/research

potential. These archaeological terrain units are also of equal significance to the Level to Very Gentle and the Gentle Drainage Depression archaeological terrain units that contain the QC01 site and site loci, part of which will be partially impacted by subsidence and subsidence remediation works and the approved open cut mine. The proposed Saddlers Creek conservation area provides for the conservation of one of the most significant sites located in the survey area (SC01), however, it does not have equal artefact densities in comparison to those within the previously proposed Quarry Creek conservation area which will be partially impacted. These results for artefact densities have not been biased by ground surface visibility during survey, as visibility was higher along Saddlers Creek.

In summary, **Table 8.2** indicates that the proposed Saddlers Creek conservation area retains the majority of the values previously suggested by the DECC as appropriate for an area conserving Aboriginal and archaeological sites and values. The area where there is some deviation relates to the comparison of the total area of archaeological terrain units/landform elements within the proposed Saddlers Creek conservation area and the impact area. It is suggested that the high Aboriginal and archaeological significance of the archaeological terrain units and sites/site loci within the proposed Saddlers Creek conservation areas offset this difference in area. However, the setting aside of the proposed Saddlers Creek conservation area is insufficient to be considered as a full offset for the loss of Aboriginal and archaeological sites and values within the predicted impact area and within the Quarry Creek conservation area. Further offsets are seen as necessary to make up the loss of this area and are discussed in **Sections 8.1.1** and **8.2**.

An earlier version of a proposed Saddlers Creek conservation area was provided as an option for consideration for cultural heritage conservation as part of the Bayswater consent. This option included slopes and ridge crests leading up from Saddlers Creek surrounding Edderton homestead (refer to **Figure 1.3**). This specific version did not contain as many sites as the additional lands proposed for conservation in the northern parts of the proposed Saddlers Creek conservation area.

Table 8.5 outlines general criteria for an Aboriginal Cultural Heritage Conservation Area from an Aboriginal cultural heritage perspective. This information was initially provided by the Aboriginal stakeholder groups during consultation in 2005 (Umwelt 2006) and also presented during the presentation made for this project to the Aboriginal groups on 22 December 2005. These criteria are assessed in relation to the proposed Saddlers Creek conservation area.

Table 8.5 - Evaluation of the Proposed Saddlers Creek Conservation Area and Values Nominated by the Aboriginal Stakeholder Groups

Values of Proposed Conservation Areas Nominated by Aboriginal Stakeholders	Evaluation
A proposed conservation area should contain Aboriginal heritage sites as all Aboriginal heritage sites are considered of high significance to Aboriginal people.	The proposed Saddlers Creek conservation area includes site loci that contain a combined assemblage of over 1000 artefacts and areas of potential archaeological deposit assessed as retaining spatial integrity. The assemblages include rarer artefact types including grindstones, hammerstones, choppers and axe heads. They also include a large variety of raw materials including porcellanite, hornfels, basalt, quartz, quartzite, chert, mudstone and silcrete. The grindstones were inspected by Mrs Foot (WC) who stated that these are important to Aboriginal people as they were used 'to grind up the medicine' (refer to Mrs Foot's comments in **Appendix 5**).
Any proposed conservation area should have a diverse range of sites within it (not just artefact scatters).	The proposed Saddlers Creek conservation area does not include other site types (other than artefact scatter loci, isolated find loci and associated PAD). The project impact area does not, however, impact on any other site types than artefact scatters and isolated finds either. Apart from one scarred tree (which will not be adversely impacted by the project), isolated finds, artefact scatters and PAD were the only sites located within the survey area.
Any proposed conservation area should be at least of equal size to the areas of proposed impact.	The proposed conservation area is not of the same area as the total subsidence area, however as the proposed impact is an underground mine, it will not lead to total destruction of archaeological values on the land above the mining area.
Any proposed conservation area should be of equal value or greater value to the Aboriginal stakeholders as the areas of proposed subsidence remediation works and proposed surface infrastructure.	Comments provided during the survey by the Aboriginal groups indicated the high cultural significance and value of the Saddlers Creek area as a proposed conservation area. In general, the proposed Saddlers Creek Conservation Area was seen as having higher values than the majority of the areas to be impacted by the project. However, there were sections of the Quarry Creek area (specifically the section of the QCO1 site to the west of Edderton Road) that had higher artefact densities and these were also found to have high Aboriginal cultural heritage values. At least part of this area will be impacted by subsidence remediation works. The proposed Saddlers Creek conservation area alone was not seen to compensate for the loss of the previously proposed Quarry Creek Conservation Area.
Any proposed conservation area should have tourism potential.	The Saddlers Creek Conservation Area has potential for tourism due to its ease of access from Edderton Road (and potentially also the mine access road if approved) and also as the site loci are easily accessible and the wide variety of easily recognised artefacts in the sites tell a story about what Aboriginal people were doing in the area. Restrictions on access will be required due to the close proximity to mining, however, these controls will not seek to reduce beneficial cultural and other opportunities agreed by the conservation area's management committee. The landscape in the proposed Saddlers Creek conservation area was assessed by the Aboriginal representatives present on the survey as being aesthetically pleasing. At the time of the survey, views of the surrounding mining operations were mostly screened by vegetation and were not intrusive. It should be noted, however, that the outlook from the northern section of the proposed Saddlers Creek conservation area would change substantially due to the proposed South Pit Extension Project to the north of the proposed Saddlers Creek conservation area.

Table 8.5 - Evaluation of the Proposed Saddlers Creek Conservation Area and Values Nominated by the Aboriginal Stakeholder Groups (cont)

Values of Proposed Conservation Areas Nominated by Aboriginal Stakeholders	Evaluation
Any proposed conservation area should be easily accessible.	The proposed Saddlers Creek conservation area will be readily accessible via Edderton Road and the underground project access road. This access will be subject to controls that ensure the safety of people when on-site due to the proximity to mining.
Any proposed conservation area should retain Biodiversity – lots of different food and medicine plants and prey animals.	The proposed Saddlers Creek conservation area does provide riparian corridor habitats that retain a greater diversity of mature and semi-mature trees and understorey species than a combination of the areas to be impacted by the project. There is also good Eucalypt woodland regeneration in some previously cleared areas along the creek line and on the southernmost of the two crests in the north-east of the Proposed Conservation Area. However, there are also some areas of open grassland where trees have not regenerated. The management approach of continued exclusion of stock from the Proposed Conservation Area will assist with the further and ongoing regeneration of native tree species. There is a range of plant and animal species present that would have been utilised/hunted by Aboriginal people.
Any proposed conservation area should have a stakeholder benefit – it should provide opportunities for employment and places for children to learn about Aboriginal culture.	The proposed Saddlers Creek conservation area does have an Aboriginal stakeholder benefit due to its intrinsic cultural value and there is an opportunity to use the area for and educational and promotional visits that may provide commercial benefit to local indigenous persons. The proposed Saddlers Creek conservation area has sites and resources that make them suitable as teaching places. Mrs Foot (WC) during her inspection of the proposed Saddlers Creek conservation area stated it was an 'impressive area' with 'good teaching potential for kids' (refer to Mrs Foot's comments in **Appendix 5**). In addition, there is the potential for Aboriginal community representatives to find employment as part of the ongoing management of the areas, particularly in land management activities such as fencing, feral animal control, tree plantings and monitoring.
Any proposed conservation area should have reliable water.	Saddlers Creek is one of the major watercourses in the locality. The creek generally retains pools of water and only flows following heavy and continued rain.

Other comments provided by the Aboriginal stakeholder groups regarding potential offsets during a meeting for the current project in December 2005 (refer to **Section 3)**, that are not directly related to the values of the land within the Proposed Conservation Area included:

- Mt Arthur Coal could provide a contribution towards a keeping place;
- Mt Arthur Coal could provide an educational package;
- Mt Arthur Coal could provide involvement of representatives of Aboriginal stakeholder groups in mine rehabilitation; and
- Mt Arthur Coal could provide permanent employment opportunities for Aboriginal people in the mine including traineeships and jobs in the proposed underground mine.

These comments were reiterated in some of the Aboriginal stakeholder group comments (refer to **Appendix 5**) provided from the review of the draft Aboriginal archaeological assessment. These comments are primarily economic in nature and are not associated with the evaluation of the proposed Saddlers Creek conservation area. Such suggestions fall outside the scope of the evaluation of the proposed Saddlers Creek conservation area. However, elements of these comments are addressed in the Aboriginal Cultural Heritage Conservation Strategy for the Underground Project.

8.1.1.1 Summary of the Mt Arthur Coal Complex Aboriginal Cultural Heritage Conservation Strategy

Mt Arthur Coal will continue to manage existing cultural heritage management zones (Edderton Road 1 and 2 and MacLeans Hill) and the Mt Arthur Conservation Area (to be subject to a Voluntary Conservation Agreement). These areas are being managed by Mt Arthur Coal as part of earlier commitments to offset the loss of Aboriginal cultural heritage values as part of the MAN development approvals.

To offset the impacts of the proposed Underground Project on Aboriginal cultural heritage, Mt Arthur Coal have made the following commitments:

- to set aside the proposed Saddlers Creek conservation area to be conserved 'in perpetuity';
- to manage the proposed Saddlers Creek conservation area under an ACHMP (refer to **Appendix 10**). The management procedures and protocols for this area will be stringent in relation to any activity that has the potential to cause ground surface disturbance. Ground surface disturbance will not be allowed without agreement of the Management Committee and in consultation with the Aboriginal stakeholder groups and the DECC;
- to provide safe access to the proposed Saddlers Creek conservation area. Visitors to the proposed Saddlers Creek conservation area will be supervised by an inducted member of the Management Committee or their representative and escorted by a Mt Arthur Coal approved representative;
- to review applications to undertake non-destructive research within the proposed Saddlers Creek conservation area which will be considered by the Management Committee and approved based on their merit;
- to fund and construct a Keeping Place within the proposed Saddlers Creek conservation area for the registered Aboriginal stakeholder groups as part of the Aboriginal cultural heritage offset strategy. The Keeping Place will have a storage room for artefacts and a display centre for teaching/educational purposes. The storage area for artefacts will

protect artefact boxes from destruction/damage by insects, damp and the elements etc. The Keeping Place will also have suitable services and amenities and a space for parking cars. The building/structure will be secured and monitored for vandalism (in order to meet the requirements of the DECC for appropriate storage of artefacts in secured premises);

- will fund training for staffing of the proposed Keeping Place. Mt Arthur Coal will fund training for five representatives from the registered stakeholder groups to undertake 'Collections Training' at the Australian Museum (or similar training). The five representatives will be employed for approximately one month to establish the Keeping Place. The Keeping Place will be funded by Mt Arthur Coal to be staffed approximately 50 days per year by two of the five trained representatives on a rotational basis. Access to the Keeping Place will be controlled by Mt Arthur Coal but it is envisaged that public access will be permitted.

  The Keeping Place may be opened for a range of purposes including for educational purposes/corporate educational seminars, training for Mt Arthur Coal staff or for school children/public visits. Where these open days are held by Mt Arthur Coal, additional days of employment may be available for the Aboriginal representatives staffing the Keeping Place. The Keeping Place will also be available for use by the Aboriginal stakeholder groups for their own purposes, as agreed with Mt Arthur Coal;

- to have 'care and control' of all salvaged artefacts for the keeping place for the life of mining operations. At the conclusion of mining operations, it is proposed that the salvaged artefacts will be reburied in the proposed Saddlers Creek conservation area as determined by the management committee; and

- to continue to encourage Aboriginal stakeholder groups to provide applications for employment in their current and proposed mining operations through their existing programs for employment (e.g. assistance with resume preparation).

It is imperative that the proposed Saddlers Creek conservation area is fenced and sign-posted to avoid any inadvertent damage from mining activities (Note: much of the area is already fenced). As fence construction entails ground disturbance it will be a requirement that any new fencing is located outside the area indicated as the proposed Saddlers Creek conservation area on **Figure 8.1**. Fence construction will be monitored by an inducted member of the Management Committee or their representative. As the proposed Saddlers Creek conservation area also has ecological values and provides a fauna corridor, the design of fencing and materials used will consider potential for impacts on native animal movements.

All stock will be removed from the proposed Saddlers Creek conservation area to allow areas of erosion to revegetate and lessen the impact of trampling on the artefact loci.

Mt Arthur Coal will seek to ensure that the Management Committee has reasonable and feasible access and budget for the ongoing management of the Saddlers Creek Conservation Area for the duration of the Underground Project.

In addition to the training and employment opportunities to maintain the Keeping Place, indigenous employment will be encouraged, where feasible, for works undertaken within or related to the Saddlers Creek conservation area, for example fencing and aspects of land management, including weed control.

The proposed Aboriginal cultural heritage conservation offset strategy was revised after the receipt of Aboriginal stakeholder group comments on the draft Aboriginal archaeological assessment. The strategy outlined above is the revised Aboriginal cultural heritage

conservation offset strategy. A summary of the original Aboriginal cultural heritage conservation offset strategy and revisions for this final assessment and how these revisions address Aboriginal stakeholder group comments is provided in **Section 8.4**.

8.1.1.2 Previously Proposed Quarry Creek Conservation Area

From an archaeological perspective the setting aside of the proposed Saddlers Creek conservation area is an adequate offset for the loss of the sites/values within the project impact area but it does not fully offset the loss of the previously proposed Quarry Creek Conservation Area (a view supported by the majority of comments provided by the registered Aboriginal stakeholder groups - refer to comments by WC, WCH, WWCCS, WLALC and MCC in **Appendix 5**). As it is not proposed, however, to impact the Quarry Creek Conservation Area until approximately year 13 of the Underground Project, it is proposed that Mt Arthur Coal provide the following as part of the overall offset strategy for the project:

- within or near to the existing fenced section of Quarry Creek west of Edderton Road, construct a facility suitable for use by the Aboriginal community when using the area for teaching purposes until such times as the area is impacted by subsidence;

- provide training for one member of each of the registered Aboriginal stakeholder groups for the project in relation to site recording and artefact recording and basic analysis. The training package will be devised so that it enables these representatives to train other members of their respective groups and the broader Aboriginal community; and

- fund salvages of all Aboriginal archaeological sites to be impacted by surface infrastructure or subsidence remediation works. Ongoing refinements of the subsidence predictions during operations may allow increases in the number of sites retained *in situ*. Salvage works will be undertaken separately for each longwall panel, prior to subsidence, (using the methodology outlined in **Appendix 9**) resulting in ongoing salvage work for the majority of the life of the project (approximately 21 years), providing continued employment for the registered Aboriginal stakeholder groups.

It is considered that these additional offsets will provide benefit to the contemporary and future Aboriginal stakeholder groups and the community. The training provided will allow Aboriginal group representatives to increase their skills and to pass on their skills to their peers. This strategy was substantially revised to its current form as outlined above after the receipt of Aboriginal stakeholder group comments on the draft Aboriginal archaeological assessment. A summary of the originally proposed draft offset strategy and its revisions for this final assessment and how these revisions address Aboriginal stakeholder group comments is provided in **Section 8.4**. Further discussion of management of impacts on the Quarry Creek area is provided in **Appendix 10**.

8.1.2 Cultural Locations

The two cultural locations identified by Mrs Barbara Foot (refer to **Section 7.1**) are within the predicted subsidence remediation zones. The tree identified by Mrs Foot as an Aboriginal scarred tree will be protected and fenced off and managed as part of the Aboriginal Heritage Management Plan for the Underground Project. The line of siltstone stones near the tree and the hill with another line of siltstone stones have the potential to be impacted by subsidence from the proposed underground mine. These locations (refer to **Figure 7.1**) will be monitored and protected where possible in consultation with the proposed Management Committee. If monitoring indicates that subsidence remediation is required, any works in the vicinity of the tree or lines of stone will be carried out manually and in consultation with the proposed Management Committee.

8.2 Management Options

The management options discussed within this section aim to develop a management strategy that recognises the Aboriginal cultural heritage value and archaeological (scientific) significance of individual sites, groups of sites, site loci and their associated PAD (where applicable) in the landscape. The Aboriginal significance/value of the sites and areas is detailed in the correspondence received from each of the groups (refer to **Appendix 5**) and will be summarised in **Sections 8.1** and **8.4**.

The range of management options potentially available for the sites/site loci/PAD within the survey area are presented in **Section 8.2.1** to **8.2.4**. Each option is discussed, and where appropriate, is nominated as the preferred management option for selected sites. **Figure 8.1** indicates the preferred management option for each of the sites.

The management options explored in this section of the report have been developed in consideration of comments made by the Aboriginal group representatives who participated in the fieldwork and those groups who provided comment on the review of the draft Aboriginal archaeological assessment report.

8.2.1 Option 1 Site Conservation

Conserve all or a selected number of Aboriginal sites/areas within the survey area and/or provide an appropriate conservation area/conservation areas to offset the loss of archaeological and Aboriginal cultural heritage sites and values within the survey area.

Discussion

The Underground Project mine plan indicates that development will potentially impact on all archaeological sites within areas of subsidence with less than 100 metres depth of cover (due to the potential need for subsidence remediation works) and for proposed surface infrastructure; including the proposed conveyor (refer to **Figure 8.1** and **Table 8.4**). Due to the expected economic benefits of the project to the local, regional, state and national economies and representation of archaeological sites in the local area, changes to the mine plan to conserve sites within these areas would only be warranted if the sites are of moderate, moderate to high, or of high Aboriginal and archaeological significance; and if there could not be an appropriate conservation offset strategy, acceptable from an Aboriginal and archaeological perspective, to ensure that sites of a comparative nature were being conserved elsewhere.

Site SC01 is assessed as having high Aboriginal and archaeological significance. A section of the proposed conveyor will run through narrow corridors in the north eastern section of this site. The majority of this site (refer to **Section 9, Table 9.1** for specific loci); however, can be set aside as an offset for the loss of cultural heritage values elsewhere within the survey area. It is proposed that this area be formalised as the Saddlers Creek Conservation Area. The land within the proposed conservation area is proposed to be rezoned for 'Conservation – Cultural Heritage' and the area managed under an ACHMP.

Site QC01 is assessed as having high Aboriginal and archaeological significance. Sections of site QC01 (including the previously proposed Quarry Creek conservation area) are within an area predicted to have impact from subsidence that will require subsidence remediation works following the removal of the Bowfield Seam from approximately Year 13 of the project (refer to **Section 9**, **Table 9.1** for specific site loci).

As the proposed Saddlers Creek conservation area will be formally established, it is proposed that site QC01 is managed under the ACHMP until 12-18 months prior to subsidence. At this time, the sections of the QC01 site that are predicted to be adversely

impacted by subsidence remediation works are to be salvaged in a manner acceptable from an Aboriginal cultural heritage and archaeological perspective (please refer to **Appendix 8** for details of the proposed salvage program). Until the site is impacted it is to be managed under the ACHMP. The other offsets discussed in **Section 8.1.1** will also be put into action within the first year of the project to further offset the loss of this area.

Scarred Tree QC02 is assessed as having high Aboriginal cultural and archaeological significance. The site is located within the area to be subsided following the removal of the Woodlands Hill seam. Ground surface cracking is unlikely to impact on the viability of the tree and any subsidence remediation work necessary in its proximity can be managed to ensure no impact on the tree (i.e. by hand or light machinery). QC02 can therefore by conserved and managed under the ACHMP. Management will include monitoring of the tree's condition prior to subsidence and then annually for three years following subsidence impact. Management will also include protection by fencing and appropriate signage, stating the cultural heritage significance of the tree and its nature.

Site WC04 is assessed as having moderate to high archaeological significance. Sections of WC04 are within an area predicted to be impacted by subsidence remediation works following the removal of the Woodlands Hill seam (refer to **Section 9**, **Table 9.1** for specific site loci). As the proposed Saddlers Creek conservation area will be formally established, it is proposed that Site WC04 is managed under the ACHMP until 12-18 months prior to subsidence. At this time, the sections of the WC04 site that will be adversely impacted by subsidence and subsidence remediation works are to be salvaged in a manner acceptable from an Aboriginal cultural heritage and archaeological perspective (please refer to **Section 9** and **Appendix 9** for details of the proposed salvage program).

Site WC05 was assessed as having moderate to high archaeological significance. This site will not be impacted by subsidence, subsidence remediation works or surface infrastructure and thus can be managed for conservation under the ACHMP.

Site QC04 is assessed as having moderate archaeological significance. This site will not be impacted by subsidence, subsidence remediation works or surface infrastructure and thus can be managed for conservation under the ACHMP.

Site SC09 is assessed as having moderate archaeological significance. Sections of SC09 are within an area predicted to be impacted by subsidence remediation works following the removal of the Glen Munro seam (refer to **Section 9**, **Table 9.1** for specific site loci). As the proposed Saddlers Creek conservation area will be formally established, it is proposed that Site SC09 is managed under the ACHMP until 12-18 months prior to subsidence. At this time, the sections of Site SC09 that will be adversely impacted by subsidence and subsidence remediation works are to be salvaged in a manner acceptable from an Aboriginal cultural heritage and archaeological perspective (please refer to **Section 9** and **Appendix 9** for details of the proposed salvage program).

The project is not expected to impact any of the other sites recorded within the survey area and outside the potential impact area (refer to **Table 9.1** – potential impacts associated with minor surface infrastructure are discussed in **Section 9.1**). These sites and their environs are assessed as appropriate for management for conservation under an ACHMP.

Preferred Option

Conservation is the preferred management option for all sites/site loci and their associated PAD located during the survey that are outside the predicted impact area (refer to **Table 8.2** and **Figure 8.1**). These sites and the proposed Saddlers Creek conservation area should be managed under an ACHMP prepared in consultation with the DECC and the relevant Aboriginal stakeholder groups.

A management strategy for the proposed Saddlers Creek conservation area will be prepared with integration of cultural heritage and ecological management objectives. It is essential that proposed management strategies are developed in consultation with relevant stakeholders to ensure there is no conflict (refer to **Appendix 10** for an outline of the proposed management process).

Conservation of the remaining sites/site loci within the impact area is not predicted to be feasible under the current mine plan; however, their destruction will be offset by the setting aside of the proposed Saddlers Creek conservation area. This conservation area, in conjunction with the Mt Arthur Conservation Area and other existing cultural heritage management areas managed by Mt Arthur Coal (refer to **Figure 1.3**), will act to conserve a representative sample of Aboriginal sites, site types and archaeological terrain units for the Project Area.

In addition to the conservation outcome, appropriate salvage of the site/site loci to be impacted is essential. The proposed salvage requirements for each site and/or loci are discussed further in **Section 9** and **Appendix 9**.

8.2.2 Option 2 Site Destruction without Salvage

Proceed with the project and subsequent destruction/damage of all sites within the predicted impact area without any further investigation/salvage.

Discussion

All of the sites within the predicted impact area are identified as having significance to the Aboriginal stakeholder groups participating in the project (refer to **Section 7.1**). Discussions held with representatives of the stakeholder groups during the survey indicate that this option is not appropriate from their perspective. The minimum requirement of the Aboriginal stakeholder groups is the surface collection of the artefacts from the sites so that they can be protected from damage/destruction/loss and so that they can be used in the future for teaching purposes.

From an archaeological perspective, although most of the predicted impact area has been disturbed by previous land use, there are several sites/site loci and their associated PAD that retain archaeological research potential as they are predicted to retain sufficient spatial integrity and/or can be predicted to have sufficiently complex sub-surface assemblages to warrant some form of sub-surface investigation in addition to surface collection. The proposed salvage requirements for each site and/or site loci are discussed further in **Section 9** and **Appendix 9**.

For the remainder of the sites surface collection is appropriate from an archaeological perspective, as the analysis of these artefacts can assist with gaining a greater understanding of the Aboriginal use of the landscape.

In summary, it is not thought appropriate to destroy any of the sites within the predicted impact area without at least surface collection and in some cases sub-surface investigation (refer to **Table 7.4**).

In relation to the SC02 scarred tree, subsidence and remediation works are not predicted to adversely impact on this site and thus the tree should be managed *in situ* and not destroyed.

Preferred Option

Site destruction without salvage is not seen as an appropriate management option for any of the sites in the impact area.

8.2.3 Option 3 Site Destruction with Salvage (Surface Collection Only)

Proceed with the project following the surface collection of all of the recorded sites within the predicted impact area.

Discussion

As discussed in **Section 8.2.2** surface collection of artefact scatter and isolated find sites is the minimum requirement of the Aboriginal stakeholder groups for the sites recorded in the predicted impact area. As also discussed, there were some sites/site loci and their associated PAD (refer to **Figure 8.1**) that in addition to surface collection, have sufficient research potential to warrant some form of sub-surface investigation (due to their potential to retain some spatial integrity and/or to have a sufficiently complex sub-surface assemblage) to warrant further research.

The sites/site loci for which surface collection (only) is thought appropriate are those that are in existing areas of high disturbance, that thus retain no integrity and which are assessed as having no potential or only low potential for complex assemblages in a sub-surface context. Many of these that are nominated for surface collection only have no intact A unit (topsoil) due to erosion initiated by prior land use.

In relation to the QC02 scarred tree, there are no associated artefact loci or associated PAD and thus, surface collection and/or sub-surface investigation is not relevant.

Preferred Option

Surface collection only is the preferred management option for the following artefact scatter and isolated find sites (refer to **Figure 8.1**):

- HR02, HR03, QC07, QC10, QC18, SC15, SC20, SC26, WC06 and WC21; and
- section(s) of QC05, QC06, QC11, QC12, QC14, SC02, SC03, SC04, SC05, SC06, SC07, SC12, (refer to **Section 9** and **Table 9.2** for specific loci).

Surface collection only is also assessed as adequate for two site loci of QC01, 35/1 and 36/1 respectively which will be impacted by the approved open cut mine. Further sub-surface investigation was recommended for the remainder of QC01.

8.2.4 Option 3 Site Destruction with Salvage (Surface Collection and Sub-surface Investigation)

Undertake surface collection and sub-surface salvage of all sites within the predicted impact area.

Discussion

As detailed in **Section 8.2.3** surface collection only is an appropriate management option for a number of the sites/site loci in the proposed impact area that are located within areas of high disturbance, that retain no integrity and which have no potential or only low potential for complex assemblages in a sub-surface context. There are also a number of site/site loci with

associated PAD that are assessed as having the potential to retain some integrity and/or to have complex assemblages in a sub-surface context.

Sub-surface investigation in the form of geomorphological inspection, test pitting and open area excavation and in some very specific cases grader scrapes (following the collection of surface artefacts) is considered appropriate within sites/site loci at some of the creek confluences and along some sections of the creeks within the impact area. Detailed geomorphic analysis is also appropriate for some of these areas, particularly parts of QC01, SC01, SC09 and WC04, in order to assist with pinpointing important areas for sub-surface investigation within these sites.

Sub-surface investigation is also considered appropriate due to differences in the environmental context of some sites/site loci to those already investigated by earlier excavations of the MAN ML by Kuskie and Clarke (2004) and in the Bayswater No. 3 ML by the BARP (1993 to 1998). Kuskie and Clarke's excavations focused on the major ridge line connecting Mt Arthur to the Hunter River associated with Whites Creek and the valley flats of Whites Creek (2004:584). Similarly BARP's (Wilson 2005a, 2005b) sub-surface investigations focused on the investigation of Mt Arthur spur which leads down into the South Pit Extension Area (Umwelt 2006) and on the valley floors of the upper Saddlers Creek drainage and the mid to Upper Saddlers Creek drainage (Fife 1995), the Bobagul Hills (Appleton 1995) and within areas adjacent to Edderton Road and within the MacDonald's Road South Edderton Catena (Davidson and McDonald 1999 and McDonald and Davidson 2005) (refer to **Section 5**). All of this work has focused on Mt Arthur and the mid to upper reaches of the watercourses that drain the mountain and flow into the Hunter River.

There has been no sub-surface investigation of the lower mid to lower reaches of Saddlers Creek, or of the Saddlers Creek tributaries that drain Mt Ogilvie. Thus whilst there has been a large amount of information gathered about areas associated directly with Mt Arthur (which has resulted in certain theories arising about the use of this area and its importance as a meeting place) there has been no investigation associated with Mt Ogilvie to ascertain if it has been subject to similar or different levels of occupancy. Thus, the sub-surface investigation of sites such as SC09 may be able to provide further information about the Aboriginal use of the Mt Ogilvie area whilst at the same time helping with interpretation of the evidence already collected for Mt Arthur.

For example, if the assemblages are similar it may mean that Mt Arthur had no greater significance than Mt Ogilvie and that the large assemblages in both areas were the result of another factor (such as the fact that the mounts are enclosed within a loop of the Hunter River ensuring easy access to an abundant source of quality stone for knapping and an area of rich plant and animal resources). If, however, the Mt Ogilvie assemblages are far smaller than those from Mt Arthur it may indicate that Mt Arthur did have a special significance. The differences in the stone assemblage may then clarify what this difference may have been (for further discussions refer to **Appendix 9**).

There has also been no sub-surface investigation associated with Quarry Creek. A section of the QC01 site (directly north-west of Edderton Road) was previously considered for conservation as part of the Bayswater Archaeological Research Project. This site was considered for conservation due to its high research and teaching potential. The site has been used by members of the Aboriginal community, DECC (when previously the NPWS) and the University of New England for teaching purposes. The site has a complex assemblage with a wide variety of artefact types and raw material types. Though badly eroded in sections the site also retains large areas in close proximity to the creek where it can be predicted there will be complex sub-surface assemblages that retain some spatial integrity.

The destruction of any section of the QC01 site could only be supported from an Aboriginal cultural heritage and archaeological perspective due to the proposed Saddlers Creek conservation area being formalised and with an appropriate salvage methodology as well as provided the recommendations outlined in **Section 8.1.1.1** are undertaken prior to subsidence (refer to **Section 9** and **Appendix 9** for details of the proposed salvage methodology). Information from the Quarry Creek salvage would also be of value in the Mt Arthur, Mt Ogilvie comparison.

Similarly there has been no investigation of Western Creek. Sub-surface investigation of the area of PAD identified in site WC04 could also provide information of value to the Mt Arthur, Mt Ogilvie comparison.

In relation to the SC02 scarred tree, there are no associated artefact loci or associated PAD and thus, surface collection and/or sub-surface investigation is not relevant.

Preferred Management Option

Areas targeted for sub-surface investigation should include (refer to **Figure 8.1**):

- Quarry Creek – surface collection followed by test pitting on both sides of Quarry Creek within the site boundary of QC01 focusing on the loci to be impacted by subsidence/ subsidence remediation including loci 8/1, 11/2, 13/1 to 15/1, 22/1 to 32/1, 34/1, 36/2, 38.1, 39/1, 41/1, 42/1, 43/1 and 44/1. This investigation should also involve the specialist input of a geomorphologist to direct sub-surface investigation and the test pitting program. Manual open area excavation(s) will be extended from selected test pits based on the results of these excavations.

  Surface collection of site loci 35/1 and 36/1 within the impact area for the approved Bayswater No. 3 open cut mining area also needs to be undertaken prior to development, under Section 90 consent.

- Saddlers Creek main creek line– surface collection followed by test pitting on both sides of Saddlers Creek within the boundary of SC01 focusing on the impacted areas of PAD within the proposed conveyor corridor. The impact corridor for this infrastructure needs to be sub-surface tested with the input of a geomorphologist to design an appropriate sub-surface investigation within the impacted areas of PAD. Manual open area excavation(s) will be extended from selected test pits based on the results of these excavations.

- Saddlers Creek's tributary draining Mt Ogilvie – surface collection followed by test pitting on both sides of the tributary within the boundary of SC09 focusing on the loci within the predicted area of impact due to subsidence remediation works and/or surface infrastructure which includes site loci 19/1, 20/1, 21/1, 22/1, 23/1, 24/1, 25/1, 26/2, 27/1, 28/1 and 29/1. This investigation should also involve the specialist input of a geomorphologist to direct the sub-surface investigation and the test pitting program. Manual open area excavation may be extended from the selected test pits based on the results of these excavations (it will not include all site loci listed above).

- Western Creek - surface collection followed by test pitting on both sides of Western Creek within the boundary of WC04 focusing on the loci within the predicted area of impact due to subsidence remediation works and/or surface infrastructure which includes site loci 5/1, 6/1, 7/1, 8/1 and 22/1. This investigation should also involve the specialist input of a geomorphologist to direct sub-surface investigations and the test pitting program. Manual open area excavation(s) will be extended from selected test pits based on the results of these excavations (it will not include all site loci listed above).

8.3 Preferred Management Options

Figure 8.1 indicates the sites and their preferred management option. The management options include conservation, surface collection and sub-surface investigation. These management options will form the basis of the management strategy presented in **Section 9**.

8.4 Proposed Aboriginal Cultural Heritage Offset Strategy

This section provides a summary of the originally proposed Aboriginal cultural heritage offset strategy presented in the draft Aboriginal archaeological assessment. After receipt of the comments from Aboriginal stakeholder groups on the draft Aboriginal archaeological assessment, Mt Arthur Coal subsequently revised the management and offset strategy for the Aboriginal archaeological assessment. This strategy was presented to the Aboriginal stakeholder groups on 17 July 2007 (refer to **Section 3.0**). The revised strategy is provided in **Section 8.4.2**.

8.4.1 Originally Proposed Aboriginal Cultural Heritage Offset and Management Strategy

The draft Aboriginal archaeological assessment report presented to the Aboriginal stakeholder groups for comment contained a draft Aboriginal cultural heritage offset strategy. This strategy was substantially revised after the receipt of the Aboriginal stakeholder groups' comments. The original draft Aboriginal cultural heritage conservation offset strategy included the following elements:

- a proposed Saddlers Creek conservation area of 261.5 hectares to be set aside and conserved 'in perpetuity (area for conservation has now been increased);
- a proposed Management Committee with three representatives from the Aboriginal stakeholder groups representing the Aboriginal community;
- a proposed salvage program of all sites within predicted subsidence remediation areas and proposed sub-surface infrastructure based on each mining seam;
- within or near to the existing fenced section of Quarry Creek west of Edderton Road, construct a facility suitable for use by the Aboriginal community when using the area for teaching purposes until such times as the area is impacted by subsidence;
- provide training for one member of each of the registered Aboriginal stakeholder groups for the project in relation to site recording and artefact recording and basic analysis. The training package will be devised so that it enables these representatives to train other members of their respective groups and the broader Aboriginal community; and
- fund training for five Aboriginal people to undertake 'Care of Collections Training' at the Australian Museum in Sydney, or a similar course. This course provides training related to the Management of Keeping Places and Cultural Centres.

8.4.2 Revised Aboriginal Cultural Heritage Offset and Management Strategy

Twelve responses were received from Aboriginal stakeholder groups regarding the draft Aboriginal archaeological assessment, which included the original offset and management strategy (refer to **Section 8.4.1**). Eight of the 12 responses did not support or questioned the proposed offset and management strategy. Responses indicated that some groups felt that further offsets were required. Five responses raised concern about impacts to the previously

proposed Quarry Creek Conservation Area. Two responses agreed with the proposed offset strategy as outlined in the draft Aboriginal archaeological assessment. These comments are summarised in detail in **Section 8.5**.

Aboriginal stakeholder groups' comments on the originally proposed offset strategy can be summarised as focusing on the following issues:

- opposition to the proposed underground mining of the previously proposed Quarry Creek Conservation Area;
- concerns relating to previous commitments by Mt Arthur Coal for past proposed conservation offset areas such as the previously proposed Saddlers Creek Conservation Area and the Quarry Creek Conservation Area;
- lack of support for the original Aboriginal cultural heritage conservation offset strategy;
- desire for increased protection for site SC01 and the inclusion of areas of land set aside in the formerly proposed Saddlers Creek Conservation Area;
- opposition to the planned access in the south of the proposed Saddlers Creek Conservation Area;
- interest in financial offsets/employment offsets/opportunities; and
- need for a Keeping Place.

Following these Aboriginal stakeholder group comments, Mt Arthur Coal reviewed and revised the originally proposed offset strategy and management strategy for the Underground Project. The revised offset and management strategy includes all the previously proposed offset measures and also includes:

- an increase in the size of the proposed Saddlers Creek Conservation Area. The revised Saddlers Creek Conservation Area is approximately 295 hectares. This revised area is 33 hectares larger than area proposed as part of the draft Aboriginal archaeological assessment report. It also includes another five artefact scatters, two isolated finds and some additional areas of simple slope, ridge crest and the main creek corridor. The proposed Conservation Area is larger in area than the combined size of the previously proposed Saddlers and Quarry Creek Conservation Areas which was 280 hectares;
- an increase in the number of Aboriginal representatives on the management committee from three to five;
- establishing a Keeping Place within the proposed Saddlers Creek Conservation Area – provides employment for Aboriginal representatives; and
- revisions to the proposed salvage approach to provide ongoing employment opportunities over the 21 years of the project.

Details of the current offset and management strategy are provided in **Section 8.1.1.1**. The revised strategy was presented to the DECC on 19 April 2007. The DECC indicated that the revised offset strategy appropriately addressed the feedback on the original offset strategy provided in the draft Aboriginal archaeological assessment report.

8.5 Aboriginal Group Comments

This section provides a summary of all Aboriginal stakeholder group comments received on the draft Aboriginal archaeological assessment report, which included the original Aboriginal cultural heritage conservation offset strategy as outlined above (refer to **Section 8.5.1.1** for a summary of comments and **Section 8.5.2** for comments by registered stakeholder). Comments made by Aboriginal stakeholder groups regarding the revised offset and management strategy are also provided in this section (refer to **Section 8.5.1.2** for a summary of comments and **Section 8.5.2** for comments by registered stakeholder) and all comments are provided in full in **Appendix 11**.

8.5.1 Summary of Aboriginal Group Comments

8.5.1.1 Original Offset and Management Strategy

WC, WLALC, WCH, VC, AF-WC, UAC, GC and UHHC (eight of the twelve responses) agreed with the original proposed draft Research Design and Methodology and the proposed draft management strategy as a suitable strategy from an Aboriginal heritage perspective. However, WC, WCH, UAC, VC, WWCCS, UHWC, WEC, WC-AF (eight of the twelve responses) did not support/and/or questioned the original Aboriginal cultural heritage conservation offset strategy as outlined in the draft Aboriginal archaeological assessment and as presented on 12 December 2006.. These groups indicated that they did not feel the original offset strategy was adequate to compensate for the loss of Aboriginal heritage values within the survey area. Specific mention is made in responses by WC, WCH, UHWC, MCC and WEC to the previously proposed Quarry Creek Conservation Area. Impact to this area was seen by these groups as being unacceptable. Responses from UHHC and GC agreed with the original Aboriginal cultural heritage conservation offset strategy as outlined in the draft Aboriginal archaeological assessment report.

WC provided knowledge regarding a tree, hill and two lines of stones which they believe to be Aboriginal cultural heritage locations. These locations were not recorded as archaeological sites during the survey as they are not considered to meet relevant criteria for being defined as an archaeological site. These locations are reported as Aboriginal cultural areas of importance in this report (refer to **Section 7.1**). The remaining seven stakeholder groups that have not provided comment on the original strategy include ANTC, LWTC, WNAC, YE, WVAC, HVCC and MC.

8.5.1.2 Revised Offset and Management Strategy

Fourteen stakeholder groups provided comments on the revised offset and management strategy. These groups included ANTC, GC, HVAC, HVCC, MC, MCC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH and Y. Despite several attempts to gain their comments, LWTC, WWCCS and WEC did not provide any feedback. WLALC stated that they would not be making comment due to the recent dismissal of their Co-ordinator. WNAC would not make comment as they are currently under Administration. Therefore, in total seventeen Aboriginal stakeholder groups were available to provide feedback on the draft management and offset strategy.

Twelve of the fourteen stakeholder groups that commented agreed with the overall revised offset and management strategy and considered it appropriate from an Aboriginal cultural heritage perspective. These groups were ANTC, GC, HVAC, HVCC, MC, MCC, UHHC, VC, WC, WCH, WC-AF and Y.

The revised Proposed Saddlers Creek Conservation Area is a commitment by Mt Arthur Coal to protect the majority of a significant Aboriginal archaeological site in perpetuity. The

revised Proposed Saddlers Creek Conservation Area is a total area of approximately 295 hectares.

UAC were undecided about the total revised management strategy, as they felt a larger conservation area between 80 to 100 hectares was required to offset the proposed mine (refer to **Section 8.5.8.2** and comments provided in **Appendix 11**).

WC-AF also did not agree that the revised Proposed Saddlers Creek Conservation Area is suitable as part of the offset strategy from an Aboriginal cultural heritage perspective. Mr Arthur Fletcher and Adam Fletcher commented that they did not 'ideally' wish the conservation area to be 'surrounded by an industrial/housing/rural property' and was concerned regarding the potential misuse of the surrounding lands in the future.

Mr Victor Perry of UHWC did not agree with the revised offset or management strategy (refer to **Section 8.5.2.9**).

Thirteen of the fourteen stakeholder groups that commented agreed that the proposed Keeping Place and funding for training of five Aboriginal people to undertake 'Care of Collections Training' at the Australian Museum in Sydney (or similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year for two people, a total of 100 person days) was suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective. These groups included ANTC, GC, HVAC, HVCC, MC, MCC, UAC, UHHC, VC, WC, WC-AF and Y.

UHWC did not agree as they felt that at least ten Aboriginal people should be funded for training to undertake 'Care of Collections Training' at the Australian Museum in Sydney (or similar course) and that the establishment and casual staffing of the Keeping Place should be for 100 days per year.

Further discussion with Mrs Foot in relation to the investigation of the hill with pointing stones will be undertaken and resolved as part consultation for the ACHMP process (refer to **Section 8.5.12.2**).

8.5.2 Summary of Comments by Registered Stakeholder Group

8.5.2.1 Aboriginal Native Title Consultants

ANTC provided no response on the original archaeology assessment and management and offset strategy (refer to **Appendix 1**).

ANTC attended the presentation of the revised management and offset strategy on 17 July 2007. ANTC agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**).

8.5.2.2 Giwiirr Consultants

GC agreed to the management strategy and Research Design and Methodology provided in the draft Aboriginal archaeological assessment and considered it appropriate from an Aboriginal Cultural Heritage perspective. GC stated that they knew of 'the massacre site'. 'The Pocket' and 'the burial site' which are sites outside the survey area and will not be impacted by the Underground Project. GC stated that all 'Aboriginal sites' are 'of high significance'. GC agreed with the original Aboriginal cultural heritage conservation offset strategy. GC stated that they 'personally would like to see the artefacts scattered within the proposed Saddlers Creek conservation area' (refer to comments in **Appendix 5**).

GC attended the presentation of the revised management and offset strategy on 17 July 2007. GC agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**).

8.5.2.3 Hunter Valley Aboriginal Corporation

HVAC provided no response on the original archaeology assessment and management and offset strategy (refer to **Appendix 1**).

HVAC attended the presentation of the revised management and offset strategy on 17 July 2007. HVAC agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**).

8.5.2.4 Hunter Valley Cultural Consultants

HVCC provided no response on the original archaeology assessment and management and offset strategy (refer to **Appendix 1**).

HVCC attended the presentation of the revised management and offset strategy on 17 July 2007. HVCC agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**).

8.5.2.5 Lower Wonnarua Tribal Consultancy Pty Ltd

LWTC provided no response to date, despite several attempts at obtaining their comments (refer to **Appendix 1**). LWTC did not attend the presentation of the revised management and offset strategy on 17 July 2007.

8.5.2.6 Mingga Consultants

MC provided no response on the original archaeology assessment and management and offset strategy (refer to **Appendix 1**).

MC attended the presentation of the revised management and offset strategy on 17 July 2007. MC agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**).

8.5.2.7 Muswellbrook Cultural Consultants

MCC stated that they did not agree the original archaeology assessment, management and offset strategy as ‘only a small area for a proposed conservation’ was promised for Saddlers Creek and it did not ‘compensate for the loss of the previously proposed Quarry Creek Conservation Area’ (refer to comments in **Appendix 5**).

MCC attended the presentation of the revised management and offset strategy on 17 July 2007. MCC agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**).

8.5.2.8 Ungooroo Aboriginal Corporation

Mr Graham Ward, (CEO, UAC) agreed to the original management strategy and Research Design and Methodology provided in the draft Aboriginal archaeological assessment and considered it appropriate from an Aboriginal cultural heritage perspective. UAC were 'undecided' about the original draft conservation offset strategy (refer to comments in **Appendix 5**).

UAC attended the presentation of the revised management and offset strategy on 17 July 2007. UAC agreed that the proposed Keeping Place and funding for training of five Aboriginal people to undertake 'Care of Collections Training' at the Australian Museum in Sydney (or similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year for two people or a total of 100 person days) was suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective.

UAC were undecided about the total revised management strategy and felt they would like to see a 'trade off' and the 'VCA expanded to 800 ha compared to the underground mine'. UAC were undecided regarding the suitability of the revised Proposed Saddlers Creek Conservation Area and stated 'more land should be put aside for a green offset, 100 hectares?' (Refer to comments in **Appendix 11**).

8.5.2.9 Upper Hunter Heritage Consultants

UHHC agreed to the management strategy and Research Design and Methodology provided in the draft Aboriginal archaeological assessment and considered it appropriate from an Aboriginal cultural heritage perspective.

UHHC stated that they 'read the draft report on the above mentioned project and can't think of anything else that needs to be added so therefore we agree with the report that you have so kindly prepared for us' (refer to comments in **Appendix 5**).

UHHC attended the presentation of the revised management and offset strategy on 17 July 2007. UHHC agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**).

8.5.2.10 Upper Hunter Wonnarua Council Inc

Mr Victor Perry, (Cultural Heritage Manager, UHWC) stated that UHWC did not agree with the original Aboriginal cultural heritage conservation offset strategy because

> Saddlers Creek (VCA) Zone has already been dedicated as an area or Off-Set to the Bayswater No. 3 Coal Lease Area. To date the Saddlers Creek VCA has not been finalized. This VCA, we believe is a part of the Development Application for Bayswater No. 3 etc. If Bayswater No. 3, Saddlers Creek VCA cannot be finalized within the first 10 years of Coal Mining, then how can we believe that the current owner will negotiate within a quick time frame to settle the outstanding issues relating to this current proposal. Why is Saddlers Creek VCA being offered again as a trade off to the Aboriginal Heritage Conservation for both Bayswater No. 3 and the new Mt Arthur North Underground Proposal….Could Umwelt please explain the current Development Application for Bayswater No 3 and the Saddlers Creek VCA please?

UHWC's written comments detail specific criticism of the original Aboriginal cultural heritage conservation offset strategy including proposed training (refer to comments in **Appendix 5**). The original offset strategy was subsequently revised to address comment made by the stakeholder groups including UHWC's comments.

UHWC stated that they do not understand why Mt Arthur Coal has not commissioned 'an Aboriginal Cultural Heritage Assessment from an Aboriginal perspective'. UHWC have stated that they did not agree with any proposed destruction of sites within the Underground Project Area until Mt Arthur Coal 'has informed us of the situation regarding the Conservation Zones that are both affected by this Development' and the legality of the proposed underground mining of the previously proposed Quarry Creek Conservation Area.

UHWC have also stated that they believe Mt Arthur Coal 'should actively support local Aboriginal Business through a Trust Fund or a Community Development Committee' (refer to comments in **Appendix 5**).

UHWC attended the presentation of the revised management and offset strategy on 17 July 2007. A face to face meeting with UHWC was also held on 3 September 2007 at UHWC's offices with Mr Victor Perry and Mrs Rhoda Perry of UHWC, Carl Bagnall and Andrew Kelly of Mt Arthur Coal, and John Merrell and Mary-Jean Sutton of Umwelt to further discuss the revised offset and management strategy and to specifically discuss the questions raised by the UHWC in previous submissions. As part of these discussions, the history of the previously proposed conservation areas was addressed, including confirmation that legal requirements relating to existing approvals had been met. UHWC provided written comment on 7 September 2007 stating that they did not endorse the revised management strategy or the revised offset strategy for the Mt Arthur Underground Project. Mr Perry stated that the 'Saddlers Creek Conservation Zones are being traded off for two ML areas'. Mr Perry stated that the proposed Keeping Place should be staffed for a '100 days per year' and 'ten people' should be trained from the Aboriginal stakeholder groups to undertake 'Care of Collections Training' or a similar course. Mr Perry stated that the revised Proposed Saddlers Creek Conservation Area was not suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective because 'other areas should be looked at to trade off for this Underground development' (refer to comments in full in **Appendix 11**).

8.5.2.11 Valley Culture

Mr Larry Van Vliet agreed to the management strategy and Research Design and Methodology provided in the draft Aboriginal archaeological assessment and considered it appropriate from an Aboriginal cultural heritage perspective. VC, however, stated that they did not agree with the original Aboriginal cultural heritage conservation offset strategy provided in the draft report. VC did not consider the conservation of site SC01 and associated terrain units within the then proposed Saddlers Creek conservation area was an adequate offset for the proposed Underground Project (refer to comments in **Appendix 5**).

VC attended the presentation of the revised management and offset strategy on 17 July 2007. VC agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**).

8.5.2.12 Wanaruah Custodians

Mrs Barbara Foot initially stated, on behalf of WC stated that 'any destruction of Quarry Creek particularly the previously proposed Quarry Creek Conservation Area' due to the predicted subsidence remediation was 'bad' for Aboriginal cultural heritage. Mrs Foot stated that 'the previously proposed Quarry Creek Conservation Area was 'a big camp site', a large and important Aboriginal cultural heritage site of high significance'. Mrs Foot stated she was 'not sure if Saddlers Creek is enough of a trade off for Quarry Creek Conservation Area being proposed for underground mining due to the cultural significance of Quarry Creek'.

Mrs Foot visited the proposed Saddlers Creek conservation area and stated that it was an 'impressive area' that had 'good teaching potential for kids'. Mrs Foot stated that retaining

trees is 'very important in any Voluntary Conservation Area'. Mrs Foot 'examined some of the artefacts within the proposed Saddlers Creek conservation area and stated that the grindstones were important as they were once used to grind up the medicine…Grindstones were generally square'. Mrs Foot stated that she would like to see 'more or all of site SC01 protected within the proposed Saddlers Creek conservation area'. Mrs Foot stated that:

> Land is important as a Conservation Area as long as it is kept at that and artefacts can be stored there…Land is good as a Conservation Area as long as it is always kept aside and has access for Aboriginal people and is not mined in the future and is kept in perpetuity for the Aboriginal community with unlimited access.

Mrs Foot stated that the 'Keeping Place training is a good idea, so is a sites school and it is important for the younger kids to show and teach them on site'. Mrs Foot stated that the proposed 'picnic place on Quarry Creek is a good idea and it's important to show people the site and may be alright'.

Mrs Foot commented in relation to the management of sites that may be impacted by the proposed Underground Project:

> sites should be collected if impacted and it is important to have a management committee and archaeologists part of that committee with the Aboriginal community to conserve any sites *in situ*.

Mrs Foot stated that it was 'important to have Aboriginal community members on a management committee who have appropriate knowledge and are recognised by the community' as having this knowledge and who are interested in 'protecting culture for future generations'.

Mrs Foot also provided information regarding a tree and line of siltstone stones and a hill with cultural heritage significance and the importance of the massacre site, 'The Pocket' (refer to **Appendix 5**). These sites are discussed in further detail in **Section 7.1**.

WC attended the presentation of the revised management and offset strategy on 17 July 2007. WC agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**). Mrs Foot commented that in relation to the revised management and offset strategy that she was 'pleased with what I have been seeing put forward by the Mt Arthur Mine'.

Mrs Foot agreed that the proposed Keeping Place and funding for training of five Aboriginal people to undertake 'Care of Collections Training' at the Australian Museum in Sydney (or similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year for two people or a total of 100 person days) was suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective. Mrs Foot commented that the 'teacher needs to be culturally aware of what they are teaching and the training of the persons that are having this taught to them' (refer to comments in **Appendix 11**).

Mrs Foot verbally commented in the information session on 17 July 2007 that the tree and line of siltstone stones and a hill needed to be protected (as outlined in **Section 8.5.12.1**). Mrs Foot also commented that the hill also had a line of stones 'which was pointing to something' that she could not make out at the time of her visit to the site. Mrs Foot would like to see that this hill is 'further investigated'. The tree and line of stones will be protected as part of the ACHMP. The hill will be further investigated and managed as part of the ACHMP process.

8.5.2.13 Wattaka Wonnarua CC Service

Mr Des Hickey, Manager on behalf of WWCCS stated that: they did not agree with original Aboriginal cultural heritage conservation offset strategy provided in the draft Aboriginal archaeological assessment. WWCCS did not consider the conservation of site SC01 and associated terrain units within the then proposed Saddlers Creek conservation area was an adequate offset for the proposed Underground Project. WWCCS stated that the proposed offset strategy 'should not be considered as compensation for the loss of Aboriginal sites and country' (refer to comments in **Appendix 5**).

WWCCS stated that these:

> offsets do not address the financial difficulties that Wonnarua people are facing today in our communities, therefore additional financial compensation should be offered. Wattaka Wonnarua CCS is requesting from Mt Arthur Coal financial compensation for the destruction of Wonnarua Country-Cultural Heritage that will be lost forever.

WWCCS attended the presentation of the revised management and offset strategy on 17 July 2007. WWCCS has provided no response to date, despite several attempts at obtaining their comments (refer to **Appendix 1**).

8.5.2.14 Wonnarua Culture Heritage

Mr Gordon Griffiths on behalf of WCH agreed to the management strategy and Research Design and Methodology provided in the draft Aboriginal Archaeological Assessment and considered it appropriate from an Aboriginal cultural heritage perspective.

WCH stated that they did not agree with proposed offset strategy provided in the draft report. WCH did not consider the conservation of site SC01 and associated terrain units within the then proposed Saddlers Creek conservation area was an adequate offset for the proposed Underground Project because it 'should be increased further north to include all of site SC01….it is unacceptable in its current form because it does not conserve all of site SC01'. WCH also disagreed with the division of the proposed Saddlers Creek conservation area for access and with the proposed underground mining of the previously proposed Quarry Creek Conservation Area.

WCH stated that a Keeping Place should be established within the proposed Saddlers Creek Conservation Area. WCH stated that the 'employment of Aboriginal people within the proposed mine is important and should be full time and additional to any cultural heritage positions made available' and that 'there should be at least five Aboriginal stakeholder groups on the Management Committee in order to have a fair representation…represent all of the families within the Aboriginal community' (refer to comments in **Appendix 5**).

WCH did not attend the presentation of the revised management and offset strategy on 17 July 2007. However, WCH provided comment on the presentation provided at the meeting (which was provided to them in hard copy format) and agreed with the revised management and offset strategy (refer to **Appendix 1**).

8.5.2.15 Wonnarua Elders Corporation

WEC advised that their views were represented by UHWC's comments (Rhoda Perry pers comm. 16 January 2007).

WEC did not attend the presentation of the revised management and offset strategy on 17 July 2007. WEC has provided no response to date, despite several attempts at obtaining their comments (refer to **Appendix 11**).

8.5.2.16 Wonnarua Nation Aboriginal Corporation

WNAC provided no response on the original archaeology assessment and management and offset strategy (refer to **Appendix 1**). WNAC did not attend the presentation of the revised management and offset strategy on 17 July 2007. As WNAC are currently under Administration, we understand that they will not be providing any further comment on the project.

8.5.2.17 Wonn11 Contracting – Arthur Fletcher

Mr Arthur Fletcher on behalf of WC-AF, completed the pro-forma for Aboriginal stakeholder group comments provided with the draft Aboriginal archaeological assessment. WC-AF agreed to the management strategy and Research Design and Methodology provided in the draft Aboriginal Archaeological Assessment and considered it appropriate from an Aboriginal cultural heritage perspective.

WC-AF stated that apart from the sites located during the survey they had 'no specific areas', which they would like recorded as part of the Aboriginal cultural heritage assessment. WC-AF stated 'although animal tracks along highlands and natural water sources were of significance for day to day life and cultural events'.

WC-AF stated that 'all identified sites as well as the country around them are culturally significant as they represent a continued connection to our cultural history and the land from where they have come from. These areas are places that our people belong to'. WC-AF stated in relation to the Aboriginal cultural heritage sensitivity of the terrain units within the survey area that 'all country that we belong to is of the highest significance'.

WC-AF stated that they agreed with the proposed offset strategy only 'with discussion of methods of protection of other sites' and 'with the inclusion of additional land being set aside for traditional Wonnarua people to utilise for cultural use'.

WC-AF attended the presentation of the revised management and offset strategy on 17 July 2007. WC-AF agreed with the revised management and offset strategy as a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage Perspective. WC-AF also agreed that the proposed Keeping Place and funding for training of five Aboriginal people to undertake 'Care of Collections Training' at the Australian Museum in Sydney (or similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year for two people or a total of 100 person days) was suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective (refer to comments in **Appendix 11**).

WC-AF did not agree that the revised Proposed Saddlers Creek Conservation Area is suitable as part of the offset strategy from an Aboriginal cultural heritage perspective. Mr Arthur Fletcher and Adam Fletcher commented that:

> Although the Saddlers Creek conservation area will be protected adjacent land has the potential to be misused in the future. I would like the conservation area to be complemented with protected rehabilitated land. Ideally this would retain the natural context of the preserved land better than if the conservation area was surrounded by an industrial/housing/rural property.

8.5.2.18 Wanaruah Local Aboriginal Land Council

Mr Barry McTaggart, (Coordinator) on behalf of WLALC stated that all sites within the draft Aboriginal archaeological assessment:

> are considered significant and require collecting or protecting. If this is not feasible an appropriate cash offset should be put to the Aboriginal community for consideration.

WLALC agreed with the proposed management strategy, however stated 'that further investigations may be required at a later date'. WLALC stated that the original draft offset strategy is:

> considered a reasonable approach the location of the site are not in keeping with the types of facilities that would enhance the betterment of Aboriginal people and would be difficult to access due its close proximity to the mine, I would suggest a cash offset that would be given to the community through the land council would be more appropriate.

WLALC stated that 'salvaged artefacts should be placed in the hands of the WLALC for safe keeping'. WLALC requested 'further consultation should take place prior to finalising this matter'.

WLALC attended the presentation of the revised management and offset strategy on 17 July 2007. Mr John Matthews (Chairperson, WLALC) stated on 23 July 2007 that WLALC will not be providing formal comment due to the recent dismissal of their Co-ordinator.

8.5.2.19 Yarrawalk

Y provided no response on the original archaeology assessment and management and offset strategy (refer to **Appendix 1**). Y attended the presentation of the revised management and offset strategy on 17 July 2007. Y agreed with the revised management and offset strategy and considered it appropriate from an Aboriginal cultural heritage perspective (refer to comments in **Appendix 11**).

9.0 Management Strategy

The following management strategy is based on the preferred management options discussed in **Section 8** and draws upon both the Aboriginal cultural heritage and the archaeological significance/sensitivity/research potential of the sites and the archaeological terrain unit/landform elements in which they occur. A summary of the management strategy is provided in **Section 9.1**.

9.1 Summary of Management Strategy

The overall management strategy can be summarised as including the following components:

- conservation outcomes;
- salvage outcomes; and
- training outcomes.

9.1.1 Conservation Outcomes

Conservation outcomes include:

- site conservation as the preferred management option for all sites, site loci and their associated PAD located outside the predicted surface impact zone (refer to **Figure 9.1**). These sites will be managed *in situ* under an ACHMP for the duration of the project, except where impacts are required for minor surface infrastructure (refer to **Section 9.1**);
- to set aside the majority of site SC01 as the proposed Saddlers Creek conservation area to be conserved 'in perpetuity'. The proposed conservation area will cover an area of approximately 295 hectares;
- to manage the proposed Saddlers Creek conservation area under an ACHMP (refer to **Appendix 10**). The management procedures and protocols for this area will be stringent in relation to any activity that has the potential to cause ground surface disturbance. Ground surface disturbance will not be allowed without agreement of the Management Committee and in consultation with the Aboriginal stakeholder groups and the DECC;
- to provide safe access to the proposed Saddlers Creek conservation area. Visitors to the proposed Saddlers Creek conservation area will be appropriately supervised as agreed by the Management Committee and Mt Arthur Coal; and
- to fund and construct a Keeping Place within the proposed Saddlers Creek conservation area for the registered Aboriginal stakeholder groups as part of the Aboriginal cultural heritage offset strategy.

9.1.2 Salvage Outcomes

Salvage outcomes include:

- surface collection and targeted subsurface investigation is proposed for sites within the surface impact zone which have been identified as having the potential to retain a degree of integrity and/or complex subsurface assemblages. The sites recommended for

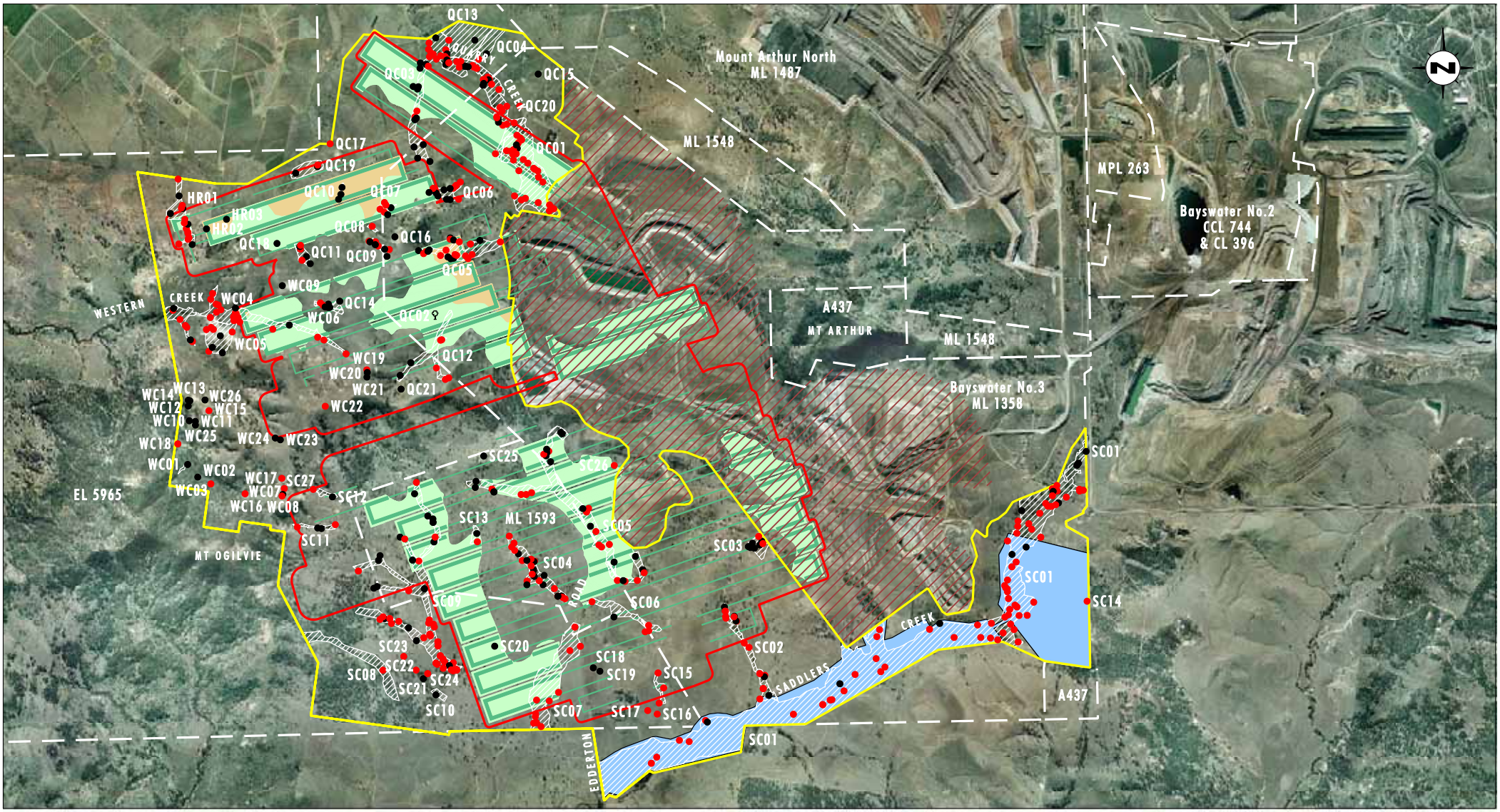


FIGURE 9.1

Proposed Saddlers Creek Conservation Area and Site Distribution

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salvage and subsurface investigation include areas of Quarry Creek (QC01), Saddlers Creek tributary (SC09) and Western Creek (WC04) in areas potentially impacted by subsidence remediation and for Saddlers Creek (SC01) within the proposed conveyor corridor (refer to **Figure 8.1**); and

- surface collection and salvage on a longwall panel basis, so that ongoing subsidence monitoring and predictions may potentially allow the predicted subsidence remediation impact zone to be refined to a smaller area. This may allow more sites to be managed *in situ*, with reduced numbers of sites requiring salvage and will also provide ongoing employment opportunities in salvage works for Aboriginal people.

9.1.3 Training Outcomes

Training outcomes include:

- within or near to the existing fenced section of Quarry Creek west of Edderton Road, construct a facility suitable for use by the Aboriginal community when using the area for teaching purposes until such times as the area is impacted by subsidence;

- Mt Arthur Coal will provide training for one member of each of the registered Aboriginal stakeholder groups for the project in relation to site recording and artefact recording and basic analysis. The training package will be devised so that it enables these representatives to train other members of their respective groups and the broader Aboriginal community;

- the use of the proposed Keeping Place as a storage room for artefacts and a display centre for teaching/educational purposes;

- Mt Arthur Coal to review applications to undertake non-destructive research within the proposed Saddlers Creek conservation area which will be considered by the Management Committee and approved based on their merit;

- Mt Arthur Coal will fund training for staffing of the proposed Keeping Place on a fifty day per year basis for two people (a total of 100 person days) for the duration of the project. Mt Arthur Coal will fund training for five representatives from the registered stakeholder groups to undertake 'Collections Training' at the Australian Museum (or similar training); and

- Mt Arthur Coal will continue to encourage Aboriginal stakeholder groups to provide applications for employment in their current and proposed mining operations through their existing programs for employment (e.g. as facilitated through the Aboriginal community liaison/management committee).

9.2 Archaeological Sites

Table 9.1 presents a summary of the management measures assessed as appropriate for the sites located within the survey area. The sites are shown on **Figure 9.1** and are colour coded to indicate their individual management strategy. This overall management strategy is that Mt Arthur Coal will:

- set aside the proposed Saddlers Creek conservation area and take measures to have the land rezoned for 'Conservation - Aboriginal Cultural Heritage' to ensure ongoing

protection of the Aboriginal site SC01 and associated archaeological terrain units within this area as indicated on **Figure 9.1**;

- carry out recommendations as outlined in **Section 8.1.1.1** and in **Appendix 10** relating to the previously proposed Quarry Creek Conservation area;

- prepare an ACHMP in consultation with the DECC and the Aboriginal stakeholder groups to facilitate:

  - the ongoing management of the sites and archaeological terrain units/landform elements located within the Underground Project area which will not be impacted by proposed subsidence, subsidence remediation works and/or proposed surface infrastructure;

  - the timing and methodology for the salvage of sites within the Underground Project area that are predicted to be impacted by subsidence remediation works and/or proposed surface infrastructure;

  - the establishment of a Management Committee which will include two representatives from Mt Arthur Coal, at least five Aboriginal stakeholder group representatives and one archaeologist as required to provide ongoing management of sites within the Underground Project area which will not be impacted by proposed subsidence remediation works and proposed surface infrastructure; and

  - the preparation of a management strategy for sites/archaeological terrain units in the proposed Saddlers Creek conservation area. This management strategy to be integrated with ecological management objectives to ensure no conflict occurs between revegetation programs and site conservation (for further details regarding the specific objectives of the ACHMP refer to **Appendix 10**).

This management strategy is based on the conceptual mine plan for the Mt Arthur Underground Project as included in the *EA* report. Some changes to the conceptual mine plan may occur as the project implementation progresses and further information becomes available about mining conditions and geology features and other mine planning considerations. Any such changes required over the life of the project, and any resultant changes to the following predicted impacts, will be managed in consultation with the Management Committee and follow the protocols outlined in the ACHMP to be prepared for the project.

Table 9.1 - Management Strategy for Sites within the Underground Project Area

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
Hunter River Catchment				
HR01	Artefact Scatter	1/1, 2/1, 2/2, 4/1, 5/1, 6/1, 7/1 are within predicted subsidence remediation areas. Areas of PAD (refer to **Figure 9.1**) are also within predicted subsidence remediation areas.	Low to Moderate	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
HR01	Artefact Scatter	3/1, 3/2, 8/1, 8/2, 9/1, 10/1, 11/1, 12/1, 13/1 and 14/1. Areas of PAD (refer to **Figure 9.1**) not predicted to be impacted.	Low to Moderate	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
HR02	Isolated Find	1/1 is within a predicted subsidence remediation area.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
HR03	Isolated Find	1/1 is within a predicted subsidence remediation area.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
Quarry Creek Catchment				
QC01	Artefact Scatter	15/1, 22/1, 23/1, 24/2, 25/1, 26/1, 26/2, 27/1, 28/1, 29/1, 29/2, 29/3, 30/1, 31/1, 32/1, 32/2, 34/1, 36/2, 38/1, 39/1, 41/1, 42/1, 42/2, 43/1 and 44/1 are within predicted subsidence remediation areas. Areas of PAD (refer to **Figure 9.1**) are also within the predicted subsidence remediation areas.	High	*Management Measure 3:* Detailed surface collection, sub-surface testing program and open area excavation following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
QC01	Artefact Scatter	All remaining loci. Areas of PAD (refer to **Figure 9.1**) not predicted to be impacted.	High	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC02	Scarred Tree	This site is within a predicted subsidence remediation area.	High	*Management Measure 6:* The scarred tree is not predicted to be impacted adversely by subsidence and should be conserved and managed in compliance with the ACHMP outlined in **Appendix 10**. The ACHMP will advise when/if input from an arborist is required.
QC03	Artefact Scatter	6/1, 6/2, 8/1, 9/1, 9/2, 11/1, and 14/1 are within predicted subsidence remediation areas. 9/3 is on the boundary of an area that may require subsidence remediation. Areas of PAD (refer to **Figure 7.3a**) are also within subsidence remediation areas.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
QC03	Artefact Scatter	1/1, 2/1, 3/1, 4/1, 4/2, 5/1, 7/1, 10/1, 12/1, 13/1 and 15/1. Areas of PAD (refer to **Figure 9.1**) not predicted to be impacted.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC04	Artefact Scatter	All loci. Areas of PAD (refer to **Figure 9.1**) not predicted to be impacted.	Moderate	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
QC05	Artefact Scatter	1/2, 1/3, 2/1, 6/1, 7/1, 7/2, 7/3, 8/1, 9/1, 10/1, 11/1, 11/2, 12/1, 12/2, 12/3 and 13/1 are within the predicted subsidence remediation areas. Areas of PAD (refer to **Figure 9.1**) are also within predicted subsidence remediation areas.	Low to Moderate	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
QC05	Artefact Scatter	1/1, 4/1, 5/1, 13/2 and 14/1. Areas of PAD (refer to **Figure 9.1**) will not be impacted.	Low to Moderate	*Management Measure 4:* These loci and their associated PAD will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC06	Artefact Scatter	7/1, 8/1 and 6/1 are within the predicted subsidence remediation areas. 4/1 is on the boundary of an area predicted for subsidence remediation. Areas of PAD (refer to **Figure 9.1**) are also within predicted subsidence remediation areas.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
QC07	Artefact Scatter	1/1, 2/1, 2/2, 3/1, 4/1 and 4/2 are within predicted subsidence remediation areas. Areas of PAD (refer to **Figure 9.1**) are also within predicted subsidence remediation areas.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
QC08	Artefact Scatter	No loci or areas of PAD (refer to **Figure 9.1**) will be impacted.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
QC09	Artefact Scatter	No loci or areas of PAD (refer to **Figure 9.1**) will be impacted.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC10	Artefact Scatter	1/1, 2/1 and 3/1 are within the predicted subsidence remediation areas. Areas of PAD (refer to **Figure 9.1**) are also within predicted subsidence remediation areas.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
QC11	Artefact Scatter	4/3 is within a predicted subsidence remediation area. 4/2 is on the boundary of a predicted subsidence remediation area. Areas of PAD (refer to **Figure 9.1**) are also within predicted subsidence remediation areas.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
QC11	Artefact Scatter	1/1, 2/1, 3/1 and 4/1. The majority of PAD (refer to **Figure 9.1**) will not be impacted.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC12	Artefact Scatter	2/1, 3/1, 4/1 and 5/1 are within the predicted subsidence remediation areas. Areas of PAD (refer to **Figure 9.1**) are also within predicted tensile subsidence remediation areas.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
QC12	Artefact Scatter	1/1, 6/1, 7/1. Areas of PAD (refer to **Figure 9.1**) not predicted to be impacted.	Low	*Management Measure 4:* These loci and their associated PAD will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC13	Artefact Scatter	1/1 No areas of PAD (refer to **Figure 9.1**) will be impacted.	Low to Moderate	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC14	Artefact Scatter	1/1, 2/1 and 3/1 are within the predicted subsidence remediation areas. Areas of PAD (refer to **Figure 9.1**) will be impacted.	Low to Moderate	*Management Measure 5:* Surface collection and test pitting of ridge crest and ridgeline within site following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
QC15	Isolated Find	1/1 No areas of PAD (refer to **Figure 9.1**) will be impacted.	Low	*Management Measure 2:* This site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC16	Isolated Find	1/1	Low	*Management Measure 2:* This site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC17	Isolated Find	1/1	Low	*Management Measure 2:* This site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
QC18	Isolated Find	1/1 is within a predicted subsidence remediation area.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
QC19	Artefact Scatter	All loci. No areas of PAD (refer to **Figure 9.1**) will be impacted.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC20	Artefact Scatter	1/1	Low	*Management Measure 2:* This site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
QC21	Isolated Find	1/1	Low	*Management Measure 2:* This site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC01	Artefact Scatter	The following loci and associated PAD are within the proposed Saddlers Creek conservation area: 7/1, 8/1, 8/2, 9/1, 10/1, 15/1, 17/1, 18/1, 19/1, 20/1, 21/1, 22/1, 22/2, 23/1, 24/1, 25/1, 26/1, 27/1, 28/1, 28/2, 29/1, 30/1, 30/2, 31/1, 31/2, 41/1, 42/1, 43/1, 44/1, 44/2, 44/3, 45/1, 46/1, 47/1, 48/1, 49/1, 50/1, 52/1, 53/1, 54/1, 55/1 and 56/1.	High	*Management Measure 7:* Conserve as part of the proposed Saddlers Creek conservation area and manage in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
SC01	Artefact Scatter	1/1, 2/1, 2/2, 4/1, 5/1, 5/2, 6/1, 7/2, 11/1, 12/1, 13/1, 14/1, 16/1, 19/2, 32/1, 33/1, 34/1, 34/2, 35/1, 36/1, 36/2, 36/3, 36/4, 37/1, 38/1, 39/1, 39/2, 40/1, 48/2, 51/1, 57/1, 57/2 and 58/1. The majority of PAD will be protected as part of the proposed Saddlers Creek conservation area.	High	*Management Measure 8:* These loci are outside the Saddlers Creek Conservation Area but will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**. This includes loci within the proposed access corridor through the proposed Saddlers Creek conservation area.
SC01	Artefact Scatter	The proposed conveyor corridor passes through SC01 and impact small sections of PAD.	High	*Management Measure 9:* The areas of PAD which will be impacted by the Underground Project and require sub-surface testing and targeted sub-surface investigation following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
SC02	Artefact Scatter	4/2 and 11/1 are within the predicted subsidence remediation areas. Areas of PAD will be impacted by the predicted subsidence remediation areas (refer to **Figure 9.1**).	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
SC02	Artefact Scatter	1/1, 1/2, 2/1, 3/1, 4/1, 5/1. 5/2, 6/1, 7/1, 8/1, 9/1, 10/1, 10/2 and 12/1. The majority of PAD will not be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC03	Artefact Scatter	1/1, 1/2, 3/1, 3/3 and 4/1 are within the predicted subsidence remediation areas. Areas of PAD will be impacted by the predicted subsidence remediation (refer to **Figure 9.1**).	Low	*Management Measure 1:* Surface collection following the methodology outlined in Appendix 9 and in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
SC03	Artefact Scatter	1/3, 2/1 and 3/2. The majority of PAD will not be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC04	Artefact Scatter	1/3, 3/1, 3/4 3/5, 3/6, 3/9, 4/1, 3/8, 5/1, 6/1 and 6/2, are within the predicted subsidence remediation areas. Areas of PAD will be impacted by the predicted subsidence remediation areas (refer to **Figure 9.1**).	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
SC04	Artefact Scatter	1/1, 1/2, 1/4, 2/1, 2/2, 2/3, 3/2, 3/3, 3/7, 3/10, 3/11, 3/12, 3/13 and 3/14. The majority of PAD will not be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC05	Artefact Scatter	1/3, 1/5, 1/6, 1/7, 2/1, 2/2, 3/1, 3/2, 4/1, 5/1, 6/1, 6/2, 7/1, 8/1, 9/1, 10/1, 10/2, 11/1, 12/1, 13/1 15/1, 13/2, 16/1, 17/1 18/1 and 19/1 are within the predicted subsidence remediation areas. 16/2 and 16/3 are on the boundary of the area of predicted subsidence impact. Areas of PAD will be impacted by the predicted subsidence remediation areas (refer to **Figure 9.1**).	Low	*Management Measure 1*: Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
SC05	Artefact Scatter	1/1, 1/4 and 14/1. Only very small sections of PAD will not be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
SC06	Artefact Scatter	1/1, 1/2, 2/2 and 2/3 are within the predicted area of subsidence impact. Areas of PAD will be impacted by the predicted subsidence remediation areas (refer to **Figure 9.1**).	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
SC06	Artefact Scatter	2/1 and 3/1. The majority of PAD will not be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC07	Artefact Scatter	1/2, 2/1 and 3/1 are within the predicted subsidence remediation areas. Areas of PAD will be impacted by the predicted subsidence remediation areas (refer to **Figure 9.1**).	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
SC07	Artefact Scatter	1/1, 4/1, 5/1, 6/1, 6/2, 7/1, 7/2, 8/1 and 9/1. Some areas of PAD will not be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC08	Artefact Scatter	All loci. No areas of PAD will be impacted (refer to **Figure 9.1**).	Low to Moderate	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC09	Artefact Scatter	19/1, 20/1, 21/1, 22/1, 23/1, 24/1, 25/1, 26/2, 27/1, 28/1 and 29/1, are within predicted subsidence remediation areas. Areas of PAD will be impacted by predicted subsidence remediation areas (refer to **Figure 9.1**).	Moderate	*Management Measure 10:* Surface collection followed by test pitting and grader scrapes along both creek banks of the main creek channel and in association with minor creek confluences following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
SC09	Artefact Scatter	1/1, 1/2, 1/3, 2/1, 2/2, 3/1, 4/1, 5/1, 6/1, 6/2, 7/1, 8/1, 9/1, 9/2, 10/1, 10/2, 11/1, 12/1, 13/1, 14/1, 15/1, 15/2, 16/1, 17/1, 18/1, 30/1, 31/1, 32/1, 33/1, 34/1, 35/1, 36/1, 37/1, 37/2, 38/1, 39/1, 40/1, 41/1, 41/2, 42/1, 43/1 and 44/1. Some areas of PAD will not be impacted (refer to **Figure 9.1**).	Moderate	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC10	Isolated Find	1/1 No PAD will be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* This site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC11	Artefact Scatter	No loci will be impacted. No areas of PAD will be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC12	Artefact Scatter	1/1 is within the predicted areas of subsidence remediation. A small section of PAD will be impacted by predicted tensile cracking (refer to **Figure 9.1**).	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
SC12	Artefact Scatter	2/1, 2/2, 3/1, 3/2, 3/3 and 3/4. The majority of PAD will not be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC13	Artefact Scatter	1/1 and 1/2 are within predicted subsidence remediation areas. Areas of PAD will be impacted by the predicted subsidence remediation areas (refer to **Figure 9.1**).	Low to Moderate	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
SC14	Artefact Scatter	All loci.	Low	*Management Measure 7:* Conserve as part of the Saddlers Creek Conservation Area and manage in compliance with the ACHMP outlined in **Appendix 10**.
SC15	Artefact Scatter	2/1 and a small section of PAD will be impacted by predicted subsidence remediation areas (refer to **Figure 9.1**).	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
SC15	Artefact Scatter	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC16	Artefact Scatter	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC17	Artefact Scatter	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC18	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC19	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
SC20	Isolated Find	1/1 is within a predicted subsidence remediation area.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
SC21	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC22	Artefact Scatter	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC23	Artefact Scatter	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC24	Artefact Scatter	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC25	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
SC26	Artefact Scatter	1/1 is within an area of predicted subsidence remediation.	Low	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
SC27	Artefact Scatter	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
Western Creek Catchment				
WC01	Isolated Find	1/1 No areas of PAD will be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC02	Isolated Find	1/1 No areas of PAD will be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC03	Artefact Scatter	1/1 No areas of PAD will be impacted (refer to **Figure 9.1**).	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC04	Artefact Scatter	5/1 and 6/1 are within the area of predicted subsidence remediation and also an area proposed for surface infrastructure. Areas of PAD will be impacted (refer to **Figure 9.1**).	Moderate to High	*Management Measure 11:* In the area incorporating the loci, surface collection and grader scrapes along both creek banks of the main creek channel and in association with minor creek confluences following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
WC04	Artefact Scatter	2/1, 3/1, 4/1, 7/1, 8/1, 9/1, 10/1, 10/2, 11/1, 12/1, 13/1, 14/1, 15/1, 15/2, 16/1, 17/1, 18/1, 18/2, 18/3, 19/1, 20/1, 21/1, 22/1, and 22/2. Some areas of PAD will not be impacted (refer to **Figure 9.1**).	Moderate to High	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC05	Artefact Scatter	No loci will be impacted. No areas of PAD will be impacted (refer to **Figure 9.1**).	Moderate to High	*Management Measure 12:* The site/site loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**. Due to the extent of erosion in this site, however, controls may need to be put in place to protect it from further erosion. Appropriate controls will be investigated in by the Management Committee in consultation with the registered Aboriginal stakeholder groups and DECC. If any ground surface disturbing works are required at this site all surface artefacts should be collected prior to impact.
WC06	Artefact Scatter	1/1 is within a predicted subsidence remediation area. Some areas of PAD may be impacted (refer to **Figure 9.1**).	Low to Moderate	*Management Measure 1:* Surface collection following the methodology outlined in **Appendix 9** and in compliance with the ACHMP outlined in **Appendix 10**.
WC06	Artefact Scatter	2/1 and 2/2. Some areas of PAD will not be impacted (refer to **Figure 9.1**).	Low to Moderate	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
WC07	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 9**.
WC08	Artefact Scatter	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC09	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC10	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 9**.
WC11	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC12	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC13	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
WC14	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC15	Artefact Scatter	All loci.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC16	Artefact Scatter	All loci.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC17	Artefact Scatter	All loci.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC18	Artefact Scatter	All loci.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC19	Artefact Scatter	All loci.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC20	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.

Table 9.1 - Management Strategy for Sites within the Underground Project Area (cont)

Site Name	Site Description	Loci/Context	Significance Assessment	Management Recommendation
WC21	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC22	Artefact Scatter.	All loci.	Low	*Management Measure 2:* These loci will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC23	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC24	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC25	Isolated Find	1/1	Low	*Management Measure 2:* This site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.
WC26	Isolated Find	1/1	Low	*Management Measure 2:* The site will not be impacted by the Underground Project and will be managed in compliance with the ACHMP outlined in **Appendix 10**.

As discussed in **Sections 2.3** to **2.4** and **Section 7.3**, in addition to the impacts outlined in **Table 9.1**, the approved West Belmont Pit near Quarry Creek (which is part of the approved Bayswater No. 3 project, refer to **Figure 7.2**) will impact on parts of sites QC01 specifically loci 35/1 and 36/1, all of site QC06 except for loci 8/1 and parts of site QC05 specifically loci 2/1, 3/1, 5/1, 13/1, 13/2 and 14/1. These sites will be managed under a separate Section 90 Consent process in consultation with the registered Aboriginal stakeholder groups and DECC. The proposed access road was moved further north outside the Underground Project Area to avoid site SC01. The construction of the access road will remain within the disturbance footprint assessed as part of the proposed South Pit Extension Project (Umwelt 2006).

9.3 Cultural Locations

As discussed in **Section 8.1**, the two cultural locations identified by Mrs Barbara Foot (refer to **Section 7.1**) are within the predicted subsidence remediation zones. The tree identified by Mrs Foot as an Aboriginal scarred tree will be protected and fenced off and managed under an Aboriginal Heritage Management Plan for the Mt Arthur Underground Project. The line of siltstone stones near the tree and the hill with another line of siltstone stones will be managed and monitored in consultation with the proposed Management Committee. Further definition of the area where the line of siltstone stones on the hill is perceived to be pointing towards will be sought from Mrs Foot as part of the consultation process for the AHMP (refer to Mrs Foot's comments in **Section 8.5.12.2**).

9.4 Timeframes and Responsibility

Table 9.2 outlines the various steps to be taken by Mt Arthur Coal to manage Aboriginal cultural heritage sites, site loci and PADs within the Underground Project area throughout the construction and life of mine phases. **Table 9.2** also provides the persons responsible for the timing and implementation of the overall management strategy incorporating both the salvage program for those sites/site loci and PADs to be salvaged ahead of impact and those to be managed for their conservation throughout the life of the Underground Project and 'in perpetuity' within the Saddlers Creek conservation area.

Table 9.2 - Timeframe and Responsibility for Aboriginal Cultural Heritage Management

Timing	Task	Relevant Sites/Site Loci	Responsibility
Prior to significant construction.	Seek to ensure that a reasonable budget is available to implement and undertake Aboriginal Cultural Heritage Management.	All sites/site loci.	Mt Arthur Coal.
	Prepare ACHMP in consultation with the DECC and the relevant Aboriginal Stakeholder groups.	All sites/site loci.	Mt Arthur Coal.
	Advertise, select and fund Aboriginal Management Committee members in compliance with ACHMP.	N/A	Mt Arthur Coal.
	Prepare cultural heritage awareness training for inductions.	All sites/site loci.	Mt Arthur Coal in consultation with the Management Committee.

Table 9.2 - Timeframe and Responsibility for Aboriginal Cultural Heritage Management (cont)

Timing	Task	Relevant Sites/Site Loci	Responsibility
	Fence Saddlers Creek Conservation Area.	SC01 and SC14.	Mt Arthur Coal in consultation with the Management Committee.
Prior to significant construction.	Undertake initial site monitoring in compliance with the ACHMP.	All sites/site loci.	Management Committee.
Prior to commencement of longwall mining in each mining area.	Undertake salvage of all sites/site loci to be impacted in each longwall panel and associated surface infrastructure.	HR01, HR02, HR03, QC01, QC03, QC05, QC06, QC07, QC10, QC11, QC12, QC13, QC14, QC18, QC21, SC02 to SC07, SC09, SC12, SC13, SC15, SC20, SC26, WC04 and WC06.	Management Committee.
Annually	Monitoring of site/site loci condition following subsidence.	All sites/site loci in subsided areas.	Management Committee.
Within 12 months of the commencement of longwall mining.	Construct facility suitable for use by the Aboriginal community when using the Quarry Creek area for teaching purposes until such times as the area is subsided.	QC01	Management Committee.
	Provide site and artefact training for one member of each of the required Aboriginal stakeholder groups for the project.	QC01	Mt Arthur Coal Management. Management Committee (implementation).
	Fund training for five Aboriginal people to undertake 'Care of Collections Training' at the Australian Museum in Sydney (or similar).	QC01	Mt Arthur Coal (funding). Management Committee (implementation).
Every three years. End of Year 3, 6, 9, 12, 15, 18, 21.	Review of ACHMP.	All sites/site loci	Management Committee.
	Monitoring of all remaining sites being managed under the ACHMP.	All remaining sites/site loci.	Management Committee.
	Re-advertise, select and fund Aboriginal Management Committee members in compliance with ACHMP.	N/A	Mt Arthur Coal.

Table 9.2 - Timeframe and Responsibility for Aboriginal Cultural Heritage Management (cont)

Timing	Task	Relevant Sites/Site Loci	Responsibility
Post mining in the Glen Munro seam.	After subsidence the area will be inspected by the Management Committee and its ongoing use as a teaching place reviewed.	QC01	Management Committee.

As noted above, the proposed surface collections, sub-surface salvages and subsequent analyses will be undertaken in accordance with the methodology outlined in **Appendix 9**. The results of the salvages and artefact analyses will be provided to the Aboriginal groups and DECC within two years of the conclusion of each stage of the salvage.

The ACHMP must be prepared in consultation with the Aboriginal stakeholder groups and DECC and DoP prior to any substantial works commencing. The ACHMP will provide detailed guidance in relation to impact to sites not predicted at the time of preparation of this assessment (refer to **Section 9.1** and **Appendix 10** for details).

9.5 Recommended Mitigation Measures for Unspecified Minor Infrastructure Locations

As discussed in **Section 2.1**, minor infrastructure such as ventilation fan facilities, access tracks, service boreholes (power etc.), gas drainage facilities, dewatering boreholes, other minor facilities and associated services will be required as underground mining progresses. The exact locations for these facilities will be determined as the project progresses and is dependant on mining operation needs. Wherever possible, this minor surface infrastructure will avoid known sites/site loci/PAD and especially those assessed as having moderate to high or high Aboriginal cultural heritage and archaeological significance (refer to **Figure 7.3**). The ACHMP (refer to **Appendix 10**) will provide a management protocol if a known site cannot be avoided by minor infrastructure, or if the minor infrastructure impacts on a previously unknown site. The research design and methodology for the site salvage program provides details for the salvage of these sites if impact cannot be avoided (refer to **Appendix 9**). The management of these site/site loci/PAD will be based on their Aboriginal cultural heritage and archaeological significance. This same process will apply should any other ground disturbing works not specifically included in this assessment be required as a result of mining operation needs.

9.6 General Management Recommendations

Two further general recommendations will apply to the Underground Project area:

- should a previously unknown site be located within any part of the Underground Project area, the Management Committee will be informed. If the site is within a direct surface impact area (excluding subsidence impacts), all surface disturbance works in the vicinity of the site will cease until such time as an appropriate management strategy has been discussed and endorsed by the Management Committee. If the site is within the area to be managed for *in situ* conservation or within the proposed Saddlers Creek conservation area, the Management Committee will ensure that the site is managed in accordance with the ACHMP. The DECC will be supplied with a DECC site card for all new sites located (if any); and

- should human/possible human skeletal material be uncovered during works or by natural erosion processes within any part of the Underground Project area, all works in that area will cease and the Management Committee will be immediately informed. The Management Committee will inform the NSW Police Department, the relevant Aboriginal stakeholder groups and the DECC. If the skeletal material is within an impact area, all works in the vicinity of the find site will cease until such time as appropriate management has been discussed and endorsed by the relevant Aboriginal stakeholder groups and the DECC. If the site is within the area to be managed for *in situ* conservation or within the Saddlers Creek Conservation Area, the Management Committee will ensure the site is managed in accordance with the wishes of the relevant Aboriginal stakeholder groups and the DECC and under a revised ACHMP that specifically addresses the requirements of that particular site.

9.7 Care and Control

Determining the care and control of the artefacts retrieved during the salvage program forms part of the consultation process with the Aboriginal stakeholder groups; however, the final approval for care and control will be determined following further consultation with groups (refer to **Appendix 5**). It should be noted that it is not considered appropriate to break up the assemblages and that all of the artefactual material should be kept in the one facility/place for future teaching and research purposes.

During the Aboriginal consultation process for the draft Aboriginal archaeological assessment the following care and control options were presented to the 19 registered Aboriginal stakeholder groups for 'Care' of salvaged artefacts:

- within a fenced area in the proposed Saddlers Creek conservation area; or
- within a fenced area in the Mt Arthur Conservation Area; or
- or within a secure area at the WLALC; or
- with the Australian Museum.

Only seven Aboriginal stakeholder groups responded to suggestions for Care and Control of artefacts. WLALC requested care of all salvaged artefacts which would be kept in the Land Council building in Muswellbrook. Three groups (GC, UAC and VC) requested all salvaged artefacts to be placed within the proposed Saddlers Creek conservation area. UAC and VC requested that the artefacts be placed within a fenced area within the proposed Saddlers Creek conservation area. GC requested that the artefacts be scattered within the proposed Saddlers Creek conservation area. WCH, WC and WC-AF stated that the salvaged artefacts should be placed in a Keeping Centre within the proposed Saddlers Creek conservation area.

Since receiving comments on the draft Aboriginal archaeological assessment, Mt Arthur Coal has proposed funding the construction and future management of a Keeping Place within the proposed Saddlers Creek conservation area (refer to **Section 8.2**). It is proposed that all artefacts salvaged from the underground mine impact area will be stored in this facility. At the end of the life of the Underground Project, it is proposed that these artefacts will then be placed within the Saddlers Creek Conservation Area, as determined by the management committee.

The proposed Keeping Place was discussed as a repository for all salvaged artefacts with the 15 Aboriginal stakeholder groups that attended the meeting on 17 July 2007. The general consensus of the meeting was that the proposed Keeping Place was the appropriate

repository. Further consultation in relation to ‘Care’ will be undertaken as part of the preparation of the ACHMP.

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APPENDIX 1

Detailed Aboriginal Consultation Log

Appendix 1 – Detailed Aboriginal Consultation Log

Date	Form of Consultation	Aboriginal Stakeholder Groups contacted
13 May 2005	Letters of notification were sent by Umwelt to five agencies including those indicated in DECC's guidelines for stakeholder consultation.	WLALC
18 May 2005	Advertisement in Hunter Valley News.	N/A
2 December 2005	Advertisement in Muswellbrook Chronicle.	N/A
8 December 2005	Umwelt sent an invitation to sixteen registered Aboriginal stakeholder groups to participate in the consultation program and a survey strategy and conservation values presentation with a site tour on 22 December 2005 at Mt Arthur Coal offices. This invitation included a request for Aboriginal stakeholder groups to provide input/knowledge on Aboriginal cultural heritage. Invitations were posted and faxed.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
9 December 2005	Letter sent to all sixteen registered groups moving the meeting date in the consultation program and a survey strategy and conservation values presentation with a site tour on 22 December 2005 at Mt Arthur Coal offices.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
8 December 2005 to 21 December 2005	Follow up telephone contact made by Umwelt to discuss proposed meeting and confirm attendance.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
14 December 2005	Phone calls to sixteen registered Aboriginal stakeholder groups to confirm their attendance to the Mt Arthur Coal meeting and site tour on 22 December 2005.	Rhoda Perry – WEC/UHWC; Barry McTaggart and Janelle Risby – WLALC; Barbara Foot – WLALC; Larry Van Vliet – VC; Margaret Matthews – ANTC; Melissa Newman – UHHC; Gordon Griffiths – WCH; Robert Lester – WNAC; Des Hickey – WWCCS; Scott Franks – Y; Rodney Matthews – GC; Christine Matthews – HVCC; UAC – Left detailed message on voicemail; Barry Anderson – LWTC – Left detailed message on voicemail and SMSed his mobile; HVAC – Left detailed message on voicemail.
19 December 2005	Invitation to Brian Horton MCC to participate in the consultation program and a survey strategy and conservation values presentation with a site tour on 22 December 2005 at Mt Arthur Coal offices. This invitation included a request for Aboriginal stakeholder groups to provide input/knowledge on Aboriginal cultural heritage. Invitation was posted.	MCC had registered interest late.

Date	Form of Consultation	Aboriginal Stakeholder Groups contacted
22 December 2005	Meeting held with Aboriginal stakeholder groups and Mt Arthur Coal that provided an introduction to the project, discussion of draft survey strategy and conservation values and potential Aboriginal cultural heritage offsets and also provided a site tour of the Mt Arthur Survey Area. This meeting included a request for Aboriginal stakeholder groups to provide information and knowledge on Aboriginal cultural heritage.	ANTC, GC, HVAC, LWTC, MCC, WLALC, UAC, UHHC, WCH, WNAC and Y.
22 December 2005	Draft survey strategy was sent out to Aboriginal stakeholder groups not present at the meeting. The draft survey strategy included a request for Aboriginal groups to provide input/knowledge on Aboriginal cultural heritage.	WEC, VC, UHWC, HVCC, WC, WWCCS.
9 January to 19 January 2006	Telephone consultation with the Aboriginal stakeholder groups to integrate comments into the proposed survey strategy including written correspondence extending comment period an additional week for survey strategy review. Incorporation of comments into draft survey strategy.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
12 January 2006	Fax to Barry McTaggart (WLALC) of another copy of the draft survey strategy for the proposed Mt Arthur Underground Project archaeological survey and a proforma to assist him with his review of this document.	WLALC.
13 January 2006	Invitation sent to all Aboriginal stakeholder groups that stated they wished to be involved in fieldwork including a job package and submission form for groups to fill in for involvement in fieldwork on a rotational basis. Invitations were faxed and posted to all Aboriginal stakeholder groups.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
13 January 2006 to 22 January 2006	Follow up telephone consultation to ensure fieldwork submissions were provided on time and all details were correctly filled out prior to evaluation of submissions.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
17 January 2006	Telephone call with Barbara Foot to discuss the location of 'The Pocket'.	WC.
17 January 2006	Fax faxed and posted to WNAC, Y and WWCCS to advise of an extension to comment period on draft survey strategy for Mt Arthur Coal fieldwork.	Robert Lester – WNAC, Des Hickey – WWCCS, Scott Franks – Y.
18 January 2006	Letter faxed to Mr Robert Lester of WNAC to clarify the location of the 'The Pocket' as being outside the Mt Arthur Underground Project Area and within the Mt Arthur Voluntary Conservation Area.	WNAC, cced to Scott Franks, Y.
23 January 2006	Phone calls to Aboriginal stakeholder groups participating in Stage 1 fieldwork to confirm their fieldwork dates and information for fieldwork.	Barbara Foot – WC; Michelle Stair – GC; Darrel Matthews – UHHC; Des Hickey – WWCCS; Graham Ward – UAC.
24 January 2006	Written acceptance of nominated representatives for fieldwork. All registered groups interested in fieldwork involvement were provided field time. Letters were faxed and posted.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, WEC and Y.
25 January 2006	Refaxed Robert Lester (WNAC) the Aboriginal Subconsultants terms of Engagement for proposed archaeological survey for Mt Arthur Coal.	WNAC.

Date	Form of Consultation	Aboriginal Stakeholder Groups contacted
25 January 2006	Faxed and posted to all Aboriginal stakeholder groups – Subconsultants Terms of Engagement for fieldwork.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, and Y.
24 January 2006 to 30 January 2006	Follow up telephone consultation with Aboriginal stakeholder groups for confirmation of field dates.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS and Y.
30 January 2006 to 10 February 2006	Fieldwork involvement with Aboriginal stakeholder groups for Stage 1. Requests were made during fieldwork to Aboriginal stakeholder representatives to provide information/knowledge on Aboriginal cultural heritage during the survey. All comments/input made by Aboriginal stakeholder groups were recorded during fieldwork.	GC, HVCC, MCC, WLALC, UAC, UHHC, UHWC, WC, WWCCS and Y.
31 January 2006	Fax sent to Rhonda Perry UHWC to confirm fieldwork days for UHWC.	UHWC.
2 February 2006	Letter posted and faxed to Mr Robert Lester, WNAC and Scott Franks of Y clarifying questions he had regarding the draft survey strategy and Aboriginal consultation for fieldwork involvement.	WNAC and Y.
10 February to May 2006	Telephone and fax communications for organisation of fieldwork commitments during Stages 1 and 2. Requests were made during fieldwork to Aboriginal stakeholder representatives to provide information/knowledge on Aboriginal cultural heritage during the survey. All comments/input made by Aboriginal stakeholder groups were recorded during fieldwork.	ANTC, GC, HVAC, HVCC, LWTC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS and Y.
27 March 2006	Letters posted and faxed to Aboriginal stakeholder groups participating in Stage 2 fieldwork to provide their fieldwork dates and information for fieldwork.	WCH, LWTC, VC, WLALC, HVAC, WNAC, MCC, WC, ANTC, HVCC.
27 March 2006	Phone calls to Aboriginal stakeholder groups participating in Stage 2 fieldwork to confirm their fieldwork dates and information for fieldwork.	Phoned and talked to Brian Horton – MCC; Margaret Matthews – ANTC; Gordon Griffiths – WCH; Christine Matthews – HVCC; Trevor Griffiths – HVAC. Robert Lester, WNAC – detailed message was left on his voicemail; Barry Anderson – LWTC was phoned at home and on mobile and detailed message was left on voicemail at home and the work number, was SMSed to his mobile phone.
16 April 2006	Chasing up Barry Anderson, LWTC to confirm his fieldwork dates for Stage 2 fieldwork.	Barry Anderson – LWTC was phoned at home and on mobile and detailed message was left on voicemail at home and the work number, was SMSed to his mobile phone.

Date	Form of Consultation	Aboriginal Stakeholder Groups contacted
16 April 2006	Phone calls to Aboriginal stakeholder groups participating in Stage 2 fieldwork to confirm their fieldwork dates and information for fieldwork.	Brian Horton – MCC; Robert Lester – WNAC; Margaret Matthews – ANTC; Barbara Foot – WC; Gordon Griffiths – WCH; Larry Van Vliet – VC; Barry McTaggart – WLALC; Christine Matthews – HVCC.
21 April 2006	Phone calls to Aboriginal stakeholder groups participating in Stage 2 fieldwork to confirm their fieldwork dates and information for fieldwork.	Larry Van Vliet – VC.
21 April 2006	Fax sent to Aboriginal stakeholder groups participating in Stage 2 fieldwork to confirm their attendance.	HVAC, WCH.
24 April 2006	Phone calls to Aboriginal stakeholder groups participating in Stage 2 fieldwork to confirm their fieldwork dates and information for fieldwork.	Robert Lester – WNAC; Brian Horton – MCC; Larry Van Vliet – VC. ANTC – left detailed message on Margaret Matthew's mobile; WC – left detailed message on Barbara Foot's email.
April to May 2006	Fieldwork involvement with all Aboriginal stakeholder groups for Stage 2.	ANTC, GC, HVAC, HVCC, MCC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH and WNAC.
30 November 2006	Letter written to all registered Aboriginal stakeholder groups that was an invitation to the presentation of the draft Aboriginal Archaeological Assessment Report at Mt Arthur Coal.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, MCC, MC WEC and Y were all invited to attend.
30 November 2006	Letter written to all registered Aboriginal stakeholder groups that was an invitation to the Elders/Senior members of the Aboriginal community to participate and provide information for the Aboriginal cultural heritage survey and assessment for the Mt Arthur Coal Underground Project organised for 11 December 2006.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, MCC, MC, WEC and Y were all invited to attend.
5 December 2006	Telephone calls to Aboriginal stakeholder groups to finalise their attendance for the proposed site inspection with senior family representatives (Elders) and the proposed presentation of the draft Aboriginal archaeological assessment on 11 and 12 December 2006 respectively.	UHWC (left a detailed message on voicemail); John Matthews – WLALC; Brian Horton – MCC; Graham Ward – UAC; Barbara Foot – WC; Larry Van Vliet – UAC; UHHC (left a detailed message on voicemails); Gordon Griffiths – WCH; Julie Griffiths – HVAC; GC (left detailed message on answering machine); HVCC (left an SMS on missed call service on mobile); MC (rang out on all numbers); Y (left detailed messages on voicemail); WNAC (left a detailed message on voicemail) and WWCCS (left a detailed message on voicemail).

Date	Form of Consultation	Aboriginal Stakeholder Groups contacted
11 December 2006	Inspection of significant archaeological sites and offset areas with senior family representatives (Elders). (All groups were invited, only one group attended the inspection). Further requests were made to Aboriginal stakeholder groups on the invitation and during the day to provide information/knowledge on Aboriginal cultural heritage values and sites within the survey area.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, MCC, MC WEC and Y were all invited to attend. WC attended the actual site inspection.
12 December 2006	Presentation of draft Aboriginal archaeological assessment report to Aboriginal stakeholder groups and site inspection of significant archaeological sites and offset areas. Further requests will be made to Aboriginal stakeholder groups to provide information/knowledge on Aboriginal cultural heritage values and sites within the survey area.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.
12 December 2006	Provision of draft Aboriginal archaeological assessment report to Aboriginal stakeholder groups for comment during presentation at Mt Arthur Coal Project Office. Site tour of significant sites and Proposed Saddlers Creek Conservation Area was undertaken on the day.	ANTC, GC, HVCC, WLALC, UAC, UHHC, UHWC, VC, WCH, WWCCS, MCC, MC and Y.
14 December 2006	Posted a copy of the draft Aboriginal archaeological assessment report to Aboriginal stakeholder groups for comment.	Des Hickey (WNAC); WC-AF, HVAC, WEC, LWTC, WC.
December 2006 to January 2007	Follow up telephone contact with Aboriginal stakeholder groups to discuss draft Aboriginal archaeological assessment report comments including a follow up fax.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.
December 2006 to April 2007	Face to face meetings (as requested), additional site inspections (as requested) and telephone and written contact to discuss draft Aboriginal archaeological assessment report and prepare comments.	WC, WHC and MCC (as requested).
16 January 2007	Follow up telephone contact with Aboriginal stakeholder groups to discuss draft Aboriginal archaeological assessment report comments.	Christine Matthews – HVCC; Julie Griffiths – HVAC; Michelle Stair – GC; Graham Ward – UAC; Melissa Newman – UHHC; Rhoda Perry – UHWC; Larry Van Vliet – VC; Barry McTaggart – WLALC; Scott Franks – Y; Brian Horton – MCC; Arthur Fletcher – WC-AF. Phoned home number for Margaret Matthews which was disconnected and rang mobile phone call which had a message stating it does not receive calls. Phoned Barry Anderson's mobile and home numbers and all numbers were disconnected. Left a detailed voice mail message for Des Hickey – WWCCS/WNAC. Hung up on by MC – left a missed call on mobile.

Date	Form of Consultation	Aboriginal Stakeholder Groups contacted
16 January 2007	Telephone call to Rhoda Perry, (WEC) who stated that WEC would not be formally providing any comment as they would represented by UHWC for their review of the draft Aboriginal archaeological assessment.	WEC
17 January 2007	Faxed reminder to all registered Aboriginal stakeholder groups that the closing date for comments on the draft Aboriginal archaeological assessment is 19 January 2007.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.
18 January 2007	Site inspection of significant sites and places with Mrs Barbara Foot and David Foot (WC) with Jillian Ford (Archaeologist, Umwelt) and Carl Bagnall (Mt Arthur Coal).	WC
22 January 2007	Email sent to Scott Franks (Y) reminding him that the closing date for his comments on the draft Aboriginal archaeological assessment was last Friday at 5pm. The email stated that we have not received a response from Yarrawalk as yet. The email requested if it was possible for Scott to provide a response today, as we understood from our conversation with him last week that we would receive a response by last Friday.	Y
23 January 2007	Follow up telephone contact with Aboriginal stakeholder groups to discuss draft Aboriginal archaeological assessment report comments.	Barry McTaggart – WLALC; Larry Van Vliet – VC; Margaret Matthews – ANTC. Barbara Foot – WC. Left a detailed message on Brian Horton's mobile voice mail – MCC. Left a detailed message on Melissa Matthew's mobile voice mail – UHHC. Phoned Barry Anderson's mobile and home numbers and all numbers were disconnected – LWTC. Phoned Scott Franks mobile and left a missed call – Y. Phoned Gordon Griffith's mobile and home numbers and all numbers were disconnected – WCH. Left a detailed message for Des Hickey on his voicemail – WNAC, WWCCS. Left a detailed message for Julie Griffiths on voicemail – HVAC. Left number on missed call service of Christine Matthew's mobile phone; home number was disconnected – HVCC. Phoned Cliff Matthew's mobile and it rang out – left a missed call – MC.

Date	Form of Consultation	Aboriginal Stakeholder Groups contacted
24 January 2007	Faxed reminder and posted reminder to Aboriginal stakeholder groups that had not provided comment that the closing date for comments was Friday, 19 January 2007 and that we had still not received their comments. The reminder states that the report will be finalised until next week Monday, 29 January 2007.	ANTC, HVAC, HVCC, LWTC, MC, MCC, UHHC, WCH, WLALC, WNAC, WWCCS and Y.
24 January 2007	Fax to Mrs Barbara Foot (WC) with a summary of her verbal comments on the draft Aboriginal archaeological assessment for her to review and a phone call.	WC
25 January 2007	Follow up telephone contact with Aboriginal stakeholder groups to discuss draft Aboriginal archaeological assessment report comments.	Barbara Foot – WC; Cheryl at WLALC; Brian Horton – MCC; Margaret Matthews –ANTC; Julie Griffiths – HVAC. Left a detailed message for Melissa Matthews on her mobile voicemail – UHHC. Phoned Barry Anderson's mobile and home numbers and all numbers were disconnected – LWTC. Phoned Des Hickey's mobile and it rang out – WWCCS and WNAC. Phoned Scott Franks' mobile and left a detailed message on his voicemail – Y. Left number on missed call service of Christine Matthew's mobile phone; home number was disconnected – HVCC. Phoned Cliff Matthew's mobile and it rang out – left a missed call – MC.
January 2007 to April 2007	Revision of the original draft proposed offset strategy and other management recommendations to meet the Aboriginal stakeholder groups comments received.	Not contacted – these groups' responses were used to revise the proposed offset strategy: GC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH, WWCCS, MCC and WEC.

Date	Form of Consultation	Aboriginal Stakeholder Groups contacted
6 February 2007	Phone calls to Aboriginal stakeholder groups that had not yet provided comment on the draft Aboriginal archaeological assessment report.	Barry McTaggart – WLALC; Brian Horton – MCC; John and Margaret Matthews – ANTC; Des Hickey – WWCCS; Mrs Cliff Matthews – MCC. Attempted to ring home and mobile numbers for Barry Anderson, LWTC – both numbers were disconnected. Left detailed message on Scott Franks' mobile voicemail – Y. Left detailed message on HVAC's voicemail. Left SMS message on missed call service for HVCC.
1 March 2007	Telephone call to Barbara Foot (WC) to discuss areas that she would like to visit within the Mt Arthur Coal Underground Project Area and organising proposed site inspection for 9 March 2007.	WC.
6 March 2007	Faxed confirmation of proposed site inspection with Barbara Foot for Friday 9 March 2007.	WC.
9 March 2007	Site Inspection of Mt Arthur Underground Project Area and 'The Pocket' with Barbara Foot and David Foot (WC).	WC.
12 March 2007	Posted Barbara Foot transcript of her verbal comments from site inspection on 9 March 2007.	WC.
May to September 2007	Finalisation of draft Aboriginal archaeological assessment report.	ANTC, GC, HVAC, HVCC, LWTC, WLALC, UAC, UHHC, UHWC, VC, WC, WC-AF, WCH, WNAC, WWCCS, MCC, MC, WEC and Y.

Specific consultation received from statutory agencies regarding the notification process:

- Letter provided to Umwelt, by Brendan Diacono (Manager Planning and Aboriginal Heritage – North East, Environment Protection and Regulation Division, DECC) concerning registration of interest for all Aboriginal Stakeholders, Mt Arthur Coal Investigations received 2 February 2006.

- Letter received by Umwelt from Chris Gidney (Manager Environmental Services, Muswellbrook Shire Council) regarding Aboriginal groups from the Muswellbrook Area dated 20 December 2005.

APPENDIX 2

Draft Survey Strategy and Comments Form Provided to Aboriginal Stakeholder Groups

Draft Survey Strategy, Mt Arthur Coal Underground Project

Introduction

This document is a draft survey strategy for the Aboriginal cultural heritage survey for the proposed Mt Arthur Coal Underground Project. As part of this draft survey strategy we have also attached figures showing the survey area, known archaeological sites and proposed survey transects (refer to **Figures 1** & **2**). Draft site recording forms and survey recording forms for use during the proposed field work are also attached for your comment.

The survey strategy proposed has been developed using site predictions based on previous archaeological research and will be undertaken in a manner to ensure the methodology and results are comparable to surveys conducted in the Mt Arthur North Mining Lease in 1999, by South East Archaeology (Peter Kuskie) and by Umwelt (Australia) Pty Ltd (Umwelt) for the South Pit Extension this year. The survey strategy is also prepared in a manner that fulfils current Department of Environment and Conservation (DEC) requirements for effective survey coverage.

This draft survey strategy is provided for your comment as part of the Aboriginal consultation process for the Mt Arthur Underground Project and in line with DEC's *Interim Guidelines for Consultation (2004)*.

Background

Previous archaeological works in the Mt Arthur Coal's Mining Leases include:

- Dyall (1980 and 1981) – early surveys in Mt Arthur Coal Lease;
- Koettig & Hughes (1985) – early surveys for Plashett Dam, Mt Arthur and Mt Arthur South;
- Davidson, James & Fife (1993) – archaeological surveys for the proposed Bayswater No.3 Colliery;
- ERM Resource Planning (1994) – Bayswater No.3 Bulk Sample Program Archaeology Survey;
- Wilson (1995) – Archaeological Survey and Salvage of Aboriginal sites in the area of McDonalds Pit Dump Site and Saddlers Pit;
- Umwelt (Australia) Pty Ltd (1997) – Bayswater Coal Mine Project – Proposed Modifications to Coal Preparation and Transport System;
- McDonald & Davidson (1998) – the Bayswater Archaeological Research Project – survey and archaeological investigations of lands south and west of Mt Arthur for the Bayswater Colliery Company Ltd;
- Kuskie (1999) South East Archaeology Pty Ltd – Mt Arthur Coal EIS, Aboriginal Archaeological Assessment; and
- Kuskie & Clarke (2004) – Salvage of Aboriginal Heritage Sites in the Mount Arthur North Coal Mine Lease Area.

The two key previous surveys that covered part of the project area are the Bayswater Archaeological Research Project and the MAN survey (Kuskie). The University of New England carried out the Bayswater Archaeological Research Project from 1993 to 1998 within the Bayswater No. 3 Mining Lease (ML). These surveys focused on exposures and on watercourses and they did not cover all landform elements. Kuskie surveyed the northeast of the project area as part of the MAN EIS in 1999. Kuskie's survey aimed at total coverage of all visible exposes in all landform elements.

The aim of the survey strategy is to systematically survey those areas to the south of Kuskie's (1999) survey area. The survey area proposed is shown on **Figures 1** and **2**. The lines on **Figure 2** are

guides only for survey coverage. These exact lines will not necessarily be walked during fieldwork. During the survey, attempts will also be made to locate previously recorded sites. All of the known sites are shown on **Figure 1**.

Proposed Survey Strategy

The survey methodology is based on the following assumptions:

- the results of this survey should be comparable to Kuskie (1999) and therefore the survey strategy should be the same;
- all major creeks and tributaries, exposures and tracks will require survey;
- an Aboriginal site is destroyed if the site card is marked 'consent to destroy issued', or if a consent to destroy has been issued in the past and is attached to the site card; and
- there will still be archaeological sites within the proposed Mt Arthur Underground Project which have not been salvaged.

Based on the assumptions provided above, the survey strategy will focus on effective coverage of the area indicated on **Figure 2**.

Kuskie's objectives (1999:65) for the earlier MAN survey are reiterated here:

- the need to sample all different environmental contexts within the study area, not simply the watercourses;
- the need to maximise productivity through focusing, where possible, on ground surfaces with higher archaeological visibility;
- the need to inspect mature trees for evidence of Aboriginal scarring, stone outcrops for evidence of extraction and sandstone bedrock for evidence of grinding grooves; and
- the need to inspect any places specifically requested by the Aboriginal community.

The resulting survey strategy involved the following components:

- division of the entire study area into particular combinations of environmental variables, that are assumed to relate to Aboriginal usage of the area;
- within each archaeological survey area, recording separately the different types of surface exposures (eg. vehicle track, erosion scour) as separate components, and identifying each component with a sequential number after the survey area number (eg. CC1/3);
- completion of a survey recording form for each archaeological survey area inspected, recording details about environmental conditions and the nature of the sample;
- completion of an Aboriginal heritage site recording form for each Aboriginal site identified. An Aboriginal artefact scatter site would be defined by the presence of one or more stone artefacts within a survey area;
- completion of a lithic recording form for the stone artefacts identified within each Aboriginal site, recording details about provenance, stone material, artefact type, size class, cortex and other relevant attributes. Where more than 100 artefacts were identified within a site locus the recording could even continue until all identified artefacts were recorded, or a summary count of artefact types by stone material could be made of any remaining artefacts within the locus. Summary counts were recorded on a separate artefact summary recording form;
- each team generally traversing their allotted survey area in a slow moving vehicle and inspecting on foot any surface exposures identified, along with samples of ground with low visibility. Only

samples of those surfaces inspected in such a manner, as to reliably enable the detection of heritage evidence were recorded, (eg typically transects on foot, although inspection from a slow-moving vehicle in areas of very low visibility could also constitute a recorded sample);

- each team completing the inspection of their allotted survey area before proceeding to the next survey area;

- where feasible, within time constraints, surveying as many surface exposures within a survey area as possible (a targeted level of surface inspection for each survey area was not designated, as the nature of surface exposures varies considerably and sufficient survey coverage of each archaeological terrain unit was expected to occur as a result of the scale of the survey); and

- defining as modified any substantial areas of disturbed ground, in which the potential for heritage evidence to exist is negligible, and not undertaking any further assessment of those areas (1999:66-67).

Defining Archaeological Terrain Units

Archaeological Terrain Units were defined by Kuskie (1999) according to:

- landform element (following the definitions of McDonald et al 1984); and

- class of slope (following McDonald et al 1984)" (1999:67).

Archaeological Terrain Units devised for the current survey are based on Kuskie (1999) and recent Umwelt projects and include:

- riparian corridor;

- spur crest;

- ridge crest;

- flat;

- bench; and

- simple slope.

Stream order has also been mapped, following Strahler's (1967) classification system, to understand permanency of water courses in order to understand patterning of Aboriginal occupation.

Three classes of slope were delineated across the MAN project area by Kuskie (1999) these will be used for the proposed Mt Arthur Underground Project survey:

- Class 1 (level/very gentle) – level to very gently inclined slopes of less than three percent;

- Class 2 (gentle) – gently inclined slopes greater than three percent and less than ten percent; and

- Class 3 (moderate/steep) – moderately inclined and steep slopes greater than ten percent (Kuskie 1999:67).

The classes of slope will be recorded in the field on the site survey recording forms attached.

Information for Survey Recording

Attached to this draft survey strategy are the site, survey and lithic (stone artefact) recording forms that are proposed for use in the field. These forms are attached for your comment. Any comments will be discussed and if appropriate integrated into the final survey strategy.

Fieldwork Involvement and Survey Coverage

It will take approximately twenty field days to complete the survey shown in **Figure 2**. It is proposed to undertake the survey with two field teams. Each group will include one archaeologist and three Aboriginal representatives.

Transects walked will target exposures and record changes in landform elements. Aboriginal resources will be recorded in each survey transect and any comments by Aboriginal representatives regarding significance and information about the landscape will be recorded. Survey transects will be walked with participants approximately five metres apart, therefore coverage in any transect walked will be approximately 20 metres in width. The total proposed survey area is approximately 3600 hectares.

Conclusion

If you have any comments on the survey areas please mark them up on the attached map and send or return fax to Mary-Jean Sutton, Umwelt (Australia) Pty Limited to fax: (02) 4950 5737 or by post. If you have any other comments on the survey strategy, please send these to Mary-Jean Sutton or phone her to discuss your ideas. We look forward to gaining your comment on the proposed survey strategy, and would appreciate your comment/input prior to **5pm, close of business Thursday 12 January, 2005**.

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: .....

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	**No:**	
☐	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☐	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☐	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

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I have the following comments/issues about cultural heritage conservation offsets:

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Signed: ..... Date: .....

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

If you have any other comments about the inception meeting, survey strategy or project, please comment below:

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If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

APPENDIX 3

Aboriginal Stakeholder Groups Written Comments on Draft Survey Strategy

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: ~~Hunter Valley Cultur~~ ~~Consultants~~ ABORIGINAL NATIVE TITLE CONSULTANTS

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☑	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☑	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

NIL WE WOULD PREFER ALL ABORIGINAL COMMUNITY GROUPS TO BE ROTATIONAL

I have the following comments/issues about cultural heritage conservation offsets:

NOT AT THIS MOMENT

Signed: J. Matthews M Matthews Date: 30.12.05

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible.

TWO WORKERS

If you have any other comments about the inception meeting, survey strategy or project, please comment below:

30.12.05

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

ATT: Mary-Jean

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: Giwiirr

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☐	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☐	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

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I have the following comments/issues about cultural heritage conservation offsets:

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Signed: ..... Date: 30-12-05

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible.

0265437884

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: Hunter Valley Aboriginal Corporation

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☐	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☑	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☐	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

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I have the following comments/issues about cultural heritage conservation offsets:

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Signed: ..... Date: 19-1-06

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

0265437884

If you have any other comments about the inception meeting, survey strategy or project, please comment below:

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: Hunter Valley Cultural Consultants

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☑	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☑	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

H.V.C.C. does agree with the methodology and would like the work to be Rotated.

I have the following comments/issues about cultural heritage conservation offsets:

Signed: C Matthews Date: 04/01/06

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible.

0265431325

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: Muswellbrook Cultrail Consultants

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☑	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☑	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

I agree with the proposed survey strategy that was bought forward at Mt Arthur Underground Project meeting.

I have the following comments/issues about cultural heritage conservation offsets:

I have no further comments at this stage.

Signed: Brian Horton Date: 28-12-05

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

3 workers

0265715777



UNGOOROO
ABORIGINAL CORPORATION

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Mobile 0418 696 821
ABN: 64 020 872 467

For the attention of:
Umwelt Australia Pty Ltd
2/20 the Boulevard
Toronto 2283 NSW
January 9, 2006

RE: Mt Arthur Coal

Dear Jan
We at Ungooroo Aboriginal Corporation have had dialogue with the representatives that attended and reviewed your report and we have no objections to the above, and concur with the findings there in the report.

Graham Ward CEO

Ward

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: Upper Hunter Heritage Consultants

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☑	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☑	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

.....

.....

.....

.....

.....

.....

I have the following comments/issues about cultural heritage conservation offsets:

.....

.....

.....

.....

.....

.....

Signed: D Matthews Date: 30.12.05.

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: upper hunter Wonnarua Council

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☐	☑	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☑	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

our Council have NO ADDitional comment's with Regards To the proposed Survey Strategy

I have the following comments/issues about cultural heritage conservation offsets:

Yes What Are the offsets and Conservation zone's !

Signed: [signature] Date: 11-1-2006

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

If you have any other comments about the inception meeting, survey strategy or project, please comment below:

Nil

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

0265425652

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: Valley Culture

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☑	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☑	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

I have read the proposed strategy and understand the way in which this project is to be carried out. If there is an aboriginal site that is found I hope it is carefully and correctly dealt with before and any card is placed on this site

I have the following comments/issues about cultural heritage conservation offsets:

Signed: [redacted] Date: 1/1/06

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

0265425652

If you have any other comments about the inception meeting, survey strategy or project, please comment below:

In regards to other groups being involved I hope we all work well together and are selected to suit the to the survey that is ahead of us.

Thanks

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

Mt Arthur Underground Project Meeting
22 December 2005

WANARUAH LOCAL ABORIGINAL
LAND COUNCIL
P.O. BOX 127,
MUSWELLBROOK, NSW 2333

Group Name: .....

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	I Agree with the proposed survey strategy for the Mt Arthur Underground Project.
☐	☐	I would prefer that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☐	I would prefer Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

Wanaruah Local Aboriginal Land Council
being the only constitutes body representing
the Aboriginal community would like
to be represented on this survey
We do agree with the survey strategy.

I have the following comments/issues about cultural heritage conservation offsets:

Signed: ..... Date: 12/1/06

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

If you have any other comments about the inception meeting, survey strategy or project, please comment below:

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: WATTAIKA WCCS.

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☐	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☑	☐	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

I AGREE IN PRINCIPAL. HOWEVER AS MANAGER OF WATTAIKA I NEED MORE TIME TO ACCESS PREVIOUS ARCHAEOLOGICAL RESEARCH REPORTS. CONCERNING THIS PROJECT.

I have the following comments/issues about cultural heritage conservation offsets:

Signed: Des Hickey Date: 12-1-06.

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: WONNARUA CULTURE HERITAGE

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes:	No:	
☑	☐	**I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.
☑	☐	**I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.
☐	☑	**I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

Wonnarua Culture Heritage attended the meeting and agree with the future works involved in the survey strategy and would like all the Groups involved in the work.

I have the following comments/issues about cultural heritage conservation offsets:

Wonnarua Culture Heritage agree with the heritage Conservations and look forward to working with you umwelt on this project.

Signed: L Griffiths Date: 3-1-06

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

B

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: Wanaruah Nation & Yarraralk as Coalition.

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes: No: under duress.

☑ ☐ **I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.

☐ ☑ **I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.

☑ ☐ **I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

See our letter of the 12 & 19 January 06

I have the following comments/issues about cultural heritage conservation offsets:

Comments are requested until surveys works are completed.

Signed: * Date: 19/1/06

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

B

Mt Arthur Underground Project Meeting
22 December 2005

Group Name: Wanaruah Nation / Yarraman as Coalition.

I have been involved and consulted in the proposed survey strategy and inception meeting for the Mt Arthur Underground Project by Umwelt (Australia) Pty Ltd.

Please tick the appropriate boxes:

Yes: No: under duress.

☑ ☐ **I Agree** with the proposed survey strategy for the Mt Arthur Underground Project.

☐ ☑ **I would prefer** that Aboriginal involvement in fieldwork to be rotational and involve all Aboriginal community groups.

☑ ☐ **I would prefer** Aboriginal community group involvement to be tendered out for the Mt Arthur Underground Project.

I have the following comments/issues about the proposed survey strategy:

See our letter of the 12 & 19 January 06

I have the following comments/issues about cultural heritage conservation offsets:

Comments are requested until Survey work is completed.

Signed: * Date: 19/1/06

If additional time is required for sign off and comments, please fax back this form to Mary-Jean Sutton at Umwelt (Australia) Pty Ltd, Fax: (02) 4950 5737 as soon as possible

Coalition of Wonnarua Traditional Custodian Descendants

Scott Franks Managing Director
Yarrawalk Enterprises Pty Ltd
PO Box 906 MUSWELLBROOK
NSW AUSTRALIA 2333
Ph: 02 65410445 \ 0422175839
Fax: 02 65410445
E-mail: yarrawalk@bigpond.com

Robert Lester Chairman
Wonnarua Nation Aboriginal Corporation
PO Box 3066, SINGLETON
NSW AUSTRALIA 2330
Ph: 02 6572 1077 \ 0417212896
Fax: 02 6571 4364
E-mail: wnac@bigpond.com

13 January 2006

To
Unwelt
Environmental Consultants
PO Box 838
Toronto, NSW 2330

Attention: Emma Stpierere, Mary Jean Sutton.
Fax No: 0249 505737

Subject: Response to Mt Arthur Coal Underground Proposal.

Dear Ms. Sutton,
At this point in time, we oppose the suggested survey strategy/methodology proposed. We believe the proposal in its current form fails to provide the descendants of the Traditional Owners with adequate information (or time) to supply an informed opinion on the cultural heritage of the proposed area.

We have sought additional information from Mt Arthur Coal P/L in the form of previous archaeological research reports, in particular the investigation undertaken by Dr. Iain Davison. Mr. Carl Bagnall assisted by providing information by CD it was unfortunate that the CD provided was corrupted and would not allow volumes 1, 2 & 2/2 to be opened. Mr. Bagnall provided a hard copy of those volumes at 7pm on 11 Jan 06. However, at our first meeting to discuss the current proposal for underground mining on the 22 December 2005, the Aboriginal community members in attendance and descendants of the Traditional Wonnarua Owners were requested to provide a response to Mt Arthur's presentation by 12 January 2006. Therefore, we have been provided with under twenty four hours, an indequate amount of time, to provide an informed interpretation of previous investigations at Mt Arthur and how they may relate to this proposal.

The area proposed for underground mining being to the South, South West of Mt Arthur, in our opinion requires careful consideration by the Aboriginal community, but more importantly by the descendants of the Traditional Owners. The area is of special significance to the descendants of the Tradition Owners as it is in close proximity to the area known as The Pocket, where it is reported that a large number of Wonnarua people were massacred by Mounted Police. (Ethographic Investigation for proposed Bayswater No 3 Colliery, Iain Davidson & Christine Lovell-Jones report June 1993)

It is of great concern to us that Mt Arthur Coal P/L (or indeed it's archaeological representative - Umwelt) appears to place such little value on Aboriginal history/values within it's area of operations. We state this for the simple reason that the timeframe set for a response to the proposal given the known oral history of the area is totally unacceptable. We feel the inception meeting being held on the 22 Dec 05, one day before the Christmas break, combined with the responses required in early January 2006 is a deliberate attempt at minimising the Aboriginal communities input into this project. While on paper this approach has given us 21 days to respond as you are required to do in DEC's *Interim Community Consultation Requirements for Applicants* (2005), in reality this omits 7 days of public holidays and weekends within the same period. Hence, in reality we have received under two weeks to provide you with comments. Subsequently should our request for an extension into this investigation of The Pocket massacre not be upheld by Mt Arthur P/L, we will be seeking a resolution with DEC on your fufilment of the consultation requirements.

Coalition of Wonnarua Traditional Custodian Descendants

Scott Franks Managing Director
Yarrawalk Enterprises Pty Ltd
PO Box 906 MUSWELLBROOK
NSW AUSTRALIA 2333
Ph: 02 65410445 \ 0422175839
Fax: 02 65410445
E-mail: yarrawalk@bigpond.com

Robert Lester Chairman
Wonnarua Nation Aboriginal Corporation
PO Box 3066, SINGLETON
NSW AUSTRALIA 2330
Ph: 02 6572 1077 \ 0417212896
Fax: 02 6571 4364
E-mail: wnac@bigpond.com

As stated above, we require additional time to investigate the proposal, previous research within the Mt Arthur mining area, The Pocket Massacre and their relationships to the current proposal. Therefore, we are seeking an extension until 31 January 06 to provide a detailed response to the proposal. This time line will also give us the opportunity to further evaluate and re-consider the Mt Arthur South Pit Extention proposal which currently we have not supported.

We are of the strong perception that Mt Arthur and the surrounding area, was and still is very significant to Wonnarua people. We believe for Mt Arthur Coal P/L to continue with investigations based on an isolated area or piecemeal approach rather than a holistic concept poorly reflects it's management systems in relation to cultural heritage and subsequent management decisions should seek to rectify this. Should this piecemeal approach continue, the Wonnarua Traditional Owners will, in addition to publically criticising the approach, seek to stop it through discussions with DEC and the LEC if required.

Yours sincerely

Robert J. Lester
Chairperson WNAC.

Scott Franks
Director, Yarrawalk.

Coalition of Wonnarua Traditional Custodian Descendants



Scott Franks Managing Director
Yarrawalk Enterprises Pty Ltd
PO Box 906 MUSWELLBROOK
NSW AUSTRALIA 2333
Ph: 02 65410445 \ 0422175839
Fax: 02 65410445
E-mail: yarrawalk@bigpond.com



Robert Lester Chairman
Wonnarua Nation Aboriginal Corporation
PO Box 3066, SINGLETON
NSW AUSTRALIA 2330
Ph: 02 6572 1077 \ 0417212896
Fax: 02 6571 4364
E-mail: wnac@bigpond.com

16 January 2006

To
Unwelt
Environmental Consultants
PO Box 838
Toronto, NSW 2330

Attention: Emma Stpierere, Mary Jean Sutton.
Fax No: 0249 505737

Subject: Response to Mt Arthur Coal Underground Proposal.

Dear Ms. Sutton,
At this point in time, we oppose the suggested survey strategy/methodology proposed. We believe the proposal in its current form fails to provide the descendants of the Traditional Owners with adequate information (or time) to supply an informed opinion on the cultural heritage of the proposed area.

We have sought additional information from Mt Arthur Coal P/L in the form of previous archaeological research reports, in particular the investigation undertaken by Dr. Iain Davison. Mr. Carl Bagnall assisted by providing information by CD it was unfortunate that the CD provided was corrupted and would not allow volumes 1, 2 & 2/2 to be opened. Mr. Bagnall provided a hard copy of those volumes at 7pm on 11 Jan 06. However, at our first meeting to discuss the current proposal for underground mining on the 22 December 2005, the Aboriginal community members in attendance and descendants of the Traditional Wonnarua Owners were requested to provide a response to Mt Arthur's presentation by 12 January 2006. Therefore, we have been provided with under twenty four hours, an indequate amount of time, to provide an informed interpretation of previous investigations at Mt Arthur and how they may relate to this proposal.

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Coalition of Wonnarua Traditional Custodian Descendants

Scott Franks Managing Director
Yarrawalk Enterprises Pty Ltd
PO Box 906 MUSWELLBROOK
NSW AUSTRALIA 2333
Ph: 02 65410445 \ 0422175839
Fax: 02 65410445
E-mail: yarrawalk@bigpond.com

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PO Box 3066, SINGLETON
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Ph: 02 6572 1077 \ 0417212896
Fax: 02 6571 4364
E-mail: wnac@bigpond.com

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Yours sincerely

Robert J. Lester
Chairperson WNAC.

Scott Franks
Director, Yarrawalk.

A

Coalition of Wonnarua Traditional Custodian Descendants

Scott Franks Managing Director
Yarrawalk Enterprises Pty Ltd
PO Box 936 MUSWELLBROOK
NSW AUSTRALIA 2333
Ph: 02 65410445 \ 0422175839
Fax: 02 65410445
E-mail: [redacted]

Robert Lester Chairman
Wonnarua Nation Aboriginal Corporation
PO Box 3088, SINGLETON
NSW AUSTRALIA 2330
Ph: 02 6572 1077 \ 0417212896
Fax: 02 6571 4304
E-mail: [redacted]

19 January 2006

To
Umwelt
Environmental Consultants
PO Box 838
Toronto, NSW 2330

Attention: Mary Jean Sutton.
Fax No: 0249 565737

Subject: **Response to Mt Arthur Coal P/L underground Proposal at Mt Arthur.**

Dear Ms. Sutton,
Further to our letter of the 12 January 06, we believe we have still not had adequate time to provide an informed response to the proposed methodology for surveying the Mt Arthur underground mining proposal. However, we will participate in the survey and will require one representative from our coalition present during all days for the duration of the survey works, if Mt Arthur Coal P/L is of the view/opinion that all groups must participate in paid field works for a limited time per group then so be it. Our representative will attend the survey without payment for the balance of the survey works.

We are of the firm view/opinion that the area is of such significants to Wonnarua descendants that it demands continuity/consistency be applied across the areas surveyed. We strongly disagree that a survey is conducted with different groups forming opinions and/or making recommendations regarding any given area, within the survey area, where other participating groups did not survey that particular area. We also disagree that vehicles should be used to conduct a survey in any part of the survey area, all areas should be surveyed on foot.

We also request that the following archaeological investigation reports listed in the powerpoint presentation to the community on the 21 December 2005, be made available to us as soon as possible, in order to provide an informed response to Mt Arthur Coal P/L of our observations when the draft report is provided on completion for community comment of the survey works, we make this request bearing in mind that there is only a 10 day period allocated for community participants to respond to that draft report. We are aware that some of these reports are not within the current area for the proposal for an underground mining operation. However, we believe they may well be relevant to Aboriginal interests when taking a holistic approach over the whole areas immediately surrounding Mt Arthur itself.

The Reports are;
Dyall (1980) & (1981), Koettig & Hughes (1985), ERM Resource Planning (1994), Wilson (1995), Umwelt (1997), Kuskie (1999)

We also supply as a result of the agreed extension of time to the 19 January 2006, our response to the questionaire provide to the community on the 22 December 2005, regarding the survey strategy and conservation offsets.

We also provide copies of our costings for paid participation in field survey works, as one of the groups if Mt Arthur Coal P/L intends to engage all groups for field survey works. We also provide a separate tender for paid Aboriginal field survey works, to undertake all those required works for the duration of the survey.

If you require any further information from Mr Franks or myself we can be contacted on the respective No's above however, Robert Lester can only be contacted on (0407 489 296) for the next two days, after this period on the office number above.

Yours sincerely

Robert J. Lester
Chairperson WNAC.

Scott Franks
Director, Yarrawalk.

Thomas Franks
on behalf Yarrawalk
Manager

APPENDIX 4

Follow-up Correspondence Regarding the Reported Massacre Site, 'The Pocket'

Umwelt (Australia) Pty Limited
2/20 The Boulevarde
PO Box 838
Toronto NSW 2283

Umwelt
Environmental Consultants

Ph. 02 4950 5322
Fax. 02 4950 5737

ABN 18 059 519 041

18 January 2006

Mr Robert Lester
Wonnarua Nation Aboriginal Corporation
44 George Street
SINGLETON NSW 2330

FAXED

Fax No. 6571 4364 (1 page)

Dear Robert

Re: The Pocket at Mt Arthur

Further to your letter dated 13 January 2006, The Pocket at Mt Arthur, the location of a reported Aboriginal massacre is within the proposed Mt Arthur voluntary conservation area and is currently managed for conservation by Mt Arthur Coal. As discussed previously on 22 December 2005, The Pocket is outside the impact areas for the proposed South Pit Extension and the Mt Arthur Coal Underground Project.

If you have any further questions please contact me on 4950 5322. We look forward to receiving your comments on the draft survey strategy for the Mt Arthur Coal Underground Project by **5 pm** on **Thursday, 19 January 2006**.

Yours faithfully

per

Mary-Jean Sutton
Senior Archaeologist

cc Scott Franks
Yarrawalk
Fax No. 6541 0445

FAXED

Umwelt (Australia) Pty Limited
2/20 The Boulevarde
PO Box 838
Toronto NSW 2283

Umwelt
Environmental Consultants

Ph. 02 4950 5322
Fax. 02 4950 5737

ABN 18 059 519 041

2 February 2006

Mr Robert Lester
Wonnarua Nation Aboriginal Corporation
44 George Street
SINGLETON NSW 2330

FAXED

Dear Robert

Re: Mt Arthur Coal Underground Project, Response to Correspondence dated 19 January 2006

Thank you for your correspondence dated 19 January 2006 in relation to the above project and your comments regarding the proposed survey strategy. In relation to this correspondence, Wonnarua Nation Aboriginal Corporation (WNAC) and Yarrawalk were provided an additional week to comment on the draft survey strategy beyond the 21 day period prescribed by the Department of Environment and Conservation (DEC). We appreciate that this is a busy time of year, however, we consider that adequate time was provided to all groups to provide a response to the draft survey strategy. We encourage WNAC and Yarrawalk to provide further comments during the ongoing consultation process for the duration of this project and appreciate your input.

In relation to your comments about involving all registered interest groups on this project, in accordance with DECs guidelines for Aboriginal consultation, Umwelt and Mt Arthur Coal are consulting with all seventeen registered Aboriginal community interest groups in the Upper Hunter area. The results of the consultation with the registered interest groups regarding fieldwork participation, is a majority preference for rotational involvement of all Aboriginal community groups with a job package. Therefore, we appreciated your time in preparing a tender submission to undertake all fieldwork associated with the project, however a job package approach will be used for this project.

In accordance with the job package approach adopted for this project, Yarrawalk and WNAC have been allotted three survey days with three representatives (Robert Lester, Mark Hickey and Luke Hickey for WNAC for three days in the second block of fieldwork in March 2006; Thomas Franks, Danny Franks and James Hayes for Yarrawalk in the first block of fieldwork for 8, 9 and 10 February 2006). Due to OH&S considerations and induction requirements, only these representatives will be able to attend the scheduled fieldwork days.

In your letter you also offered to provide representatives to participate in all fieldwork without payment for the balance of the survey work. Unfortunately, due to OH&S and operational considerations, and as outlined at the survey strategy meeting held on 22 December 2005, the maximum number of Aboriginal community representatives that can be safely included in the field team on any day is six. We will therefore be unable to take any additional representatives on field days. As discussed at our meeting of 22 December 2005, you will be provided with the opportunity to visit sites of interest at a meeting to be held following the completion of fieldwork to discuss the survey results.

In relation to your request for archaeological investigation reports listed in the PowerPoint presentation given to Aboriginal community representatives on 22 December 2005, the key components of these reports have been summarised in the South Pit Extension archaeological assessment which was forwarded to both WNAC and Yarrawalk in 2005. Due to copyright constraints, we cannot provide you with copies of these reports (excluding Umwelt reports that are on the public record), however, you are welcome to visit our office and review these reports if you wish. Alternatively, you could contact DEC's Aboriginal Heritage Information Management Systems library where copies of these reports should be available.

Regarding the agreement for the Mt Arthur conservation area, as discussed at our meeting on 22 December 2005, a formal agreement for this area is yet to be completed, however, Mt Arthur Coal are committed to achieving this outcome during 2006. Mt Arthur Coal will consult with both WNAC and Yarrawalk as registered interest groups in the Upper Hunter Valley regarding the formal agreement for this area during the preparation of the agreement.

If you have any further questions please contact Mary-Jean Sutton or myself 4950 5322.

Yours sincerely



John Merrell
Associate

Umwelt (Australia) Pty Limited
2/20 The Boulevarde
PO Box 838
Toronto NSW 2283

Umwelt
Environmental Consultants

Ph. 02 4950 5322
Fax. 02 4950 5737

ABN 18 059 519 041

2 February 2006

Mr Scott Franks
Yarrawalk
PO Box 906
MUSWELLBROOK NSW 2333

FAXED

Dear Scott

Re: Mt Arthur Coal Underground Project, Response to Correspondence dated 19 January 2006

Thank you for your correspondence dated 19 January 2006 in relation to the above project and your comments regarding the proposed survey strategy. In relation to this correspondence, Wonnarua Nation Aboriginal Corporation (WNAC) and Yarrawalk were provided an additional week to comment on the draft survey strategy beyond the 21 day period prescribed by the Department of Environment and Conservation (DEC). We appreciate that this is a busy time of year, however, we consider that adequate time was provided to all groups to provide a response to the draft survey strategy. We encourage WNAC and Yarrawalk to provide further comments during the ongoing consultation process for the duration of this project and appreciate your input.

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In relation to your request for archaeological investigation reports listed in the PowerPoint presentation given to Aboriginal community representatives on 22 December 2005, the key components of these reports have been summarised in the South Pit Extension archaeological assessment which was forwarded to both WNAC and Yarrawalk in 2005. Due to copyright constraints, we cannot provide you with copies of these reports (excluding Umwelt reports that are on the public record), however, you are welcome to visit our office and review these reports if you wish. Alternatively, you could contact DEC's Aboriginal Heritage Information Management Systems library where copies of these reports should be available.

Regarding the agreement for the Mt Arthur conservation area, as discussed at our meeting on 22 December 2005, a formal agreement for this area is yet to be completed, however, Mt Arthur Coal are committed to achieving this outcome during 2006. Mt Arthur Coal will consult with both WNAC and Yarrawalk as registered interest groups in the Upper Hunter Valley regarding the formal agreement for this area during the preparation of the agreement.

If you have any further questions please contact Mary-Jean Sutton or myself 4950 5322.

Yours sincerely



John Merrell
Associate

APPENDIX 5

Aboriginal Stakeholder Groups Comments on the Draft Aboriginal Archaeological Assessment Report

UPPER HUNTER HERITAGE CONSULTANTS

140 SYDNEY STREET
MUSWELLBROOK
NSW 2333
AUSTRALIA
0427911908

Attention: Mary-Jean
Umwelt Australia
Fax: 49505737

Regarding: Mt Arthur coal underground Project Draft Report

Mary-Jean,

I have read your draft report on the above mentioned project and can't think of anything else that needs to be added so therefore we agree with the report that you have so kindly prepared for us.

Kind Regards
Melissa Matthews
U.H.H.C.

Umwelt (Australia) Pty Limited
2/20 The Boulevarde
PO Box 838
Toronto NSW 2283

Umwelt
Environmental Consultants

Ph. 02 4950 5322
Fax. 02 4950 5737
ABN 18 059 519 041

FACSIMILE TRANSMISSION

DATE: 29 January 2007 **NO OF PAGES** (including cover sheet): 2 **TIME:** 11:30

ATTENTION: Brian Horton **COMPANY:** Muswellbrook Cultural Consultants **FAX NO:** (02) 6542 5377 (02) 6541 0088

Dear Brian

Re: Comments for Mt Arthur Coal Underground Project Draft Aboriginal Archaeological Assessment report

As discussed during our phone call last Thursday, I have written up your comments on the draft Aboriginal archaeological assessment report for the Mt Arthur Coal Underground Project. A summary of these comments are attached. Can you please review this document to make sure it is accurate. If you have any edits please mark them up or cross out any sections of text you feel are not your own.

Can you please sign these comments once you have reviewed them and fax them back to our office on (02) 4950 5737 or post them to us directly. Please feel free to add any additional comments you would like to make to this document.

Your signed final comments will be integrated into the final Aboriginal Archaeological Assessment for the Mt Arthur Coal Underground Project and attached in full as an Appendix. The final report will be submitted to the Department of Environment and Conservation (DEC), all Aboriginal stakeholders registered for the project and provided to Mt Arthur Coal (MAC).

Please feel free to discuss this fax with me at any time on (02) 4950 5322.

Kind regards

Mary-Jean Sutton
Senior Archaeologist

This facsimile is confidential and is for the use of the intended recipient only.
If you have received this facsimile in error, please notify us immediately and destroy all copies.

Summary of Comments made by Brian Horton (Muswellbrook Cultural Consultants) to Mary-Jean Sutton (Senior Archaeologist, Umwelt) during a telephone conversation on 25 January 2007 regarding the draft Aboriginal Archaeological Assessment, Mt Arthur Coal Underground Project.

Brian Horton's comments are as follows:

"I don't agree with the proposed Mt Arthur Coal Underground Mine as it has promised only a small area for a proposed conservation area at Saddlers Creek. This proposed conservation area at Saddlers Creek does not compensate for the loss of the previously proposed Quarry Creek Conservation Area. It is not enough of an offset to the community and it is also part of an earlier promised Conservation Area for Saddlers Creek that was never finalised despite promises to do so to our community".

We need better offsets for our community that areas that are promised for conservation and then taken away from us".

'Jobs are better than conservation areas that are promised and taken away".

"I do not agree with the proposed offset package or for the proposed underground mine to go ahead with the current strategy outlined in the draft report".

Signed and Reviewed by Brian Horton **Muswellbrook Cultural Consultants** 29-1-07 **(Date).** **(Brian Horton,**

This facsimile is confidential and is for the use of the intended recipient only.
If you have received this facsimile in error, please notify us immediately and destroy all copies.

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08/02/2007 11:12 02654313 25 UPPER HUNTER LIBRARY PAGE 04

LOCAL ABORIGINAL LAND COUNCIL
WANARUAH

P.O. BOX 127
19 MAITLAND STREET,
MUSWELLBROOK 2333
ABN 33 251 730 169

PH: (02) 6543 1288
(02) 6543 1962
FAX: (02) 6542 5377
EMAIL: wanarua@bigpond.net.au

Umwelt Environmental Consultatns
Box 838
Toronto 2283

22nd February 2007

Subject:Mount Arthur Coal underground Project.

Dear Mary-Jean,

Thank you for your report pertaining to the subject matter.

The items located in the area discussed in section 7 and summarized in table 7.3 are considered significant and require collecting or protecting.If this is not feasible an appropriate cash offset should be put to the Aboriginal community for consideration.

The Aboriginal sensitivity of the terrain units is of great concern as is any are where items of significance exist and may require further investigation including grader scrates as it is land that has been disturbed in the past.

The proposed management strategy as provided in section 9 of the report are considered reasonable at this time ,however further investigations may be require at a later date.

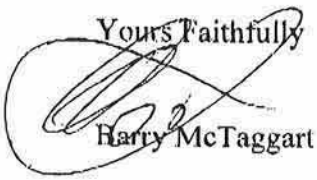
Whilst the proposed offsets are considered a reasonable approach the location of the sites are not in keeping with the types of facilities that would enhance the betterment of Aboriginal people and would be difficult to access due to its close proximity to the mine,I would suggest a cash offset that would be given to the community through the land council would be more appropriate..

Salvaged artifacts should be placed in the hands of Wanaruah Local Aboriginal Land Council for safe keeping.



Further consultation should take place prior to finalizing this matter

Yours Faithfully



Harry McTaggart

Summary of Comments made by Barbara Foot (Wanaruah Custodians) to Mary-Jean Sutton (Senior Archaeologist, Umwelt) during a telephone conversation on 24 January 2007 and during a site inspection on 9 March 2007 regarding the draft Aboriginal Archaeological Assessment, Mt Arthur Coal Underground Project.

Barbara Foot made the following comments in relation to a tree which has a scar and a line of siltstone rocks.

Barbara stated that the *"tree which has a scar and a line of siltstone rocks pointing away from the tree was important"* and that it was pointing to a *"women's site"*.

Barbara believes that *"where the scar was and line of stones is something very important. The big rocks that were there, is a line of stones and the tree has a women's face…up on the hill as you were facing the tree it had a face and it was important"*. Barbara felt that this was a women's site and an important cultural site.

On 9 March 2007 Barbara revisited the line of stones and found that they were pointing to a hill with another line of stones. Barbara stated that the hill, the line of stones and the tree *"are an important women's site"*. Photographs of the tree and their MGA grid co-ordinates are attached to this document.

Barbara Foot stated that the scarred tree, site QC02 *"was an important Aboriginal cultural site"*.

Barbara Foot made the following comments in relation to proposed impacts to Quarry Creek and the previously proposed Quarry Creek Conservation Area: *"It's a terrible thing cutting off the creeks and the current water situation is very bad and has destroyed lots of the waterways"*. Barbara stated that "*any destruction of Quarry Creek particularly the previously proposed Quarry Creek Conservation Area*" due to the predicted subsidence remediation was "*bad*" for Aboriginal cultural heritage.

Barbara stated that the previously proposed Quarry Creek Conservation Area was *"a big camp site"*, a large and important Aboriginal cultural heritage site of high significance.

Barbara stated she was *"not sure if Saddlers Creek is enough of a trade off for Quarry Creek Conservation Area"* being proposed for underground mining due to the cultural significance of Quarry Creek.

Barbara visited the Proposed Saddlers Creek Conservation Area and stated that it was an *"impressive area"* that had *"good teaching potential for kids"*. Barbara stated that retaining *"trees is very important in any Voluntary Conservation Area"*.

Barbara examined some of the artefacts within the Proposed Saddlers Creek Conservation Area and stated that the grindstones were important as *"they were once used to grind up the medicine…Grindstones were generally square"*.

Barbara stated that she would like to see *"more or all of site SC01 protected"* within the Proposed Saddlers Creek Conservation Area.

Barbara stated that *"Land is important as a Conservation Area as long as it is kept as that and artefacts can be stored there"*. *"Land is good as a Conservation Area as long as it is always kept aside and has access for Aboriginal people" and is not mined in the future and is kept in perpetuity for the Aboriginal community with unlimited access"*.

Barbara stated that the *"Keeping Place training is a good idea, so is a sites school and it is important for the younger kids to show and teach them on site"*.

Barbara stated that the *"Picnic place on Quarry Creek is a good idea and its important to show people the site and may be alright"*.

Barbara Foot and David Foot with Carl Bagnall (Environment and External Affairs Manager, Mt Arthur Coal) and Mary-Jean Sutton visited the area surrounding the historically documented massacre site, "The Pocket" on 9 March 2007. The Pocket is within the proposed Mt Arthur Voluntary Conservation Area. Barbara waited on the slopes near "The Pocket". Mary-Jean Sutton, Carl Bagnall and David Foot walked into "the Pocket" and identified a mudstone primary flake, a large shaft (which has been recorded in the past as a well) and a rainwater tank. Photographs of "The Pocket" and the mudstone flake, shaft and tank are attached to this document.

Barbara stated that "The Pocket" should be registered as a *"massacre site and an important Aboriginal cultural site if it is not already listed"* on the DEC Aboriginal sites register (AHIMS). Barbara felt that "The Pocket" *"was a very sad place", "a very important place"* and *"must be protected"*. Barbara stated that many rocks on the slopes of the area near "The Pocket" *"were used to sharpen axes"*.

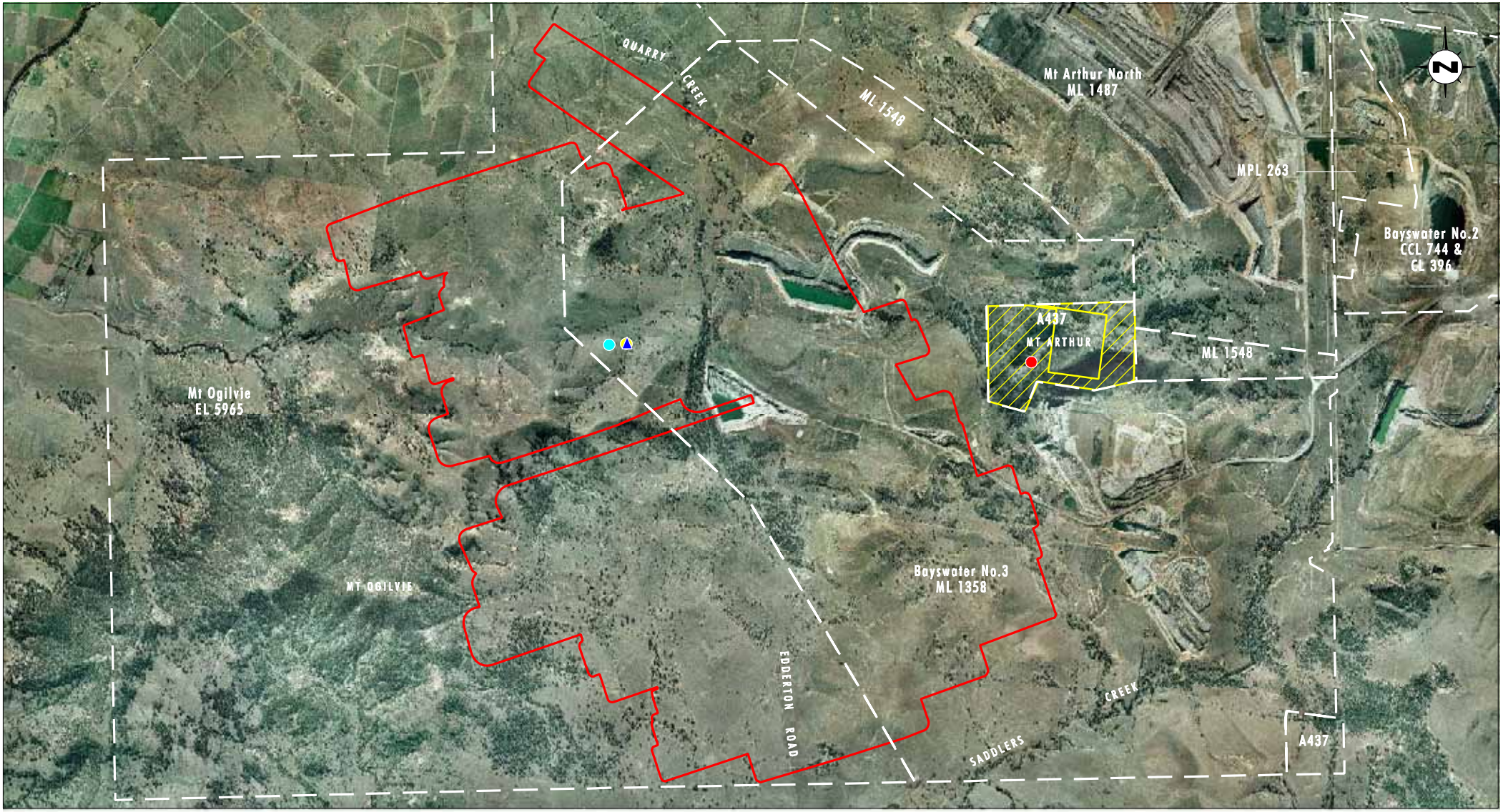
A wedge tail eagle flew above Barbara Foot while she visited the area near "The Pocket". Barbara stated that the *"wedge tail eagle is my totem"*.

Barbara Foot made the following comments in relation to the proposed Research Design and management of sites that may be impacted by the proposed Underground Project:

"Sites should be collected if impacted and it is important to have a management committee and archaeologists part of that committee with the Aboriginal community to conserve any sites in situ..."

Barbara stated it was "*important to have Aboriginal community members on a management committee who have appropriate knowledge and are recognised by the community*" as having this knowledge and who are interested in "*protecting culture for future generations*".

Signed and Reviewed by Barbara Foot B. A. Foot. **(Barbara Foot, Wanaruah Custodians) on** 21-3-07 **(Date).** Wanaruah Elder.



Base Source: Mt Arthur Coal

Legend

- Mining and Exploration Lease Boundary
- Subsidence Affectation Area
- Proposed Mt Arthur Conservation Area
- Grey Box Tree identified by Barbara Foot as an Aboriginal scarred tree
- The siltstone rocks identified by Barbara Foot as "pointing stones"
- A hill identified as an Aboriginal women's site by Barbara Foot
- Shaft/well within "The Pocket" historically documented Aboriginal massacre site and location of isolated mudstone primary flake

FIGURE 1

Location of sites of Aboriginal cultural importance identified by Barbara Foot (Wanaruah Custodians)

File Name (A4): V1/2051_280.dgn



PLATE 1

Facing Northeast, Grey Box tree that Barbara Foot believes is an Aboriginal scarred tree, (MGA 293734, 6417309)



PLATE 2

Facing Northwest, siltstone rocks outcropping on nearby slope. Barbara Foot identified these siltstone rocks as "pointing stones" (MGA 293724, 6417319). The hill in the foreground is an area which Barbara Foot identified as an important women's site (MGA 293552, 6417304)



PLATE 3

Facing Northwest, overview of landscape looking down from the top of the hill identified as an important women's site to the Grey Box tree which Barbara Foot identified as an Aboriginal scarred tree (MGA 293617, 6417340)



PLATE 4

Facing North, Looking up and into "The Pocket", a historically documented Aboriginal massacre site



PLATE 5
Carl Bagnall (Environmental & External Affairs Manager, Mt Arthur Coal) and David Foot (Wanaruah Custodians) looking into the shaft/well at "The Pocket" (MGA 297850, 6417127)



PLATE 6
Close up of the shaft/well at "The Pocket" (MGA 297850, 6417127)



PLATE 7
Close up of patinated, primary mudstone flake identified in "The Pocket" (MGA 2978850, 6417127)



PLATE 8
Facing Northeast, an overview of the landscape surrounding Mt Arthur looking from the Mt Arthur Coal Underground Project Area. The location of "The Pocket" is shown

WONNARUA CULTURE HERITAGE
ABN: ~~[illegible]~~ 50574123352
19 O'Donnell Crescent
METFORD NSW 2323
Fax & Phone: 02 4934 6437
Mob: ~~0432 020702~~ 0401028807

Mary-Jean Sutton
Senior Archaeologist
Umwelt
PO Box 838
TORONTO NSW

25 January 2007

Dear Mary-Jean,

These are my comments on behalf of Wonnarua Culture Heritage regarding the draft Aboriginal Archaeological Assessment prepared for the Mt Arthur Coal Underground Project:

- Quarry Creek, the previously proposed conservation area should be a conservation area as previously agreed to at a meeting with the Aboriginal community as part of the earlier Bayswater Consent.

- A cultural centre should be established on Saddlers Creek within the proposed Conservation Area. It should also be an employment opportunity for Indigenous persons with at least two permanent full time cultural heritage positions made available. It is **imperative we have a cultural centre (which includes a keeping place)** within the Conservation Area which would employ Aboriginal people full time for cultural heritage. **Artefacts are currently being taken out of country and away from our community, a keeping place keeps the artefacts within our Wonnarua community and is important for our children and future generations.**

- Employment of Aboriginal people within the proposed mine is important and should be full time and additional to any cultural heritage positions. Full time employment is more important than the proposed training discussed in the report which is for a few days for positions in cultural heritage that do not currently exist in our community. The mines take and take from our community and are raping our land, full time employment is one way the mines can give us something back. We understand from Umwelt that Mt Arthur Coal provide training for assistance with employment in the mines, however this training is for jobs we don't know about and these training opportunities are not advertised in our community.

- The proposed Saddlers Creek Conservation Area should be increased further north to include all of site SC01 as it is unacceptable in its current form because it does not conserve all of site SC01. It must be kept for future generations and this must be finalised as a Conservation Area for Aboriginal heritage with full access by our community within 12 months of the finalisation of the draft report and its submission to the Department of Environment and Conservation.

- I agree with the proposed salvage for the conveyor crossing. I do not agree with cutting up the conservation area for the access area further south, if another mine needs access up through the conservation area then the Aboriginal community needs to be financially compensated and all Aboriginal groups needs to agree with this proposed access route.

- It is important that all areas that will need to have subsidence remediation works need to be salvaged in consultation with the Aboriginal community. All salvaged artefacts should be stored with the Wanaruah Local Aboriginal Land Council, if a keeping place is not established on Saddlers Creek.

- Fieldwork rates for proposed salvages should be higher than the $500 day job package and should be directly negotiated between Mt Arthur Coal and the Aboriginal stakeholder groups.

- There should be at least five Aboriginal stakeholders on the Management Committee in order to have a fair representation of the Management Committee. The Management Committee should represent all of the families within the Aboriginal community. It should be selected by nominees voted on by Aboriginal groups within the Wonnarua community. These positions must be paid positions and negotiated directly with the Aboriginal groups selected for the Committee and Mt Arthur Coal. The Management Committee should meet quarterly every year.

- All sites are important to Aboriginal people, significance cannot be rated into high, low etc, all sites are significant in culture and heritage.

- The scarred tree, QC02 should be protected as within the predicted subsidence remediation area, it should be fenced off and a plaque should be made that says what the tree is and how important it is to Aboriginal people. The plaque should be made in consultation with the Aboriginal stakeholder groups within the Wonnarua.

Yours faithfully

G Griffiths

Gordon Griffiths
Public Officer

Valley Culture.

Proforma for Aboriginal Stakeholder Group Comments – Mt Arthur Coal Underground Project Aboriginal Cultural Heritage Assessment

Apart from the sites located during the survey, are you aware of any cultural significance/values for the Mt Arthur Coal Underground Project Area/Mt Ogilvie areas (such as stories or mythological sites) that you would like to record as part of the Aboriginal cultural heritage assessment?

☑ Yes ☐ No

Comments: I believe there is huge significance in and around these areas. I have been told stories from my mother Bev. and also leading archaeologist about massacre that took place at the packet of mount Arthur.

The archaeological significance assessment of sites identified in the survey area is discussed in Section 7 of the report and summarised in Table 7.3. How would your group assess the Aboriginal cultural heritage significance of these sites? (Attached is a table with all the sites listed - you may use this table to identify the significance of each of the sites if you wish.)

Comments: More research needs to be done in this area. After reading the draft report Wet & Series Valley Culture would do more fieldwork & archaeological digs considering the size of this area

03-JAN-07 TUE 15:51 MANARUAH LALC FAX NO. 0265425377 P. 1
0265425377

Is the proposed management strategy provided in Section 9 of the draft report and detailed in Table 9.1 a suitable strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

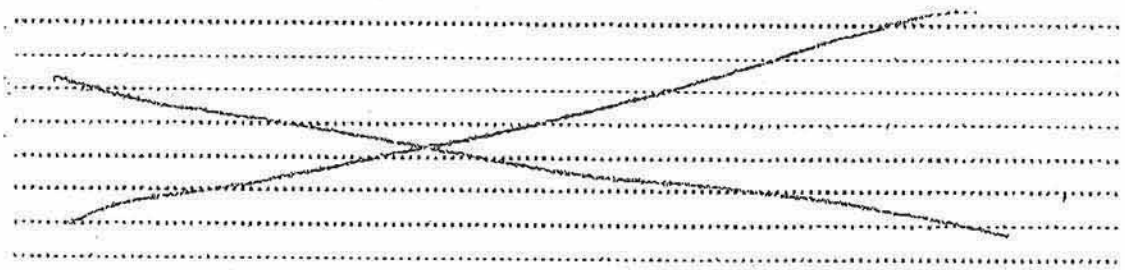
Comments:

Is the Draft Research Design and Methodology for the salvage of the sites within the impact areas detailed in Appendix 7 of the draft report suitable from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:

23-JAN-07 TUE 15:51 WANARUAH LALC FAX NO. 0265425377 P. 2
0265425377



The Australian Museum has a shortage of space for accepting artefact collections. In light of this, the DEC would prefer Aboriginal stakeholder groups agree to an alternative option for the ongoing care of the artefacts collected during salvage programs. If the Mt Arthur Coal Underground Project is approved, which of the following options would you prefer for care and control **(Please circle)**:

Option 1: Placing salvaged artefacts within a fenced area within the Proposed Saddlers Creek Conservation Area; or

Option 2: Placing salvaged artefacts within a fenced area in the Mt Arthur Conservation Area; or

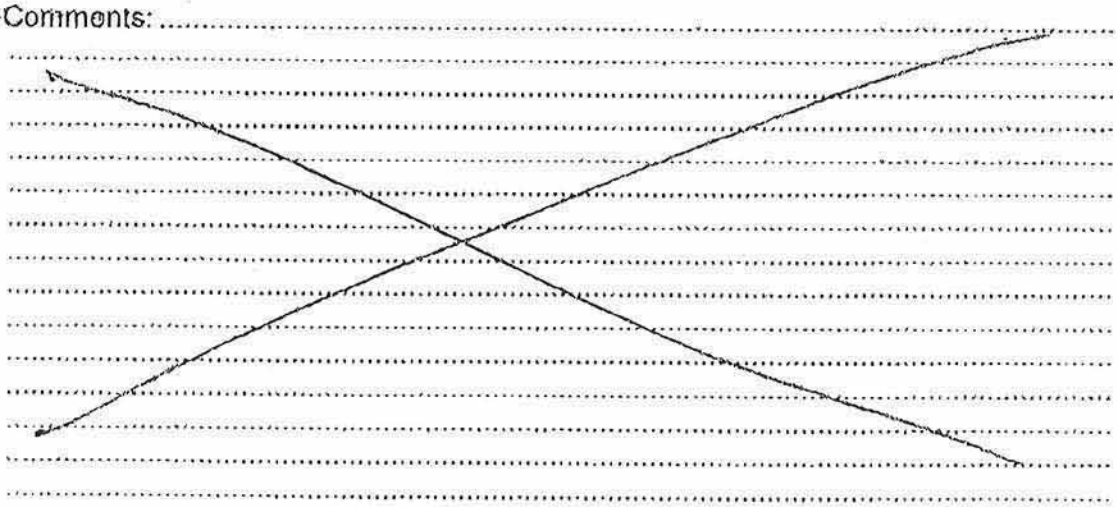
Option 3: Placing salvaged artefacts within a secure area at the Wanaruah Local Aboriginal Land Council; or

Option 4: Placing salvaged artefacts within a secure facility at the Mt Arthur Coal Office Complex; or

Option 5: Placing salvaged artefacts within the Australian Museum.

Option 6: Or, do you have another option for their care? (Please note that the options outlined above are suggestions only and that the input of all stakeholder groups is requested as part of the review of the draft report).

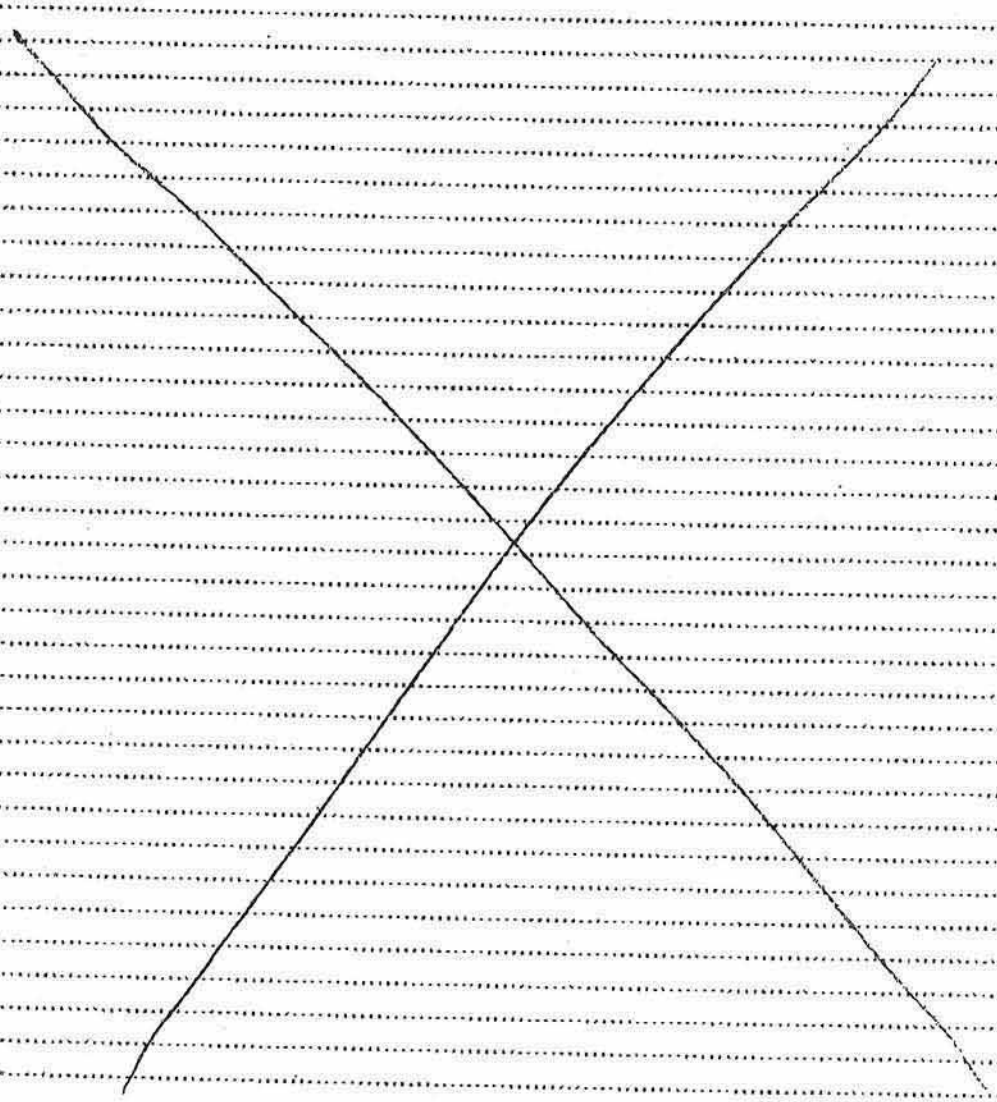
Comments:



Are there any other matters you would like discussed within the draft report or that you would like to discuss with us further before the report is finalised?

☐ Yes ☑ No

Comments:



If you would like to discuss any matters relating to the provision of comments, or would like to provide verbal comment please call either Mary-Jean Sutton or Jan Wilson at Umwelt on 4950 5322.

Please post or fax (4950 5737) your comments to
Mary-Jean Sutton or Jan Wilson
at Umwelt (Australia) Pty Limited
PO Box 838, Toronto NSW 2283
by close of business on Friday 19 January 2006.

02654253777
3-JAN-07 TUE 15:54 WANARUAH LALC FAX NO. 0265425377 P. 1

Do you think that the conservation of most of site SC01 and the terrain units within the Proposed Saddlers Creek Conservation Area will assist with compensating for the loss of the sites and terrain units within the predicted subsidence remediation zones and impacts from the proposed infrastructure including the conveyor crossing Saddlers Creek; if the sites within the predicted subsidence remediation zones are salvaged in the way discussed in Section 9 and Appendix 7 of the draft report?

☐ Yes ☑ No

Comments: With previous future work that was done at Saddlers Creek the aboriginal people was promised things such as educational packs etc but was never recevied. We dont feel that conserving one site will compensate the loss of so many other sites

Do you have any comments about the proposed the conservation of most of site SC01 and the terrain units within the Proposed Saddlers Creek Conservation Area and the draft conservation strategy outlined in Section 8.1.1.1 and 8.1.1.2 of the draft report and for the loss of the previously Proposed Quarry Creek Conservation Area?

The additional offsets outlined in Section 8.1.1.2 included:

- construction of a facility suitable for use by the Aboriginal community when using the area for teaching purposes until such times as the area is impacted by subsidence;
- provide training for up to one member of each of the registered Aboriginal stakeholder groups for the project in relation to site recording and artefact recording and basic analysis. The training package will be devised so that it enables these representatives to train other members of their respective groups and the broader Aboriginal community;
- fund training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, or a similar course. This course provides training related to the Management of Keeping Places and Cultural Centres; and
- prior to subsidence, salvage the areas predicted to be impacted and subsidence remediation works using the methodology outlined in **Appendix 8**.

Comments:

02654253 77
23-JAN-07 TUE 15:55 WANARUAH LALC FAX NO. 0265425377 P. 2

61 6572 2791

29/01/07

Umwelt (Australia) Pty Limited

Attention; Mary-Jean Sutton

Re; Draft Aboriginal Cultural Heritage Assessment Mt Arthur Coal Underground Project.

Des Hickey
WWCCS

61 6572 2791



WATTAKA. Wonnarua Cultural Consultants Services.
4 Kennedy st Singleton 2330
Ph: 0432977978 Fax: 02 65712609 B.P.N. N.N98021119
ABN 88 758 080759

W.W.C.C.S

29/1/07

Umwelt
(Australia) Pty Limited PO Box 838 Toronto NSW 2283

Att: Mary-Jean Sutton

Re: Draft Aboriginal Cultural Heritage Assessment Mt Arthur Coal Underground Project.

Dear Mary-Jean

Wattaka Wonnarua CCS have received a very large report on the above said project, however you have provided a pro-forma guide for Wattaka to comment on.

You ask in the report if Wattaka is aware of any cultural significance / values within the project area, and also the Aboriginal cultural heritage significance of all the sites.
Wonnarua people considers all Aboriginal sites within its tribles boundaries important, small or large they all hold the some values, Aboriginal cultural heritage is not limited to the artefacts and art that have survived the impact of european settlement.
It is a living cultural and includes landforms, water holes, vegetation, habitats, and people.
You also ask in the report that the conservation of most of site SCO1 and the terrain units within the proposed saddlers creek conservation area will assist with compensating for the loss of the sites and terrain units within the predicted subsidence remediation zones, and impacts from the proposed infrastructure including the conveyor crossing saddlers creek.
Wattaka Wonnarua CCS considers that the proposed saddlers creek conservation area should not be consided as compensation for the loss of the sites and terrain units within the predicted subsidence remediation zones.
The additional offsets outlined in section 8.1.1.2
Wattaka also feels that these offsets should not be considered as compensation for the loss of Aboriginal sites and country.

61 6572 2791

These offsets do not address the financial difficultis that Wonnarua people are faceing today in our communnities, therefore additional financial compensation should be offered. Wattaka Wonnarua CCS is requesting from Mt Arthur Coal financial compensation for the destruction of Wonnarua Country-Cultural Heritage that will be lost forever.

Des Hickey
Manager
WWCCS

8 Fitzgerald ave
Muswellbrook N.S.W 2333

Ph: 65410506
Fax: 65410751
Mobile: 0432476009
E-mail: bigrodshouse@hotmail.com

Giwiirr

Fax Transmittal Form

To

Mary-Jean Sutton

From

Rodney Matthews
Manager

Ph: 65410506
Fax: 65410751
Mobile: 0432476009
E-mail: bigrodshouse@hotmail.com

19 [illegible] 2007

Urgent
For Review
Please Comment
Please Reply

Date sent:
Time sent:
Number of pages including cover page:

Message: Sending comment sheet on Mt Arthur Underground Project

Proforma for Aboriginal Stakeholder Group Comments – Mt Arthur Coal Underground Project Aboriginal Cultural Heritage Assessment

Apart from the sites located during the survey, are you aware of any cultural significance/values for the Mt Arthur Coal Underground Project Area/Mt Ogilvie areas (such as stories or mythological sites) that you would like to record as part of the Aboriginal cultural heritage assessment?

☑ Yes ☐ No

Comments:

* Massacre site known as the pocket
* Burial site

these sites are located within the Mt Arthur Boundaries of which you no

The archaeological significance assessment of sites identified in the survey area is discussed in Section 7 of the report and summarised in Table 7.3. How would your group assess the Aboriginal cultural heritage significance of these sites? (Attached is a table with all the sites listed - you may use this table to identify the significance of each of the sites if you wish.)

Comments:

We believe that all Aboriginal sites to be of High significance, whether you rate as an archaeological prespective of these site of High, Moderate, low

The archaeological sensitivity assessment of the terrain units in the survey area is discussed in Section 7 of the report and summarised in Table 7.5. How would your group assess the Aboriginal cultural heritage sensitivity of the terrain units within the survey area? (Attached is a table with all the terrain units listed - you may use this table to identify the significance of each of the terrain units if you wish.)

Comments: .....

Do you have any other comments or general input you would like to provide regarding the cultural values of the survey area and/or the identified sites?

☐ Yes ☑ No

Comments: .....

Is the proposed management strategy provided in Section 9 of the draft report and detailed in Table 9.1 a suitable strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: .....

Is the Draft Research Design and Methodology for the salvage of the sites within the impact areas detailed in Appendix 7 of the draft report suitable from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: Do agree

This is what I would have recommended

Do you think that the conservation of most of site SC01 and the terrain units within the Proposed Saddlers Creek Conservation Area will assist with compensating for the loss of the sites and terrain units within the predicted subsidence remediation zones and impacts from the proposed infrastructure including the conveyor crossing Saddlers Creek; if the sites within the predicted subsidence remediation zones are salvaged in the way discussed in Section 9 and Appendix 7 of the draft report?

☑ Yes ☐ No

Comments: .....

Do you have any comments about the proposed the conservation of most of site SC01 and the terrain units within the Proposed Saddlers Creek Conservation Area and the draft conservation strategy outlined in Section 8.1.1.1 and 8.1.1.2 of the draft report and for the loss of the previously Proposed Quarry Creek Conservation Area?

The additional offsets outlined in Section 8.1.1.2 included:

- construction of a facility suitable for use by the Aboriginal community when using the area for teaching purposes until such times as the area is impacted by subsidence;
- provide training for up to one member of each of the registered Aboriginal stakeholder groups for the project in relation to site recording and artefact recording and basic analysis. The training package will be devised so that it enables these representatives to train other members of their respective groups and the broader Aboriginal community;
- fund training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, or a similar course. This course provides training related to the Management of Keeping Places and Cultural Centres; and
- prior to subsidence, salvage the areas predicted to be impacted and subsidence remediation works using the methodology outlined in **Appendix 8**.

Comments: .....

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The Australian Museum has a shortage of space for accepting artefact collections. In light of this, the DEC would prefer Aboriginal stakeholder groups agree to an alternative option for the ongoing care of the artefacts collected during salvage programs. If the Mt Arthur Coal Underground Project is approved, which of the following options would you prefer for care and control **(Please circle)**:

Option 1: Placing salvaged artefacts within a fenced area within the Proposed Saddlers Creek Conservation Area; or

Option 2: Placing salvaged artefacts within a fenced area in the Mt Arthur Conservation Area; or

Option 3: Placing salvaged artefacts within a secure area at the Wanaruah Local Aboriginal Land Council; or

Option 4: Placing salvaged artefacts within a secure facility at the Mt Arthur Coal Office Complex; or

Option 5: Placing salvaged artefacts within the Australian Museum.

Option 6: Or, do you have another option for their care? (Please note that the options outlined above are suggestions only and that the input of all stakeholder groups is requested as part of the review of the draft report).

Comments: .....
..... would
..... personally ~~would~~ like to see the artefacts
stored within the proposed Saddlers Creek Conservation
.....
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Are there any other matters you would like discussed within the draft report or that you would like to discuss with us further before the report is finalised?

☐ Yes ☑ No

Comments: .....

If you would like to discuss any matters relating to the provision of comments, or would like to provide verbal comment please call either Mary-Jean Sutton or Jan Wilson at Umwelt on 4950 5322.

Please post or fax (4950 5737) your comments to
Mary-Jean Sutton or Jan Wilson
at Umwelt (Australia) Pty Limited
PO Box 838, Toronto NSW 2283
by close of business on Friday 19 January 2006.

0265715777

FAX COVER SHEET

From: Ungooroo Aboriginal Corporation Singleton
Telephone 02 6571 5111 - Fax 02 65 715 777

For the Attention Of: M J Sutton Umwelt Australia Pty Ltd 2/20 the Boulevard Toronto 2283 NSW					**Pages Including Cover -**
Date: January 20, 2007			Phone		FAX
URGENT	PLEASE REVIEW	REPLY ASAP	PLEASE COMMENT	AS REQUESTED	**CONFIRM RECIPT**

REMARKS:
Sorry I'm Late but the Best I could do with my time frame at present

Graham Ward CEO

0265715777

Proforma for Aboriginal Stakeholder Group Comments – Mt Arthur Coal Underground Project Aboriginal Cultural Heritage Assessment

Apart from the sites located during the survey, are you aware of any cultural significance/values for the Mt Arthur Coal Underground Project Area/Mt Ogilvie areas (such as stories or mythological sites) that you would like to record as part of the Aboriginal cultural heritage assessment?

☐ Yes ☑ No

Comments: .....

The archaeological significance assessment of sites identified in the survey area is discussed in Section 7 of the report and summarised in Table 7.3. How would your group assess the Aboriginal cultural heritage significance of these sites? (Attached is a table with all the sites listed - you may use this table to identify the significance of each of the sites if you wish.)

Comments: U.A.C HAS STATED ON MANY OCCASIONS THAT ALL WONNARUAH SITES ARE OF SIGNIFICANCE.

0265715777

The archaeological sensitivity assessment of the terrain units in the survey area is discussed in Section 7 of the report and summarised in Table 7.5. How would your group assess the Aboriginal cultural heritage sensitivity of the terrain units within the survey area? (Attached is a table with all the terrain units listed - you may use this table to identify the significance of each of the terrain units if you wish.)

Comments: ANY LANDSCAPE WAS USED IF POTENTIAL ALLOWED (AS AREA INDICATED ON THIS PROJECT) BY THE RESOURCES AVAILABLE.

Do you have any other comments or general input you would like to provide regarding the cultural values of the survey area and/or the identified sites?

☐ Yes ☑ No

Comments: WHEN THE NEED ARISES.

0265715777

Is the proposed management strategy provided in Section 9 of the draft report and detailed in Table 9.1 a suitable strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: .....

Is the Draft Research Design and Methodology for the salvage of the sites within the impact areas detailed in Appendix 7 of the draft report suitable from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: WITHOUT CHANGES

0265715777

Do you think that the conservation of most of site SC01 and the terrain units within the Proposed Saddlers Creek Conservation Area will assist with compensating for the loss of the sites and terrain units within the predicted subsidence remediation zones and impacts from the proposed infrastructure including the conveyor crossing Saddlers Creek; if the sites within the predicted subsidence remediation zones are salvaged in the way discussed in Section 9 and Appendix 7 of the draft report?

☐ Yes ? ☐ No

Comments: UNDESIDED.

Do you have any comments about the proposed the conservation of most of site SC01 and the terrain units within the Proposed Saddlers Creek Conservation Area and the draft conservation strategy outlined in Section 8.1.1.1 and 8.1.1.2 of the draft report and for the loss of the previously Proposed Quarry Creek Conservation Area?

The additional offsets outlined in Section 8.1.1.2 included:

- construction of a facility suitable for use by the Aboriginal community when using the area for teaching purposes until such times as the area is impacted by subsidence;
- provide training for up to one member of each of the registered Aboriginal stakeholder groups for the project in relation to site recording and artefact recording and basic analysis. The training package will be devised so that it enables these representatives to train other members of their respective groups and the broader Aboriginal community;
- fund training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, or a similar course. This course provides training related to the Management of Keeping Places and Cultural Centres; and
- prior to subsidence, salvage the areas predicted to be impacted and subsidence remediation works using the methodology outlined in **Appendix 8**.

Comments:

0265715777

The Australian Museum has a shortage of space for accepting artefact collections. In light of this, the DEC would prefer Aboriginal stakeholder groups agree to an alternative option for the ongoing care of the artefacts collected during salvage programs. If the Mt Arthur Coal Underground Project is approved, which of the following options would you prefer for care and control **(Please circle)**:

Option 1: Placing salvaged artefacts within a fenced area within the Proposed Saddlers Creek Conservation Area; or

Option 2: Placing salvaged artefacts within a fenced area in the Mt Arthur Conservation Area; or

Option 3: Placing salvaged artefacts within a secure area at the Wanaruah Local Aboriginal Land Council; or

Option 4: Placing salvaged artefacts within a secure facility at the Mt Arthur Coal Office Complex; or

Option 5: Placing salvaged artefacts within the Australian Museum.

Option 6: Or, do you have another option for their care? (Please note that the options outlined above are suggestions only and that the input of all stakeholder groups is requested as part of the review of the draft report).

Comments: U.A.C Recommends option N°1

Are there any other matters you would like discussed within the draft report or that you would like to discuss with us further before the report is finalised?

0265715777

☐ Yes ☑ No

Comments: .....

If you would like to discuss any matters relating to the provision of comments, or would like to provide verbal comment please call either Mary-Jean Sutton or Jan Wilson at Umwelt on 4950 5322.

Please post or fax (4950 5737) your comments to
Mary-Jean Sutton or Jan Wilson
at Umwelt (Australia) Pty Limited
PO Box 838, Toronto NSW 2283
by close of business on Friday 19 January 2006.

65731103

FAX COVER SHEET

UPPER HUNTER WONNARUA COUNCIL INC
PO BOX 184
SINGLETON NSW 2330
PH 02 65 714888
FX 02 65 714889

Send to: KIMWOLT	**From:** VIC PORRY
Attention: MARY JOAN SUTTON.	**Date:** 17-1-07.
Office location: TORONTO	**Office location:** SINGLETON.
Fax number: 49505737	**Phone number:**

☒ Urgent ☐ Reply ASAP ☐ Please comment ☐ Please review ☐ For your information

Total pages, including cover:

Comments:

OFFICE 65714888.
HOME 65731103.

65731103

Upper Hunter Wonnarua Council Inc

PO BOX 184 SINGLETON NSW 2330
PHONE: 02 6571 4888 FAX: 02 6571 4889

ABN: 24 070 620 198

Mary Jean Sutton
Senior Archaeologist
Umwelt Australia Pty Ltd
PO Box 838
TORONTO NSW 2283

17th January 2007

RE; MT ARTHUR COAL UNDERGROUND PROJECT
DRAFT ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

Dear Mary Jean
The following comments are intended to be our response to the Mt Arthur Underground project.

* The Saddlers Creek (VCA) Zone has already been dedicated as an area or Off-Set to the Bayswater No 3 Coal Lease Area.

* Too date the Saddlers Creek VCA has not been finalized.
This VCA, we believe is a part of the Development Application for Bayswater No 3 etc.

* If Bayswater No 3, Saddlers Creek VCA cannot be finalized within the first 10 years of Coal Mining, then how can we believe that the current owner will negotiate within a quick time frame to settle the outstanding issues relating to this current proposal.

* Why is Saddlers Creek VCA being offered again as a trade off to the Aboriginal Heritage Conservation for both Bayswater No 3 and the new Mt Arthur North Underground Proposal.

* The previous Conservation Zones have not worked in the past, therefore why would this new proposal have any credit with our Community now.

  Could the developer please explain how one conservation zone can be used for two (2) Mining Leases.

* Could Unwelt please explain the current Development Application for Bayswater No 3 and the Saddlers Creek VCA please.

  If the VCA is tied into the Bayswater No 3 Project and has not been finalized, then is the Mining Company in BREACH of their D/A Conditions.

65731103

Upper Hunter Wonnarua Council Inc

PO BOX 184 SINGLETON NSW 2330
PHONE: 02 6571 4888 FAX: 02 6571 4889

ABN: 24 070 620 198

Could we get an Independent Review of these Conditions please. We will be able to assist you choose an Independent person for this job.

* In relation to the Underground Project, parts of the area have been included in the Bayswater Conservation Off-Set Areas.
Our question is why this area has been set aside in the first place if the intention is to affect or Destroy these Conservation Off-Sets, then what's the point in having Conservation Zones.

* As seen not only in this area but in other Sites across the Mining Industry, Conservation Zones do very little for the Protection of Aboriginal Interest or Historical Landscapes.

  Aboriginal people have no real control over these areas and in the past the NPWS had very little time or money to invest in the Management over these places long term.

  Therefore a Conservation Zone does very little indeed to us, it is more like smoke and mirrors.

* The Upper Hunter Wonnarua Council has been involved in the Original Surveys and Fieldwork for the current Bayswater and Mt Arthur North Coal Mining Development.

  We have over 19 years experience working with International and Local Mining Company's in the Hunter Valley.
  I am the Registrared Native Title Claimant for Power Coal NUA and the Mt Pleasant Coal Mine Project MLA-100.

We feel that we have enough KNOWLEDGE and EXPERTIZE to provide Cross Cultural Training for any Non-Aboriginal Staff associated with your Open-Cut or Underground Mining Lease.

We understand that Umwelt has put forward a proposal to provide Cultural Training. We would support this if Umwelt were providing Technical Information Only, but disagree if they are intending to provide Local Aboriginal Heritage Training.

This is Culturally INAPPROPRIATE and should not happen.

Any Aboriginal Heritage Training should be done by Aboriginal people with the Suitable Qualifications.

65731103

Upper Hunter Wonnarua Council Inc

PO BOX 184 SINGLETON NSW 2330
PHONE: 02 6571 4888 FAX: 02 6571 4889

ABN: 24 070 620 198

* Also an Aboriginal Cultural Heritage Assessment from an Aboriginal Perspective has NOT BEEN DONE>

  Could we ask why this important Report has not been done.

  Under the Current ACT Aboriginal Consultants can provide Cultural Heritage Assessments at Consultant Rates etc.

  You have complied by having an Archaeological Assessment but there needs to be an Aboriginal Assessment, and not just a letter either, this is missing.

* As for the Sites Affected by this Development, the Upper Hunter Wonnarua Council does not agree to any "Consent to Destroy" for any of the Aboriginal Sites located in the Underground Area, until the Company has informed us of the situation regarding the Conservation Zones that are both affected by this Development.

* We also believe that the Developer should actively Support Local Aboriginal Business through a Trust Fund or a Community Development Committee.

Yours

Victor Perry
Manager
Upper Hunter Wonnarua Council

0249547751

Attn: Mary Jean Sutton
Umwelt (Australia) Pty Ltd

02 49505737

From Arthur Charles Fletcher
Wonn 1 sites Officer
02 49547751

Note: Thanks for an opportunity to be involved in the consultation process.

Arthur Fletcher
a.c. Fletcher.
19/1/07

0249547751

Comments on Draft Aboriginal Cultural Heritage Assessment, Mt Arthur Coal Underground Project

Introduction

The draft report provides details of the archaeological assessment of the Mt Arthur Coal Underground Project Area and the Proposed Saddlers Creek Conservation Area. There are places within the report where sections are provided for the comments of the Aboriginal stakeholder groups that have indicated an interest in the project. These sections of the report will be completed following receipt of your comments. It is extremely important that the reporting process is used by the Aboriginal stakeholder groups to get across their point of view, including assessment of the significance of the sites and the landscape within the area proposed for impact by mining and the Proposed Saddlers Creek Conservation Area.

There are often complaints from Aboriginal stakeholder groups that reports prepared for Aboriginal Cultural Heritage Assessments are biased towards the archaeology and that there is not enough discussion related to the Aboriginal significance/value of the proposed development area and the sites it contains. Only Aboriginal people can provide that feedback and we encourage the Aboriginal stakeholder groups participating in this project to take the time to record their opinions so that they can be included within the report.

There are a few comments within the draft report in relation to the Aboriginal significance of some of the sites recorded during the survey. These comments are those provided by the group representatives present during the recording of the sites and can be amended if they are not those of the group in general. We understand that you have been provided a very large report on which to make comment, therefore we have provided a pro-forma, which you may use to assist you with providing your comment. The pro-forma is a guide only and you are encouraged to address other topics/issues of importance to your group. We are also pleased to accept verbal comments and will write these up for you and provide them to you for your signature and endorsement.

Of course use of this pro-forma is voluntary and we will be pleased to receive your comments in a format most suitable to you. A list of the sites has been provided so that you may rank each site's significance individually, or if you prefer, you may discuss their significance in a more general way (for example, sites along creeks, sites on simple slope etc. sites in the predicted subsidence remediation zones and sites in the Proposed Saddlers Creek Conservation Area, sites in the Quarry Creek area).

Closing date for your comments will be close of business **Friday 19 January 2006**. All comments provided will be summarised within the report and attached in full as an Appendix of the report.

0249547751 Arthur Charles Fletcher 19/1/07

Proforma for Aboriginal Stakeholder Group Comments – Mt Arthur Coal Underground Project Aboriginal Cultural Heritage Assessment

Apart from the sites located during the survey, are you aware of any cultural significance/values for the Mt Arthur Coal Underground Project Area/Mt Ogilvie areas (such as stories or mythological sites) that you would like to record as part of the Aboriginal cultural heritage assessment?

☐ Yes ☑ No

Comments: No specific areas, although animal tracks along highlands and natural water courses were of significance for day to day life and cultural events.

The archaeological significance assessment of sites identified in the survey area is discussed in Section 7 of the report and summarised in Table 7.3. How would your group assess the Aboriginal cultural heritage significance of these sites? (Attached is a table with all the sites listed - you may use this table to identify the significance of each of the sites if you wish.)

Comments: All identified sites, as well as the country around them are culturally significant as they represent a continued connection to our cultural history and the land from where we have come from.
These areas are places that our people belong to.

0249547751

The archaeological sensitivity assessment of the terrain units in the survey area is discussed in Section 7 of the report and summarised in Table 7.5. How would your group assess the Aboriginal cultural heritage sensitivity of the terrain units within the survey area? (Attached is a table with all the terrain units listed - you may use this table to identify the significance of each of the terrain units if you wish.)

Comments: [illegible] most important [illegible] the landscape [illegible] today [illegible] used

All country that we belong to is of the highest significance.

Do you have any other comments or general input you would like to provide regarding the cultural values of the survey area and/or the identified sites?

☐ Yes ☑ No

Comments: Not at this stage

0249547751

Is the proposed management strategy provided in Section 9 of the draft report and detailed in Table 9.1 a suitable strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: At this stage the strategy provides a working platform.

Is the Draft Research Design and Methodology for the salvage of the sites within the impact areas detailed in Appendix 7 of the draft report suitable from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: Yes to the best of our Knowledge

0249547751

☑ Yes ☐ No

Comments: Would like another community meeting ~~invited~~ including WEC members and other traditional owners (TO's)

Would appreciate more time (or better timing - away from holiday period) for groups not involved in study to be given an opportunity to ~~have~~ research and liase with participants and other community members

Arthur Fletcher
A.C. Fletcher
19/1/07

If you would like to discuss any matters relating to the provision of comments, or would like to provide verbal comment please call either Mary-Jean Sutton or Jan Wilson at Umwelt on 4950 5322.

Please post or fax (4950 5737) your comments to
Mary-Jean Sutton or Jan Wilson
at Umwelt (Australia) Pty Limited
PO Box 838, Toronto NSW 2283
by close of business on Friday 19 January 2006.

APPENDIX 6

Site Database including Comments Made by Aboriginal Stakeholder Groups during Fieldwork

Appendix 6 - Database Categories and Definition of Terms Used

Site Number	These numbers are numbered sequentially after the catchment area they are identified within.
Locus	This term refers to the name of each spatially separate location of heritage evidence within a site; eg. site CC1, Locus A, Locus B etc). Artefacts/features clearly associated and occurring as a discrete event (eg. A knapping floor) were also recorded as separate *loci*.
Component	A part of a survey area with a different type of surface exposure such as a vehicle track, erosion scour or grassed surface. Each component was recorded separately and identified with a sequential number after the survey area number (eg. CC1/3, CC1/4). Often multiple occurrences of a type of exposure (eg. erosion scour) were recorded as a single component (size and visibility characteristics were noted separately to enable more accurate calculation of effective survey coverage).
Map Reference	Map reference refers to the co-ordinate system which was recorded for this project in MGA.
Grid Reference	Eastings and Northings co-ordinates for site location taken from a GPS.
Site Type	Whether a site is an open artefact scatter, rockshelter with archaeological deposit or an isolated find. Separate recording forms for grinding grooves and other sites need to be filled out for other site types.
Archaeological Terrain Unit	A broader classification of a topographical feature which loosely followed Kuskie (1999).
Landform Element	Specific type of topographical feature, following the definitions of McDonald et al 1984.
Aspect	Aspect refers to the compass point where the site is facing.
Outlook	Outlook should be measured in degrees. Refers to the view that can be seen from site over landscape.
Slope	Slope is defined by the following three criteria: 1 – Level/Very Gentle 2 – Gentle 3 – Moderate/Steep
Erosion State	1. High state of erosion 2. Moderate state of erosion 3. Low state of erosion
Erosion Form	1: Sheet erosion 2: Rill erosion 3: Gully erosion 4: Stream bank erosion 5: Aggrading 6: Modified 7: Densely vegetated
Erosion extent	Extent of erosion is defined by limited to A unit, A/B units or eroded down to B unit.

Vegetation	1: Modified grass/crop 2: Native Grass 3: Scattered woodland 4: Open woodland 5: Absent
Disturbance	1. High 2. Moderate 3. Low
Number of artefacts	This number refers to the total number of artefacts recorded within a site locus, in addition to the estimated or counted number of artefacts that were observed but not recorded in detail.
Dominant raw material	Most common raw material type includes silcrete, mudstone, tuff, chert, volcanic, petrified wood, hornfels, sandstone, quartz, quartzite, porcellanite, silicified sandstone, chalcedony, fine grained siliceous and other.
Other raw materials	Other materials identified which were not dominant (as types outlined above).
Dominant artefact type	Most common artefact type includes flakes, broken flakes, retouched flakes, Bondi Point, Backed blade, Geometric microlith, Elouera, Flake used as a core, Flaked piece, Core, Axe/blank, Grindstone, Hammerstone, Anvil, Manuport, Heat Shatter and Other.
Other artefact types	Other artefact types identified which were not dominant (as types outlined above).
Area	This term refers to the gross surface area in which artefacts are visible (for each site locus).
Area defined by	Area defined by refers to what is defining the visible site area ie. is it a vehicle track bordered by grass or gravel, a salt scour etc.
Aboriginal Significance	Comments made by the Aboriginal stakeholder groups regarding the values of the site to them.
Comments including any stories or comments from Aboriginal groups about values of sites.	Any comments made by Aboriginal stakeholder groups regarding survey areas, sites, stories etc.
Artefact Comments	More detailed information recorded regarding artefacts in site assemblages.

Table 1: Environmental Description of Archaeological Sites

Final Name	Loci	Component	Co-ordinate System	Easting	Northing	Site type	Date Recorded	Recorded By	Archaeological Terrain Unit	Landform Element	Aspect	Slope	Outlook	Visibility Inside Exposure	Visibility Outside Exposure	Erosion State	Erosion Form	Erosion Extent	Vegetation
HR01	1	1	MGA	290965	6418209	Isolated Find	28/04/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (eastern side of creek bank)	NNW	3	270	95	0	1	1, 2, 6	B	1
HR01	2	1	MGA	290926	6418284	Artefact Scatter	28/04/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (eastern side of creek bank)	NNW	3	270	95	0	1	1, 2, 6	B	1
HR01	2	2	MGA	290929	6418285	Artefact Scatter	28/04/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	NNW	3	270	95	0	1	1, 2, 6	B	1
HR01	3	1	MGA	290918	6418332	Artefact Scatter	28/04/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	NNW	3	270	95	0	1	1, 2, 6	B	1
HR01	3	2	MGA	290917	6418345	Artefact Scatter	28/04/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	NNW	3	270	95	0	1	1, 2, 6	B	1
HR01	4	1	MGA	290899	6418386	Artefact Scatter	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	NNW	3	270	40	0	1	1, 2, 6	B	1
HR01	5	1	MGA	290917	6418435	Isolated Find	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (eastern side of creek bank)	NNW	3	270	95	5	1	1, 2, 6	B	1
HR01	6	1	MGA	290877	6418450	Artefact Scatter	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	NNW	3	270	95	5	1	1, 2, 5, 6	B	1
HR01	7	1	MGA	290884	6418490	Artefact Scatter	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	NNW	3	270	95	5	1	2, 6	B	1
HR01	8	1	MGA	290861	6418611	Isolated Find	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	NNW	3	270	95	5	1	2	B	1
HR01	8	2	MGA	290845	6418616	Artefact Scatter	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (eastern side of creek bank)	NNW	3	270	95	5	1	2	B	1
HR01	9	1	MGA	290855	6418644	Artefact Scatter	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (eastern side of creek bank)	NNW	3	270	95	5	1	1, 4	B	1
HR01	10	1	MGA	290819	6418750	Isolated Find	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (eastern side of creek bank)	NNW	3	270	95	5	1	1, 4	B	1

Table 1: Environmental Description of Archaeological Sites

Final Name	Loci	Component	Co-ordinate System	Easting	Northing	Site type	Date Recorded	Recorded By	Archaeological Terrain Unit	Landform Element	Aspect	Slope	Outlook	Visibility Inside Exposure	Visibility Outside Exposure	Erosion State	Erosion Form	Erosion Extent	Vegetation
HR01	11	1	MGA	290808	6418937	Artefact Scatter	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (eastern side of creek bank)	NNW	3	270	95	5	1	1, 3	B	1
HR01	12	1	MGA	290723	6418554	Isolated Find	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	N	3	270	95	5	1	1	B	1
HR01	13	1	MGA	290920	6418267	Artefact Scatter	1/05/2006	JF	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	NNW	3	270	95	5	1	1, 2, 6	B	1
HR01	14	1	MGA	290816	6418215	Artefact Scatter	1/05/2006	JF	Moderate to Steep Simple Slope	Moderate Slope	N	3	270	95	5	1	1, 2, 6	B	1
HR02	1	1	MGA	291124	6418383	Isolated Find	9/05/2006	MJS	Spur crest	Spur crest	W	3	360	5	0	2	1, 2, 3	A/B	3
HR03	1	1	MGA	291347	6418490	Isolated Find	9/05/2006	MJS	Moderate to Steep Drainage Depression	Moderate Slope (western side of creek bank)	W	3	360	5	0	2	1, 2	A/B	3
QC01	1	1	MGA	294412	6419693	Artefact Scatter	3/04/2005	JF	Gentle Drainage Depression	Creek line (southern and eastern banks of the creek)	-	2	360	75	0	2	1, 2, 3, 4	A/B	3
QC01	1	2	MGA	294388	6419735	Artefact Scatter	3/04/2006	JF	Gentle Drainage Depression	Creek line (northern side)	-	2	360	90	90	2	1, 2, 3, 4	A/B	3
QC01	2	1	MGA	294545	6419562	Artefact Scatter	3/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	70	0	2	1, 2, 3, 4	A/B	3
QC01	3	1	MGA	294463	6419747	Artefact Scatter	3/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	80	0	2	1, 2, 3, 4	A/B	3
QC01	4	1	MGA	294375	6419933	Artefact Scatter	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	60	0	1	1,2,3	B	3
QC01	5	1	MGA	294082	6420201	Artefact Scatter	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	50	0	1	1,2,3	B	3
QC01	5	2	MGA	294090	6420185	Artefact Scatter	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	60	5	1	1,2,3	B	3
QC01	5	3	MGA	294115	6420178	Artefact Scatter	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	60	5	1	1,2,3	B	3
QC01	5	4	MGA	294130	6420168	Artefact Scatter	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	60	5	1	1,2,3	B	3

Table 1: Environmental Description of Archaeological Sites

Final Name	Loci	Component	Co-ordinate System	Easting	Northing	Site type	Date Recorded	Recorded By	Archaeological Terrain Unit	Landform Element	Aspect	Slope	Outlook	Visibility Inside Exposure	Visibility Outside Exposure	Erosion State	Erosion Form	Erosion Extent	Vegetation
QC01	6	1	MGA	294250	6420072	Artefact Scatter	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	70	0	1	1,2,3	B	3
QC01	6	2	MGA	294270	6420049	Artefact Scatter	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	85	0	1	1,2,3	B	3
QC01	6	3	MGA	294260	6420041	Isolated Find	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	85	0	1	1,2,3	B	3
QC01	7	1	MGA	294294	6419992	Artefact Scatter	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	70	0	1	1,2,3	B	3
QC01	8	1	MGA	293785	6420375	Artefact Scatter	4/04/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	95	0	1	1,2,3	B	3
QC01	9	1	MGA	293819	6420481	Artefact Scatter	4/04/2006	JF	Very gentle simple slope	Creek line (western side)	-	1	360	85	0	1	1,2,3	B	3
QC01	10	1	MGA	293800	6420330	Isolated Find	4/04/2006	JF	Level to very gentle drainage depression	Creek line (eastern side)	-	1	360	70	0	1	1,2,3	B	3
QC01	11	1	MGA	293727	6420308	Artefact Scatter	4/04/2006	JF	Level to very gentle drainage depression	Creek line (eastern side)	-	1	360	80	0	1	1,2,3	B	3
QC01	12	1	MGA	293776	6420301	Artefact Scatter	4/04/2006	JF	Level to very gentle drainage depression	Creek line (eastern side)	-	1	360	65	0	1	1,2,3	B	3
QC01	12	2	MGA	293798	6420277	Artefact Scatter	4/04/2006	JF	Level to very gentle drainage depression	Creek line (eastern side)	-	1	360	70	0	1	1,2,3	B	3
QC01	12	3	MGA	293798	6420261	Isolated Find	4/04/2006	JF	Level to very gentle drainage depression	Creek line (eastern side)	-	1	360	75	0	1	1,2,3	B	3
QC01	13	1	MGA	293907	6420243	Artefact Scatter	4/04/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	70	0	1	1,2,3	B	3
QC01	14	1	MGA	293599	6420451	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (western side).	-	1	360	75	0	1	1,2,3	B	3
QC01	15	1	MGA	293645	6420326	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (western side).	-	1	360	70	0	1	1,2,3	B	3
QC01	16	1	MGA	293989	6420194	Isolated Find	5/04/2006	JF	Level to very gentle drainage depression	Creek line (western side).	-	1	360	70	0	1	1,2,3	B	3
QC01	16	2	MGA	294007	6420190	Isolated Find	5/04/2006	JF	Level to very gentle drainage depression	Creek line (eastern side)	-	1	360	65	0	1	1,2,3	B	3
QC01	16	3	MGA	294034	6420186	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (in the centre of creek).	-	1	360	90	0	1	1,2,3	B	3

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Final Name	Loci	Component	Co-ordinate System	Easting	Northing	Site type	Date Recorded	Recorded By	Archaeological Terrain Unit	Landform Element	Aspect	Slope	Outlook	Visibility Inside Exposure	Visibility Outside Exposure	Erosion State	Erosion Form	Erosion Extent	Vegetation
QC01	17	1	MGA	293952	6420247	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (eastern side)	-	1	360	70	0	1	1,2,3	B	3
QC01	18	1	MGA	293935	6420181	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (western side).	-	1	360	80	0	1	1,2,3	B	3
QC01	19	1	MGA	293785	6420213	Isolated Find	5/04/2006	JF	Level to very gentle drainage depression	Creek line (western side).	-	1	360	75	0	1	1,2,3	B	3
QC01	19	2	MGA	293819	6420231	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (western side).	-	1	360	75	0	1	1,2,3	B	3
QC01	20	1	MGA	293640	6420327	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (eastern side)	-	1	360	80	0	1	1,2,3	B	3
QC01	21	1	MGA	293674	6420507	Isolated Find	5/04/2006	JF	Level to very gentle drainage depression	Foot slope / modified	WNW	1	360	80	0	1	1,2,3	B	3
QC01	22	1	MGA	294464	6419547	Artefact Scatter	3/04/2006	MJS	Gentle Drainage Depression	Foot slope site is on a confluence	NW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	1	MGA	294418	6419536	Isolated Find	3/04/2006	MJS	Gentle Drainage Depression	Creek bank (southern side of Quarry Creek)	SW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	2	MGA	294371	6419569	Isolated Find	3/04/2006	MJS	Gentle Drainage Depression	Creek bank (southern side of Quarry Creek)	SW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	3	MGA	294368	6419600	Isolated Find	3/04/2006	MJS	Gentle Drainage Depression	Creek bank (southern side of Quarry Creek)	SW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	4	MGA	294353	6419619	Artefact Scatter	3/04/2006	MJS	Gentle Drainage Depression	Creek bank (southern side of Quarry Creek)	SW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	5	MGA	294352	6419629	Artefact Scatter	3/04/2006	MJS	Gentle Drainage Depression	Creek bank (southern side of Quarry Creek)	SW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	6	MGA	294007	6420191	Isolated Find	3/04/2006	MJS	Gentle Drainage Depression	Creek bank (southern side of Quarry Creek)	SW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	7	MGA	294202	6420044	Artefact Scatter	3/04/2006	MJS	Gentle Drainage Depression	Creek bank (southern side of Quarry Creek)	SW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	8	MGA	294214	6420041	Artefact Scatter	3/04/2006	MJS	Gentle Drainage Depression	Creek bank (southern side of Quarry Creek)	SW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	9	MGA	294207	6420001	Isolated find	3/04/2006	MJS	Gentle Drainage Depression	Creek bank (southern side of Quarry Creek)	SW	2	360	15	3	1	1, 3, 4, 8, 9	B	1
QC01	23	10	MGA	294200	6419980	Isolated Find	3/04/2006	MJS	Level to very gentle drainage depression	Creek bank (southern side of Quarry Creek)	SW	1	360	15	3	1	1, 3, 4, 8, 9	B	1

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QC01	24	1	MGA	293594	6420381	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	70	0	1	1, 3, 4, 8, 9	B	1
QC01	24	2	MGA	294337	6419219	Artefact Scatter	4/04/2006	MJS	Gentle simple slope	Foot slope	SE	2	360	20	10	1	2, 3, 4, 9	B	1
QC01	25	1	MGA	294576	6419425	Artefact Scatter	4/04/2006	MJS	Gentle Drainage Depression	Modified-Dam on western side of creek	SE	2	40	10	0	1	2, 3, 4, 9	B	1
QC01	26	1	MGA	294581	6419322	Artefact Scatter	4/04/2006	MJS	Gentle Drainage Depression	Foot slope on western side of creek	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	26	2	MGA	294592	6419340	Artefact Scatter	4/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	NNW	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	27	1	MGA	294629	6419373	Artefact Scatter	4/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	NNW	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	28	2	MGA	294615	6419393	Isolated Find	4/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	NNW	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	29	1	MGA	294580	6419278	Isolated Find	4/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	29	2	MGA	294538	6419264	Artefact Scatter	4/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	29	3	MGA	294570	6419317	Isolated Find	4/04/2006	MJS	Gentle Drainage Depression	Foot slope	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	30	1	MGA	294508	6419248	Artefact Scatter	4/04/2006	MJS	Gentle simple slope	Western side of creek on lower slope	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	31	1	MGA	294461	6419252	Artefact Scatter	4/04/2006	MJS	Gentle simple slope	Foot slope	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	32	1	MGA	294529	6419213	Artefact Scatter	4/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank (foot slope)	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	32	2	MGA	294569	6419218	Artefact Scatter	4/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank (foot slope)	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	33	1	MGA	294537	6419149	Artefact Scatter	4/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank (foot slope)	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	34	1	MGA	294598	6419030	Artefact Scatter	4/04/2006	MJS	Gentle simple slope	Lower slope	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1
QC01	35	1	MGA	294550	6418750	Artefact Scatter	4/04/2006	MJS	Gentle simple slope	Lower slope	SE	2	360	20	10	1	2, 3, 4, 9	A/B	1

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QC01	36	1	MGA	294625	6418705	Artefact Scatter	2/04/2006	MJS	Gentle simple slope	Lower slope near confluence	NE	1	360	15	0	2	8	A/B	1
QC01	36	2	MGA	294670	6418723	Artefact Scatter	2/04/2006	MJS	Gentle simple slope	Lower slope near confluence	NE	1	360	15	0	2	8	A/B	1
QC01	37	1	MGA	294986	6418607	Artefact Scatter	5/04/2006	MJS	Modified	Modified creek bed near eastern side of creek	SE	2	360	20	5	1	1, 2, 3, 4, 8, 9	B	3
QC01	37	2	MGA	294937	6418583	Artefact Scatter	5/04/2006	MJS	Modified	Modified creek bed near eastern side of creek	SE	2	360	20	5	1	1, 2, 3, 4, 8, 9	B	3
QC01	37	3	MGA	294951	6418631	Artefact Scatter	5/04/2006	MJS	Modified	Modified creek bed near eastern side of creek	SE	2	360	20	5	1	1, 2, 3, 4, 6, 8, 9	B	3
QC01	38	1	MGA	294813	6418675	Artefact Scatter	5/04/2006	MJS	Gentle simple slope	Lower slope on western side of creek	SE	2	360	10	0	2	1, 4	A/B	3
QC01	39	1	MGA	294864	6418904	Artefact Scatter	5/04/2006	MJS	Gentle Drainage Depression	Within centre of creek line	SE	2	360	10	0	2	1, 4	B	3
QC01	40	1	MGA	294817	6418958	Artefact Scatter	5/04/2006	MJS	Gentle Drainage Depression	Within centre of creek line	SE	2	360	10	0	2	1, 4	B	3
QC01	41	1	MGA	294808	6419027	Artefact Scatter	5/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	SE	2	360	10	0	2	1, 4	B	3
QC01	42	1	MGA	294777	6419045	Artefact Scatter	5/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	SE	2	360	10	0	2	1, 4	B	3
QC01	42	2	MGA	294762	6419057	Artefact Scatter	5/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	SE	2	360	10	0	2	1, 4	B	3
QC01	43	1	MGA	294647	6419154	Artefact Scatter	5/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	SE	2	360	10	0	2	1, 4	B	3
QC01	44	1	MGA	294698	6419114	Artefact Scatter	5/04/2006	MJS	Modified	Modified on western side of creek bank and dam construction	SE	2	360	10	0	2	1, 4	B	3
QC01	45	1	MGA	294939	6418650	Artefact Scatter	5/04/2006	MJS	Modified	Modified on western side of creek bank		2	360	10	0	2	1, 4	B	3
QC12	6	1	MGA	293818	6416726	Artefact Scatter	28/04/2006	MJS	Ridgeline Crest/Ridgeline	Crest	SE	3	360	80	10	1	1,2,6,8	B	1
QC12	7	1	MGA	293780	6416709	Artefact Scatter	28/04/2006	MJS	Ridgeline Crest/Ridgeline	Crest	SE	3	360	80	10	1	1,2,6,8	B	1

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QC03	1	1	MGA	293618	6420342	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	270	65	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	2	1	MGA	293680	6420271	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	270	70	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	3	1	MGA	293567	6420213	Isolated Find	5/05/2006	JF	Level to very gentle drainage depression	Creek line	NE	1	270	90	5	1	1, 2, 3, 4, 8, 9	B	3
QC03	4	1	MGA	293604	6420298	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	North-western side of creek bank	NE	1	270	90	5	1	1, 2, 3, 4, 8, 9	B	3
QC03	4	2	MGA	293619	6420317	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	North-western side of creek bank	NE	1	270	70	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	5	1	MGA	293590	6420193	Artefact Scatter	5/04/2006	JF	Level to very gentle drainage depression	South-eastern side of creek bank	NE	1	270	70	5	1	1, 2, 3, 4, 8, 9	B	3
QC03	6	1	MGA	293480	6419964	Isolated Find	5/04/2006	JF	Level to very gentle drainage depression	North-western side of creek bank	NE	1	270	90	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	6	2	MGA	293471	6419939	Isolated Find	5/04/2006	JF	Level to very gentle drainage depression	North-western side of creek bank	NE	1	270	90	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	7	1	MGA	293472	6419170	Isolated Find	5/04/2006	JF	Moderate to Steep Simple Slope	Upper slope	NE	3	360	90	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	8	1	MGA	293464	6419694	Artefact Scatter	5/04/2006	JF	Gentle Drainage Depression	Erosion scour in creek bank south eastern side of creek	NNE	2	360	85	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	9	1	MGA	293441	6419629	Artefact Scatter	5/04/2006	JF	Gentle Drainage Depression	Erosion scour at the edge of a drainage depression south eastern side of creek	NNE	2	360	90	10	1	1, 2, 3, 4, 8, 9	B	3
QC03	9	2	MGA	293459	6419615	Isolated Find	5/04/2006	JF	Gentle Drainage Depression	Erosion scour at the edge of a drainage depression south eastern side of creek	NNE	2	360	60	10	1	1, 2, 3, 4, 8, 9	B	3
QC03	9	3	MGA	293442	6419596	Isolated Find	5/04/2006	JF	Gentle Drainage Depression	Erosion scour at the edge of a drainage depression south eastern side of creek	NNE	2	360	70	10	1	1, 2, 3, 4, 8, 9	B	3

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QC03	10	1	MGA	293503	6420228	Isolated Find	5/04/2006	JF	Level to very gentle drainage depression	North-western side of creek bank	NNE	1	360	80	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	11	1	MGA	293499	6420169	Isolated Find	5/04/2006	JF	Level to very gentle drainage depression	North-western side of creek bank	NNE	1	360	80	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	12	1	MGA	293534	6419320	Isolated Find	26/04/2006	JF	Moderate to Steep Drainage Depression	North-western side of creek bank	NW	3	360	70	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	13	1	MGA	293609	6419133	Isolated Find	26/04/2006	JF	Ridgecrest/Ridgeline	Crest	NNW	3	360	40	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	14	1	MGA	293423	6419967	Isolated Find	26/04/2006	JF	Gentle simple slope	Lower slope	N	2	360	90	0	1	1, 2, 3, 4, 8, 9	B	3
QC03	15	1	MGA	293432	6419294	Isolated Find	26/04/2006	JF	Moderate to Steep Simple Slope	Moderate slope	N	3	360	85	0	1	1, 2, 3, 4, 8, 9	B	3
QC04	1	1	MGA	294151	6420270	Artefact Scatter	4/04/2006	JF	Gentle simple slope	Lower slope	-	2	360	80	0	1	1, 2, 3, 4, 8, 9	B	3
QC04	2	1	MGA	294238	6420331	Isolated Find	5/04/2006	JF	Moderate to Steep Simple Slope	Modified Partially/ moderate slope	W	2	360	80	0	1	1, 2, 3, 4, 8, 9	B	3
QC05	1	1	MGA	293835	6418282	Isolated Find	26/04/2006	MJS	Moderate to Steep Simple Slope	Moderate slope	NE	3	360	15	0	1	1, 2, 3, 8, 9	B	3
QC05	1	2	MGA	293834	6418268	Artefact Scatter	26/04/2006	MJS	Moderate to steep simple slope	Moderate slope	NE	3	360	15	0	1	1, 2, 3, 8, 9	B	3
QC05	1	3	MGA	293872	6418259	Isolated Find	26/04/2006	MJS	Moderate to steep simple slope	Moderate slope	NE	3	360	15	0	1	1, 2, 3, 8, 9	B	3
QC05	2	1	MGA	293935	6418239	Artefact Scatter	26/04/2006	MJS	Moderate to steep simple slope	Moderate slope	NE	3	360	15	0	1	1, 2, 3, 8, 9	B	3
QC05	3	1	MGA	294059	6418215	Artefact Scatter	26/04/2006	MJS	Gentle Drainage Depression	Western side of creek bank	NE	2	360	15	0	1	1, 2, 3, 8, 9	B	3
QC05	4	1	MGA	294164	6418255	Isolated Find	26/04/2006	MJS	Gentle simple slope	Lower slope	NE	2	360	30	5	1	3, 8,	B	1
QC05	5	1	MGA	294392	6418238	Artefact Scatter	26/04/2006	MJS	Gentle simple slope	Modified track - lower slope	NE	2	360	80	10	1	2, 8, 9	B	3
QC05	6	1	MGA	293482	6418142	Isolated Find	27/04/2006	MJS	Moderate to Steep Drainage Depression	Creek bank on south western side of creek	N	3	360	30	10	1	1, 2, 3, 8	B	3
QC05	7	1	MGA	293538	6418108	Artefact Scatter	27/04/2006	MJS	Moderate to Steep Drainage Depression	Creek bank on south western side of creek	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	B	3

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QC05	7	2	MGA	293564	6418129	Isolated Find	27/04/2006	MJS	Moderate to Steep Drainage Depression	Creek bank on south western side of creek	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	7	3	MGA	293587	6418134	Isolated Find	27/04/2006	MJS	Moderate to Steep Drainage Depression	Creek bank on south western side of creek	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	8	1	MGA	293601	6418149	Isolated Find	27/04/2006	MJS	Moderate to Steep Drainage Depression	Creek bank on north western side of creek bank	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	9	1	MGA	293788	6418146	Artefact Scatter	27/04/2006	MJS	Moderate to Steep Simple Slope	Modified dam - mid slope	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	10	1	MGA	293727	6418087	Artefact Scatter	27/04/2006	MJS	Moderate to Steep Drainage Depression	South western side of creek bank	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	A/B	3
QC05	11	1	MGA	293809	6418071	Isolated Find	27/04/2006	MJS	Moderate to Steep Drainage Depression	South western side of creek bank	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	11	2	MGA	293840	6418051	Isolated Find	27/04/2006	MJS	Moderate to Steep Simple Slope	Moderate slope	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	12	1	MGA	293872	6418057	Isolated Find	27/04/2006	MJS	Moderate to Steep Drainage Depression	South western side of creek bank	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	12	2	MGA	293887	6418098	Artefact Scatter	27/04/2006	MJS	Moderate to Steep Drainage Depression	North-western side of creek bank	N	3	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	12	3	MGA	293906	6418089	Artefact Scatter	27/04/2006	MJS	Gentle Drainage Depression	North-western side of creek bank	N	2	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	13	1	MGA	294004	6418083	Artefact Scatter	27/04/2006	MJS	Gentle Drainage Depression	South western side of creek bank	N	2	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	13	2	MGA	294033	6418052	Artefact Scatter	27/04/2006	MJS	Gentle Drainage Depression	South western side of creek bank	N	2	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC05	14	1	MGA	294077	6418097	Artefact Scatter	27/04/2006	MJS	Gentle Drainage Depression	South western side of creek bank	N	2	360	30	10	1	1, 2, 3, 6, 8, 9	B	3
QC06	1	1	MGA	293947	6418904	Artefact Scatter	28/04/2006	MJS	Moderate to Steep Drainage Depression	North eastern side of creek bank	SW	3	360	15	0	1	2, 3, 4, 6, 8	B	1
QC06	1	2	MGA	293903	6418868	Artefact Scatter	26/04/2006	MJS	Moderate to Steep Drainage Depression	North eastern side of creek bank	SW	3	360	15	0	1	2, 3, 4, 6, 8	B	1
QC06	2	1	MGA	293892	6418858	Artefact Scatter	26/04/2006	MJS	Moderate to Steep Drainage Depression	North eastern side of creek bank	SW	3	360	15	0	1	2, 3, 4, 6, 8	B	1

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QC06	3	1	MGA	293869	6418836	Artefact Scatter	26/04/2006	MJS	Moderate to Steep Drainage Depression	North eastern side of creek bank	SW	3	360	15	0	1	2, 3, 4, 6, 8	B	1
QC06	4	1	MGA	293698	6418749	Isolated Find	26/04/2006	MJS	Moderate to Steep Drainage Depression	North eastern side of creek bank	SW	3	360	15	0	1	2, 3, 4, 6, 8	B	1
QC06	5	1	MGA	293765	6418817	Isolated Find	26/04/2006	MJS	Moderate to Steep Simple Slope	Lower slope	SW	3	360	15	0	1	2, 3, 4, 6, 8	B	1
QC06	6	1	MGA	293677	6418782	Isolated Find	26/04/2006	MJS	Moderate to Steep Simple Slope	Mid slope	SW	3	360	15	0	1	2, 3, 4, 6, 8	B	1
QC06	7	1	MGA	293644	6418834	Artefact Scatter	26/04/2006	MJS	Moderate to Steep Simple Slope	Lower slope	SW	3	360	15	0	1	2, 3, 4, 6, 8	B	1
QC06	8	1	MGA	293599	6418788	Artefact Scatter	26/04/2006	MJS	Moderate to Steep Drainage Depression	south western side of creek bank (foot slope)	SW	3	360	15	0	1	2, 3, 4, 6, 8	B	1
QC06	9	1	MGA	293794	6418713	Isolated Find	26/04/2006	MJS	Moderate to Steep Simple Slope	Mid slope	SW	3	360	25	0	1	1,2, 3, 8	B	1
QC06	9	2	MGA	293833	6418708	Isolated Find	26/04/2006	MJS	Moderate to Steep Simple Slope	Mid slope	SW	3	360	40	5	1	1,2, 3, 8	B	1
QC06	10	1	MGA	293928	6418713	Artefact Scatter	26/04/2006	MJS	Moderate to Steep Simple Slope	Mid slope	SW	3	360	30	1	1	1,2, 3, 8	B	1
QC06	11	1	MGA	293833	6418832	Isolated Find	26/04/2006	MJS	Moderate to Steep Drainage Depression	North western side of creek bank	SW	3	360	20	5	1	1, 2, 3, 8, 9	B	1
QC07	1	1	MGA	293054	6418602	Artefact Scatter	28/04/2006	JF	Moderate to Steep Drainage Depression	Southern side of creek bank	WNW	3	360	40	0	2	1, 2	A/B	3
QC07	2	1	MGA	293100	6418570	Artefact Scatter	28/04/2006	JF	Moderate to Steep Simple Slope	Bench	WNW	3	360	40	5	2	1, 2	A/B	3
QC07	2	2	MGA	293139	6418541	Isolated Artefact	28/04/2006	JF	Moderate to Steep Drainage Depression	South-eastern side of creek bank	WNW	3	360	40	5	2	1, 2	A/B	3
QC07	3	1	MGA	293176	6418619	Isolated Find	28/04/2006	JF	Moderate to Steep Drainage Depression	Southern side of creek bank	WNW	3	360	40	5	2	1, 2	A/B	3
QC07	4	1	MGA	293119	6418648	Artefact Scatter	28/04/2006	JF	Moderate to Steep Simple Slope	Mid slope	WNW	3	360	40	5	2	1, 2	A/B	3
QC07	4	2	MGA	293103	6418676	Artefact Scatter	28/04/2006	JF	Moderate to Steep Drainage Depression	Northern Side of Creek bank	WNW	3	360	70	0	2	1, 2	A/B	3
QC08	1	1	MGA	292967	6418412	Artefact Scatter	28/04/2006	JF	Moderate to Steep Drainage Depression	Creek line (northern side)	WNW	3	360	60	10	2	1, 2	A/B	3

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QC09	1	1	MGA	293131	6418077	Isolated Find	28/04/2006	JF	Moderate to Steep Simple Slope	Upper slope	NW	3	360	70	0	2	1,2,3	A/B	3
QC09	2	1	MGA	293156	6418153	Artefact Scatter	28/04/2006	JF	Moderate to Steep Simple Slope	Upper slope	NW	3	360	60	0	2	1, 2, 3, 4	A/B	3
QC09	3	1	MGA	293105	6418157	Isolated Find	28/04/2006	JF	Moderate to Steep Drainage Depression	North western side of creek bank	NW	3	360	100	0	2	1, 2, 3, 4	A/B	3
QC09	4	1	MGA	293033	6418193	Isolated Find	28/04/2006	JF	Moderate to Steep Drainage Depression	North western side of creek bank	NW	3	360	80	0	2	1, 2, 3, 4	A/B	3
QC09	5	1	MGA	293003	6418239	Artefact Scatter	28/04/2006	JF	Moderate to Steep Drainage Depression	North western side of creek bank	NW	3	360	95	0	2	1, 2, 3, 4	A/B	3
QC09	5	2	MGA	293001	6418207	Isolated Find	28/04/2006	JF	Moderate to Steep Drainage Depression	North western side of creek bank	NW	3	360	95	0	2	1, 2, 3, 4	A/B	3
QC09	6	1	MGA	292932	6418246	Artefact Scatter	28/04/2006	JF	Moderate to Steep Drainage Depression	South western side of creek bank	NW	3	360	95	0	1	1, 2, 3, 6	B	1
QC09	6	2	MGA	292942	6418239	Isolated Find	28/04/2006	JF	Moderate to Steep Drainage Depression	South western side of creek bank	NW	3	360	95	0	1	1, 2, 3, 6	B	1
QC10	1	1	MGA	292593	6418712	Isolated Find	27/094/2006	JF	Moderate to Steep Drainage Depression	South western side of creek bank	NNE	3	360	75	0	1	1, 2, 3, 6, 8, 9	B	3
QC10	2	1	MGA	292619	6418767	Isolated Find	27/094/2006	JF	Moderate to Steep Drainage Depression	South western side of creek bank	NNE	3	360	70	0	1	1, 2, 3, 6, 8, 9	B	3
QC10	3	1	MGA	292631	6418844	Isolated Find	27/094/2006	JF	Moderate to Steep Drainage Depression	South western side of creek bank	NNE	3	360	70	0	1	1, 2, 3, 6, 8, 9	B	3
QC11	1	1	MGA	292278	6417996	Isolated Artefact	3/05/2006	JF	Moderate to Steep Drainage Depression	South eastern side of creek bank	NW	3	360	30	30	1	1,2	B	3
QC11	2	1	MGA	292236	6418075	Isolated Artefact	3/05/2006	JF	Moderate to Steep Drainage Depression	South eastern side of creek bank	NW	3	360	90	10	1	1,2	B	3
QC11	3	1	MGA	292186	6418034	Artefact Scatter	3/05/2006	JF	Moderate to Steep Drainage Depression	South western side of creek bank	NW	3	360	20	20	1	1,2	B	3
QC11	4	1	MGA	292170	6418158	Artefact Scatter	3/05/2006	JF	Moderate to Steep Drainage Depression	North eastern side of creek bank	NW	3	360	70	0	1	1,2	B	3
QC11	4	2	MGA	292161	6418186	Isolated Find	3/05/2006	JF	Moderate to Steep Drainage Depression	North eastern side of creek bank	NW	3	360	85	0	1	1,2	B	3
QC11	4	3	MGA	292170	6418200	Artefact Scatter	3/05/2006	JF	Moderate to Steep Drainage Depression	North eastern side of creek bank	NW	3	360	60	15	1	1,2	B	3

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QC12	1	1	MGA	293681	6416836	Artefact Scatter	28/04/2006	MJS	Moderate to Steep Drainage Depression	South western side of creek bank	SE	3	360	80	10	1	1,2,6,8	A/B	1
QC12	2	1	MGA	293396	6416895	Isolated Find	27/04/2006	MJS	Moderate to Steep Drainage Depression	North western side of creek bank (foot slope)	SW	3	360	20	5	1	1, 2, 3, 6, 8, 9	B	1
QC12	3	1	MGA	293727	6417145	Artefact Scatter	27/04/2006	MJS	Moderate to Steep Simple Slope	Dam	SW	3	360	20	5	1	1, 2, 3, 6, 8, 9	A/B	3
QC12	4	1	MGA	293740	6417150	Artefact Scatter	27/04/2006	MJS	Moderate to Steep Simple Slope	Track	SW	3	360	20	5	1	1, 2, 3, 6, 8, 9	B	3
QC12	5	1	MGA	293278	6416754	Isolated Find	27/04/2006	MJS	Moderate to Steep Simple Slope	Lower slope	SW	3	360	20	5	1	1, 2, 3, 6, 8, 9	B	3
QC13	1	1	MGA	294108	6420482	Isolated Find	5/04/2006	JF	Gentle simple slope	Lower slope	SW	2	270	80	0	1	1, 2, 3, 6, 8, 9	B	3
QC14	1	1	MGA	292391	6417560	Artefact Scatter	3/05/2006	JF	Ridgeline Crest	Crest	-	3	360	40	10	1	1, 2, 3, 6, 8, 9	B	3
QC14	2	1	MGA	292606	6417579	Isolated Find	27/094/2006	JF	Ridgeline Crest	Crest	-	3	360	80	0	1	1, 2, 3, 6, 8, 9	B	3
QC15	1	1	MGA	294813	6420105	Isolated Find	4/04/2006	JF	Moderate to Steep Drainage Depression	south eastern side of creek bank (foot slope)	-	3	360	95	0	1	1, 2, 3, 6, 8, 9	B	3
QC16	1	1	MGA	293219	6418295	Isolated Find	26/04/2006	JF	Moderate to Steep Simple Slope	Upper slope	-	3	360	70	5	1	1, 2, 3, 6, 8, 9	B	3
QC17	1	1	MGA	292499	6419330	Artefact Scatter	27/04/2006	JF	Gentle Drainage Depression	Western side of creek bank (foot slope)	NW	3	360	85	0	1	1, 2, 3, 6, 8, 9	B	3
QC18	1	1	MGA	291908	6418221	Isolated Find	2/05/2006	JF	Moderate to Steep Simple Slope	Moderate slope	N	3	360	30	30	1	1, 2, 3, 6, 8, 9	B	3
QC19	1	1	MGA	292116	6419002	Isolated Find	3/05/2006	JF	Moderate to Steep Drainage Depression	Eastern side of creek bank (foot slope)	NNE	3	360	100	0	1	1, 2, 3, 6, 8, 9	B	3
QC19	2	1	MGA	292358	6419076	Isolated Find	3/05/2006	JF	Moderate to Steep Drainage Depression	Eastern side of creek bank (foot slope)	-	3	360	95	0	1	1, 2, 3, 6, 8, 9	B	3
QC19	3	1	MGA	292360	6419094	Artefact Scatter	3/05/2006	JF	Moderate to Steep Drainage Depression	Eastern side of creek bank (foot slope)	-	3	360	95	0	1	1, 2, 3, 6, 8, 9	B	3
QC20	1	1	MGA	294608	6419750	Artefact Scatter	3/04/2006	MJS	Gentle Drainage Depression	North eastern side of creek bank	SE	2	360	50	5	1	6	B	1
QC21	1	1	MGA	293288	6416601	Isolated Find	27/04/2006	MJS	Ridge line/Ridge Crest	Ridge Line/Ridge Crest	NW	3	360	20	5	1	1, 2, 3, 6, 8, 9	B	3

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QC02	1	1	MGA	293667	6417397	Scarred Tree		MJS	Spur crest	Spur crest	n/a	3	360	20	5	N/AT195T194	n/a	n/a	3
QC02	3	1	MGA	292479	6417547	Isolated Find	3/05/2006	JF	Ridge line/Ridge Crest	Crest	-	3	360	40	10	1	1, 2, 3, 6, 8, 9	B	3
SC01	1	1	MGA	300906	6415908	Isolated Find	30/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	NW	1	360	5	0	2	1, 4	2	1
SC01	2	1	MGA	300820	6415777	Isolated Find	30/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	NW	1	360	5	0	2	1, 4	2	1
SC01	2	2	MGA	300803	6415753	Isolated Find	30/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	NW	1	360	5	0	2	1, 4	2	1
SC01	3	1	MGA	300599	6415336	Isolated Find	30/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	5	0	3	1, 4.	A	1
SC01	4	1	MGA	300581	6415530	Artefact Scatter	30/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	5	0	3	1, 4.	A	1
SC01	5	1	MGA	300391	6415220	Artefact Scatter	30/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	5	0	3	1, 4.	A	1
SC01	5	2	MGA	300269	6415104	Artefact Scatter	30/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	5	0	3	1, 4.	A	1
SC01	6	1	MGA	300301	6415043	Isolated Find	31/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	5	0	3	1,4,8	A	3
SC01	7	1	MGA	300239	6414844	Artefact Scatter	31/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SE	1	90	20	0	1	6,1,2,4,	B	3
SC01	7	2	MGA	300402	6414954	Artefact Scatter	31/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	NE	1	90	20	0	1	6,1,2,4,	B	3
SC01	8	1	MGA	300128	6414678	Artefact Scatter	31/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	W	1	270	90	5	1	8,6	B	3
SC01	8	2	MGA	300081	6414625	Artefact Scatter	31/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	N	1	360	70	0	2	9	A/B	3
SC01	9	1	MGA	300115	6414199	Artefact Scatter	31/01/2006	MJS	Level to very gentle drainage depression	Creek terrace	SE	1	360	5	0	2	1, 4	A/B	3
SC01	10	1	MGA	300137	6414179	Artefact Scatter	31/01/2006	MJS	Level to very gentle drainage depression	Creek terrace	SE	1	360	5	0	2	1, 3, 4, 8, 9	A/B	3
SC01	11	1	MGA	300161	6414083	Artefact Scatter	31/01/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	NW	1	90	25	3	1	1, 9	B	3

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SC01	12	1	MGA	300067	6413987	Artefact Scatter	1/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	220	15	0	2	1, 8,9	A/B	1
SC01	13	1	MGA	299983	6413890	Artefact Scatter	1/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	90	15	0	3	1, 3, 8	B	1
SC01	14	1	MGA	300150	6413789	Artefact Scatter	1/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	NE	1	360	10	0	2	1, 3, 8	A/B	1
SC01	15	1	MGA	300251	6414085	Artefact Scatter	1/02/2006	MJS	Level to very gentle simple slope	Eastern side of creek bank	NE	1	360	15	15	3	8	A/B	1
SC01	16	1	MGA	300105	6413927	Artefact Scatter	1/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NE	2	360	15	15	3	8	A/B	1
SC01	17	1	MGA	300324	6414231	Artefact Scatter	1/02/2006	MJS	Moderate to Steep Drainage Depression	Eastern side of creek bank	SW	3	360	40	5	1	3, 4, 8, 9	B	1
SC01	18	1	MGA	299438	6413839	Artefact Scatter	1/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	S	1	360	20	5	2	1, 3, 4, 8	A/B	3
SC01	19	1	MGA	299734	6413839	Artefact Scatter	1/02/2006	MJS	Gentle Drainage Depression.	Eastern side of creek bank	W	2	360	80	5	1	6	B	1
SC01	19	2	MGA	299843	6413833	Artefact Scatter	1/02/2006	MJS	Gentle Drainage Depression.	Eastern side of creek bank	W	2	360	80	5	0	1, 3, 4, 8	A/B	
SC01	20	1	MGA	299923	6413813	Artefact Scatter	1/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SE	1	360	20	10	1	1 to 9	B	1
SC01	21	1	MGA	296492	6412681	Artefact Scatter	3/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	30	10	2	1,2,3,6,8,9	A/B	3
SC01	22	1	MGA	296071	6412440	Artefact Scatter	3/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	30	10	2	2, 3, 4, 6, 8, 9	A/B	1
SC01	22	2	MGA	296131	6412508	Artefact Scatter	3/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	30	10	2	2, 3, 4, 6, 8, 9	A/B	1
SC01	23	1	MGA	298669	6413510	Isolated Find	6/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	20	5	3	8	A	1
SC01	24	1	MGA	298623	6413459	Artefact Scatter	6/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	20	10	3	3,8	A	3
SC01	25	1	MGA	298337	6413428	Artefact Scatter	6/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	NW	1	360	40	15	1	3, 4, 8, 9	A/B and B in gullies	1
SC01	26	1	MGA	298168	6413324	Artefact Scatter	6/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SE	1	360	10	10	2	3, 4, 8,	A/B and B in gullies	3

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SC01	27	1	MGA	298214	6413245	Artefact Scatter	6/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	W	1	360	15	15	2	1, 8,	A/B	3
SC01	28	1	MGA	298080	6413147	Artefact Scatter	6/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	15	15	2	3	A/B	3
SC01	28	2	MGA	298060	6413143	Artefact Scatter	6/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	15	15	2	2, 3, 4, 6, 8, 9	A/B	1
SC01	29	1	MGA	297651	6412985	Artefact Scatter	6/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	SW	1	360	15	15	2	3	A/B	3
SC01	30	1	MGA	297977	6413093	Artefact Scatter	6/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	NW	1	360	20	5	2	3	A/B	3
SC01	30	2	MGA	297978	6413091	Artefact Scatter	6/02/2006	MJS	Gentle simple slope	Eastern side of creek bank	NW	2	360	20	5	2	3	A/B	3
SC01	31	1	MGA	296674	6412915	Artefact Scatter	10/02/2006	MJS	Gentle Drainage Depression	Northern Side of Creek bank	SE	2	360	85	40	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	31	2	MGA	296694	6412898	Artefact Scatter	10/02/2006	MJS	Level to very gentle simple slope	Bench	SE	1	360	85	40	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	32	1	MGA	297278	6413155	Artefact Scatter	10/02/2006	MJS	Level to very gentle simple slope	Lower slope	NW	1	360	30	10	1	1, 2, 3, 4, 8, 9	B	1
SC01	33	1	MGA	300875	6415477	Artefact Scatter	30/01/2006	JF	Level to very gentle drainage depression	Creek line (stat)	W	1	360	65	5	3	1,2,4	A	3
SC01	34	1	MGA	300832	6415487	Artefact Scatter	30/01/2006	JF	Level to very gentle drainage depression	Creek line (stat)	W	1	360	65	5	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	34	2	MGA	300834	6415468	Artefact Scatter	30/01/2006	JF	Level to very gentle drainage depression	Creek line (southern side)	W	1	360	65	5	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	35	1	MGA	300686	6415400	Artefact Scatter	30/01/2006	JF	Level to very gentle drainage depression	Creek line (southern side)	-	1	360	70	0	3	1,2,4	A	3
SC01	36	1	MGA	300556	6415464	Artefact Scatter	30/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	70	0	1	1,2,4	A/B	3
SC01	36	2	MGA	300586	6415468	Artefact Scatter	30/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	70	0	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	36	3	MGA	300531	6415493	Artefact Scatter	30/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	35	35	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	36	4	MGA	300540	6415464	Isolated Find	30/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	35	35	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1

Table 1: Environmental Description of Archaeological Sites

Final Name	Loci	Component	Co-ordinate System	Easting	Northing	Site type	Date Recorded	Recorded By	Archaeological Terrain Unit	Landform Element	Aspect	Slope	Outlook	Visibility Inside Exposure	Visibility Outside Exposure	Erosion State	Erosion Form	Erosion Extent	Vegetation
SC01	37	1	MGA	300532	6415415	Artefact Scatter	30/01/2006		Level to very gentle drainage depression	Creek line (western side)	-	1	360	35	35	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	38	1	MGA	300190	6415250	Isolated find	31/01/2006	JF	Level to very gentle drainage depression	Modified	-	1	360	80	5	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	39	1	MGA	300149	6415134	Artefact Scatter	31/01/2006	JF	Level to very gentle simple slope	Lower slope	-	1	360	80	5	3	1,2,4	A	3
SC01	39	2	MGA	300146	6415075	Artefact Scatter	31/01/2006	JF	Level to very gentle simple slope	Lower slope	-	1	360	80	5	3	1,2,4	A	3
SC01	40	1	MGA	300136	6414998	Artefact Scatter	31/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	80	20	3	1,2,4	A	3
SC01	41	1	MGA	300032	6414912	Artefact Scatter	31/01/2006	JF	Level to very gentle simple slope	Lower slope	-	1	360	80	20	3	1,2,4	A	3
SC01	42	1	MGA	300082	6414763	Isolated Find	31/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	70	0	3	1,2,4	A	3
SC01	43	1	MGA	300032	6414478	Artefact Scatter	31/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	70	10	3	1,2,4	A	3
SC01	44	1	MGA	300000	6414416	Artefact Scatter	31/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	75	20	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	44	2	MGA	300012	6414391	Artefact Scatter	31/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	90	20	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	44	3	MGA	300029	6414380	Artefact Scatter	31/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	5	0	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	45	1	MGA	300031	6414348	Artefact Scatter	31/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	50	5	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	46	1	MGA	300043	6414272	Artefact Scatter	31/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	50	20	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	47	1	MGA	300057	6414151	Artefact Scatter	31/01/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	75	15	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	48	1	MGA	300042	6414091	Artefact Scatter	1/02/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	80	15	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	48	2	MGA	300003	6414066	Artefact Scatter	1/02/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	80	15	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	49	1	MGA	299853	6413996	Artefact Scatter	1/02/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	60	20	3	1,2,4	A	3

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Final Name	Loci	Component	Co-ordinate System	Easting	Northing	Site type	Date Recorded	Recorded By	Archaeological Terrain Unit	Landform Element	Aspect	Slope	Outlook	Visibility Inside Exposure	Visibility Outside Exposure	Erosion State	Erosion Form	Erosion Extent	Vegetation
SC01	50	1	MGA	299699	6413978	Artefact Scatter	1/02/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	70	40	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	51	1	MGA	299278	6413995	Isolated Find	1/02/2006	JF	Level to very gentle drainage depression	Creek line (western side)	-	1	360	70	NA	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	52	1	MGA	299165	6413930	Artefact Scatter	1/02/2006	JF	Level to very gentle simple slope	Lower slope	-	1	360	70	20	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	53	1	MGA	298609	6413926	Artefact Scatter	1/02/2006	JF	Level to very gentle drainage depression	Creek line (meandering section of Saddlers creek - northern bank)	-	1	360	20	35	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	54	1	MGA	298579	6413848	Artefact Scatter	1/02/2006	JF	Level to very gentle drainage depression	Creek line (meandering section of Saddlers creek - western bank)	-	1	360	60	20	1	1, 2, 3, 4, 5, 6, 7, 8, 9	B	1
SC01	55	1	MGA	298571	6413604	Artefact Scatter	1/02/2006	JF	Level to very gentle drainage depression	Creek terrace on northern side of creek bank	-	1	360	40	40	2	1, 2, 3	A/B	3
SC01	56	1	MGA	296383	6412695	Artefact Scatter	3/02/2006	MJS	Level to very gentle drainage depression	Northern Side of Creek bank	N	1	360	40	40	2	1, 2, 3	A/B	3
SC01	57	1	MGA	300568	6415315	Artefact Scatter		MJS	Level to very gentle drainage depression	Eastern side of creek bank	N	1	360	40	40	1	3,8	B	1
SC01	57	2	MGA	300521	6415297	Artefact Scatter		MJS	Level to very gentle drainage depression	Eastern side of creek bank	N	1	360	40	40	1	3,8	B	1
SC01	58	1	MGA	300481	6415299	Artefact Scatter		MJS	Level to very gentle drainage depression	Eastern side of creek bank	E	1	360	40	40	1	3,8	B	1
SC01	58	2	MGA	300457	6415329	Artefact Scatter		MJS	Level to very gentle drainage depression	Eastern side of creek bank	E	1	360	40	40	1	3,8	B	1
SC02	1	1	MGA	297158	6413729	Artefact Scatter	10/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	30	10	1	1, 2, 3, 4, 8, 9	B	1
SC02	1	2	MGA	297104	6413778	Artefact Scatter	10/02/2006	MJS	Gentle drainage depression	Eastern side of creek bank	NW	2	360	30	10	1	1, 2, 3, 4, 8, 9	B	1
SC02	2	1	MGA	297316	6413271	Artefact Scatter	10/02/2006	JF	Moderate to Steep Drainage Depression	Western side of creek bank	-	3	360	30	10	1	1, 2, 3, 4, 8, 9	B	1
SC02	3	1	MGA	296994	6414075	Isolated Find	10/02/2006	JF	Moderate to Steep Drainage Depression	Western side of creek bank	-	3	360	90	0	1	1, 2, 3, 4, 8, 9	B	1

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SC02	4	1	MGA	296895	6414131	Artefact Scatter	10/02/2006	JF	Moderate to Steep Drainage Depression	Western side of creek bank	S	3	360	70	70	1	1, 2, 3, 4, 8, 9	B	1
SC02	4	2	MGA	296884	6414177	Isolated Find	10/02/2006	JF	Moderate to Steep Drainage Depression	Western side of creek bank	S	3	360	70	70	1	1, 2, 3, 4, 8, 9	B	1
SC02	5	1	MGA	297333	6413418	Artefact Scatter	10/02/2006	JF	Very gentle simple slope	Lower slope	S	1	360	90	60	1	1, 2, 3, 4, 8, 9	B	1
SC02	5	2	MGA	297327	6413402	Isolated Find	10/02/2006	JF	Level to very gentle drainage depression	Eastern side of creek bank	-	1	360	80	5	1	1, 2, 3, 4, 8, 9	B	1
SC02	6	1	MGA	297277	6413437	Artefact Scatter	10/02/2006	JF	Level to very gentle drainage depression	Creek line (eastern side)	-	1	360	80	60	1	1, 2, 3, 4, 8, 9	B	1
SC02	7	1	MGA	297378	6413194	Isolated Find	10/02/2006	JF	Level to very gentle simple slope	Lower slope	-	1	360	80	50	1	1, 2, 3, 4, 8, 9	B	1
SC02	8	1	MGA	297316	6413271	Artefact Scatter	10/02/2006	JF	Level to very gentle drainage depression	Eastern side of creek bank	-	1	360	80	60	1	1, 2, 3, 4, 8, 9	B	1
SC02	9	1	MGA	297019	6414020	Artefact Scatter	5/04/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	NE	3	360	20	2	1	1, 2, 3, 4, 8, 9	B	1
SC02	9	2	MGA	297013	6414023	Artefact Scatter	5/04/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	NE	3	360	20	2	1	1, 2, 3, 4, 8, 9	B	1
SC02	10	1	MGA	296991	6414069	Artefact Scatter	5/04/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	NE	3	360	20	2	1	1, 2, 3, 4, 8, 9	B	1
SC02	10	2	MGA	296898	6414073	Artefact Scatter	5/04/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	NE	3	360	20	2	1	1, 2, 3, 4, 8, 9	B	1
SC02	11	1	MGA	296893	6414132	Artefact Scatter	5/04/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	NE	3	360	20	2	1	1, 2, 3, 4, 8, 9	B	1
SC02	12	1	MGA	296901	6414053	Artefact Scatter	5/04/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	NE	3	360	20	2	1	1, 2, 3, 4, 8, 9	B	1
SC03	1	1	MGA	297299	6414910	Isolated Artefact	9/02/2006	JF	Moderate to Steep Drainage Depression	South eastern side of creek bank	SSE	3	360	20	2	1	1, 2, 3, 4, 8, 9	B	1
SC03	1	2	MGA	297278	6414869	Isolated Artefact	9/02/2006	JF	Moderate to Steep Drainage Depression	South eastern side of creek bank	SSE	3	360	60	60	1	1, 2, 3, 4, 8, 9	B	1
SC03	1	3	MGA	297312	6414883	Artefact Scatter	5/04/2006	MJS	Moderate to steep simple slope	South eastern side of creek bank	NW	3	360	30	10	1	1, 3, 6, 8	B	3
SC03	2	1	MGA	297217	6414832	Isolated Find	5/04/2006	MJS	Moderate to steep simple slope	Modified due to dam/ partially moderate slope	NW	3	360	30	10	1	1, 3, 6, 8	B	3

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SC03	3	1	MGA	297196	6414888	Isolated Find	5/04/2006	MJS	Moderate to Steep Drainage Depression	south western side of creek bank	NW	3	360	30	10	1	1, 3, 6, 8	B	3
SC03	3	2	MGA	297174	6414838	Isolated Find	5/04/2006	MJS	Moderate to Steep Simple slope	Modified due to dam	NW	3	360	30	10	1	1, 3, 6, 8	B	3
SC03	3	3	MGA	297150	6414850	Isolated Find	5/04/2006	MJS	Moderate to Steep Drainage Depression	south western side of creek bank	NW	3	360	30	10	1	1, 3, 6, 8	B	3
SC03	4	1	MGA	297326	6414990	Artefact Scatter	5/04/2006	MJS	Moderate to Steep Drainage Depression	Modified due to dam	NW	3	360	30	10	1	1, 3, 6, 8	B	3
SC04	1	1	MGA	294867	6414425	Artefact Scatter	7/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	N	1	360	80	0	1	1, 2, 3, 4, 8, 9	B	1
SC04	1	2	MGA	295030	6414299	Artefact Scatter	7/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	N	1	360	80	0	1	1, 2, 3, 4, 8, 9	B	1
SC04	1	3	MGA	294689	6414467	Artefact Scatter	7/02/2006	MJS	Gentle simple slope	Lower slope	N	2	360	80	0	1	1, 2, 3, 4, 8, 9	B	1
SC04	1	4	MGA	295075	6414299	Artefact Scatter	7/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	N	1	360	80	0	1	1, 2, 3, 4, 8, 9	B	1
SC04	2	1	MGA	295082	6414286	Isolated Find	7/02/2006	MJS	Level to very gentle drainage depression	Western side of creek bank	NW	1	360	20	0	2	1, 8	A/B	3
SC04	2	2	MGA	295032	6414297	Isolated Find	7/02/2006		Level to very gentle drainage depression	Western side of creek bank	NW	1	360	20	0	2	1, 8	A/B	3
SC04	2	3	MGA	294687	6414425	Isolated Find	7/02/2006	MJS	Gentle simple slope	Lower slope	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	1	MGA	295111	6414270	Artefact Scatter	7/02/2006	MJS	Level to very gentle drainage depression	Eastern side of creek bank	NW	1	360	20	0	2	1, 8	A/B	3
SC04	3	2	MGA	294993	6414383	Artefact Scatter	7/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	3	MGA	294879	6414529	Isolated Find	7/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	4	MGA	294771	6414688	Artefact Scatter	7/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	5	MGA	294767	6414682	Isolated Find	7/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	6	MGA	294733	6414710	Artefact Scatter	7/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3

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SC04	3	6	MGA	294635	6414694	Artefact Scatter	7/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	8	MGA	294592	6414770	Isolated Find	7/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	9	MGA	294687	6414696	Isolated Find	7/02/2006	MJS	Gentle Drainage Depression	Western side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	10	MGA	294824	6414470	Artefact Scatter	7/02/2006	MJS	Gentle Drainage Depression	Western side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	11	MGA	294769	6414518	Isolated Find	7/02/2006	MJS	Gentle simple slope	Lower slope	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	12	MGA	294762	6414590	Isolated Find	7/02/2006	MJS	Gentle drainage depression	Western side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	13	MGA	294746	6414543	Artefact Scatter	7/02/2006	MJS	Gentle simple slope	Lower slope	NW	2	360	20	0	2	1, 8	A/B	3
SC04	3	14	MGA	294735	6414635	Artefact Scatter	7/02/2006	MJS	Gentle Drainage Depression	Western side of creek bank	NW	2	360	20	0	2	1, 8	A/B	3
SC04	4	1	MGA	294551	6414807	Artefact Scatter	8/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	SE	2	360	80	0	2	1, 8	A/B	3
SC04	5	1	MGA	294491	6414966	Artefact Scatter	8/02/2006	JF	Gentle Drainage Depression	Eastern side of creek bank	SE	2	360	70	0	2	1, 8	A/B	3
SC04	6	1	MGA	294544	6414888	Artefact Scatter	8/02/2006	JF	Gentle Drainage Depression	Eastern side of creek bank	SE	2	360	75	0	2	1, 8	A/B	3
SC04	6	2	MGA	294519	6414846	Artefact Scatter	8/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	SE	2	360	70	0	2	1, 8	A/B	3
SC05	1	1	MGA	295976	6414592	Isolated Find	9/02/2006	MJS	Modified	Western side of modified creek bank	S	2	360	90	20	1	1, 3, 8, 9	B	1
SC05	1	2	MGA	295991	6414558	Artefact Scatter	9/02/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	S	2	360	90	20	1	1, 3, 8, 9	B	1
SC05	1	3	MGA	295693	6414473	Artefact Scatter	9/02/2006	MJS	Gentle Drainage Depression	Southern side of creek bank	S	2	360	90	20	1	1, 3, 8, 9	B	1
SC05	1	4	MGA	295915	6414473	Artefact Scatter	9/02/2006	MJS	Gentle Drainage Depression	Southern side of creek bank	S	2	360	90	20	1	1, 3, 8, 9	B	1
SC05	1	5	MGA	295779	6414463	Artefact Scatter	9/02/2006	MJS	Gentle Drainage Depression	Southern side of creek bank	S	2	360	90	20	1	1, 3, 8, 9	B	1

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SC05	1	6	MGA	295758	6414471	Isolated Find	9/02/2006	MJS	Gentle Drainage Depression	Southern side of creek bank	S	2	360	90	20	1	1, 3, 8, 9	B	1
SC05	1	7	MGA	295657	6414677	Isolated Find	9/02/2006	MJS	Gentle Drainage Depression	Western side of creek bank	S	2	360	90	20	1	1, 3, 8, 9	B	1
SC05	2	1	MGA	295604	6414874	Artefact Scatter	9/02/2006	MJS	Modified	Western side of creek bank (foot slope)	SE	2	360	90	20	1	1, 3, 8, 9	B	1
SC05	2	2	MGA	295894	6414740	Isolated Find	9/02/2006	MJS	Modified	Modified	SE	2	360	10	0	1	1, 3, 8, 9	A/B	1
SC05	3	1	MGA	295455	6415017	Artefact Scatter	9/02/2006	JF	Gentle Drainage Depression	Eastern side of creek bank	-	2	360	5	0	1	1, 3, 8, 9	B	1
SC05	3	2	MGA	295488	6414868	Artefact Scatter	9/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	-	2	360	20	0	1	1, 3, 8, 9	B	1
SC05	4	1	MGA	295517	6414845	Artefact Scatter	9/02/2006	JF	Gentle simple slope	Lower slope	-	2	360	20	0	1	1, 3, 8, 9	B	1
SC05	5	1	MGA	295394	6415076	Isolated artefact	9/02/2006	JF	Gentle Drainage Depression	Creeklines (stat)	-	2	360	70	30	1	1, 3, 8, 9	B	1
SC05	6	1	MGA	295351	6415234	Artefact Scatter	9/02/2006	JF	Gentle Drainage Depression	Creek line (north-eastern side)	-	2	360	70	30	1	1, 3, 8, 9	B	1
SC05	6	2	MGA	295373	6415275	Artefact Scatter	9/02/2006	JF	Gentle simple slope	Lower slope	-	2	360	70	30	1	1, 3, 8, 9	B	1
SC05	7	1	MGA	295309	6415272	Isolated Artefact	9/02/2006	JF	Gentle Drainage Depression	Creek line (north-eastern side)	-	2	360	20	0	1	1, 3, 8, 9	B	1
SC05	8	1	MGA	294951	6415793	Isolated Artefact	10/02/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	45	0	1	1, 3, 8, 9	B	1
SC05	9	1	MGA	294901	6415859	Isolated Find	10/02/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	45	0	1	1, 3, 8, 9	B	1
SC05	10	1	MGA	294931	6415911	Artefact Scatter	10/02/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	60	0	1	1, 3, 8, 9	B	1
SC05	10	2	MGA	294909	6415891	Isolated Find	10/02/2006	JF	Gentle Drainage Depression	Creek line western side)	-	2	360	30	0	1	1, 3, 8, 9	B	1
SC05	11	1	MGA	294875	6415877	Artefact Scatter	10/02/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	80	0	1	1, 3, 8, 9	B	1
SC05	12	1	MGA	294907	6415932	Isolated find	10/02/2006	JF	Gentle Drainage Depression	Creek line (eastern side)	-	2	360	30	5	1	1, 3, 8, 9	B	1

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Final Name	Loci	Component	Co-ordinate System	Easting	Northing	Site type	Date Recorded	Recorded By	Archaeological Terrain Unit	Landform Element	Aspect	Slope	Outlook	Visibility Inside Exposure	Visibility Outside Exposure	Erosion State	Erosion Form	Erosion Extent	Vegetation
SC05	13	1	MGA	295064	6146120	Artefact Scatter	10/02/2006	JF	Modified	Modified	-	2	360	100	0	1	1, 3, 8, 9	B	1
SC05	13	2	MGA	295080	6416103	Isolated Find	10/02/2006	JF	Modified	Lower slope modified	-	2	360	90	0	1	1, 3, 8, 9	B	1
SC05	14	1	MGA	294121	6415576	Isolated Find	8/05/2006	MJS	Moderate to Steep Drainage Depression	Northern Side of Creek bank	E	3	360	30	5	1	1, 2, 3, 8	B	3
SC05	15	1	MGA	294113	6415508	Isolated Find	8/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	30	5	1	1, 2, 3, 8	B	3
SC05	16	1	MGA	294299	6415489	Artefact Scatter	8/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	30	5	1	1, 2, 3, 8	B	3
SC05	16	2	MGA	294321	6415457	Isolated Find	8/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	30	5	1	1, 2, 3, 8	B	3
SC05	16	3	MGA	294321	6415458	Isolated Find	8/05/2006	MJS	Moderate to Steep Simple Slope	Moderate slope	E	3	360	30	5	1	1, 2, 3, 8	B	3
SC05	17	1	MGA	294623	6415429	Artefact Scatter	8/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	30	5	1	1, 2, 3, 8	B	3
SC05	18	1	MGA	294679	6415429	Artefact Scatter	8/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	30	5	1	1, 2, 3, 8	B	3
SC05	19	1	MGA	294739	6415449	Artefact Scatter	8/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	30	5	1	1, 2, 3, 8	B	3
SC06	1	1	MGA	295411	6414236	Artefact Scatter	6/02/2006	MJS	Level to very gentle simple slope	Southern side of creek bank	NW	1	360	20	5	2	3	A/B	3
SC06	2	1	MGA	296041	6413974	Artefact Scatter	8/02/2006	MJS	Moderate to Steep Simple Slope	Upper slope	S	3	360	20	5	1	1, 3, 8, 9	B	1
SC06	2	2	MGA	296042	6413913	Artefact Scatter	8/02/2006	MJS	Moderate to Steep Simple Slope	Upper slope	S	3	360	20	5	1	1, 3, 8, 9	B	1
SC06	2	3	MGA	296003	6413902	Artefact Scatter	8/02/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	S	3	360	20	5	1	1, 3, 8, 9	B	1
SC06	3	1	MGA	295655	6414067	Isolated Find	8/02/2006	MJS	Gentle drainage depression	Lower slope	NE	2	360	20	5	1	1, 3, 8, 9	B	1
SC07	1	1	MGA	295165	6413693	Artefact Scatter	2/02/2006	ESP	Level to very gentle drainage depression	North eastern side of creek bank	-	1	360	70	70	2	3	A/B	3
SC07	2	1	MGA	295039	6413229	Artefact Scatter	2/02/2006	ESP	Level to very gentle drainage depression	North eastern side of creek bank	-	1	360	70	0	2	3	A/B	3

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SC07	3	1	MGA	294795	6413143	Artefact Scatter	2/02/2006	ESP	Level to very gentle drainage depression	South western side of creek bank (foot slope)	-	1	360	70	70	2	3	A/B	3
SC07	4	1	MGA	294936	6413133	Artefact Scatter	2/02/2006	ESP	Level to very gentle drainage depression	Flood plain on south eastern side of creek bank	-	1	360	5	5	2	3	A/B	3
SC07	5	1	MGA	294782	6412960	Artefact Scatter	2/02/2006	ESP	Level to very gentle drainage depression	Western side of creek bank	-	1	360	0	50	2	3	A/B	3
SC07	6	1	MGA	294795	6412891	Artefact Scatter	2/02/2006	ESP	Level to very gentle drainage depression	Western side of creek bank	-	1	360	0	50	2	3	A/B	3
SC07	6	2	MGA	294763	6412886	Artefact Scatter	2/02/2006	ESP	Level to very gentle drainage depression	Western side of creek bank	-	1	360	0	60	2	3	A/B	3
SC07	7	1	MGA	294810	6412801	Artefact Scatter	2/02/2006	ESP	Level to very gentle drainage depression	Western side of creek bank	-	1	360	0	60-70	2	3	A/B	3
SC07	7	2	MGA	294784	6412989	Artefact Scatter	7/02/2006	JF	Level to very gentle drainage depression	Western side of creek bank	-	1	360	20	20	2	3	A/B	3
SC07	8	1	MGA	295282	6413741	Artefact Scatter	2/02/2006	ESP	Modified	Modified foot slope associated with tributary of Saddlers Creek	-	1	360	70	70	2	3	A/B	3
SC08	1	1	MGA	293087	6413475	Artefact Scatter		MJS	Gentle Drainage Depression	Eastern side of creek bank	N	2	360	20	20	2	3,8	A/B	1
SC09	1	2	MGA	293603	6414033	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	20	0	2	1, 2, 3	A/B	3
SC09	1	3	MGA	293595	6413999	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	80	20	1	1, 2, 6	B	1
SC09	2	1	MGA	293648	6413986	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	Eastern side of creek bank	N	2	360	60	20	1	1, 2, 6	B	1
SC09	2	2	MGA	293658	6413955	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	Eastern side of creek bank	N	2	360	40	0	1	1, 2, 6	B	1
SC09	3	1	MGA	293607	6413876	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	60	10	1	1, 2, 6	B	1
SC09	4	1	MGA	293541	6413836	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	20	20	1	1, 2, 6	B	1

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SC09	5	1	MGA	293459	6413803	Isolated artefact	7/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	60	10	1	1, 2, 6	B	1
SC09	6	1	MGA	293900	6413477	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	Creek line	N	2	360	80	10	1	1, 2, 6	B	1
SC09	6	2	MGA	293867	6413467	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	20	20	1	1, 2, 6	B	1
SC09	7	1	MGA	293680	6413553	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	15	15	2	1, 2	A/B	3
SC09	8	1	MGA	293868	6413558	Artefact Scatter	7/02/2006	JF	Gentle Drainage Depression	North eastern side of creek bank	N	2	360	80	5 to 10	2	1, 2	A/B	3
SC09	9	1	MGA	293697	6413788	Artefact Scatter	8/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	80	5 to 10	2	1, 2	A/B	3
SC09	9	2	MGA	293699	6413744	Artefact Scatter	8/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	80	5 to 10	2	1, 2	A/B	3
SC09	10	1	MGA	293725	6413634	Artefact Scatter	8/02/2006	JF	Gentle Drainage Depression	Eastern side of creek bank	N	2	360	80	5 to 10	2	1, 2	A/B	3
SC09	10	2	MGA	293752	6413601	Artefact Scatter	8/02/2006	JF	Gentle Drainage Depression	Eastern side of creek bank	N	2	360	80	5 to 10	2	1, 2	A/B	3
SC09	11	1	MGA	293772	6413565	Artefact Scatter	8/02/2006	JF	Gentle Drainage Depression	Eastern side of creek bank	N	2	360	80	5 to 10	2	1, 2	A/B	3
SC09	12	1	MGA	293825	6413526	Isolated artefact	8/02/2006	JF	Gentle Drainage Depression	Eastern side of creek bank	N	2	360	80	5 to 10	2	1, 2	A/B	3
SC09	13	1	MGA	293547	6414381	Isolated Find	5/02/2006	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	70	0	2	1, 2	A/B	3
SC09	14	1	MGA	293373	6414358	Artefact Scatter	5/02/2006	JF	Moderate to Steep Drainage Depression	Western side of creek bank	N	3	360	80	0	2	1, 2	A/B	3
SC09	15	1	MGA	292985	6414387	Isolated Artefact	5/02/2006	JF	Moderate to Steep Drainage Depression	Southern side of creek bank	N	3	360	60	0	2	1, 2	A/B	3
SC09	15	2	MGA	293022	6414405	Isolated Find	5/02/2006	JF	Moderate to Steep Drainage Depression	Northern side of Creek bank	N	3	360	90	0	2	1, 2	A/B	3
SC09	16	1	MGA	292813	6414578	Artefact Scatter	8/05/2005	JF	Gentle Drainage Depression	Southern side of creek bank	N	2	360	30	0	2	1, 2	A/B	3
SC09	17	1	MGA	293037	6414696	Isolated Find	8/05/2005	JF	Gentle Drainage Depression	Creek terrace on western side of creek	N	2	360	90	0	2	1, 2	A/B	3

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SC09	18	1	MGA	293054	6414749	Isolated Find	8/05/2005	JF	Gentle Drainage Depression	Western side of creek bank	N	2	360	90	0	2	1, 2	A/B	3
SC09	19	1		293278	6414955	Isolated Find	8/05/2005	JF	Gentle Drainage Depression	Eastern side of creek bank - modified from dam	N	2	360	80	0	2	1, 2	A/B	3
SC09	20	1	MGA	293329	6414934	Artefact Scatter	8/05/2005	JF	Gentle Drainage Depression	Eastern side of creek bank - modified from dam	N	2	360	60	0	2	1, 2	A/B	3
SC09	21	1	MGA	293654	6414902	Isolated Find	5/05/2006	MJS	Gentle Drainage Depression	Western side of creek bank	N	2	360	10	0	2	1, 2, 3, 8	A/B	1
SC09	22	1	MGA	293667	6414955	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Western side of creek bank	N	2	360	10	0	2	1, 2, 3, 8	B	1
SC09	23	1	MGA	293485	6414689	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Northern Side of Creek bank	N	2	360	10	0	2	1, 2, 3, 8	B	1
SC09	24	1	MGA	293415	6414700	Isolated Find	5/05/2006	MJS	Gentle Drainage Depression	Western side of creek bank	N	2	360	10	0	2	1, 2, 3, 8	B	1
SC09	25	1	MGA	293642	6415157	Isolated Find	5/05/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	N	3	360	10	0	2	1, 2, 3, 8	B	1
SC09	26	1	MGA	293643	6415120	Isolated Find	5/05/2006	MJS	Moderate to Steep Drainage Depression	Eastern side of creek bank	N	3	360	10	0	2	1, 2, 3, 8	A/B	1
SC09	26	2	MGA	293644	6415119	Isolated Find	5/05/2006	MJS	Moderate to Steep Drainage Depression	Eastern side of creek bank	N	3	360	10	0	1	1, 2, 3, 8	B	1
SC09	27	1	MGA	293585	6415190	Isolated Find	5/05/2006	MJS	Moderate to Steep Simple Slope	Western side of creek bank	N	3	360	10	0	1	1, 2, 3, 8	B	1
SC09	28	1	MGA	293438	6415437	Isolated Find	5/05/2006	MJS	Moderate to Steep Simple Slope	Mid slope partially modified due to dam	N	3	360	10	0	1	1, 2, 3, 8	B	1
SC09	29	1	MGA	293458	6415563	Artefact Scatter	5/05/2006	MJS	Moderate to Steep Simple Slope	Mid slope partially modified due to dam	N	3	360	10	0	1	1, 2, 3, 8	B	1
SC09	30	1	MGA	293615	6413857	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	B	1
SC09	31	1	MGA	293697	6413792	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	B	1
SC09	32	1	MGA	293723	6413636	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	B	1

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SC09	33	1	MGA	293755	6413595	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	B	1
SC09	34	1	MGA	293897	6413488	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Eastern side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	A/B	1
SC09	35	1	MGA	293846	6413479	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Southern side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	B	1
SC09	36	1	MGA	293757	6413497	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Southern side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	B	1
SC09	37	1	MGA	293691	6413541	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	Southern side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	B	1
SC09	37	2	MGA	293675	6413553	Artefact Scatter	5/05/2006	MJS	Gentle Drainage Depression	South western side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	B	1
SC09	38	1	MGA	293371	6413946	Artefact Scatter	8/05/2006	MJS	Gentle Drainage Depression	North eastern side of creek bank	W	2	360	40	5	1	8,9	B	3
SC09	39	1	MGA	293262	6414018	Artefact Scatter	8/05/2006	MJS	Gentle slope	Lower slope	W	2	360	40	5	1	2, 3, 8, 9	B	3
SC09	40	1	MGA	293181	6413994	Artefact Scatter	8/05/2006	MJS	Gentle drainage depression	South western side of creek bank (foot slope)	W	2	360	40	5	1	2, 3, 8, 9	B	3
SC09	41	1	MGA	293103	6414048	Isolated Find	8/05/2006	MJS	Gentle drainage depression	North western side of creek bank	W	2	360	40	5	1	2, 3, 8, 9	B	3
SC09	41	2	MGA	293087	6414069	Artefact Scatter	8/05/2006	MJS	Gentle drainage depression	North western side of creek bank	W	2	360	40	5	1	2, 3, 8, 9	B	3
SC09	42	1	MGA	293053	6414040	Artefact Scatter	8/05/2006	MJS	Gentle drainage depression	North western side of creek bank	W	2	360	40	5	1	2, 3, 8, 9	B	3
SC09	43	1	MGA	293162	6414050	Artefact Scatter	8/05/2006	MJS	Gentle drainage depression	North western side of creek bank	W	2	360	40	5	1	2, 3, 8, 9	B	3
SC09	44	1	MGA	293909	6413477	Artefact Scatter	5/05/2006	MJS	Gentle drainage depression	Western side of creek bank	NW	2	360	80	5	1	1, 2, 3, 8	B	1
SC10	1	1	MGA	293675	6413201	Isolated Find	8/05/2006	MJS	Level to very gentle drainage depression	Western side of creek bank	W	1	360	40	5	1	1, 2, 3, 8	B	1
SC11	1	1	MGA	292134	6415066	Artefact Scatter	8/05/2005	JF	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	30	0	1	1, 2, 3, 8	B	1
SC11	2	1	MGA	292360	6415057	Isolated Find	8/05/2005	JF	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	30	0	1	1, 2, 3, 8	B	1

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SC11	3	1	MGA	292402	6415050	Isolated Find	8/05/2005	JF	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	30	0	1	1, 2, 3, 8	B	1
SC11	4	1	MGA	292557	6415094	Artefact Scatter	8/05/2005	JF	Moderate to Steep Simple Slope	Southern side of creek bank	E	3	360	95	0	1	1, 2, 3, 8	B	1
SC12	1	1	MGA	292525	6415402	Isolated Find	9/05/2006	MJS	Moderate to Steep Drainage Depression	Northern side of Creek bank	W	3	360	5	0	2	1, 2, 3,	A/B	1
SC12	2	1	MGA	292311	6415486	Artefact Scatter	9/05/2006	MJS	Moderate to Steep Drainage Depression	Contour bank on southern edge of creek bank	W	3	360	30	10	1	1, 2, 3, 6, 8	B	1
SC13	1	1	MGA	294136	6414903	Artefact Scatter	7/02/2006	MJS	Gentle drainage depression	Eastern side of creek bank	N	2	360	80	0	1	1, 2, 3, 4, 8, 9	B	1
SC13	1	2	MGA	294130	6414995	Isolated Find	7/02/2006	MJS	Moderate to Steep Drainage Depression	Northern Side of Creek bank	N	3	360	80	0	1	1, 2, 3, 4, 8, 9	B	1
SC14	1	1	MGA	300917	6414242	Artefact Scatter	1/02/2006	MJS	Level to very gentle drainage depression	Creek line	SE	1	360	20	5	1	4	B	-
SC15	1	1	MGA	296146	6413445	Artefact Scatter	10/02/2006	MJS	Ridge crest/ridge line	Crest	SE	3	360	60	60	2	1, 2, 3, 4, 5, 6, 7, 8, 9	A/B	1
SC15	2	1	MGA	296208	6413278	Artefact Scatter	10/02/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	SE	3	360	60	60	2	1, 2, 3, 4, 5, 6, 7, 8, 9	A/B	1
SC15	3	1	MGA	296158	6413109	Artefact scatter	10/02/2006	MJS	Gentle simple slope	Mid slope	SE	2	360	60	60	2	1, 2, 3, 4, 5, 6, 7, 8, 9	A/B	1
SC16	1	1	MGA	296137	6412987	Isolated Find	3/02/2006	MJS	Gentle simple slope	Mid slope	SE	2	360	60	60	1	1	A/B	1
SC17	1	1	MGA	296031	6413026	Artefact Scatter	3/02/2006	MJS	Moderate to Steep Simple Slope	Upper slope	SE	3	360	60	60	1	1	A/B	1
SC18	11		MGA	295426	6413501	Isolated find	8/02/2006	MJS	Gentle drainage depression	Southern side of creek bank	S	3	360	80	40	1	1, 8, 9	A/B	1
SC19	1	1	MGA	295499	6413463	Isolated Find	8/02/2006	MJS	Gentle drainage depression	Southern side of creek bank	S	2	360	80	40	1	1, 8, 9	A/B	1
SC20	1	1	MGA	294329	6413742	Isolated Find	9/02/2006	JF	Level to very gentle simple slope	Lower slope	-	1	360	80	30	1	1, 3, 8, 9	A/B	3
SC21	1	1	MGA	293535	6413381	Isolated Find	8/05/2006	MJS	Gentle simple slope	Lower slope	W	2	360	40	5	3	8	A	1

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SC22	1	1	MGA	293455	6413476	Artefact Scatter	8/05/2006	MJS	Spur crest	Spur crest	W	2	360	40	5	1	8	B	1
SC23	1	1	MGA	293317	6413628	Artefact Scatter	8/05/2006	MJS	Spur crest	Spur crest	W	2	360	40	5	1	8,9	B	3
SC24	1	1	MGA	293584	6413437	Artefact Scatter	7/02/2006	JF	Spur crest	Spur	ENE	2	360	60	10	1	1, 3, 8, 9	A/B	3
SC25	1	1	MGA	294207	6415857	Isolated Artefact	10/02/2006	JF	Moderate to Steep Simple Slope	Upper slope	-	3	360	45	0	1	1, 3, 8, 9	A/B	3
SC26	1	1	MGA	295659	6415752	Artefact Scatter	10/02/2006	MJS	Gentle simple slope	Lower slope	S	2	360	20	5	1	1, 3, 8, 9	A/B	3
SC27	1	1	MGA	291989	6415495	Artefact Scatter	4/05/2006	JF	Ridge crest ridge line	Crest	W	3	360	90	0	1	1, 3, 8, 9	A/B	3
SC28	9	1	MGA	295221	6413954	Isolated Find	10/02/2006	JF	Level to very gentle drainage depression	Creek line	-	1	360	95	5	1	1, 2, 3, 8, 9	B	1
WC01	1	1	MGA	290914	6415763	Isolated Find	5/05/2006	JF	Moderate to Steep Drainage Depression	Creek line (southern bank)	E	3	360	80	5	1	1, 2, 3, 8, 9	B	1
WC02	1	1	MGA	291027	6415623	Isolated Find	5/05/2006	JF	Moderate to Steep Drainage Depression	Creek line (southern bank)	E	3	360	20	5	1	1, 2, 3, 8, 9	B	1
WC03	1	1	MGA	291172	6415547	Artefact Scatter	5/05/2006	JF	Moderate to Steep Drainage Depression	Modified southern bank of creek bank.	NNE	3	360	60	5	1	1, 2, 3, 8, 9	B	1
WC04	1	1	MGA	291171	6417600	Artefact Scatter	2/05/2006	JF	Moderate to Steep Drainage Depression	Modified / Creek line (northern bank)	-	3	360	80	0	1	1, 3, 8, 9	A/B	3
WC04	2	1	MGA	291192	6417665	Artefact Scatter	2/05/2006	JF	Moderate to Steep Drainage Depression	Modified / Creek line (northern bank)	-	3	360	70	0	1	1, 3, 8, 9	A/B	3
WC04	3	1	MGA	291230	6417546	Artefact Scatter	2/05/2006	JF	Moderate to Steep Simple Slope	Lower slope	-	3	360	65	7	1	1, 3, 8, 9	A/B	3
WC04	3	2	MGA	291254	6417537	Artefact Scatter	2/05/2006	JF	Moderate to Steep Simple Slope	Lower slope	-	3	360	85	5	1	1, 3, 8, 9	A/B	3
WC04	4	1	MGA	292430	6417147	Artefact Scatter	28/04/2006	MJS	Moderate to Steep Drainage Depression	Foot slope	SW	3	230	50	20	1	1, 2, 3, 8	B	1
WC04	5	1	MGA	291861	6417267	Artefact Scatter	28/04/2006	MJS	Moderate to Steep simple slope	Moderate slope	NE	3	360	10	5	1	1, 2, 3, 8	A/B	1
WC04	6	1	MGA	292045	6417313	Isolated Find	28/04/2006	MJS	Moderate to Steep Drainage Depression	Northern side of Creek bank	E	3	360	10	5	1	1, 2, 3, 8	A/B	1

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WC04	7	1	MGA	291445	6417448	Artefact Scatter	28/04/2006	MJS	Moderate to Steep Drainage Depression	Eastern side of creek bank	E	3	360	10	5	1	1, 2, 3, 8	A/B	1
WC04	8	1	MGA	291284	6417483	Artefact Scatter	28/04/2006	MJS	Moderate to Steep Drainage Depression	Northern side of Creek bank	E	3	360	10	5	1	1, 2, 3, 8	B	1
WC04	9	1	MGA	291235	6417456	Artefact Scatter	28/04/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	E	3	360	10	5	1	1, 2, 3, 8	B	1
wc04	10	1	MGA	291167	6417398	Artefact Scatter	28/04/2006	MJS	Moderate to Steep Simple Slope	Moderate slope	SE	3	360	40	40	1	1, 2, 3, 4, 5, 6, 8, 9	B	1
WC04	11	1	MGA	291430	6417363	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	N	3	360	90	20	1	1, 2, 3, 8, 9	B	1
WC04	12	1	MGA	291494	6417347	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Simple Slope	Moderate slope	N	3	360	90	20	1	1, 2, 3, 8, 9	B	1
WC04	13	1	MGA	291475	6417398	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Simple Slope	Moderate slope	N	3	360	90	20	1	1, 2, 3, 8, 9	B	1
WC04	14	1	MGA	291430	6417366	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	N	3	360	90	20	1	1, 2, 3, 8, 9	B	1
WC04	14	2	MGA	291424	6417404	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	N	3	360	90	20	1	1, 2, 3, 8, 9	B	1
WC04	15	1	MGA	291453	6417438	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Simple Slope	Moderate slope	N	3	360	90	20	1	1, 2, 3, 8, 9	B	1
WC04	16	1	MGA	291446	6417503	Isolated Find	1/05/2006	MJS	Moderate to Steep Drainage Depression	Northern side of Creek bank	N	3	360	90	20	1	8	A/B	1
WC04	17	1	MGA	290966	6417130	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	SW	3	360	15	5	2	1, 2, 3, 8, 9	A/B	1
WC04	17	2	MGA	290966	6417133	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	SW	3	360	15	5	2	1, 2, 3, 8, 9	B	1
WC04	17	3	MGA	290945	6417149	Isolated Find	1/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	SW	3	360	15	5	2	1, 2, 3, 8, 9	B	1
WC04	18	1	MGA	290905	6417288	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Drainage Depression	Eastern side of creek bank	SW	3	360	15	5	2	1, 2, 3, 8, 9	B	1
WC04	19	1	MGA	290830	6417376	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	SW	3	360	15	5	2	1, 2, 3, 8, 9	B	1
WC04	20	1	MGA	290888	6417309	Isolated Find	1/05/2006	MJS	Moderate to Steep Drainage Depression	Eastern side of creek bank	SW	3	360	15	5	2	1, 2, 3, 8, 9	B	1

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WC04	21	1	MGA	290751	6417478	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Drainage Depression	Northern side of Creek bank	SW	3	360	15	5	2	1, 2, 3, 8, 9	B	1
WC04	22	1	MGA	290758	6417499	Isolated Find	1/05/2006	MJS	Moderate to Steep Drainage Depression	Northern side of Creek bank	SW	3	360	15	5	2	1, 2, 3, 8, 9	B	1
WC04	23	1	MGA	292676	6416993	Artefact Scatter	28/04/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	SW	3	360	80	0	1	1, 2, 3, 8	B	1
WC04	24	1	MGA	292360	6417178	Artefact Scatter	28/04/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	SW	3	230	50	20	1	1, 2, 3, 8	B	1
WC05	1	1	MGA	291410	6417237	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Simple Slope	Upper Slope	SW	3	360	20	5	1	1, 2, 3, 6, 8, 9	B	3
WC05	2	1	MGA	291278	6417194	Isolated Find	1/05/2006	MJS	Spur crest	Crest	SW	3	360	80	20	1	2, 3, 8,	B	1
WC05	3	1	MGA	291175	6417287	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Simple Slope	Upper Slope	SW	3	360	80	20	1	2, 3, 8,	B	1
WC05	3	2	MGA	291200	6417265	Artefact Scatter	1/05/2006	MJS	Spur crest	Spur crest	SW	3	360	80	20	1	1, 2, 3, 8, 9	B	1
WC05	4	1	MGA	291123	6417263	Artefact Scatter	1/05/2006	MJS	Spur crest	Spur crest	SW	3	360	80	20	1	1, 2, 3, 8, 9	B	1
WC05	5	1	MGA	291150	6417021	Artefact Scatter	1/05/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	SW	3	360	50	30	1	1, 2, 3, 8, 9	B	1
WC05	5	2	MGA	291190	6417065	Isolated Find	1/05/2006	MJS	Moderate to Steep Simple Slope	Moderate slope	SW	3	360	50	30	1	1, 2, 3, 8, 9	B	1
WC05	6	1	MGA	291302	6417005	Isolated Find	1/05/2006	MJS	Moderate to Steep Drainage Depression	Southern side of creek bank	SW	3	360	50	30	1	1, 2, 3, 8, 9	B	1
WC06	7	1	MGA	292419	6417535	Artefact Scatter	3/05/2006	JF	Ridge line/Ridge Crest	Ridgeline Saddle	-	3	360	40	10	1	1, 2, 3, 8, 9	B	1
WC06	8	1	MGA	292495	6417510	Isolated Find	3/05/2006	JF	Ridge line/Ridge Crest	Ridgeline Saddle	-	3	360	40	10	1	1, 2, 3, 8, 9	B	1
WC06	2	2	MGA	292478	6417510	Isolated Find	3/05/2006	JF	Ridge line/Ridge Crest	Ridgeline Saddle	-	3	360	40	10	1	1, 2, 3, 8, 9	B	1
WC06	9	1	MGA	292443	6417510	Isolated Find	3/05/2006	JF	Ridge line/Ridge Crest	Crest	-	3	360	40	10	1	1, 2, 3, 8, 9	B	1
WC07	1	1	MGA	291973	6415430	Isolated Find	4/05/2006	MR	Ridge line/Ridge Crest	Crest	-	3	360	60	5	1	1, 2, 3, 8, 9	B	1

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WC08	1	1	MGA	291964	6415412	Artefact Scatter	4/05/2006	MR	Ridge line/Ridge Crest	Crest	-	3	360	60	5	1	1, 2, 3, 8, 9	B	1
WC09	1	1	MGA	291967	6417752	Isolated find	6/04/2006	JF	Ridge line/Ridge Crest	Crest	-	3	360	75	5	1	1, 2, 3, 8, 9	B	1
WC10	1	1	MGA	290932	6416249	Isolated Find	4/05/2006	JF	Moderate to Steep Drainage Depression	Southern side of creek bank	-	3	360	10	10	1	1, 2, 3, 8, 9	B	1
WC11	1	1	MGA	291000	6416241	Isolated Find	4/05/2006	JF	Moderate to Steep Drainage Depression	Southern side of creek bank	-	3	360	80	0	1	1, 2, 3, 8, 9	B	1
WC12	1	1	MGA	290921	6416413	Isolated Find	4/05/2006	JF	Ridgeline Crest	Ridgeline saddle	-	3	360	85	0	1	1, 2, 3, 8, 9	B	1
WC13	1	1	MGA	290921	6416478	Isolated Find	4/05/2006	JF	Ridgeline Crest	Ridgeline Crest	-	3	360	85	0	1	1, 2, 3, 8, 9	B	1
WC14	1	1	MGA	290939	6416471	Isolated Find	4/05/2006	JF	Ridgeline Crest	Ridgeline Crest	-	3	360	85	0	1	1, 2, 3, 8, 9	B	1
WC15	1	1	MGA	291151	6416361	Artefact Scatter	4/05/2006	JF	Ridgeline Crest	Hillock	-	3	360	85	0	1	1, 2, 3, 8, 9	B	1
WC16	1	1	MGA	291553	6415437	Artefact Scatter	4/05/2006	JF	Moderate to Steep Drainage Depression	Confluence on western side of creek bank	-	3	360	70	0	1	1, 2, 3, 8, 9	B	1
WC17	1	1	MGA	291962	6415609	Artefact Scatter	4/05/2006	JF	Ridge line/Ridge Crest	Crest	-	3	360	90	0	1	1, 2, 3, 8, 9	B	1
WC18	1	1	MGA	290805	6415992	Artefact Scatter	5/02/2006	JF	Moderate to Steep Simple Slope	Mid slope	W	3	360	80	0	1	1, 2, 3, 8, 9	B	1
WC19	1	1	MGA	292907	6416815	Artefact Scatter	28/04/2006	MJS	Ridgeline/ridge crest	Crest	NW	3	360	80	10	1	1,2,6,8	B	1
WC20	1	1	MGA	292912	6416786	Isolated Find	28/04/2006	MJS	Ridgeline Crest	Crest	S	3	360	80	10	1	1,2,6,8	B	1
WC21	1	1	MGA	292908	6416734	Isolated Find	28/04/2006	MJS	Ridgeline Crest	Crest	SE	3	360	80	10	1	1,2,6,8	B	1
WC22	1	1	MGA	292445	6416410	Artefact Scatter	2/05/2006	MJS	Ridgeline Crest	Crest partially modified on a vehicle track	SW	3	360	90	0	1	1, 2, 3, 8, 9	B	1
WC23	1	1	MGA	291945	6416037	Isolated Find	2/05/2006	MJS	Moderate to steep drainage depression	Headwaters of creek line on western side	SW	3	360	5	0	2	1, 2, 3, 8	A/B	1
WC24	1	1	MGA	291889	6416057	Isolated Find	2/05/2006	MJS	Moderate to Steep Drainage Depression	Western side of creek bank	SW	3	360	5	0	2	1, 2, 3, 8	B	1

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WC25	1	1	MGA	291001	6416201	Isolated Find	4/05/2006	MR	Moderate to Steep Simple Slope	Moderate slope	SW	3	360	50	5				
WC26	1	1	MGA	291107	6416480	Isolated Find	4/05/2006	MR	Ridge line/Ridge Crest	Crest	SW	3	360	50	5				

Table 2: Cultural Description of Archaeological Sites

Final Name	Site type	Disturbance	Number of artefacts	Predominant raw material	Other raw materials	Predominant artefact type	Other artefact types	Site Area	Area defined by	Aboriginal Significance	Comments including any stories or comments from Aboriginal groups about values of sites	Artefact Comments
HR01	Isolated Find	1	1	mudstone	-	broken flake	-	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	The artefact has a transverse break leaving the medial and distal parts of the flake. There is also some edge damage (cattle trampling), and the mudstone is not uniform in colour being white and light pink in places indicating weathering/that the artefact may be heat affected.
HR01	Artefact Scatter	1	4	porcellanite	mudstone	broken flake	flake	12m x 7m	Artefact Distribution.	No comment made in field.	None made.	The mudstone is not uniform in colour, it is white and pink perhaps indicating that it is heat affected/weathered (one of the mudstone artefacts has some patination). The artefact breakage has some edge damage indicating cattle trampling.
HR01	Artefact Scatter	1	4	mudstone / silcrete	-	flakes	broken flake	25m x 5m	Artefact Distribution.	No comment made in field.	None made.	Some colour change and crazing in the mudstone suggesting that it has been affected by heat.
HR01	Artefact Scatter	1	25	silcrete	mudstone	flake	broken and retouched flakes, flaked pieces and a core	13m x 15m	Artefact Distribution.	No comment made in field.	None made.	There is colour change in some of the artefacts suggesting that they have been effected by heat. There is some artefact breakage and edge damage (cattle trampling).
HR01	Artefact Scatter	1	15	silcrete	mudstone	retouched and broken flake	a core	15m x 5m	Artefact Distribution.	No comment made in field.	None made.	There is some colour change and crazing in the mudstone and silcrete artefacts suggesting they are heat effected.
HR01	Artefact Scatter	1	11	porcellanite	silcrete, petrified wood	flake	broken flakes, backed blades	10m x 15m	Artefact Distribution.	No comment made in field.	None made.	
HR01	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	Some edge damage (cattle).
HR01	Artefact Scatter	1	2	mudstone	-	flake	-	1m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	The artefacts have some differential colour change (i.e. they are heat affected).
HR01	Artefact Scatter	1	4	mudstone	quartz	flake	-	5m x 3m	Artefact Distribution.	No comment made in field.	None made.	
HR01	Isolated Find	1	1	silcrete	-	core	-	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
HR01	Artefact Scatter	1	2	silcrete	-	flake / broken flake	-	2m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	The slicrete broken flake is approximately 9cm in length.
HR01	Artefact Scatter	1	2	mudstone/silcrete	-	flake	-	0.5m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	
HR01	Isolated Find	1	1	mudstone/silcrete	-	core	-	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	Differential colour change (heat affected) observed.
HR01	Artefact Scatter	1	2	silcrete / basalt/ quartzite	-	flake / broken flake	-	0.5m x 0.2m	Artefact Distribution.	No comment made in field.	None made.	The basalt flake is larger than most all of the other artefacts found in this drainage depression (approximately 6.5 cm long).
HR01	Isolated Find	1	1	silcrete	-	core	-	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
HR01	Artefact Scatter	1	4	mudstone	silcrete	broken flakes	flake	1.5m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	The silcrete is red and has a greasy lustre, probably heat treated.
HR01	Artefact Scatter	1	2	mudstone	-	flakes	-	5m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	
HR02	Isolated Find	2	1	silcrete	-	core	-	1m by 1m	Area is used for grazing and has been cleared and is defined by cattle treadage scalds.	No comment made in field.	None made.	This core has 20% cortex.
HR03	Isolated Find	2	1	silcrete	-	flake	-	1m by 1m	Area is used for grazing and has been cleared and is defined by cattle treadage scalds.	No comment made in field.	None made.	
QC01	Artefact Scatter	2	1500-2000	mudstone	petrified wood, silcrete, quartz, volcanics (quartzite, basalt).	flake / broken flake	Cores, retouched artefacts including a Bondi point	60m by30m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	Bev Van Vliet said this is a previously recorded site (she said she had recorded it with Jan).	
QC01	Artefact Scatter	2	3	mudstone	silcrete	flake / broken flake	Flakes with use wear and broken flakes	7m by 3m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	2	5	Quartz	silcrete, petrified wood	flake		20m by 8m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	heat shatter present

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QC01	Artefact Scatter	2	50	Silcrete/Mudstone	basalt, sandstone	core, flake	broken flakes, broken axes	25m by 8m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	210-500	Silcrete	mudstone	flake, broken flake	Cores	40m by 35m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	3	silcrete	-	flake	-	4m by 0.5m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	3	silcrete	quartz	flake	-	5m x 3m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	3	mudstone	-	flake	-	10m x 3m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	4	Silcrete	-	flake	-	1m x 1m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	3	mudstone, quartz, silcrete		flake	-	7m x 3m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	6	mudstone and silcrete	basalt, quartz	flake	core	10m x 7m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Isolated Find	1	1	mudstone	-		-	Isolated Artefact	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	5	mudstone	silcrete	flake	flaked piece	15m x 5m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	30-40	mudstone	-	flake and flaked piece	blade	6m x 5m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Mudstone knapping floors. Mudstone has colour change which seems to indicate that the stone was heat treated and then has been subsequently effected by further heat exposure..
QC01	Artefact Scatter	1	25-30	silcrete	banded mudstone, hornfels	flake	broken flake / heat shatter	5m x 5m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	silcrete and mudstone has some differential colour change and there is mudstone heat shatter present. There are a number of silcrete and mudstone artefacts with pebble cortex.
QC01	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	3	mudstone	silcrete	flake	-	10m x 2m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	2	mudstone	cores		-	0.5m x 0.5m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	

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QC01	Artefact Scatter	1	2	mudstone		flake	-	1m x 1m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Isolated Find	1	1	mudstone		heat shatter	-	Isolated Artefact	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	10	mudstone	silcrete	flake	core	5m x 2m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	85	silcrete	mudstone	flake	cores, backed flakes, broken flakes	30m x 7m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	2	mudstone	-	flake	-	20m x 2m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	1	silcrete	-	flake	-	Isolated Artefact	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	2	mudstone	-	flake	-	0.5m x 0.5m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	5	silcrete	quartz, mudstone	flake	broken flake, flaked piece	10m x 2m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Some colour change in the artefacts.
QC01	Isolated Find	1	1	silcrete	-	flake	-	Isolated Artefact	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	16	silcrete	mudstone, quartz	flake	broken flakes, Bondi point	30m x 20m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	The mudstone and the silcrete has been heat affected (colour change and some heat shattered mudstone is present).
QC01	Artefact Scatter	1	2	mudstone	-	flake	-	1m x1m	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Isolated Find	1	1	silcrete	-	broken flake	-	Isolated Artefact	Artefact Distribution.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	This was one silcrete flake broken into three pieces which could be conjoined - the artefact breakage was probably due to a grader.
QC01	Artefact Scatter	1	71	silcrete	Mudstone, chert, porcellanite, silicified sandstone, quartz, quartzite, basalt, siltstone, hornfels	flake	Broken flake, flaked piece, core, broken anvil, broken grindstone, hammerstone siltstone with worked edges	264m by 498m	Both sides of the creek bank scouring associated with gully erosion and bank fall.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Retouched flakes, grindstone, cores with multiple rotations a mixture of wasted cores and cores with over 60% cortex, lots of broken flakes from cattle trampling over site

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QC01	Isolated Find	1	1	mudstone	-	flake	-	2m by 1m	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Retouched yellow-red mudstone flake.
QC01	Isolated Find	1	1	basalt	-	flake	-	2m by 3m	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Retouched flake with 50% cortex.
QC01	Isolated Find	1	1	silcrete	-	flake	-	2m by 5m	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 yellow silcrete flake
QC01	Artefact Scatter	1	2	mudstone	-	flake	-	2m by 5m	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 weathered mudstone flake and 1 red mudstone heat treated, mudstone flake with greasy lustre.
QC01	Artefact Scatter	1	6	hornfels/silcrete	mudstone, basalt	flaked piece	flake	10m by 15m	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 yellow mudstone flaked piece with 10% cortex, 2 red silcrete flaked pieces, 2 hornfels flaked pieces and 1 basalt flake.
QC01	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 purple mudstone flake with greasy lustre - heat treated.
QC01	Artefact Scatter	1	3	mudstone	chert	broken flake / flake / flaked piece	-	10m by 3m	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 broken yellow mudstone flake, 1 grey blue chert broken flake and 1 red mudstone flaked piece.
QC01	Artefact Scatter	1	2	mudstone	-	broken flake/core	-	15m by 4m	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 red-purple broken mudstone flake and 1 yellow mudstone core.
QC01	Isolated Find	1	1	mudstone	-	core	-	Isolated Artefact	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 primary yellow mudstone core
QC01	Isolated Find	1	1	silcrete	-	flake	-	Isolated Artefact	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 white silcrete flake.
QC01	Artefact Scatter	1	2	mudstone and basalt	one of each	flakes	-	3m x 0.5m	Scour on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Basalt flake has polish
QC01	Artefact Scatter	1	7	mudstone	quartz	flake	broken flake	15m by 5m	Scald on foot slope from cattle treadage	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Broken flakes from cattle treadage
QC01	Artefact Scatter	1	2	mudstone	-	core	flake	5m by 5m	Scald on creek bank associated with dam	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 mudstone core with 50% cortex, 1 heated glossy red mudstone flake with retouch
QC01	Artefact Scatter	2	8	silcrete	Basalt, petrified wood, siltstone and quartz	broken flake	core, siltstone worked edge, flaked piece	20m by 1m	Scald on creek bank due to cattle	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 petrified wood core, 1 basalt core, broken flakes from cattle treadage
QC01	Artefact Scatter	2	6	silcrete/siltstone	basalt, petrified wood.	broken flakes	core	1m by 19m	Small scald on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 basalt core, 1 petrified wood core, 2 yellow siltstone flakes, 2 broken silcrete flakes.

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QC01	Artefact Scatter	2	6	mudstone	silcrete, quartz	broken flakes	flake, flaked piece	14m by 20m	Medium scald on edge of creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	3 mudstone broken flakes, 1 silcrete flake, 1 mudstone flaked piece and 1 quartz broken flake.
QC01	Isolated Find	2	1	quartz	-	flake	-	Isolated Artefact	Small scald on creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 bifacially flaked white quartz flake.
QC01	Isolated Find	2	1	quartzite	-	hammerstone	-	1m by 5m	Scald on creek bank from cattle	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	2	5	silcrete	mudstone	flake	broken flake	3m by 5m	Scald on creek bank from cattle	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Isolated Find	2	1	siltstone	-	worked edge manuport	-	Isolated Artefact	Scald from cattle treadage	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	2	5	mudstone	porcellanite	broken flake	flake	18m by 7m	Scald on foot slope from cattle treadage	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Broken flakes from cattle treadage
QC01	Artefact Scatter	2	50	silcrete	mudstone	flake	core, broken flake	25m by 35m	Scald on foot slope from cattle treadage	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Silcrete cores, retouched flakes some cores are wasted
QC01	Artefact Scatter	2	8	mudstone	silcrete, quartz	flake	broken flake	10m by 3m	Scald on cattle treadage	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	2	2	silcrete/mudstone	-	core/flake	-	2m by 3m	Scald on creek bank due to cattle	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Silcrete core.
QC01	Artefact Scatter	2	7	silcrete	mudstone	flake	broken flake, core	31m by 41m	Scald on creek bank due to cattle	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Broken flakes due to cattle and retouch on mudstone flake on all margins and one mudstone core
QC01	Artefact Scatter	2	2	mudstone	-	core	-	1m by 5m	Scald on creek due to cattle	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	2 large mudstone cores and 70% cortex on each greasy lustre yellow white in colour.
QC01	Artefact Scatter	2	7	silcrete	mudstone and unidentified igneous river cobble	broken flakes	flake, struck pebble	2m by 58m	Scald on creek due to cattle	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Broken flakes from cattle treadage and one unidentifiable igneous cobble.
QC01	Artefact Scatter	2	26	mudstone	silcrete	flake	core, broken flake			Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	2	31	silcrete	mudstone, chert, porcellanite	flake	core,	54m by 13m	Scald near the main arm of Quarry creek near large overburden pile	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Primary flakes with some cortex and there is also retouch on some of the flakes
QC01	Artefact Scatter	1	4	mudstone	silcrete	flake	core	5m by 7m	Artefacts have washed down into creek bed.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Grey Silcrete core, mudstone flake retouched with pot lid,

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QC01	Artefact Scatter	1	2	mudstone	silcrete	flake	-	2m by 3m	Site is on a mini confluence which is a little raised island in the creek	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Pinky creamy red mudstone flakes.
QC01	Artefact Scatter	1	83	mudstone	silcrete, porcellanite, basalt, quartz & petrified wood, basalt hand axe	flake	cores, broken flakes, flaked pieces, heat shatter	30m by 16m	Site is on a vehicle track and is eroded to b horizon. It is near the edge of the creek and a pile of revegetated overburden.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	3 basalt, 20 Silcrete, 6 cores, 31 mudstone, 1 petrified wood, 2 porcellanite and 1 quartz were counted within a sample of 63 artefacts
QC01	Artefact Scatter	2	3	silcrete	basalt	flake	-	1m by 4m	Site is under a big tree and is a small scald associated with cattle and defined by tree root exposure and edge of creek bank.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	10	silcrete	-	flake	-	3m by 15m	Edge of a dam wall defines this site.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Blue silcrete.
QC01	Artefact Scatter	1	2	silcrete	-	flake	broken flake	3m by 15m	Edge of a dam wall defines this site.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	6	mudstone	silcrete, basalt	flake	core	15m by 5m	Edge of a dam wall defines this site.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	2	mudstone	-	Flake	-	15m by 5m	Edge of a dam wall defines this site.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	7	mudstone	silcrete, basalt	flake	core	5m by 10m	Near overburden pile and dam construction which define the edge of this site and the edge of Quarry Creek. No integrity.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	1 basalt core, remainder are all flakes.
QC01	Artefact Scatter	1	8	silcrete	mudstone	flake	-	3m by 4m	Near overburden pile and dam construction which define the edge of this site and the edge of Quarry Creek. No integrity.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	
QC01	Artefact Scatter	1	30	mudstone	silcrete	flake	broken flakes, cores	51m by 41m	Exposure associated with creek line scalding and edge of vegetation.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	Flakes are broken from cattle trampling and dam construction.
QC01	Artefact Scatter	1	67	mudstone	silcrete, porcellanite, basalt, quartz & petrified wood	flake	cores, broken flakes, flaked pieces, heat shatter	30m by 16m	Site is on a vehicle track and is eroded to B horizon. It is near the edge of the creek and a pile of revegetated overburden.	Quarry Creek is important site to Aboriginal people. No specific comment made in the field.	None made.	This site was predominantly flakes and broken flakes which showed evidence of patination and heat treatment.
QC12	Artefact Scatter	1	2	silcrete/quartzite	-	flake	-	50m by 45m	Scald on hill crest	No comment made in field.	None made.	
QC12	Artefact Scatter	1	2	mudstone	-	flake/broken flake	-	15m by 5m	ants nest on scald adjacent to track.	No comment made in field.	None made.	Both artefacts are very weathered and patinated. One flake had retouch.
QC03	Artefact Scatter	1	12	silcrete	mudstone	flake	broken flake	15m x 8m	Artefact Distribution.	No comment made in field.	None made.	the silcrete and mudstone had colour change (heat effected).
QC03	Artefact Scatter	1	3	mudstone	silcrete	flake	core	1m x 1m	Artefact Distribution.	No comment made in field.	None made.	
QC03	Isolated Find	1	1	mudstone	-	Cores, flakes		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC03	Artefact Scatter	1	5	mudstone	-	flakes	core	10m x 5m	Artefact Distribution.	No comment made in field.	None made.	
QC03	Artefact Scatter	1	4	mudstone / silcrete	-	flakes		5m x 2m	Artefact Distribution.	No comment made in field.	None made.	

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QC03	Artefact Scatter	1	4	mudstone	silcrete	flakes	core	12m x 3m	Artefact Distribution.	No comment made in field.	None made.	
QC03	Isolated Find	1	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	artefact was found on a freshly graded vehicle track
QC03	Isolated Find	1	1	silcrete		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	artefact was found on a freshly graded vehicle track
QC03	Isolated Find	1	1	silcrete		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	artefact was found on a freshly graded vehicle track
QC03	Artefact Scatter	1	9	mudstone	silcrete	flakes	cores, a Bondi point	60m x 10m	Artefact Distribution.	No comment made in field.	None made.	
QC03	Artefact Scatter	1	5	silcrete	mudstone	flakes		12m x 3m	Artefact Distribution.	No comment made in field.	None made.	
QC03	Isolated Find	1	1	mudstone		core		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC03	Isolated Find	1	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC03	Isolated Find	1	1	silcrete		broken flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC03	Isolated Find	1	1	petrified wood		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC03	Isolated Find	1	1	silcrete	flake			Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	the flake is weathered and there is moss on the distal side. There may be some retouch on the dorsal side of the flake.
QC03	Isolated Find	1	1	mudstone	broken flake with retouch			Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	looks like the proximal end of a blade, with some retouch on the distal surface at the bottom of the right lateral margin. The flake has differential colour change and crazing.
QC03	Isolated Find	1	1	mudstone	broken flake			Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	this flake has some differential colour change and some crazing.
QC03	Isolated Find	1	1	chert	core			Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	core is 40% pebble cortex.
QC04	Artefact Scatter	1	100	silcrete	mudstone, quartz,	flakes	cores, broken flakes, debitage, some with retouch.	150m 50m	Artefact Distribution.	No comment made in field.	None made.	there was a variety of weathering present in the assemblage. Some of the mudstone particularly is very weathered.
QC04	Isolated Find	1	1	silcrete		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	this flake was found in a freshly graded vehicle track, roughly in situ.
QC05	Isolated Find	1	1	mudstone	-	flake	-	1m by 1m	Edges of a minor gully.	No comment made in field.	None made.	1 mudstone flake.
QC05	Artefact Scatter	1	3	chert/mudstone/Silcrete	-	Flake	broken flake	4m by 19m	Ants nest scald.	No comment made in field.	None made.	Weathered mudstone retouched flake.
QC05	Isolated Find	1	1	mudstone	-	broken flake	-	2m by 5m	Edges of a minor gully.	No comment made in field.	None made.	
QC05	Artefact Scatter	1	2	mudstone	-	flake/blade	-	6m by 1m	Edges of a minor gully.	No comment made in field.	None made.	
QC05	Artefact Scatter	1	4	Silcrete	mudstone	flake/broken flake	-	3m by 2m	Edges of a minor gully.	No comment made in field.	None made.	
QC05	Isolated Find	1	1	quartz	-	flake	-	1m by 1m	Ants nest scald defined by scald and edge of grass.	No comment made in field.	None made.	
QC05	Artefact Scatter	1	8	silcrete	mudstone, petrified wood	flake	core, blade, broken flake	2m by 24m	Track scald and edge of vegetation.	No comment made in field.	None made.	Mudstone and Silcrete have weathering. Mudstone is patinated. Core is wasted.
QC05	Isolated Find	1	1	silcrete	-	flaked piece	-	1m by 1m	Vegetation and scald.	No comment made in field.	None made.	Pink Silcrete.
QC05	Artefact Scatter	1	3	mudstone	silcrete	flaked piece	flake	56m by 35m	Gully erosion and ants nest scald and edge of grassy vegetation.	No comment made in field.	None made.	
QC05	Isolated Find	1	2	mudstone	-	flake	core	5m by 5m	Gully erosion and ants nest scald and edge of grassy vegetation.	No comment made in field.	None made.	Core is wasted and very weathered.
QC05	Isolated Find	1	1	quartz	-	flake	-	1m by 1m	Gully erosion and edge of vegetation.	No comment made in field.	None made.	
QC05	Isolated Find	1	1	mudstone	-	flaked piece	-	1m by 1m	Gully erosion and edge of vegetation.	No comment made in field.	None made.	Weathered mudstone flaked piece.

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QC05	Artefact Scatter	1	45	mudstone	silcrete, quartz, hornfels, basalt, quartzite,	flake	broken flake, flaked pieces, backed blade, horseshoe core,	3m by 63m	Gully erosion and edge of dam wall.	No comment made in field.	None made.	5 Silcrete horseshoe core, 8 mudstone flakes, 4 mudstone broken flakes, 10 silcrete flakes, 2 silcrete flaked pieces, 2 silcrete broken flakes, 1 silcrete core, 1 quartzite core, 1 basalt flake, 2 silcrete cores, 1 hornfels flake, 2 mudstone core, 2 quartzite cores, 5 quartz flakes, 2 mudstone flaked pieces. Hornfels and mudstone and silcrete sometimes showed weathering, 1 mudstone flake was retouched. cores had 30% cortex.
QC05	Artefact Scatter	2	25	silcrete	mudstone, quartz	flake	core, broken flake, flaked piece, blade	25m by 3m	Gully erosion and track scald and edge of dam wall.	No comment made in field.	None made.	Silcrete blades and 5 silcrete cores. Silcrete looks heated.
QC05	Isolated Find	1	1	basalt	-	core	-	1m by 1m	Gully erosion and edge of vegetation	No comment made in field.	None made.	
QC05	Isolated Find	1	1	mudstone	-	flake	-	1m by 1m	Gully erosion and edge of vegetation	No comment made in field.	None made.	Weathered primary mudstone red-white flake
QC05	Isolated Find	1	1	mudstone	-	core	-	1m by 1m	Gully erosion and edge of vegetation	No comment made in field.	None made.	Mudstone core is heat treated.
QC05	Artefact Scatter	1	7	silcrete	mudstone, petrified wood, chert	flake	core, flaked piece,	5m by 3m	Gully erosion, ants nest scald and edge of vegetation.	No comment made in field.	None made.	Mudstone core,
QC05	Artefact Scatter	1	3	silcrete	mudstone	flake	core	3m by 2m	Gully erosion and edge of vegetation and scald.	No comment made in field.	None made.	Silcrete flakes and one mudstone core
QC05	Artefact Scatter	1	2	silcrete	mudstone	Flake/broken flake	-	2m by 3m	Gully erosion, ants nest scald and edge of vegetation.	No comment made in field.	None made.	
QC05	Artefact Scatter	1	14	mudstone	silcrete, petrified wood, chert	flake	core, flaked pieces	3m by 5m	Gully erosion, ants nest scald and edge of vegetation.	No comment made in field.	None made.	
QC05	Artefact Scatter	1	27	silcrete	quartzite, petrified wood, mudstone	flake	core, microlith, broken flake, flaked piece	20m by 10m	Gully erosion and edge of vegetation	No comment made in field.	None made.	Silcrete microlith, petrified wood core
QC06	Artefact Scatter	1	9	mudstone	hornfels, basalt, petrified wood	flake	core, broken flake, backed blade	25m by 5m	Edge of the foot slope where there is a contour bank for the edge of dam	No comment made in field.	None made.	retouched flakes, basalt backed blade which was also notched, heated artefacts with greasy lustre on mudstone and cores with approximately 80% cortex
QC06	Artefact Scatter	1	2	mudstone	basalt	flake / broken flake	-	3m by 5m	Edge of the foot slope where there is a contour bank for the edge of dam	No comment made in field.	None made.	Both artefacts had evidence of retouch on margins.
QC06	Artefact Scatter	1	2	mudstone	-	broken flakes	-	3m by 7m	Edge of the foot slope where there is a contour bank for the edge of dam	No comment made in field.	None made.	Broken due to dam construction.
QC06	Artefact Scatter	1	3	mudstone / silcrete / quartz	-	core, flake, broken flake	-	6m by 12m	Edge of the foot slope where there is a contour bank for the edge of dam	No comment made in field.	None made.	Broken due to dam construction.
QC06	Isolated Find	1	1	silcrete	-	flake	-	15m by 4m	Scald due to cattle treadage.	No comment made in field.	None made.	
QC06	Isolated Find	1	1	silcrete	-	core	-	1m by 1m	Scald due to cattle treadage.	No comment made in field.	None made.	
QC06	Isolated Find	1	1	silcrete	-	core		1m by 1m	Scald due to cattle treadage.	No comment made in field.	None made.	
QC06	Artefact Scatter	1	2	silcrete	mudstone	flake	-	3m by 2m	Scald due to cattle treadage.	No comment made in field.	None made.	Both retouched flakes, one with greasy lustre.
QC06	Artefact Scatter	1	1	quartz	-	flake	-	3m by 2m	Scald due to cattle treadage.	No comment made in field.	None made.	
QC06	Isolated Find	1	1	basalt	-	axe head	-	1m by 1m	Scald due to cattle treadage.	Trick and Shelley believed it may be related to trees with scars. Those trees have since been examined and are not scarred in the past by humans.	Trick and Shelley believed it may be related to trees with scars. Those trees have since been examined and are not scarred in the past by humans.	Basalt hand axe
QC06	Isolated Find	1	1	Silcrete	-	core	-	1m by 1m	Scald on track site defined to limits of track.	No comment made in field.	None made.	1 white Silcrete core.
QC06	Artefact Scatter	1	2	mudstone / quartz	-	flake	-	100m by 50m	Large scald on slope due to erosion from wind.	No comment made in field.	None made.	
QC06	Isolated Find	1	1	mudstone	-	core	-	1m by 1m	Near a dam and there is little to zero integrity in this area as it is also located in very eroded channel.	No comment made in field.	None made.	1 mudstone core

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QC07	Artefact Scatter	2	2	mudstone		flakes		5m x 0.2m	Artefact Distribution.	No comment made in field.	None made.	
QC07	Artefact Scatter	2	4	mudstone / silcrete		cores	flake, heat shatter	5m x 15m	Artefact Distribution.	No comment made in field.	None made.	
QC07	Isolated Artefact	2	1	silcrete		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC07	Isolated Find	2	1	mudstone		broken flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC07	Artefact Scatter	2	2	mudstone		core/flake		2m x 0.2m	Artefact Distribution.	No comment made in field.	None made.	
QC07	Artefact Scatter	2	2	mudstone		flake / retouched flake		30m x 10m	Artefact Distribution.	No comment made in field.	None made.	
QC08	Artefact Scatter	2	10	mudstone	silcrete	flakes	broken flakes, heat shatter	15m x 20m	Artefact Distribution.	No comment made in field.	None made.	
QC09	Isolated Find	2	1	quartzite		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC09	Artefact Scatter	2	9	mudstone	silcrete	flakes	heat shatter	20m x 20m	Artefact Distribution.	No comment made in field.	None made.	
QC09	Isolated Find	2	1	mudstone		retouched flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC09	Isolated Find	2	3	mudstone	basalt/quartzite			25m x 30m	Artefact Distribution.	No comment made in field.	None made.	the basalt/quartzite flake is from an axe or hammerstone there is some pitting (no obvious polish)
QC09	Artefact Scatter	2	3	mudstone	silcrete	flakes	broken flake	20m x 15m	Artefact Distribution.	No comment made in field.	None made.	
QC09	Isolated Find	2	1	silcrete		retouched flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC09	Artefact Scatter	1	3	mudstone	silcrete	retouched flake, broken flake, flake		2.5m x 5m	Artefact Distribution.	No comment made in field.	None made.	
QC09	Isolated Find	1	1	silcrete		core		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC10	Isolated Find	1	1	mudstone		core		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC10	Isolated Find	1	1	chert		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC10	Isolated Find	1	1	quartzite / hornfels		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC11	Isolated Artefact	1	1	silcrete	flake			Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC11	Isolated Artefact	1	1	silcrete		core		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC11	Artefact Scatter	1	8	silcrete	mudstone	flake	broken flake, core	15m x 5m	Artefact Distribution.	No comment made in field.	None made.	
QC11	Artefact Scatter	1	3					20m x 7m	Artefact Distribution.	No comment made in field.	None made.	
QC11	isolated find	1	1	mudstone		heat shatter		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC11	Artefact Scatter	1	4	mudstone	silcrete	flakes	heat shatter, a core	15m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	
QC12	Artefact Scatter	1	2	silcrete / quartz	-	core	-	5m by 1m	Scald from erosion in gully	No comment made in field.	None made.	Silcrete core, quartz core
QC12	Isolated Find	1	1	mudstone	-	broken flake	-	1m by 1m	Ants nest scald and edge of vegetation	No comment made in field.	None made.	patinated and weathered.
QC12	Artefact Scatter	1	2	mudstone	-	Broken flake/flake	-	3m by 3m	On contour bank and edge of foot slope near dam construction.	No comment made in field.	None made.	-
QC12	Artefact Scatter	1	14	mudstone	-	broken flake	Flaked pieces	5m by 4m	On contour bank and edge of foot slope near dam construction.	No comment made in field.	None made.	10% cortex on 1 mudstone broken flake.
QC12	Isolated Find	1	1	mudstone	-				Artefact Distribution.	No comment made in field.	None made.	

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QC13	Isolated Find	1	1	silcrete		broken flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	Site was located on a freshly graded vehicle track.
QC14	Artefact Scatter	1	20	mudstone	silcrete, basalt,	flakes	cores,	50m x 25m	Artefact Distribution.	No comment made in field.	None made.	
QC14	Isolated Find	1	1	basalt / quartzite	-	axe with retouch (flaked)		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC15	Isolated Find	1	1	Mudstone	-	flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC16	Isolated Find	1	1	mudstone	retouched flake			isolated find	Artefact Distribution.	No comment made in field.	None made.	This artefact while found on the upper slope has probably come form the ridgeline crest immediately above it.
QC17	artefact scatter	1	7	mudstone / silcrete	flakes	broken axe, flaked piece	basalt	15m x 3m	Artefact Distribution.	No comment made in field.	None made.	These artefacts were located on a vehicle track immediately down slope from a dam.
QC18	Isolated Find	1	1	basalt / silcrete	flake			Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
QC19	Isolated Find	1	1	silcrete		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	This artefact is located on a vehicle track
QC19	Isolated Find	1	1	mudstone		broken flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	Artefact located on a dam
QC19	Artefact Scatter	1	2	mudstone / silcrete		core/flake		0.5m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	Artefacts located on a dam
QC20	Artefact Scatter	1	4	Silcrete	quartzite	broken flake	flake, blade, flaked piece	5m by 5m	Artefacts located on edge of dam wall.	No comment made in field.	None made.	Silcrete blade.
QC21	Isolated Find	1	1	silcrete	-	flake	-	1m by 1m	Isolated find.	No comment made in field.	None made.	Silcrete flake.
QC02	Scarred Tree	3	0					-	Artefact Distribution.	No comment made in field.	None made.	
QC02	Isolated Find	1	1	silcrete		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC01	Isolated Find	2	1	mudstone		flake		Isolated Artefact	Cattle treadage in patches in vegetation.	No comment made in field.	None made.	Retouched flake very weathered.
SC01	Isolated Find	2	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	Primary mudstone flake with retouch
SC01	Isolated Find	2	1	porcellanite		broken flake			Artefact Distribution.	No comment made in field.	None made.	Porcellanite broken flake.
SC01	Isolated Find	2	1	mudstone		broken flake			Visibility in patches on creek terrace.	No comment made in field.	None made.	Hinge termination.
SC01	Artefact Scatter	2	19	mudstone	silcrete, porcellanite	flake	broken Flake, Core, Flaked Piece	3m by 5m	Visibility in patches on creek terrace.	No comment made in field.	None made.	Some retouched flakes, some heat treated mudstone with colour change and greasy lustre mixed in with some older artefacts that show patination. Silcrete is coarse with clasts.
SC01	Artefact Scatter	2	24	mudstone	silcrete, quartz, chert, chalcedony and porcellanite	flake	broken flake	32m by 150m	Large erosion scour on confluence minor tributary underneath transmission line	No comment made in field.	None made.	Mudstone has been heat treated and has greasy lustre. Some older flakes showing weathering and patination mixed in with more recent knapping. Some flakes had retouched.
SC01	Artefact Scatter	2	24	mudstone	silcrete, quartz, chert, chalcedony and porcellanite	flake	broken flake	11m by 130m	Large erosion scour on confluence minor tributary underneath transmission line	No comment made in field.	None made.	Mudstone has been heat treated and has greasy lustre. Some older flakes showing weathering and patination mixed in with more recent knapping. Some flakes had retouch.
SC01	Isolated Find	2	1	mudstone		broken flake			Patch of exposure from cattle treadage scald.	No comment made in field.	None made.	Snapped distal end of flake with a crushed platform.
SC01	Artefact Scatter	1	9	mudstone	silcrete, river pebble unidentified	flake	broken flake, flaked piece, core	65m by 62m	Exposure associated with dam construction and where woodland begins and visibility stops.	No comment made in field.	None made.	Some amber bottle glass, Flakes show retouch for mudstone, and some heat treating exhibited by greasy lustre, mudstone core was from outcropping and is heat treated
SC01	Artefact Scatter	1	9	mudstone	silcrete	flake	broken flake	65m by 62m	Exposure associated with dam construction and where woodland begins and visibility stops.	No comment made in field.	None made.	Flakes show retouch for mudstone, and some heat treating exhibited by greasy lustre, mudstone core was from outcropping and is heat treated
SC01	Artefact Scatter	1	2	mudstone	petrified wood	flake / broken flake		7m by 6m	Vehicle track exposure graded and extent of artefacts and vegetation	No comment made in field.	None made.	1 petrified wood retouched flake, 1 broken red mudstone flake with greasy lustre.
SC01	Artefact Scatter	1	4	mudstone	mudstone	flake	broken Flake	5m by 0.5m	Artefact distribution with exposure.	No comment made in field.	None made.	

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SC01	Artefact Scatter	1	3	mudstone	mudstone	flake	core	1m by 0.25m	Artefact distribution with exposure.	No comment made in field.	None made.	2 retouched mudstone flakes, one flake had a feather termination, 1 mudstone core which is rotated tires.
SC01	Artefact Scatter	2	26	mudstone	silcrete, quartz.	broken flake	flake, flaked piece, core, flake used as a core, heat shatter	70m by 300m	Artefact distribution within several scalds on both sides of bank in concentrations.	No comment made in field.	None made.	Flakes were retouched and had greasy lustre. Some flakes had blade scars on them and were used as a core. There is cortex on some flakes which looks like pebble cortex. Mudstone is not weathered or patinated and is a more recent knapping episode.
SC01	Artefact Scatter	1	14	mudstone		flake	Broken flake, flake used as a core,	80m by 87m	Track exposure and gully exposure.	No comment made in field.	None made.	Flakes had retouch and some had pebble cortex. Heat treating was observable from greasy lustre and colour change.
SC01	Artefact Scatter	2	7	silcrete	mudstone	flake	Broken flake, heat shatter	1.5m by 8m	Bushfire and burnt vegetation	No comment made in field.	None made.	Flakes had retouch in some cases, there are feather terminations on flakes and some evidence of heat treatment.
SC01	Artefact Scatter	1	23	mudstone	silcrete, sandstone, chert,	flake	Broken flake, heat shatter, core sandstone anvil,	85m by 65m	Bushfire and burnt vegetation and edge of gully and creek line	No comment made in field.	None made.	Flakes had heating and there is come retouch, there is a sandstone anvil with a worked edge at this site.
SC01	Artefact Scatter	2	16	silcrete	quartz, mudstone	flake	blade cores, heat shatter	10m by 1m	Creek terrace and edge of Saddlers Creek	No comment made in field.	None made.	
SC01	Artefact Scatter	2	5	mudstone	silcrete	flake	broken flake	15m by 20m	Creek terrace and edge of Saddlers Creek	No comment made in field.	None made.	Artefacts are heat affected from recent burning due to bush fires.
SC01	Artefact Scatter	2	24	mudstone	porcellanite, silcrete, chert,	flake	Broken Flake, core	56m by 90m	Creek terrace to edge of Saddlers Creek	No comment made in field.	None made.	Mudstone flakes have retouch on some margins. One core has lots of rotations.
SC01	Artefact Scatter	1	14	mudstone	-	flake	Broken flake, core,	50m by 50m	Edge of creek and inside of creek and ants nest and saltpan erosion in creek	No comment made in field.	None made.	One knapping floor discernable of all same material. Yellow mudstone used and some evidence of retouch and bifacially flaked material.
SC01	Artefact Scatter	2	28	mudstone	silcrete, hornfels,	broken flake	Flake, heat shatter, backed blade	280m by 40m	Edge of Creek	No comment made in field.	None made.	At least two knapping floors of mudstone. One backed blade shows blade manufacture.
SC01	Artefact Scatter	1	10	mudstone	silcrete	flake	Broken flake, core	3m by 6.5m	Vehicle track exposure and edges of vegetation.	No comment made in field.	None made.	1 cream mudstone flake, 2 pink mudstone flakes, 2 red mudstone flakes, 2 red silcrete flakes, 1 big primary yellow mudstone core, 2 pink mudstone broken flakes.
SC01	Artefact Scatter		14	mudstone	silcrete, quartz	broken flake	flake, flaked piece	3m by 6.5m	Vehicle track exposure and edges of vegetation.	No comment made in field.	None made.	Five broken mudstone flakes, six mudstone flakes, 1 mudstone flaked piece, 1 broken silcrete flake and 1 broken quartz flake.
SC01	Artefact Scatter	1	145-200	mudstone	porcellanite, silcrete, quartz, silicified sandstone, river pebbles, quartzite, basalt.	flakes	Broken flakes, heat shatter, flaked pieces, backed blade, core, grindstone, hammer stones	78m by 32m	Creek line and edge of creek and break to lower slope landform.	No comment made in field.	None made.	Backed blade manufacture. Several knapping floors discernible. Grindstone and hammerstone located. Thumbnail scraper found. Cores are mostly wasted.
SC01	Artefact Scatter	1	146-250	mudstone	silcrete, porcellanite, chert, petrified wood, basalt, hornfels	Flake	Broken flakes, blade core, backed blade, flaked pieces, heat shatter, cores, scraping tool, scrapers, choppers, axe head.	90m by 35m	Edge of creek bank and gullies define the site.	No comment made in field.	None made.	Backed blade manufacture. Several knapping floors discernible. Cores found including petrified wood core and porcellanite core. Backed blade manufacture for mudstone only. Chert cores.
SC01	Artefact Scatter	3	25	mudstone	silcrete, quartz, chert, petrified wood	Flake	Broken flake, flaked piece, core, pebble cores,	70m by 68m	Edge of creek bank and contour bank.	No comment made in field.	None made.	Primary flakes, some retouched flakes, and many flakes have over 50% cortex in mudstone. 1 red yellow mudstone flake with hinge termination, heat treated with 40% cortex, 1 red mudstone flaked piece, 2 yellow mudstone flakes (1 with retouch and 1 with feather termination), 2 broken pink mudstone flakes, 1 pink silcrete flaked piece, 2 red mudstone broken flakes, 1 red mudstone primary flake, three mudstone flakes, 1 white-yellow quartz flaked piece, 2 red mudstone flakes, 1 struck mudstone pebble core with 60% cortex, 1 broken petrified wood flake, 1 petrified wood core wasted with 10% cortex, 2 quartz flaked pieces, 1 white red chert flake, 1 yellow mudstone flake with pebble cortex 60%, 1 red and 1 yellow mudstone flake.
SC01	Artefact Scatter	2	10	mudstone	silcrete, hornfels,	broken flake	flake, flaked piece	25m by 3m	Edge of creek bank and contour bank.	No comment made in field.	None made.	2 broken red mudstone flakes, 1 red silcrete flaked piece, 2 red mudstone primary flakes with 60% cortex, 1 yellow mudstone flake with 60% cortex, 1 yellow mudstone broken flake, 1 red mudstone broken flake, 1 hornfels flake and 1 red mudstone primary flake.
SC01	Isolated Find	1	1	mudstone	-	broken flake	-	50m by 50m	Edge of Creek terrace.	No comment made in field.	None made.	

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SC01	Artefact Scatter	2	22	mudstone	chert, silcrete, quartz,	broken flake	Flake, core, heat shatter, axe head, flaked piece	97m by 14m	Edge of floodplain to elevated area of creek terrace.	No comment made in field.	None made.	Burnt artefacts from recent fires. Flakes have cortex and there are cores with over 6 rotations, there are also blade cores and evidence of retouch on flakes.
SC01	Artefact Scatter	2	39	silcrete	mudstone, quartz, chert	flake	Broken flake, core, flaked pieces,	13m by 19m	Edge of vehicle track and adjacent gully.	No comment made in field.	None made.	Burnt artefacts from recent fires. Broken flakes from use as track. Flakes with some evidence of retouch. 1 quartz core, 1 Silcrete core.
SC01	Artefact Scatter	2	3	mudstone		flake	Core, manuport	5m by 5m	Scald on creek terrace near Saddlers Creek.	No comment made in field.	None made.	One mudstone large pink/red manuport. I weathered flake with a hinge termination and retouch on left and right margins. 1 yellow mudstone core with 50% cortex.
SC01	Artefact Scatter	2	2	mudstone		flake	Core	5m by 5m	Creek terrace.	No comment made in field.	None made.	One mudstone retouched flake and one core with 80% cortex.
SC01	Artefact Scatter	2	4	mudstone	quartz, silcrete	core	flake	10m by 2m	Creek terrace.	No comment made in field.	None made.	Mudstone has been heat treated and also some cortex on flakes. Greasy lustre. 1 white red mudstone core wasted, 1 red yellow mudstone core with 60% cortex, 1 white quartz flake and 1 yellow mudstone core with 80% cortex.
SC01	Artefact Scatter	2	4	mudstone	-	flake, broken flake, core, flaked piece	-	10m by 2m	Creek terrace.	No comment made in field.	None made.	1 small wasted red mudstone core with greasy lustre and 30% remaining cortex, 1 red yellow mudstone flaked piece, 1 broken red yellow silcrete flake and 1 broken red yellow mudstone flake.
SC01	Artefact Scatter	2	17	mudstone	silcrete, quartz	core	flake	15m by 5m	Creek terrace.	No comment made in field.	None made.	
SC01	Artefact Scatter	2	5	mudstone	silcrete	Flake	Broken flake, core	15m by 5m	Foot slope of creek and edge of Saddlers Creek.	No comment made in field.	None made.	4 of yellow mudstone artefacts have 60% cortex.
SC01	Artefact Scatter	2	5	mudstone	silcrete	Flake	Broken flake, core	15m by 5m	Foot slope of creek and edge of Saddlers Creek.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	4	mudstone	silcrete, quartz	flake	broken flake	20m by 25m	Midslope scald associated with track.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	1	silcrete	-	broken flake	-	1m by 1m	Confined to bench.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	3	silcrete	quartz	flake	Core used as flake	41m by 1m	Confined to edge of tributary of Saddlers Creek which leads up to a dam.	No comment made in field.	None made.	
SC01	Artefact Scatter	3	2	mudstone		flakes		10m x 8m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	2	mudstone		flakes		2m x 2m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	2	mudstone / porcellanite		flakes		5m x5m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	3	2	mudstone / porcellanite		flakes	heat treated/effected	10m x 1m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	2	70-100	mudstone	silcrete, petrified wood, porcellanite	flakes			Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	2	mudstone / silcrete		flake and flaked piece		2.5m x .5m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	3	mudstone	silcrete	flakes	heat shatter	3m x 1m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Isolated Find	1	1	mudstone		broken heat effected flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	11	mudstone	silcrete	flakes/heat shatter		15 m x 5m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Isolated find	1	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	3	5	mudstone		flakes	broken flakes	3m x 4m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	3	50-100	mudstone	silcrete	flakes	broken flakes, heat shatter and cores	18m x 30m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	3	50-100	silcrete	mudstone	flakes and broken flakes	blades, retouched flakes, cores, flakes pieces	30m x 50m	Artefact Distribution.	No comment made in field.	None made.	

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SC01	Artefact Scatter	3	50	mudstone	silcrete, quartz, chert	flakes	cores, broken flakes, backed blade	70m x 15m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Isolated Find	3	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	3	9	mudstone	flakes	quartz, porcellanite and silcrete		15m x 8m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	13	mudstone	silcrete and quartz	flakes	heat shatter and a scraper	10m x 5m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	2	mudstone				.5m x .5m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	6	silcrete	mudstone	broken flakes	flakes	5m x 2m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	5	mudstone		flakes		1m x 1m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	8	mudstone	silcrete	flakes	blade flake, heat shatter	5m x 7m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	30-50	mudstone	silcrete, basalt, hornfels, quartzite	flakes	backed and broken flakes, cores, broken edge ground axe	30m x 10m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	6	mudstone	quartz	flakes	ochre cake, heat shatter	25m x 8m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	2	mudstone		core and flake		10m x 2.5m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	3	20	silcrete	mudstone, porcellanite, hornfels	flakes and broken flakes	large % cortex	15m x 15m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	4	mudstone		flakes	broken flakes	25m x 20m	Artefact Distribution.	No comment made in field.	None made.	Artefacts on contour bank / vehicle track.
SC01	Isolated Find	1	1	mudstone		manuport		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	Artefact on dam.
SC01	Artefact Scatter	1	21	mudstone	silcrete	flakes	flakes used as cores, heat shatter, cores, flaked pieces	30m x 10m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	1	2	mudstone	silcrete	cores, flakes		10m x 1m	Artefact Distribution.	No comment made in field.	None made.	Large Artefacts.
SC01	Artefact Scatter	1	7	mudstone	silcrete, indeterminate	cores, flakes	broken and retouched flakes, heat shatter	20m x 6m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	2	100-200	mudstone	quartz, porcellanite and silcrete	flakes and broken flakes	cores, backed artefacts and heat shatter	15m x 60m	Artefact Distribution.	No comment made in field.	None made.	
SC01	Artefact Scatter	2	3	silcrete	mudstone	flake	core	10m by 32m	Exposure along creek bank	No comment made in field.	None made.	1 yellow mudstone core with 20% cortex, 2 pink silcrete flakes retouch on margins.
SC01	Artefact Scatter	1	24	mudstone	porcellanite, Silcrete, chert,	Flake	core, flaked piece, broken flake,	47m by 18m	Exposure within landform	No comment made in field.	None made.	Flakes have retouch and there is also evidence of cortex. Porcellanite is blue not sure if from bush fires or it is heat treated.
SC01	Artefact Scatter	1	19	mudstone	quartz and silcrete	flake	core, flaked piece	30m by 5m	Exposure along creek bank	No comment made in field.	None made.	Five quartz flakes, 2 silcrete flakes 1 silcrete flaked piece, 6 red-yellow heat treated mudstone flakes - 3 contain 30% cortex, 1 mudstone core and 1 mudstone flaked piece.
SC01	Artefact Scatter	1	5	mudstone	silcrete quartz	flake	broken flake, flaked piece	12m by 35m	Exposure within landform	No comment made in field.	None made.	
SC01	Artefact Scatter	1	6	mudstone	silcrete, porcellanite	flake	broken flake, core	12m by 35m	Exposure within landform	No comment made in field.	None made.	Rotated core.
SC02	Artefact Scatter	1	11	mudstone	silcrete, quartzite	Broken flake	flake, broken hammerstone	7m by 4m	Confined to edge of tributary of Saddlers Creek which leads up to a dam	No comment made in field.	None made.	Quartzite hammerstone with crushing almost like a flake scar.
SC02	Artefact Scatter	1	8	silcrete	mudstone, quartz	Flake	-	76m by 90m	Confined to edge of tributary of Saddlers Creek which leads up to a dam	No comment made in field.	None made.	Primary silcrete flake.
SC02	Artefact Scatter	1	30-50	mudstone	silcrete	flake	broken flake		Artefact Distribution.	No comment made in field.	None made.	Both large and small artefacts present. Some seem heat effected (colour change / crazing on the mudstone) and others do not.

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SC02	Isolated Find	1	1	mudstone	-	retouched flake (with possible use wear	-	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	Site is located on a dam
SC02	Artefact Scatter	1	2	mudstone / basalt	-	flaked axe head, flakes piece	-	7.5m x 1m	Artefact Distribution.	No comment made in field.	None made.	
SC02	Isolated Find	1	1	silcrete	-	broken flake	-	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC02	Artefact Scatter	1	4	silcrete	sandstone and mudstone	flakes, broken flake, hammer stone	-	5m x 3m	Artefact Distribution.	No comment made in field.	None made.	
SC02	Isolated Find	1	1	mudstone		flake	-	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC02	Artefact Scatter	1	15	silcrete	mudstone, basalt/quartzite	broken flakes, flakes	flakes piece, hammer stone	15m x 10m	Artefact Distribution.	No comment made in field.	None made.	
SC02	Isolated Find	1	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC02	Artefact Scatter	1	27	mudstone	silcrete	flakes and broken flakes	flaked piece, retouched flakes	45m x 10m	Artefact Distribution.	No comment made in field.	None made.	
SC02	Artefact Scatter	1	2	silcrete	mudstone	flaked piece	-	5m by 2m	Scald on creek bank	No comment made in field.	None made.	Broken flakes from cattle treadage.
SC02	Artefact Scatter	1	1	silcrete	mudstone	core	-	5m by 2m	Scald on creek bank	No comment made in field.	None made.	Silcrete core and yellow mudstone core.
SC02	Artefact Scatter	1	3	mudstone	-	broken flakes	Core	5m by 2m	Scald on creek bank	No comment made in field.	None made.	Red mudstone broken flakes and one core.
SC02	Artefact Scatter	1	3	silcrete	basalt	flake	Basalt hand axe retouch	43m by 10m	Scald on creek bank	No comment made in field.	None made.	Basalt hand axe with retouch and retouched Silcrete flakes.
SC02	Artefact Scatter	1	6	silcrete	-	broken flakes	-	10m by 3m	On dam wall	No comment made in field.	None made.	Broken flakes due to dam construction.
SC02	Artefact Scatter	1	2	mudstone	silcrete	broken flake	Flake	12m by 4m	Vehicle track exposure graded and extent of artefacts and vegetation	No comment made in field.	None made.	
SC03	Isolated Artefact	1	1	mudstone		flake		Isolated Artefact		No comment made in field.	None made.	Artefacts found on dam.
SC03	Isolated Artefact	1	1	mudstone		flake		Isolated Artefact		No comment made in field.	None made.	
SC03	Artefact Scatter	1	3	mudstone	-	flake	-	3m by 12m	Vehicle track exposure graded and extent of artefacts and vegetation	No comment made in field.	None made.	
SC03	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Dam constructed and site is within creek bank nearby dam walls	No comment made in field.	None made.	
SC03	Isolated Find	1	1	mudstone	-	broken flake	-	Isolated Artefact	Dam constructed and site is within creek bank nearby dam walls	No comment made in field.	None made.	
SC03	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Dam constructed and site is within creek bank nearby dam walls	No comment made in field.	None made.	
SC03	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Dam constructed and site is within creek bank nearby dam walls	No comment made in field.	None made.	
SC03	Artefact Scatter	1	4	silcrete	-	broken flake	flaked piece	Isolated Artefact	Dam constructed and site is within creek bank nearby dam walls	No comment made in field.	None made.	
SC04	Artefact Scatter	1	1	mudstone	-	broken flake	-	1m by 1m	Edge of Saddlers Creek.	No comment made in field.	None made.	Pink-red mudstone flake with 10% cortex broken distal and proximal.
SC04	Artefact Scatter	1	3	silcrete	quartz chert	flake	broken flakes	15m by 5m	Edge of Saddlers Creek.	No comment made in field.	None made.	2 broken yellow silcrete flakes, 1 quartz broken flake and 1 broken chert flake retouch on left and right margins.

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SC04	Artefact Scatter	1	4	silcrete	quartz chert	broken flake	flake	9m by 120m	Edge of Saddlers Creek.	No comment made in field.	None made.	1 white quartz flake broken and 1 pink/white silcrete flake with retouch.
SC04	Artefact Scatter	1	1	silcrete	-	flake	-	3m by 5m	Ants nest	No comment made in field.	None made.	1 white silcrete flake with feather termination, retouched on margins and a platform scar.
SC04	Isolated Find	2	1	silcrete	-	broken flake	-	1m by 1m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 yellow broken silcrete flake with 60% pebble cortex and heated.
SC04	Isolated Find	2	1	mudstone	-	flake	-	Isolated Artefact	Edge of tributary of creek and beginning of vegetation	No comment made in field.	None made.	1 white mudstone flake retouched with a feather termination and crushed platform.
SC04	Isolated Find	2	1	mudstone	-	broken flake	-	Isolated Artefact	Edge of tributary of creek and beginning of vegetation	No comment made in field.	None made.	One pink red mudstone broken flake with 10% cortex and a broken distal end.
SC04	Artefact Scatter	2	14	mudstone	silcrete, quartz	flake	Broken flake core	10m by 3m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 yellow mudstone core 60% cortex multidirectional not wasted.
SC04	Artefact Scatter	2	2	mudstone	quartz	core	broken flake	5m by 5m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 red/white mudstone core with 60% cortex heat treated.
SC04	Isolated Find	2	1	mudstone	-	broken flake	-	2m by 4m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 broken mudstone flake no retouch.
SC04	Artefact Scatter	2	2	silcrete	-	broken flake	core	3m by 5m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 yellow silcrete primary broken flake and 1 silcrete core.
SC04	Isolated Find	2	1	mudstone	-	flake	-	1m by 1m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 yellow primary flake with retouch.
SC04	Artefact Scatter	2	4	mudstone	-	broken flake	-	1m by 1m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 yellow mudstone broken flake, 1 broken red mudstone flake has retouch on margins, 1 yellow/red heat treated flake retouched with feather termination, 1 pink silcrete flake with retouch and plunging termination.
SC04	Artefact Scatter	2	15	mudstone	silcrete, chert, petrified wood,	flake	broken flake, core, flaked pieces, backed blade	3m by 7m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 pink silcrete core, 1 chert core, 2 petrified wood cores, 1 white quartz broken flake, 3 pink Silcrete flakes, 1 mudstone backed blade, 5 retouched mudstone flakes and 1 mudstone flaked piece.
SC04	Isolated Find	2	1	mudstone	-	flake	-	1m by 1m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 yellow-red mudstone flake.
SC04	Isolated Find	2	1	mudstone	-	flake	-	1m by 1m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 red mudstone retouched flake.
SC04	Artefact Scatter	2	4	mudstone	-	flake	-	2m by 4m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	
SC04	Isolated Find	2	1	silcrete	-	flake	-	5m by 6m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	
SC04	Isolated Find	2	1	mudstone	-	broken flake	-		Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	1 red broken mudstone flake.
SC04	Artefact Scatter	2	4	mudstone	silcrete	flake	broken flake	5m by 37m	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	pink white silcrete retouched flake, pink white mudstone flakes retouched.
SC04	Artefact Scatter	2	14	mudstone	silcrete	flake	heat shatter, backed blade, core	30m (east) by 150m north	Edge of Saddlers Creek and vehicle track	No comment made in field.	None made.	red mudstone core, retouched flakes and heat treatment of silcrete.
SC04	Artefact Scatter	2	8	silcrete	mudstone	flake	some heat affected, retouched an broken	15m x 5m	Artefact Distribution.	No comment made in field.	None made.	
SC04	Artefact Scatter	2	30	silcrete	mudstone	flake	some heat affected, retouched an broken	25m x 10m	Artefact Distribution.	No comment made in field.	None made.	
SC04	Artefact Scatter	2	10	silcrete	mudstone	flake	some heat affected, retouched an broken	3m x 10m	Artefact Distribution.	No comment made in field.	None made.	
SC04	Artefact Scatter	2	2	silcrete	mudstone	flake	some heat affected, retouched an broken	0.5m x 4m	Artefact Distribution.	No comment made in field.	None made.	
SC05	Isolated Find	3	1	mudstone	-	flake	-	1m by 1m	Edge of minor tributary of Saddlers Creek and dam edge.	No comment made in field.	None made.	1 pink silcrete flake, retouched feather termination.
SC05	Artefact Scatter	3	2	silcrete / mudstone	-	broken flake	-	1m by 1m	Edge of minor tributary creek bank and dam.	No comment made in field.	None made.	
SC05	Artefact Scatter	3	5	mudstone	silcrete	flake	broken flake, core	15m by 5m	Edge of dam in tributary of Saddlers Creek.	No comment made in field.	None made.	Flakes are retouched and show evidence of heat treatment by colour change.
SC05	Artefact Scatter	3	2	basalt	-	broken flake	core	15m by 5m	Edge of dam in tributary of Saddlers Creek.	No comment made in field.	None made.	Basalt looks almost blue.
SC05	Artefact Scatter	3	3	mudstone	silcrete	broken flake / flake / core	-	2m by 4m	Edge of creek bank.	No comment made in field.	None made.	

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SC05	Isolated Find	3	1	mudstone	-	broken flake	-	1m by 1m	Edge of creek bank.	No comment made in field.	None made.	Red and white spotty mudstone.
SC05	Isolated Find	3	1	mudstone	-	broken flake	-	1m by 1m	Edge of creek bank.	No comment made in field.	None made.	
SC05	Artefact Scatter	3	11	mudstone	silcrete, quartz	flake	broken flake	20m by 5m	Edge of creek bank.	No comment made in field.	None made.	Retouched flakes all mudstone.
SC05	Isolated Find	3	1	mudstone	-	flake	-	1m by 1m	Edge of creek bank.	No comment made in field.	None made.	Red glossy white spotted mudstone flake.
SC05	Artefact Scatter	3	250-300	mudstone	silcrete, petrified wood, quartz, basalt.	flake	edge ground axe, cores,	30m x 80m	Artefact Distribution.	No comment made in field.	None made.	Some of the mudstone had colour change and pot lidding and some was unaffected by heat.
SC05	Artefact Scatter	3	40	mudstone	silcrete, basalt	flake / broken flake	heat shatter, an edge ground axe	40m x 5m	Artefact Distribution.	No comment made in field.	None made.	
SC05	Artefact Scatter	3	3	mudstone		flake	heat shatter	3m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	
SC05	Isolated artefact	3	1	mudstone				Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC05	Artefact Scatter	3	15	mudstone	silcrete, quartz	flakes	some broken, retouched and most heat effected	5m x 7.5m	Artefact Distribution.	No comment made in field.	None made.	
SC05	Artefact Scatter	3	5	mudstone	silcrete, chert/really fine quartzite	broken flakes	a blade and a flaked piece	5m x 3.5m	Artefact Distribution.	No comment made in field.	None made.	
SC05	Isolated Artefact	3	1	silcrete		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC05	Isolated Artefact	3	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC05	Isolated Find	3	1	mudstone	flake			Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC05	Artefact Scatter	3	5	silcrete	mudstone	flakes	cores	10m x 5m	Artefact Distribution.	No comment made in field.	None made.	
SC05	Isolated Find	3	1	mudstone		core		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC05	Artefact Scatter	3	13	mudstone	silcrete	flakes, broken flakes	core, flaked pieces	10m x 3m	Artefact Distribution.	No comment made in field.	None made.	
SC05	Isolated find	3	1	silcrete		retouched flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC05	Artefact Scatter	3	1	Mudstone		broken flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC05	Isolated Find	3	1	Silcrete		broken flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC05	Isolated Find	1	1	Silcrete	-	broken flake	-	1m by 1m	Scald on creek bank.	No comment made in field.	None made.	
SC05	Isolated Find	1	1	mudstone	-	broken flake	-	1m by 1m	Scald on creek bank.	No comment made in field.	None made.	Mudstone has greasy lustre.
SC05	Artefact Scatter	1	8	mudstone	silcrete, quartz	flaked piece	flake, core	5m by 2m	Scald on creek bank	No comment made in field.	None made.	Some of the mudstone is patinated.
SC05	Isolated Find	1	1	mudstone	-	broken flake	-	1m by 1m	Scald on creek bank	No comment made in field.	None made.	Yellow mudstone broken flake.
SC05	Isolated Find	1	1	mudstone	-	flake	-	1m by 1m	Scald on creek bank	No comment made in field.	None made.	Retouched mudstone flake.
SC05	Artefact Scatter	1	3	mudstone	-	flakes	-	5m by 10m	Scald on creek bank	No comment made in field.	None made.	Broken flakes heat treated and retouched.
SC05	Artefact Scatter	1	3	mudstone	silcrete	flake	flaked piece	20m by 10m	Scald on creek bank	No comment made in field.	None made.	
SC05	Artefact Scatter	1	2	mudstone / tuff	-	broken flake	-	5m by 2m	Scald on creek bank	No comment made in field.	None made.	-
SC06	Artefact Scatter	2	7	mudstone	-	flake	Broken flake	5m by 5m	Foot slope of creek and edge of Saddlers Creek	No comment made in field.	None made.	5 mudstone flakes are red/yellow would appear to be heat treated.
SC06	Artefact Scatter	3	3	mudstone	silcrete	flake	core, heat shatter	4m by 0.5m	Edge of Minor tributary of Saddlers Creek	No comment made in field.	None made.	

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SC06	Artefact Scatter	3	2	mudstone	siltstone	flake	Flaked piece	15m by 5m	Edge of Minor tributary of Saddlers Creek	No comment made in field.	None made.	Mudstone flake is a primary flake with 60% cortex and has been heat treated.
SC06	Artefact Scatter	3	5	mudstone / silcrete	petrified wood,	broken flake	flake, flake used as a core, core	5m by 30m	Edge of Minor tributary of Saddlers Creek	No comment made in field.	None made.	Petrified wood core, Yellow mudstone flake used as a core which is 30% cortex and is heat treated. Silcrete is weathered compared to mudstone.
SC06	Isolated Find	3	1	silcrete	-	primary flake	-	5m by 30m	Edge of Minor tributary of Saddlers Creek	No comment made in field.	None made.	Silcrete primary flake.
SC07	Artefact Scatter	2	11	silcrete	mudstone, petrified wood	flakes	broken flakes	130m x 60m	Artefact Distribution.	No comment made in field.	None made.	
SC07	Artefact Scatter	2	84	mudstone	silcrete, quartz	flakes	broken flakes, flaked pieces	5m x 250m	Artefact Distribution.	No comment made in field.	None made.	
SC07	Artefact Scatter	2	33	silcrete		flakes	broken flakes	30m x 100m	Artefact Distribution.	No comment made in field.	None made.	
SC07	Artefact Scatter	2	9	mudstone	silcrete, chert	flakes	cores, broken flakes	20m x 60m	Artefact Distribution.	No comment made in field.	None made.	
SC07	Artefact Scatter	2	48	mudstone	silcrete, chert	flakes	broken flakes, cores		Artefact Distribution.	No comment made in field.	None made.	
SC07	Artefact Scatter	2	8	mudstone	silcrete	flakes	cores	10m x 50m	Artefact Distribution.	No comment made in field.	None made.	
SC07	Artefact Scatter	2	89	porcellanite	mudstone, chert, silcrete	flakes	blades	20m x 10m	Artefact Distribution.	No comment made in field.	None made.	
SC07	Artefact Scatter	2	96	mudstone	silcrete, porcellanite, quartz	flakes	broken flakes, backed blades, blades, cores	unknown	Artefact Distribution.	No comment made in field.	None made.	
SC07	Artefact Scatter	2	4	mudstone		flakes	broken flakes, core	0.5m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	
SC07	Artefact Scatter	2	2	silcrete		Cores, flakes	vegetation had been recently ripped	15m x .25m	Artefact Distribution.	No comment made in field.	None made.	
SC08	Artefact Scatter	1	2	mudstone	silcrete	flakes	broken flakes	3m by 5m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	2	25	mudstone	silcrete, porcellanite, volcanics	flakes	broken flakes, cores,	30m x 8m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	1						10m x 8m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	1						25m x 5	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	1						7m x 2m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	1						30m x 60m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	1						40m x 35m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Isolated artefact	1	1		Bondi point			Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	1	25	silcrete	hornfels, mudstone			15m x 5m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	1	20	mudstone	silcrete, porcellanite, petrified wood, chalcedony			60m x 35m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	2	20	mudstone	silcrete	flakes, broken and retouched flakes	debitage	75m x 35m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	2	3	silcrete	mudstone	flakes		2m x 8m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	2	7	mudstone	silcrete	flakes	one retouched, most heat effected	10m x 7m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	2	6	mudstone/silcrete		flakes	broken flakes	15m x 5m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	2	6	mudstone		flakes	flakes piece, elouera	20m x 7m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	2	11	mudstone	silcrete, basalt	flakes	retouched flakes, heat shatter	12m x 7m	Artefact Distribution.	No comment made in field.	None made.	

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SC09	Artefact Scatter	2	3	mudstone		flakes	core	115m x 30m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Isolated artefact	2	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC09	Isolated Find	2	1	silcrete		broken flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	2	16	mudstone	silcrete, quartz	broken flake	flake, heat affected	3.5m x 10m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Isolated Artefact	2	1	mudstone		flake	heat affected primary flake	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC09	Isolated Find	2	1	mudstone		flake	heat affected	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC09	Artefact Scatter	2	5	mudstone		flakes	broken flakes including heat effected (colour change and pot lidding)	15m x 30m	Artefact Distribution.	No comment made in field.	None made.	
SC09	Isolated Find	2	1	mudstone		heat effected flake		Isolated Artefact		No comment made in field.	None made.	
SC09	Isolated Find	2	1	silcrete		retouched flake		Isolated Artefact		No comment made in field.	None made.	
SC09	Isolated Find	2	1	mudstone		flake		Isolated Artefact		No comment made in field.	None made.	
SC09	Artefact Scatter	2	6	mudstone	silcrete	flakes		1m x 1m		No comment made in field.	None made.	
SC09	Isolated Find	2	1	petrified wood	-	flake	-	1m by 1m	Vehicle track exposure and edge of dam.	No comment made in field.	None made.	
SC09	Artefact Scatter	1	2	silcrete / mudstone	-	blade/flake	-	15m by 10m	Dam wall.	No comment made in field.	None made.	1 silcrete blade and 1 small retouched mudstone flake with 50% cortex.
SC09	Artefact Scatter	1	10	mudstone	Silcrete, quartz	flake	broken flakes, cores	8m by 2m	Ants nest scald which is off a minor tributary adjacent to at the dam and on the vehicle track scald.	No comment made in field.	None made.	2 quartz flakes, 2 silcrete flakes, 1 silcrete core, 2 mudstone flakes and 3 mudstone broken flakes.
SC09	Isolated Find	1	1	mudstone	-	core	-	1m by 1m	Scald on vehicle track.	No comment made in field.	None made.	
SC09	Isolated Find	1	1	mudstone	-	flake	-	1m by 1m	Scald on vehicle track.	No comment made in field.	None made.	
SC09	Isolated Find	1	1	mudstone	-	flake	-	1m by 1m	Scald on vehicle track.	No comment made in field.	None made.	
SC09	Isolated Find	1	1	mudstone	-	core	-	Isolated Artefact	Scald associated with dam on tributary of Saddlers Creek and edge of vegetation	No comment made in field.	None made.	1 red yellow mudstone core.
SC09	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Scald associated with dam on tributary of Saddlers Creek and edge of vegetation	No comment made in field.	None made.	1 red yellow mudstone flake with retouch.
SC09	Isolated Find	1	1	mudstone	-	core	-	1m by 1m	scald near dam wall.	No comment made in field.	None made.	1 yellow mudstone core.
SC09	Artefact Scatter	1	3	mudstone / basalt / silcrete	-	flake	-	5m by 10m	scald on foot slope due to ants nest.	No comment made in field.	None made.	
SC09	Artefact Scatter	1	500-700	mudstone	silcrete, basalt, quartz, chert, tuff, petrified wood	flake	broken flake, core, flaked piece, heat shatter,	84m by 64m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	Numerous knapping floors and concentrations based on gully exposures along creek.
SC09	Artefact Scatter	1	6	mudstone	-	flake	core	10m by 3m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	1 mudstone pebble core, 3 weathered mudstone flakes and remainder show evidence of heat treatment.
SC09	Artefact Scatter	1	2	mudstone	-	flake/core	-	3m by 2m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	1 yellow mudstone core and flake.
SC09	Artefact Scatter	1	7	mudstone	-	flakes	cores, flaked pieces	5m by 3m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	2 mudstone cores, 3 mudstone flakes, and 2 mudstone flaked pieces; very weathered and heat treated change in colour.
SC09	Artefact Scatter	2	62	silcrete	basalt, mudstone, petrified wood,	flake	broken flake, cores,	50m by 30m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	Artefacts are eroding out of the soil in the gullies.

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Final Name	Site type	Disturbance	Number of artefacts	Predominant raw material	Other raw materials	Predominant artefact type	Other artefact types	Site Area	Area defined by	Aboriginal Significance	Comments including any stories or comments from Aboriginal groups about values of sites	Artefact Comments
SC09	Artefact Scatter	1	2	mudstone / silcrete	-	broken flake/blade	-	3m by 2m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	1 mudstone broken flake and 1 silcrete blade.
SC09	Artefact Scatter	1	2	mudstone	-	flake	-	3m by 2m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	1 mudstone weathered flake and 1 mudstone flake.
SC09	Artefact Scatter	1	3	mudstone	-	core/flake/flaked piece	-	12m by 4m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	1 red mudstone core with 70% cortex, 1 red mudstone flaked piece, 1 red mudstone flake.
SC09	Artefact Scatter	1	12	silcrete	mudstone	broken flakes	flakes, core	13m by 19m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	Knapping floor for silcrete and also a mudstone knapping floor.
SC09	Artefact Scatter	1	125	mudstone	silcrete, petrified wood, chert, tuff, porcellanite, hornfels, basalt	broken flakes	broken flakes, choppers, hammerstone, cores, flaked pieces, heat shatter	23m by 50m	Localised to creek banks of tributary and underneath cattle scalds in between trees.	No comment made in field.	None made.	Lots of artefacts knapping floors (min, 4 counted) and areas with lots of different materials.
SC09	Artefact Scatter	1	125	mudstone	silcrete, petrified wood, chert, tuff, porcellanite, hornfels, basalt	broken flakes	broken flakes, choppers, hammerstone, cores, flaked pieces, heat shatter	55m by 100m	Localised to creek banks of tributary and underneath cattle scalds in between trees.	No comment made in field.	None made.	Lots of artefacts knapping floors (min, 4 counted) and areas with lots of different materials.
SC09	Artefact Scatter	1	14	silcrete	mudstone, hornfels, basalt, quartz	flakes	broken flakes, core	65m by 120m	Localised to creek banks of tributary and underneath cattle scalds in between trees.	No comment made in field.	None made.	
SC09	Isolated Find	1	1	mudstone	-	core	-	1m by 1m	Isolated find.	No comment made in field.	None made.	Mudstone core on its own.
SC09	Artefact Scatter	1	11	mudstone	silcrete, chert	flake	broken flake, cores,	5m by 3m	Ants nest scald on creek bank edge.	No comment made in field.	None made.	Mudstone is glossy and greasy lustre. Mudstone flakes have retouch on all margins.
SC09	Artefact Scatter	1	5	mudstone	chert, silcrete	flake	core, broken flake	20m by 10m	Scald under trees on creek bank.	No comment made in field.	None made.	Mudstone is glossy and greasy lustre.
SC09	Artefact Scatter	1	20	mudstone	silcrete, chert	broken flake	flake,	50m by 25	Scald under trees on creek bank.	No comment made in field.	None made.	Mudstone has greasy lustre and mudstone flakes are retouched. Breakage on site is from cattle grazing.
SC09	Artefact Scatter	1	12	mudstone	-	flake	core, broken blade that conjoins	12m by 4m	Scald on gullies and creek bank edge.	No comment made in field.	None made.	1 yellow mudstone core with 85% cortex, 2 red/yellow mudstone flakes, 3 broken mudstone flakes, 1 silcrete core heat treated and glossy, 2 mudstone flakes and 2 conjoin broken blade fragments
SC10	Isolated Find	2	1	silcrete	-	broken flake	-	1m by 1m	Scald is near the dam wall.	No comment made in field.	None made.	1 broken pink silcrete flake
SC11	Artefact Scatter	2	2	mudstone	-	flake	broken flake	1m x 0.5m	Artefact Distribution.	No comment made in field.	None made.	
SC11	Isolated Find	2	1	silcrete	-	flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC11	Isolated Find	2	1	mudstone	-	heat affected flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC11	Artefact Scatter	2	6	mudstone	silcrete	flakes		12 m x 4m	Artefact Distribution.	No comment made in field.	None made.	Artefacts found on a dam.
SC12	Isolated Find	2	1	mudstone	-	core	-	1m by 1m	Scald on creek bank	No comment made in field.	None made.	1 weathered mudstone core.
SC12	Artefact Scatter	1	39	mudstone	Silcrete, basalt, quartzite	flake	core, broken flake hammerstone	73m by 69m	Contour bank	No comment made in field.	None made.	Weathered mudstone with more recent knapping events. Mixture of materials including a polished basalt hammerstone
SC13	Artefact Scatter	1	2	mudstone	quartz	flake used as a core	quartz core	2m by 4m	Foot slope of creek and edge of Saddlers Creek and track exposure	No comment made in field.	None made.	quartz core looks like it was a river pebble. Mudstone flake used as a core is red/yellow and looks heat treated rather than heat affected.
SC13	Isolated Find	1	1	mudstone	-	flake	-	2m by 4m	Edge of Saddlers Creek.	No comment made in field.	None made.	White mudstone flake with retouch on feather margins, 1 platform scar and 6 dorsal scars.
SC14	Artefact Scatter	1	2	mudstone		flake		1m by 1m	Inside of creek where artefacts have washed down from foot slope.	No comment made in field.	None made.	One flake had retouch. One was a primary flake. Both flakes were heat treated, exhibited by colour change.
SC15	Artefact Scatter	2	3	mudstone	basalt	flake	heat shatter/axe head	2m by 4m	Edge of crest and burnt vegetation scalds from fire	No comment made in field.	None made.	1 retouched mudstone flake and 1 heat shatter
SC15	Artefact Scatter	2	3	silcrete	-	broken flake	flake	18m by 56m	Edge of crest and burnt vegetation scalds from fire	No comment made in field.	None made.	Red silcrete.

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SC15	Artefact scatter	2	2	silcrete	basalt	broken flake/axe head	-	90m by 42m	Edge of crest and burnt vegetation scalds from fire	No comment made in field.	None made.	Potential axe head.
SC16	Isolated Find	1	1	mudstone	-	flake	-	Isolated Artefact	Exposure and edge of vegetation	No comment made in field.	None made.	One white mudstone flake with 50% pebble cortex and heat treated.
SC17	Artefact Scatter	1	2	mudstone	-	flake/core	-	2m by 5m	Exposure and edge of vegetation	No comment made in field.	None made.	1 retouched mudstone flake and 1 mudstone core with 75% cortex.
SC18	Isolated find	1	1	mudstone	-	broken flake	-	2m by 4m	Edge of contour bank near saddlers creek	No comment made in field.	None made.	
SC19	Isolated Find	1	1	hornfels	-	flake	-	2m by 4m	Edge of contour bank near saddlers creek	No comment made in field.	None made.	
SC20	Isolated Find	1	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC21	Isolated Find	3	1	mudstone	-	broken flake	-	1m by 1m	Scald due to cattle treadage on lower slope.	No comment made in field.	None made.	1 red/yellow mudstone primary broken flake.
SC22	Artefact Scatter	1	5	mudstone	silcrete	broken flake	core	12m by 4m	Scald due to cattle treadage on lower slope.	No comment made in field.	None made.	4 broken mudstone flakes and 1 silcrete core.
SC23	Artefact Scatter	1	22	silcrete	mudstone, quartz	broken flake	flake, core, flaked piece	15m by 25m	Scald down to B horizon on upper slope.	No comment made in field.	None made.	Core has 20% cortex.
SC24	Artefact Scatter	1	15	mudstone		flake	broken flakes, cores.	30m x 20m	Artefact Distribution.	No comment made in field.	None made.	
SC25	Isolated Artefact	1	1	mudstone		core rejuvenation flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
SC26	Artefact Scatter	1	4	mudstone	silcrete	broken flake	flake	3m by 5m	Edge of creek bank near McDonalds "s Lane and Transmission tower easement not far from overburden wall	No comment made in field.	None made.	Broken mudstone flakes likely to be conjoins.
SC27	Artefact Scatter	1	12	mudstone	silcrete, quartz	flake	heat shatter	5m x 3m	Artefact Distribution.	No comment made in field.	None made.	
SC28	Isolated Find	1	1	mudstone		blade		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	Artefact found on a dam.
WC01	Isolated Find	1	1	mudstone		retouched flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
WC02	Isolated Find	1	1	quartzite		broken axe/hammerstone which has been flaked		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
WC03	Artefact Scatter	1	20	mudstone	chert, silcrete	flake	cores	10m x 7m	Artefact Distribution.	No comment made in field.	None made.	Some of the artefacts have differential colour change (*heat effected). Part of the site is on a vehicle track.
WC04	Artefact Scatter	1	50	mudstone	silcrete	flake	broken flakes, cores, some blade manufacture but not much retouch	5m x 25m	Artefact Distribution.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	
WC04	Artefact Scatter	1	4	mudstone		flake	cores	10m x 5m	Artefact Distribution.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	
WC04	Artefact Scatter	1	100-150	mudstone	silcrete, porcellanite, basalt	flake	cores, debitage, cores, backed blades, debitage	30m x 40m	Artefact Distribution.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	
WC04	Artefact Scatter	1	25	mudstone	silcrete, basalt	flake	broken flakes, retouched flakes	20m x 10m	Artefact Distribution.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	
WC04	Artefact Scatter	1	2	mudstone	-	flake/Bondi point	-	15m by 6m	Scald on the banks of the dam.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	White/pink mudstone Bondi point.
WC04	Artefact Scatter	2	15	mudstone	silcrete, chert, quartz	flake	broken flake, struck cobble	40m by 20m	Scald near Kurrajong trees along banks of creek.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	Chert has weathering.

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WC04	Isolated Find	2	1	mudstone	-	broken flake	-	1m by 1m	Scald from cattle treadage	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	
WC04	Artefact Scatter	2	12	mudstone	silcrete,	flake	broken flake, core	30m by 16m	Scald from cattle treadage	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	2 mudstone cores with 50% cortex and 1 silcrete core.
WC04	Artefact Scatter	1	3	mudstone	-	core/broken flake/flake	-	12m by 4m	Scald from cattle treadage	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 mudstone core, 1 mudstone broken flake and 1 flake
WC04	Artefact Scatter	1	100-150	mudstone	silcrete, rose quartz, porcellanite, chert, quartzite	flake	core, blade, flake used as a core for blade, backed blade,	4m by 19m	Scald from cattle treadage and large rill and gully erosion.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	Site is a confluence of several minor tributaries.
WC04	Artefact Scatter	1	350-450	mudstone	silcrete, rose quartz, porcellanite, chert, quartzite, basalt, hornfels, silicified sandstone	flake	core, blade, flake used as a core for blades, backed blade, broken flakes, flaked pieces		Scald from cattle treadage and large rill and gully erosion.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	Site is a confluence of several minor tributaries.
WC04	Artefact Scatter	1	41 sample; estimate 41-200	mudstone	petrified wood, quartz, chert, silcrete,	flake	broken flake, cores, flaked pieces, blade core, manuport,	80m by 50m	Large erosion scald and took a sample count	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	Silcrete cores, mudstone blade core, very weathered petrified wood flakes, 1 mudstone manuport which has 80% cortex and greasy lustre
WC04	Artefact Scatter	1	2	basalt / chert	-	flake	-	4m by 19m	Small scald near gully and edge of tributary.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 basalt flake and 1 chert flake.
WC04	Artefact Scatter	1	8	mudstone	silcrete, chalcedony	flake	core	25m by 5m	Ants nest scald near edge of tributary on foot slope	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 chalcedony flake, 4 mudstone flakes with retouch, 1 mudstone core with 20% cortex, 1 silcrete core and 1 silcrete primary flake.
WC04	Artefact Scatter	1	6	silcrete	-	flake	broken flake	5m by 6m	Scald near edge of tributary on creek banks.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	2 broken silcrete flakes and 4 silcrete flakes.
WC04	Artefact Scatter	1	3	mudstone	-	broken flake	core	3m by 2m	Scald near edge of tributary on creek banks.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 mudstone core and 2 mudstone broken flakes.
WC04	Artefact Scatter	1	20	mudstone	silcrete, quartz	broken flake	Flake, core,	12m by 4m	Scald near gullies near edge of creek banks.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 mudstone core with greasy lustre and 30% cortex, 2 primary mudstone flakes, 1 quartz struck pebble, 2 silcrete flakes and 14 mudstone broken flakes
WC04	Isolated Find	2	1	chert	-	broken flake	-	1m by 1m	Cattle treadage in patches in vegetation.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 broken chert flake.
WC04	Artefact Scatter	1	36-85	mudstone	silcrete, hornfels,	flake	broken flake, core, heat shatter,	15m by 20m	Small scald from gully erosion and due to movement of soils on foot slope.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	Weathered mudstone flakes, mudstone core with 50% cortex, and numerous mudstone and silcrete flakes.
WC04	Artefact Scatter	1	14	silcrete	mudstone, basalt	flake	backed blade, broken flakes, core	15m by 7.5m	Small scald from gully erosion and due to movement of soils on foot slope.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 silcrete core and numerous flaked including 1 mudstone backed blade with greasy lustre.
WC04	Isolated Find	1	1	hornfels	-	core	-	1m by 1m	Small scald from gully erosion and due to movement of soils on foot slope.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 hornfels core.
WC04	Artefact Scatter	1	19	mudstone	basalt, silcrete, chalcedony, hornfels, quartzite, quartz	flake	core, broken flakes, heat shatter, Bondi point	55m by 30m	Small scald on creek banks adjacent to foot slope.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	3 basalt flakes, 1 hornfels flake, 2 quartzite flakes, 1 chalcedony fragment, 4 mudstone flakes, 3 quartz flakes, 1 silcrete flaked piece, 1 mudstone heat shatter and 2 mudstone broken flakes.
WC04	Artefact Scatter	1	3	mudstone	silcrete	flake	-	12m by 4m	Scald associated with vehicle track.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	
WC04	Isolated find	1	2	mudstone	silcrete	flake / flaked piece	-	6m by 4m	Scald associated with creek bank.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	
WC04	Artefact Scatter	1	3	mudstone	silcrete, chalcedony	flake	broken flake, flaked piece	3m by 4m	Scald near a vehicle track on creek bank.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 small red greasy lustre mudstone broken flake, 1 red silcrete flake and 1 chalcedony flaked piece.

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WC04	Isolated Find	1	1	mudstone	-	flake	-	1m by 3m	Scald near a vehicle track	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 small yellow red mudstone primary flake.
WC04	Artefact Scatter	1	7	silcrete	mudstone, petrified wood and basalt	flake	-	90m by 18m	Scald defines site and is 90m by 18m.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	Silcrete has been heat affected by colour change and mudstone by colour change.
WC04	Artefact Scatter	1	2	mudstone	-	flake	-	15m by 6m	Scald on the banks of the dam.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	White mudstone with pink flecks.
WC05	Artefact Scatter	1	9	mudstone	basalt, silcrete, quartzite	flake	flaked pieces, broken flakes, blade, horseshoe core	200m by 180m	Erosion scald	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	
WC05	Isolated Find	1	1	mudstone	-	flake	-	1m by 1m	Cattle treadage in patches in vegetation.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 mudstone flake with 10% cortex and a step termination.
WC05	Artefact Scatter	1	4	silcrete	mudstone, quartz	flake	broken flake and blade	2m by 3m	Cattle treadage in patches in vegetation.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 broken quartz flake, 1 broken mudstone blade, 1 broken Silcrete flake and 1 large Silcrete primary flake
WC05	Artefact Scatter	1	200	mudstone	petrified wood, silcrete, quartz, hornfels, basalt	flake	pebble, core,	33m by 22m	Large erosion scald from top of crest and down to lower slope.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	Flakes show weathering and patination and other artefacts do not and appear much more recent. Large range of materials and knapping methods.
WC05	Artefact Scatter	1	200	mudstone	petrified wood, silcrete, quartz, hornfels, basalt	flake	pebble, core,	33m by 22m	Large erosion scald from top of crest and down to lower slope.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	A sample of 23 counted these included the following: 5 mudstone flakes, 3 silcrete flakes, 1 petrified wood flake, 1 petrified wood core, 1 quartz pebble core, 2 weathered yellow mudstone flakes, 1 yellow silcrete flake and core, 1 broken quartz flake, 1 broken mudstone blade, 1 broken silcrete flake and 1 large broken mudstone primary flake and 1 mudstone blade core.
WC05	Artefact Scatter	1	2	mudstone / silcrete	-	flake / broken flake	-	25m by 55m	Large scald on slope and near transmission tower easement	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 broken mudstone flake and 1 yellow Silcrete primary flake.
WC05	Isolated Find	1	1	silcrete	-	flaked piece	-	1m by 1m	Small scald on slope due to movement of soils.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 grey silcrete flaked piece.
WC05	Isolated Find	1	1	mudstone	-	core	-	1m by 1m	Small scald on slope due to movement of soils.	No comment made in field.	HVAC and WLALC thought it was possible that this creek may be a travel route from Mt Dangar to Mt Arthur from the Hunter River.	1 yellow mudstone core with 95% cortex.
WC06	Artefact Scatter	1	10	mudstone	silcrete, quartz, chert	flakes	cores,	10m x 10m	Artefact Distribution.	No comment made in field.	None made.	
WC06	Isolated Find	1	1	silcrete		broken flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
WC06	Isolated Find	1	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
WC06	Isolated Find	1	1	silcrete		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
WC07	Isolated Find	1	1	silcrete		flake		3m by 100m	Vehicle access track	No comment made in field.	None made.	
WC08	Artefact Scatter	1	2	mudstone		flake		3m by 100m	Vehicle access track	No comment made in field.	None made.	
WC09	Isolated find	1	1	mudstone	manuport			Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	Manuport was found in a large erosion scald among mixed ironstone gravels.
WC10	Isolated Find	1	1	mudstone		flake (retouched)		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
WC11	Isolated Find	1	1	mudstone		retouched flake	heat effected	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
WC12	Isolated Find	1	1	chert		core	pebble cortex	Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
WC13	Isolated Find	1	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	
WC14	Isolated Find	1	1	mudstone		flake		Isolated Artefact	Artefact Distribution.	No comment made in field.	None made.	

Table 2: Cultural Description of Archaeological Sites

Final Name	Site type	Disturbance	Number of artefacts	Predominant raw material	Other raw materials	Predominant artefact type	Other artefact types	Site Area	Area defined by	Aboriginal Significance	Comments including any stories or comments from Aboriginal groups about values of sites	Artefact Comments
WC15	Artefact Scatter	1	2	silcrete / mudstone		broken flake/core		2m x 2m	Artefact Distribution.	No comment made in field.	None made.	
WC16	Artefact Scatter	1	6	mudstone	silcrete	flakes	core	35m x 25m	Artefact Distribution.	No comment made in field.	None made.	Artefacts found on a dam.
WC17	Artefact Scatter	1	7	mudstone	silcrete	flake	broken flakes, core, retouched flake	15m x 7.5m	Artefact Distribution.	No comment made in field.	None made.	
WC18	Artefact Scatter	1	5	mudstone	silcrete	broken flakes	flake, heat shatter	2m x 0.2m	Artefact Distribution.	No comment made in field.	None made.	Site was located on a vehicle track, there is also a dam approximately 20 metres upslope for the site.
WC19	Artefact Scatter	1	3	silcrete	mudstone	broken flake	flake	55m by 30m	Scald on hill crest	No comment made in field.	None made.	One retouched flake and one very weathered mudstone flake, remainder did not show patination or weathering.
WC20	Isolated Find	1	1	mudstone	-	core	-	50m by 20m	Scald on hill crest part of vehicle track. Site is defined by track exposure.	No comment made in field.	None made.	Mudstone core.
WC21	Isolated Find	1	1	silcrete	-	flaked piece	-	1m by 1m	Near a fence and part of an ants nest scald.	No comment made in field.	None made.	
WC22	Artefact Scatter	1	4	mudstone	hornfels, Silcrete	flaked piece	broken flake, flake	54m by 14m	Vehicle track exposure graded and extent of artefacts and vegetation	No comment made in field.	None made.	2 mudstone flaked pieces, 1 broken hornfels flake and 1 silcrete flake.
WC23	Isolated Find	2	1	silcrete	-	flake	-	1m by 1m	Vehicle track exposure graded and extent of artefacts and vegetation	No comment made in field.	None made.	1 silcrete flake.
WC24	Isolated Find	2	1	mudstone	-	flake	-	1m by 1m	Vehicle track exposure graded and extent of artefacts and vegetation	No comment made in field.	None made.	1 yellow mudstone flake.
WC25	Isolated Find		1	mudstone		flake		60m by 15m	Exposure within landform.	No comment made in field.	None made.	
WC26	Isolated Find		1	mudstone		flake		110m by 35m	Exposure (erosion scour).	No comment made in field.	None made.	

APPENDIX 7

Detailed Summary of Previous Archaeological Research

Appendix 7 – Review of Previous Archaeological Research

1.0 Previous Archaeological Research within the Survey Area

This appendix provides detailed discussions related to previous archaeological survey and assessment and salvage within the current survey area and its proximity.

1.1 Dyall (1980) Mt Arthur North Coal Lease, Muswellbrook

Dyall (1980) carried out a survey for Aboriginal sites within the Mt Arthur North Coal Lease, which focused on 'all major creeks and a substantial selection of their tributaries. Attention was given to sandstone horizons in the creek beds, because these might have been used for sharpening axes' (Dyall 1980:2). The survey included floodplain terrains, which Dyall considered pointless due to repeated deposition of black silt that buried or eroded evidence of campsites. The sides of Mt Arthur were surveyed in detail and 'all of its summit ridges were checked' (1980:2).

The survey identified 20 artefact scatters and two axe-grinding grooves on slabs of fine grained sandstone in creek beds (most outcrops in creek beds were coarse conglomerate). Six of the 20 artefact scatters contained over 100 stone artefacts, eight sites contained over 50 artefacts, three sites contained over 20 stone artefacts and three sites had less than 20 artefacts. Dyall did not record raw material, but recorded the presence of Bondaian types (Bondi points and geometric microliths), edge ground axes (four broken examples were located) and examples of the 'so-called Bulga knife'. All sites were located on creek banks or near natural waterholes. The sites identified within the survey area are listed in **Table A.1**.

1.2 Dyall (1981) Mount Arthur South Coal Lease

Dyall (1981) surveyed the Mount Arthur South Coal Lease. This survey also focused on the watercourses (Saddlers and Saltwater Creeks), ploughed land and ridges. Dyall located two sites that each contained 'thousands of stone flakes and were exceptionally large by local standards' (1981:1). The site beside Saltwater Creek was associated with a large group of 'axe-sharpening grooves' in the sandstone bed of the creek. The two sites were located on the southern boundary of the then, Mt Arthur South Coal Lease 'but five smaller creek side camps were reported from within the lease boundaries' (1981:1).

The results of the survey included a total of 24 open campsites (with two of these containing more than 500 artefacts) all associated with creeks (Dyall 1981:5). Dyall notes 'flake-and-blade' types form the majority of artefact assemblages, but also 'microlithic backed blades', 'edge-ground implements', axes, choppers made from basalt, grinding stones and mullers were noted within some assemblages. Dyall also recorded the location of isolated finds of 'axes, choppers, grinding slabs and mullers' (Appendix B: Dyall 1981). Dyall noted that 'Bulga knives' are unlikely to be made through knapping processes, but appear to be natural cobbles (1981:6).

Table A.1 - Sites Identified in Dyall (1980-1981) that are within the Survey Area

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0021	Upper Saddlers Creek	Artefact Scatter	Creek banks of Upper Saddlers Creek and includes artefacts found on a vehicular track 200 m from the main creek.	The area has been grazed and cropped with wheat. The creek valley is wide and sloping gently. The main creek is permanent, but only puddles remained in the side creeks.	Less than 5 m for majority of site, vehicular track with artefacts is over 200 m from creek.	No total artefact number is given for the site. However, Dyall collected 19 waste flakes (mostly chert), 2 flaking cores, and 6 implements (1 geometric, 5 scrapers). According to information provided on the stone matches the cobbles found in the local alluvial soil.
37-2-0022	Upper Saddlers Creek	Artefact Scatter	This site was located on the high north bank of the creek in an erosion exposure.	The site was within an exposure which has eroded to clay. The creek is within an area of 'a string of springs and pools' which at the time of the survey was not dry.	Less than 5 m from Saddlers Creek.	No total artefact number is given for this site. However, Dyall has collected artefacts from this site including '57 waste flakes, mostly chert with some tuffs and quartzites…of local origin…and 3 flaking cores and 8 implements (6 scrapers, 1 knife, and 1 hammerstone)'.
37-2-0024	Upper Saddlers Creek	Artefact Scatter	This site was located on a high eroded north bank of the creek.	This site was highly eroded.	Less than 5 m from Saddlers Creek.	No total artefact number is given for this site. However, Dyall collected artefacts from this site including '150 waste flakes, mostly chert with less amounts of tuff and quartzite, 7 flaking cores and 42 implements (35 scrapers, 5 knives and 2 hammerstones)' which matches local cobbles.
37-2-0026	Upper Saddlers Creek	Artefact Scatter	This site was located along the south-east bank of the creek.	This site was highly eroded including disturbance from ants' nests.	Less than 5 m from Saddlers Creek.	No total artefact number is given for this site. However, Dyall collected artefacts from this site including '130 waste flakes (nearly all chert, with a few tuffs and quartzites), 11 flaking cores and 18 implements (5 Bondi points, 1 geometric, 8 scrapers, 3 knives and 1 broken but used edge)' which matches local cobbles.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0042	Upper Saddlers Creek	Artefact Scatter	Creek bank of Upper Saddlers Creek, close to Edderton Road.	Area has been cleared for grazing and wheat cropping, few Casuarinas along creek line. Site condition was described as satisfactory.	On creek bank of permanent creek of one of the major tributaries for the Hunter River.	Artefact numbers are unclear. Although, the study stated that few artefacts were present but that a random collection of artefacts yielded 31 waste flakes (mostly chert), 5 flaking cores and 4 implements (1 scraper, 3 cleavers). It appears material was also found on a dry creek bed running into main creek, yielding 4 waste flakes, 1 core and 1 large used (artefact?).
37-2-0070	Saddlers Creek	Artefact Scatter	Broad lower valley flat of Saddlers Creek.	The area had been cleared and was ploughed annually for wheat cropping.	On the NE side of large dam. Seasonal creek adjacent to site.	At least 100 artefacts noted including large flaking cores, utilised cobbles and heavy flakes of predominately rhyolite and chert. Also implements including 1 heavily used basalt slice, 1 flat cobble of coarse siliceous material, crudely flaked at ends, 1 heavily utilised slice of the edge of a cobble of indeterminate siliceous material and 1 basalt cobble flake-thinned.
37-2-0106	Upper Saddlers Creek	Artefact Scatter	Site was located on 'high flat ground in the angle between two creeks' (1976:1). Most likely a terrace in the confluence of two creeks. Site consisted of an area between 30 x 30 m.	Large Eucalypts and stands of Casuarinas are recorded as within the creek area. The area was recorded as having been grazed and cleared with kangaroos and echidnas still located in the site's vicinity. Comments notated by Dyall on site card made orally by Mr HC 'Edderton' who reported 'that stone implements are often ploughed out lower down the creek, but not this high up' (1976:2).	Less than 5 m.	The site was collected by Dyall and included waste flakes 127 (mostly chert, some tuffs and quartzites), 8 flaking cores, 16 implements (6 Bondi Points, 2 geometrics, 4 scrapers and 3 knives, 1 cleaver). Dyall reports collecting 'every stone flake seen. The material is in the Australian Museum' (1976:2).

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0109	Quarry Creek	Artefact Scatter	Thin scatter of artefacts along both banks of Quarry Creek for a length of approximately 150 m and approximately 30 m back.	Disturbed by storm water erosion and ploughing. Suspected amateur collecting	Less than 5 m.	Dyall reported at least 100 flakes on the south bank and at least another 100 on the north bank. This count included several blade cores, one micro elouera and one backed blade.
37-2-0116	Quarry Creek (Whites Creek)	Artefact Scatter	Dyall has recorded scatter on spur of creek and on east bank of Quarry Creek (1980:1).	The banks of the spur creek are described as severely eroded. Dyall believed that a local has collected artefacts from the site (1980:1).	Less than 5 m.	No numbers are given. Dyall has noted that 'over 50 stone artefacts…the flakes consisted of rhyolites and cherts, no implements were recognized at casual inspection' (1980:1). Site description on another card copied in file 'more than 50 artefacts per 1000 sq. metres' (1981:1). There may have been two edge ground axes on site previously further upstream based on information Dyall collected from the 1980 Owner J Gilder of 'Goruk'.
37-2-0124	Quarry Creek	Artefact Scatter	The site is located 'in a sweeping bend of the main creek, on the west bank about 100 m upstream from the junction of a spur creek from the west' (Dyall 1980:1).	'Material is disturbed by storm water erosion and ploughing' (Dyall 1980:1). Area has also been 'totally cleared for cattle-grazing and cropping' (1980:2). The site was recorded as a scatter 'of waste flakes of honey-coloured chert on a patch of bare ground alongside the creek. '	Less than 5 m.	'There were over 20 flakes' (Dyall 1980:1). Site is defined in separate card recording as 'more than 20 artefacts per 1000 sq. metres' (Dyall 1980:3). According to local informants 'Mr J. Gilder of 'Goruk' on Edderton Road has found two edge-ground axes on Quarry Creek, and Ian Gordon (Sydney St, Muswellbrook) told me he has seen Aboriginal material on this creek' (Dyall 1980:2).

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0174	Quarry Creek	Artefact Scatter	The site was located on the southwest bank of Quarry Creek, opposite a minor spur (Dyall 1980:1). 'The site covers about 200 m of a creek bank, and is not clearly separated from the general thin scatter of stone artefacts all along Quarry Creek' (1980:1).	Site was recorded as 'material has been exposed by water erosion, ploughing and cattle' (1980:1).	Less than 5 m from creek.	The site consists of a 'scatter of 20 or more stone artefacts along patches of bare alluvial soil on the bank of Quarry Creek. The materials are chert, rhyolite and occasional quartz and quartzite. There was one heavy flaked cobble, otherwise no implements were recognised' (Dyall 1980:1).
37-2-0282	Saddlers Creek	Artefact Scatter	The site was recorded as located 'on the fork of a major creek junction' (1976:1).	Site condition was recorded as 'undisturbed' (1976:1). However, there is some mention that the site has been subject to clearing and used for wheat and grazing of cattle. **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m.	Dyall (1976:1) wrote 'a total collection in 1976 obtained 127 waste flakes (98 chert, 11 rhyolite, 14 quartzite and 4 quartz), 8 flaking cores (5 chert, 1 quartzite, 2 quartz) and 16 implements (6 Bondi points, 2 geometrics, 4 scrapers, 3 blades and 1 cleaver)'.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0283	Saddlers Creek	Artefact Scatter	The site was recorded as 'covers 2 hectares on the south bank… The material extends from Saddlers Creek for 70 metres up the west bank of a small creek, and eastwards from there, between the main creek and a farm dam' (Dyall 1981:2).	Site condition was recorded as 'greatly disturbed by ploughing' and 'the material is great disturbed and very thinly scattered' (Dyall 1981:1). The 'area is used for wheat and for grazing of cattle'. **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m.	Site contents are not detailed but site card included the following comments 'The artefacts included 2 (broken) sandstone grinding dishes found above the main creek 70 m west of the minor junction. Material extended 300 m up this bank of the main creek. Also noted were 5 large chert cores made on water worn cobbles, and 2 smaller cores of rhyolite. There was one heavy used flake of chert but not other implements were recognised. In all, over 100 stone pieces were seen. Most of the material was chert; then followed quartz, acid volcanics, and quartzites in that order' (1981:1).
37-2-0284	Saddlers Creek	Artefact Scatter	The site was located on the west bank of Saddlers Creek, extending 120 m up both banks of the spur creek.	Site condition was recorded as 'undisturbed except for erosion' (1981:1). **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m.	Site contents described as 'a thin scatter of about 50 stone flakes, extending back from the creek junction along the minor creek for 120 metres on both banks…The lithology is chert, quartzite, quartz and rhyolite in decreasing order of occurrence. The material included two small horse hoof cores, a small blade core of glossy cream chert, and a Bondi Point of this same glossy cream chert' (Dyall 1981:1).

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0285	Saddlers Creek	Artefact Scatter	The site was located at the 'junction of two major arms of Saddler's Creek' (1981:1).	Site condition was recorded as 'undisturbed except by erosion' (1981:1). The land has been 'cleared for grazing, but a number of eucalypts grow along the creek channels. The area would originally have carried an open woodland cover' (1981:2). **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m up to 50 m from watercourse.	No detailed site recording. The material is described as 'all waste flakes, mostly of glossy, cream chert but with occasional flakes of quartz and quartzite. No implements were recognized among the flake material. There was one utilized cobble' (1981:1).

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0286	Saddlers Creek	Artefact Scatter	The site was located at the 'junction of a small creek meeting Saddlers Creek from the west, stone scatters extend 200 metres down the west bank of Saddlers Creek and 150 metres up the south bank of the side creek' (1981:1).	Site condition was recorded as 'undisturbed except for erosion' (1981:1). Dyall recorded that 'there are scores of eucalypts in the creek channel, and these probably indicate the original vegetation. Otherwise, the broad valley is totally cleared for grazing' (1981:2). **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m.	Site contents are recorded as 'over 100 stone flakes on these two areas, and only 10 on the north bank of the smaller creek. There was no sign of material more than 10 m back from the banks, thought that may be a function of erosion depth. The 1981 material was noted to include one chert elouera scraper of micro size, and a utilized water worn cobble…Most material was chert, followed by rhyolite, jasper and quartz. The waste flakes included microlithic blades but there was no sign of backed blades. In 1976 I made a total collection over this area, obtaining 150 waste flakes (108 chert, 15 rhyolite, 19 quartzite, 8 quartz), 7 cores (5 chert, 2 quartzite) and 42 implements (35 scrapers, 5 knives, 2 hammerstones)' (1981:1).

1.3 Koettig and Hughes (1985)

Koettig and Hughes (1985:1) surveyed three areas for a potential coal mine development near Mount Arthur. These areas included the Plashett Dam site and water storage area on Saltwater Creek and Mount Arthur North and Mount Arthur South coal lease areas. The results of the survey indicated (for the three survey areas) that the 'nature and distribution of archaeological materials in each [were] generally very similar' (1985:45). The predominant site type identified was artefact scatters which were 'almost the only type of site found' (1985:45). The other site type, 'grinding grooves – were present at only three locations, two of which had been recorded by Dyall and which were not re-recorded in this study' (1985:45). Open sites in their study area are characterised by Koettig and Hughes (1985:46) as:

> …typified by stone artefacts which are scattered across eroded surfaces on both Units A and B. In many places the Unit A is still intact and artefacts are obviously eroding out of that soil unit. Nowhere can it be said that artefacts were eroding out of the Unit B. Because of the much more disturbed nature of this Unit i.e. cracking of the clay and reworked deposit washing over the surface, it cannot definitely be said from surface observations that there are no artefacts present in Unit B. If they are present they must be in very low numbers compared with Unit A.

At some sites Koettig and Hughes (1985:46) identified the remains of hearths:

> … general pattern of site distribution in all areas is that most sites are located along the watercourses and that there appears to be a decrease in the number of sites along some but not all tributaries. At Saltwater Creek and Mount Arthur South sites appear to be concentrated along the major creeks whereas at Mount Arthur North sites appear to occur with the same frequency along the major creek and tributary creeks B and C.

Koettig and Hughes (1985:46) stated that the 'number of sites and the density of artefacts decreased rapidly in frequency away from the watercourses to very low levels beyond 100m'. Furthermore Hughes and Koettig (1985:46) found that:

> No sites were recorded along the section of Saltwater Creek downstream of site SC1 [which] may be due primarily to the fact that alluvial build up of the flats has obscured archaeological material. The same is probably true of the downstream section of Saddlers Creek below site MAS127. The archaeological potential of the Hunter River flats thus remains to be determined.

Sites were defined by Koettig and Hughes (1985:47) 'on the basis of exposure by erosion, obviously their frequency is largely dependent on the extent of such erosion'.

The following conclusions were reached by Koettig and Hughes (1985:50) about the distribution of sites in the three surveyed areas:

> Dense artefact scatters were most frequent along the lower section of Saddlers Creek, but sites containing high densities of artefacts occurred along the whole creek within the survey area. There was a very notable variation in artefact densities between tributary creeks.
>
> Dense artefact scatters occurred consistently along the upper portion of Whites Creek and its two largest tributaries and there appeared to be a decrease in artefact frequencies in the lower section of the major creek.
>
> At Saltwater Creek there is no obvious variation in maximum artefact densities at sites along the creek system. Maximum artefact densities were much lower at Saltwater Creek than in the other two survey areas (1985:50).

Koettig and Hughes (1985:51) found that the dominant raw materials identified overall were 'indurated mudstone and silcrete'. Indurated mudstone was dominant at Saltwater Creek, silcrete at Mount Arthur North and 'they were co-dominant at Mount Arthur South' (1985:51). Koettig and Hughes attribute these variations in materials at areas to the availability of stone resources and 'different preferences by the Aborigines for different raw materials in relation to the technological qualities of the rock and devised end product' (1985:52).

Koettig and Hughes (1985:53) found that 'at all three areas flaked artefacts were usually smaller than 5 cm in length. Cores were generally larger and had volumes of less than 100 cu cm irrespective of raw material'.

No evidence was identified by Koettig and Hughes (1985:53) to suggest 'that flakes changed in their sizes according to their location along a creek line e.g. Lower Saltwater Creek as against Upper Saltwater Creek':

> At neither Mount Arthur North or Mount Arthur South (except for those associated with sites MAS52 and 76) was there any patterning or variation of core sizes across the study area or along the creek i.e. the size ranges remain constant throughout. The cores were either multiplatform or single platform, with the former predominating noticeably in all three areas (1985:53).

Koettig and Hughes (1985:54) identified artefacts with retouch and usewear at 'sites in all three areas which consisted mainly of amorphous flakes and flaked pieces with Retouch/Use Wear and backed pieces with occasional hammerstones, axes (included hafted ones) and grindstone fragments'.

Table A.2 - Sites identified by Koettig and Hughes (1985) within the Survey Area

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0331	MAN87	Artefact Scatter	The site was located on creek flats on the valley floor. Slope was characterised as flat (less than 2 degrees).	Site condition was recorded as being subject to slope wash, rill and gully erosion to both the A and B units. The site has been subject to ploughing. Comments about site condition included 'Unit A exposed over entire site except small portion of Unit B in NW corner, distinct A/B horizons, Unit A, 10 to 15 cm. Unit B is exposed in the gully of Creek Gat 50-100 cm. Some accumulated sand and gravel on surface of exposure, vegetated patch with grasses and little visibility' (1984:2).	5 m from Creek G.	Site contents included 7 indurated mudstone flakes and 6 indurated mudstone flaked pieces, 2 porcellanite flakes and 1 flaked piece, 1 porcellanite core, 1 quartz core, 1 chert flake, 4 silcrete flakes and 3 silcrete flaked pieces. Two indurated mudstone flaked pieces had retouch and were broken.
37-2-0428	MAN93	Artefact Scatter	This site was identified as a on the northern bank of Saddler's Creek.	At the time this site was recorded, A unit was still intact and the ground did not appear to be ploughed.	Less than 5 m from creek.	A total of 11 artefacts were recorded on site. These included 4 indurated mudstone and 6 silcrete artefacts and also 1 siltstone hammerstone.
37-2-0429	MAN94	Artefact Scatter	This site was identified as on the horseshoe bend in Saddlers Creek.	This site was partially disturbed as it is near an artificial wall/dyke across the northern end of Saddlers Creek.	Less than 10 m from Creek.	A total of 58 artefacts were recorded including 14 indurated mudstone artefacts, 28 silcrete artefacts, 10 chert and six quartzite artefacts.
37-2-0481	MAS129	Artefact Scatter	This site was identified as on a peninsula between the junction of two creeks.	This site at the time it was recorded had partial disturbance to the A unit from erosion.	Less than 10 m from Creek.	A total of 11 artefacts were recorded including indurated mudstone, silcrete, quartz and quartzite artefacts.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0482	MAS128	Artefact Scatter	The site was recorded as located on the creek banks and creek junction in a valley floor. Slope is characterised as flat (less than 2 degrees).	The condition of the site has been recorded as cultivated with gully erosion. Vehicle tracks have disturbed some of the site.	100 m to Saddlers Creek. Les than 50 m to nearest watercourse.	A total number of 25 artefacts were recorded on site. These included 18 indurated mudstone and 7 silcrete stone artefacts.
37-2-0483	MAS130	Artefact Scatter	This site was identified within the creek bed of Saddlers Creek.	This site at the time it was recorded was partially eroded and disturbed by cattle treadage.	20 m to Saddlers Creek.	A total of 19 artefacts were recorded including 6 indurate mudstone and 13 porcellanite artefacts.
37-2-0484	MAS131	Artefact Scatter	The site was identified within the lower slopes of Saddlers Creek.	The site is described as being in good condition.	Less than 50 m to Saddlers Creek.	A total of 22 artefacts were recorded.
37-2-0485	MAS132	Artefact Scatter	This site is located on the southern bank of Saddlers Creek.	This site was eroded to both A and B horizons and disturbed from rill erosion.	10-30 m to creek.	The initial recording included a total of 146 artefacts were recorded including 84 indurated mudstone, 41 silcrete, 11 quartz, 3 chert, 4 fossilised wood and 3 porcellanite artefacts.
37-5-0486	MAS133	Artefact Scatter	This site was identified on the bank of Saddlers Creek.	This site was subject to slope wash and was a small exposure at the edge of the creek bank which had been trampled by cattle.	Less than 5 m to creek.	The initial recording included a total of 12 artefacts including 8 indurated mudstone, 1 silcrete, 2 quartz and 2 chert artefacts.
37-2-0487	MAS134	Artefact Scatter	This site was identified on the flats besides Saddlers Creek.	This site was on the edge of a creek bank and was a small exposure in the A unit.	Les than 50 m to watercourse.	A total of 33 artefacts including 24 indurated mudstone, 4 silcrete, 2 quartz and 1 porcellanite artefact.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0488	MAS135	Artefact scatter	The site is located on land beside western bank of Saddlers Creek.	This site was identified within a fence line exposure near a gate picket hole. This site was disturbed by cattle treadage and the construction of the fence.	Approximately 45 m to Saddlers Creek.	The initial recording included a total of 34 artefacts including 19 indurated mudstone, 1 silcrete, 8 quartz, 2 quartzite, 4 igneous and 1 chert artefact.
37-2-0489	MAS136	Artefact scatter	This site was identified on the southern banks near a bend in Saddlers Creek.	This site was identified on the edge of a creek bank and had no A/B horizons intact due to ploughing these deposits were mixed.	Approximately over 100 m to creek.	A total of 34 artefacts including 14 indurated mudstone, 17 silcrete, 1 quartz, 1 igneous hammerstone and 1 porcellanite artefact.
37-2-501	BMP2	Artefact Scatter	This site was identified on the eastern, eroded bank above Saddlers Creek.	This site was identified on the eastern bank of Saddlers Creek in an area where erosion into the valley fill is up to a depth of up to 10 m.	Approximately 20 m from a creek.	A total of 5 artefacts including 3 indurated mudstone flakes, 1 quartz flaked piece and 1 silcrete flake.
37-2-0503	BMP4	Artefact Scatter	The site was recorded on the banks of an ephemeral stream.	Site condition was recorded as ‘exposed by erosion’. Water action has ‘cut into an orange deposit to a depth of approximately 1 m. Erosion of 1-3 cm has exposed the deposits on the banks, leaving a sparse gravel lag’.	1 m from a creek.	1 silcrete flake, 1 silcrete flaked piece and 1 quartz Bondi point. One silcrete flaked piece had retouch/usewear on edge. The quartz Bondi point had retouch.
37-2-0504	BMP5	Artefact Scatter	The site is recorded as located on lower hill slope.	The site consisted ‘of an extensive area of sheet wash erosion 50 x 50 m in area consisted of 3 artefacts found scattered over an area of 20 x 10 m, where erosion had cut from 2-50 cm into a reddish clay-rich deposit which overlay a sandy reddish-yellow lower University of t’ . Site is mapped underneath a transmission tower.	15 m form a stream.	Site contents include 1 silcrete flake and 2 silcrete flaked pieces.

*Site contents at the time of the initial recording on the site card.

1.4 Bayswater Archaeological Research Project 1993 to 2005

The Bayswater Archaeological Research Project (BARP) carried out archaeological investigations over five years from 1993 to 1998. The results of the BARP were analysed and compiled between 1998 to 2005. The project was a collaboration between the University of New England and the Bayswater Colliery Company Pty Ltd. The BARP included investigations and several reports, which documented results of stages of survey and excavation including: Davidson, James and Fife (1993), ERM Resource Planning (1994), Appleton (1995), Fife (1995) Wilson (1995a and 1995b), MacDonald (1996), MacDonald and Davidson (1998) and MacDonald and Davidson (2005). Witter (1994) provided a separate report as part of his role at NPWS (now DEC) in response to work carried out by the BARP. The purpose of this section is to provide a review of survey and physical investigations carried out as part of the BARP.

In 1993, BARP (Davidson, James and Fife 1993) focused on the Aboriginal archaeology of the lands south and west of Mount Arthur. The survey focused on two drainage lines which had not been previously investigated. These included a major tributary of Saddlers Creek and its associated gullies, Quarry Creek and two of its tributaries, and surveys of areas away from drainage lines were also undertaken. Part of their survey area overlapped the current survey area. The initial strategy was random sampling; however, due to poor ground surface visibility this was changed to the examination of exposures identified on aerial photographs. The survey was carried out using pedestrian transects. The Davidson et al. (1993) survey located 13 Aboriginal sites in the current survey area. Site descriptions are provided in **Table A.7.**

The BARP project (MacDonald and Davidson 1998, MacDonald 1996) proposed a catena model for understanding archaeological site distribution within their study area. This model 'recognizes erosional units based on drainage divides'. The model identifies depositional areas and depositional sinks on the basis of the analysis of stereo paired air photos. Zones of deposition and erosion were identified by the BARP project. However, it was expected that transitional zones would be identified during archaeological fieldwork as the project progressed (MacDonald 1996:65). These transitional zones were identified during fieldwork in MacDonald and Davidson (1998:189-191). These zones were useful in understanding drainage systems and the directions and 'areas of deposition where individual depositional events and stratigraphy might be distinguished' and were useful in the identification of areas of archaeological visibility (1998:191). Further analysis of sites following the catena model is proposed but has not yet been finalised as part of the BARP reports to date.

The remaining summary of work carried out BARP is provided as discussions related to Catenas.

Quarry Creek Catena Zone 1

In Quarry Creek Catena 1 two surface surveys were carried out. John Appleton (1995) carried out a salvage excavation (manual excavation and grader scrapes) and collection at Bobagul Hills 2 and McDonald included a survey with detailed recording and mapping of surface Aboriginal stone artefacts (MacDonald and Davidson 2005:12) of the same site two years after Appleton's collection.

McDonald's re-survey of the area salvaged by Appleton (1995) led to the identification in excess of 300 artefacts in the same grader scrapes. Appleton had only identified three artefacts from the three grader scrapes initially. This result indicated to McDonald and Davidson (2005:18-19) that Appleton's salvage was not adequate for the site and that natural weathering over time will expose numerous artefacts in a salvage location.

Quarry Creek Catena Zone 2

In the Quarry Creek Catena Zone 2 (ERM Resource Planning: 1994) the only excavations were four backhoe excavations undertaken by Curran in 1994 across the northern section of the study area (2005:115). Sites excavated (if any) are not identified. Curran worked with the landscape unit system developed by Witter (1994).

Quarry Creek Catena Zone 3

In Quarry Creek Catena 3, it was recommended that Edderton Road 2 (ER2) was recommended to:

> …be set aside as a conservation area for educational purposes (as recommended on the initial site record and consistent with the BARP research design, the preference stated by the WLALC during the initial DJF (1993) work, and the recommendations of the Commission of Inquiry).

This area was surveyed twice but no artefacts were collected (MacDonald and Davidson 2005:23). In total, 2,564 artefacts were recorded in varying degrees of detail at the ER2 investigation area. Of these 1,197 were recorded in detail (2005:26).

Saddlers Pit Catena

The Saddlers Pit Catena was the focus of both salvage and research. The work in this area was divided into three analytical units (Zones 1, 2 and 3) based on locations within the Catena. Zone 1 encompasses the headwaters of the Saddlers Creek Tributary, and Zones 2 and 3 are downstream. Zone 1 has been further sub-divided into three zones: Zone 1 west (1w), Zone 1 central (1c) and Zone 1 east (1e). The survey work in the Saddler's Pit Catena was carried out by Wilson (MacDonald Pit (MP) and MacDonald Pit Dump Site (MPDS) – 1995, and Saddler's Pit – 1995), Fife (LFG sites – 1995) and MacDonald (MacDonald Road South – 1997). The MP and MPDS surveys straddled the Saddler's Pit Catena and Edderton Catena divide.

Curran as part of ERM Resource Planning (1994) carried out a survey for Aboriginal archaeology for a proposed sample program at Bayswater No. 3 Colliery. This survey included assessment of a bulk sample site area, a trial pit, a dump and ROM pad, a contractors work area and an internal haul road. The total survey area was 1.2325 km^2 (ERM Resource Planning 1994:3). Curran attempted to use a survey strategy comparable with Davidson et al. (1993) so that the results of the bulk sample survey were useful to ongoing archaeological investigations of Bayswater No. 3 Colliery by UNE. Curran recorded 31 sites in total during the field investigation. Curran also found that erosion and disturbance (vehicle tracks, animal impacts, contour banks, fence lines) played a large part in the location of archaeological material (ERM Resource Planning 1994:15).

Curran concluded that of the 31 sites recorded, 61.3% were open artefact scatters, 35.5% were isolated artefacts and 3.2% were a complex of sites. The complex of sites (BS2) consisted of open artefact scatters, axes and axe grinding grooves (ERM Resource Planning 1994:18). The largest sites were found in creeks/gullies; however, it was recognised that these areas are subject to a greater degree of erosion and disturbance which increases the detectability of Aboriginal sites in these land forms (ERM Resource Planning 1994:18). Curran, found that the frequency of raw materials in the survey area was highest for indurated mudstone (36.4%) followed by silcrete (27.1%), a result that was reflected by many other surveys in the general area.

The majority of sites recorded in the Curran study were assessed as having low significance in terms of public, educational and scientific value. The aforementioned site BS2 was rated as having 'considerable significance' for all three criteria (ERM Resource Planning 1994). Other sites including HR10, HR11, HR12, HR13, HR14, HR15 and HR16, were rated with 'some considerable' scientific significance (ERM Resource Planning 1994). It was suggested that they may provide assemblages suitable for further investigation and provided research potential pertaining to the Aboriginal occupation of the Mt Arthur area (ERM Resource Planning 1994:23). Two of these sites (HR2, and HR10) are located within the survey area. Site descriptions are provided in **Table A.8.**

Ray Fife (1995a) completed a salvage of the area known as the LFG complex which incorporated recorded sites by Davidson et al (1993) as LFG04, LFG05, LFG06 and LFG07 at MacDonald's Creek (MacDonald and Davidson 2005:52). This salvage was within zone 2 of the Saddler's Pit Catena. Witter (1994:12) 'reclassified these sites as MacDonald Creek and MacDonald Creek 1'. Witter argued that the area was a ceremonial centre and that 'LFG05 was the site of ritual ceremonial performance (Fife 1995a; Witter 1994b)'.Fife was unable to locate the feature that led Witter to his interpretations for the Mt Arthur region. Fife's salvage of the sites Witter (1994) called MacDonald Creek and MacDonald Creek 1, consisted of surface collection, and salvage excavation within the site complex. Fife (2005:52) excavated in eight locations (totalling 21 square metres of subsurface investigation). Backhoe squares excavated by Noeleen Curran also fell within Zone 2 of the Saddler's Pit Catena (MacDonald and Davidson 2005:165). Fife's salvage of the sites was at the following locations LFG05/1 and LFG05/2, LFG06/1 and LFG6/02, LFG06C/1 and LFG06C/2, LFGP and LFG Contour (MacDonald and Davidson 2005:166).

The Saddler's Pit Catena Zone 1w and Edderton Catena – MP and MPDS were surveyed by Wilson (1995 a and b). Previous to Wilson (1995), Davidson et al (1993:35) identified the following sites in the MP and MPDS areas:

Table A.3 - Cited from (Table 2.5 Known Sites in the MP and MPDS Areas (after Davidson et al. 1993)

Area	Site Name	No. of Artefacts
MP	LEE1	39
MP	LEE2	1
MP	LEF1	1
MP	LEF2	2
MP	LEF3	3
MP	LEF4	11
MP	LEF5	1
MP	LEF6	1
MP	LEF7	1
MP	LEF8	1
MPDS	LFE1	22
MPDS	LFF1	3
Total		**86**

Due to the passage of time and natural processes such as erosion, surface visibility was greater during Wilson's (1995) survey and more sites were therefore detected. Eight of the originally recorded sites were located and these were incorporated into three larger sites.

Wilson also recorded four new sites (2005:29). Wilson revisited sites LEE1 and LEE2 and incorporated then into one site named LEE1 (2005:30).

Table A.4 - Cited from Table 2.6 Site Descriptions MP and MPDS (2005:31)

Site Names DJF 1993	Site Name June 1995	Site Type	Dimensions (m)	Catena/ Zone	Artefacts DJF 1993	Artefacts June 1995
LEE1, LEE2	LEE1	Open site	120 x 80	SP/1w	40	90
LFF1	LFF1	2 artefacts	20 cm apart	EC/1	3	2
LEF4,5, 6, 7, 8	MP1	Open site	900 x 100E 900 x 600W	SP/1w	15	307
New site	MP2	Open site	50 x 20	SP/1w	N/A	12
New site	MPDS1	Scatter	20 x 5	EC/1	N/A	3
New site	MPDS2	Scatter	75 x 20	EC/1	N/A	4
LFE1A, LFE1B	MPDS3	Open site	300 x 150	EC/1	23	111
New site	MPDS4	2 artefacts	20 m apart	EC/1	N/A	2
Total	**8 Sites**				**Total**	**531**

Wilson could not locate the Davidson et al (1993) recorded sites LEF1, LEF2, and assumed that they were destroyed prior to the survey being undertaken by the opening of the McDonald's Pit or the establishment of graded roads around its periphery. It could also have been due to changed surface conditions (MacDonald and Davidson 2005:31). All of the scatters listed in **Table A.5** were surface collected (2005:32).

Saddlers Pit Catena Zone 1c and Zone 1e were salvaged by Wilson (1995). Davidson et al (1993) originally identified a total of ten sites requiring salvage in the area proposed for Saddler's Pit (SP) and the Saddler's Pit Extension (SPE) which included the Mount Arthur Spur (MAS).

Table A.5 - Sites Located in Saddlers Pit and Saddlers Pit Extension (cited from Table 2.9 Davidson et al 1993)

Area	Site Name	No. of Artefacts
SP	LEI1	1
SP	LEI2	3
SP	LEI3	2
SP	LEI	12
SP	LEH1	56
MAS	LEI5	55
MAS	LEI6	2
SP Ext.	LEH2	8
SP Ext.	LEH3	1
SP Ext.	LFG7	5

In a critique of the Davidson et al (1993) report, Witter (NSW NPWS) suggested that some of the sites reported be amalgamated into larger landscape based sites. In the Mount Arthur

Spur area, a salvage was carried out by Wilson (1995) as part of the BARP based on investigating Witter's basis for amalgamating the Davison et al. sites (1993) into larger landscape sites.

In 1995 Wilson conducted the Mount Arthur spur salvage which concentrated on MAS1. This site was an amalgamation of sites LEI5 and LEI6 previously identified by Davidson et al. (1993). The site consisted of a concentration of artefacts spread across an area approximately 150 metres in length along the crest of a spur running from Mount Arthur. There was also a light scatter of artefacts down the north-westerly facing slope of the spur. Salvage of the site was deemed necessary as it was due to be destroyed by infrastructure associated with Saddler's Pit. A total of 256 surface artefacts were collected and four artefacts were uncovered by subsurface investigations. Of the surface artefacts collected, 110 were silcrete and 88 were mudstone, other materials included quartz, chert, chalcedony, quartzite, basalt and porcellanite. The majority of artefacts were broken flakes, followed by flakes and retouched flakes, other types included flaked pieces, cores, one axe and three grindstones. Wilson's investigations included work in the zone 1c of the Saddler's Pit Catena – Saddler's Pit and Saddler's Pit Extension and zone 1e Saddler's Pit Catena-Mount Arthur Spur and Saddler's Pit.

Davidson and McDonald (2005) write that

> Wilson identified three new sites, amalgamated several Davidson et al (1993) sites, and clarified the extent of three other sites. Five of these sites were salvaged in the first field season (MAS1, SP1E, SP2, SP3, SP4), containing a total of 1,548 surface artefacts. The sixth site, SP1, in the SP Ext area, was the subject of a second field season and 4,704 surface artefacts were collected (Wilson 1995) (Table 2.11). In total, 6,252 Aboriginal stone artefacts were surface collected in the Saddler's Pit Catena Zones 1central and 1e (MacDonald and Davidson 2005:38).

Table A.6 - SP and SP ext. Survey and Surface Salvage (cited from Table 2.20 in MacDonald and Davidson 2005)

Site Name DJF 1993	Site Name Wilson 1995	Site Type	Approx. Site dimension (m)	Analytical Zone	Artefacts DJF 1993	Artefacts June 1995
LEI5, LEI6	MAS 1	Open site	550 x 220	Zone 1e	57	256
LEH3	SP1E	Open site	500 x 100	Zone 1c	1	156
New site	SP1	Open site	500 x 500	Zone 1c	N/A	4704
LEI1, 2, 3, 4	SP2	Open site	800 x 600	Zone 1e	17	905
New site	SP3	Open site	100 x 30	Zone 1e	N/A	52
New site	SP4	Open site	200 x 90	Zone 1c	N/A	179
					Total	**6252**

As a result of her work, Wilson (1995:38-39) strongly argued that the amalgamation of smaller sites into the MAS1 site as defined by Witter (1994:13), was not supported by the surface survey evidence. Wilson suggested that MAS1 only included LEI5 and LEI6 and the artefacts located on the north-western slope, but that a distance of approximately 150 metres between the artefacts in SP2 and the artefacts from MAS1 suggest that these are separate sites (as defined by NPWS requirements). Wilson also argued that even disregarding NPWS

guidelines for site identification, the sites could not easily be amalgamated (Wilson 1995:39) (MacDonald and Davidson 2005:38-39).

The area known as MacDonald Road South (MRS) was originally surveyed by Davidson et al. (1993). Their surveys included a Saddler's Creek tributary (MacDonald Creek), and one transect at right angles to the creek. Nineteen sites were recorded in the area, including three scarred trees. In 1996, BARP revisited the area to locate the sites, and assess the area in terms of its research potential. In 1997, the BARP team returned to carry out intensive surveys, surface collections and excavations (2005:55).

Surface collection and excavation carried out was within zone 1w Saddler's Pit Catena – MacDonald Pit and Dump Site (MacDonald and Davidson (2005:117). Backhoe pit excavations were also undertaken by Curran across the northern section of this study area in 1994 (2005:117).

MacDonald carried out survey, shovel test pits, backhoe excavation, hand excavation and surface collection within Zone 3 of the Saddler's Pit Catena at MRS (2005:180). Sub-surface testing shovel test pits were carried out on site LGH05, which was also surface collected prior to testing (2005:182). A systematic shovel test pit program was carried out for the MRS area and no specific detail about investigation of sites is provided (2005:185).

A random backhoe excavation program was carried out in the MRS area. MRS hand excavation 1 was located on a low north south trending ridge-line which ran between the present course of MacDonald Creek and a now extinct channel of the same watercourse. (2005:190). MRS Excavation 2 was located in an area previously identified by Davidson et al (1993) as LGH06 which was adjacent to a set of Aboriginal axe grinding grooves (37-2-0731 – refer to **Figure 5.1**) and involved hand excavation (2005:195). MRS excavation 2 was located 20 metres east of an upper tributary of Saddler's Creek. This tributary drains from Mt Arthur in the north and flows in a southerly direction through the MacDonald Road South area (2005:199). There are no further results for this excavation in existing draft reports.

Edderton Catena

Two surveys were carried out in the Edderton Catena. Wilson 1995 carried out the first survey, before the BARP determined the focus on catenas, as part of the salvage of MP and MPDS, straddling the Edderton and Saddler's Pit Catenas. The second survey, the Edderton Road survey was carried out as a site survey to establish whether the catena contained archaeological material and might be suitable to set aside as a conservation zone. No details are provided in MacDonald and Davidson (2005) in relation to any sites salvaged.

Edderton Catena – MacDonald and MacDonald Pit Dump Site Surveys

The survey of MP and the MPDS (Wilson 1995) straddled the Edderton and Saddler's Pit Catenas (Chapter 2.6.2, Figure 2.12 – MacDonald and Davidson 2005:59). Three of the artefact scatters collected in these survey areas fell within the Saddler's Pit Catena, and five artefact scatters fell within the Edderton Catena. A total of 122 Aboriginal stone artefacts were collected during the salvage collection of the MP and MPDS area in the Edderton Catena (Table 2.22 – MacDonald and Davidson 2005:59). No details are provided in this report in relation to the sites salvaged.

Edderton Catena Site Surveys

Survey was carried out in this catena to identify if artefacts were present. Davidson and MacDonald (2005:61) had recommended 'that areas of the catena be set aside for a

conservation zone- and it was important to establish that there are Aboriginal Heritage sites to be conserved in the zone before making such a recommendation' (2005:61). Stone artefacts were not recorded in detail and are not included in the BARP database (2005:61). Twenty-eight sites were identified as part of this survey, one of these a historic site. These sites included EC1 to EC24 and EC26 to EC28 which are artefact scatters and EC25 is a historic site.

Conclusions

The preliminary conclusions of the first survey and salvage phase were:

- artefacts were recorded on a higher portion of ridges/crests and lower slopes, than on mid or upper slopes. A geomorphological model was suggested to explain this pattern. Lower slopes and flats are areas of sediment accumulation and material remains are more likely to be buried within those accumulating deposits. There is likely to be more sediment loss on upper slopes and some down slope movement of exposed artefacts; and

- there was a high correlation between exposure of artefacts and degree of disturbance: as degree of disturbance increased, so did the proportion of surveyed area bearing artefacts (MacDonald and Davidson 1998:7).

In total the BARP team surveyed 25% of the Bayswater No. 3 ML area (total of 11,725,000 m^2). Excavations were undertaken of a number of sites using a variety of techniques including hand and mechanical methods such as shovel test pits, broad area excavation and smaller test pits as well as grader scrapes and backhoe pits (MacDonald and Davidson 1998:18). No hearths or heat treatment pits were located as further analysis showed that burnt clay features were in situ burnt root systems or had formed through natural rather than cultural processes (MacDonald and Davidson 1998:18).

BARP's work indicated that long term ploughing had created a layer of artefacts at the base of the plough zone. MacDonald and Davidson (1998:159-160) write that:

> …where advancing erosion intersects the artefact layer, an artificially dense scatter of artefacts is often located usually along watercourses. This pattern supports the contention that caution must be exercised in interpreting the artefact scatters in their current form, as resulting from past human behaviour alone. Specifically we suggest that:
>
> - Detailed analysis of the spatial relationships of artefacts within 'sites' may be meaningful.
> - General assessment of spatial relationships may be possible.
> - Individual artefacts may still carry information.
> - Analysis of broad spatial patterning across landscapes is still possible.'

MacDonald and Davidson argue that 'reliable interpretation of human behaviour is not possible at the site level in these circumstances and broad patterns across much larger areas must be the focus of any such questions' (1998:160). No firm conclusions were drawn from early artefact analyses from the early investigations, however, some preliminary conclusions were drawn including:

1. Although relative frequencies of artefact categories (flakes, snapped flakes, flaked pieces, retouched flakes and cores) are rather variable for small samples, for samples greater than 100 artefacts, the relative frequencies appear to stabilise at approximately 30% for complete flakes, 40% snapped flakes, 20% flaked pieces, 7% retouched flakes and 3% cores. The proportions are remarkably similar in the larger samples.

2. The proportions of snapped flakes in the assemblages could result from post-depositional trampling by cattle, or through deliberate snapping by Aboriginal people. If the snaps are caused by cattle trampling, there would be a high degree of conjoined snapped flakes.

3. Raw material representation follows that of previous Hunter surveys. Artefacts manufactured from silcrete and indurated mudstone was most common. Over 50% of artefact locations have 70% of their assemblages manufactured from mudstone and silcrete.

A summary of all recorded sites by the BARP within the current survey area is provided in **Table A.7.**

Table A.7 - Sites from BARP (1993-2005) Located within the Survey Area including ERM Resource Planning (1994)

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0670	LBD1	Artefact Scatter	The site was recorded as eroding out of a creek bank.	The site dimensions were 185 m long by 50 m wide. The condition of the site is recorded as '50% visibility, cattle disturbance, erosion and anthills'.	10 m from Quarry Creek.	Site contents included at a minimum of 106 artefacts. Silcrete found on site included 17 flakes, 11 snapped flakes, 4 flaked pieces, 5 cores, 2 tranchet retouch and 1 pirri graver. Mudstone consisted of 20 flakes, 9 snapped flakes, 8 flaked pieces, 3 cores, 5 tranchet retouch and 1 tranchet retouch snapped. Quartz included 4 flakes, 4 snapped flakes, 4 flaked pieces and 1 core. Petrified wood included 1 core and 1 snapped flake. Silicified sandstone included 1 flake and 2 cores. 1 translucent chert flake was recorded. 1 topstone was recorded.
37-2-0671	LBD2	Artefact Scatter	Site was located on a creek bank.	Site condition was recorded as being '40% visibility, ploughed and cattle disturbance'.	0 m from tributary of Quarry Creek.	Site has at least 63 artefacts for total number. Mudstone recorded on site included 12 flakes, 7 snapped flakes, 4 flaked pieces, 3 cores and 1 tranchet retouch. Basalt recorded included 3 flakes and 2 cores. Silcrete included 9 flakes, 4 snapped flakes, 3 flaked pieces and 6 cores. Quartz included 1 flake, 1 snapped flake, 2 flaked pieces, 1 core and 1 backed blade. 1 porcellanite flake, 1 silicified sandstone core and 1 muller with polish.
37-2-0673	LCC1	Artefact Scatter	Finds are recorded on near knolls near dam. The landform element was defined as creek bank on site card with a slope of 6 degrees or 11%.	Site condition was recorded as '60% visibility, pebbles on slope obscure visibility, cattle disturbance, anthills and erosion'.	0 m from tributary of Quarry Creek.	1 basalt flake with potlids. 2 basalt snapped flakes in 75 m by 30 m.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0674	LCC3	Artefact Scatter	Scatter was recorded on a creek bank under casuarinas.	Site condition was recorded as '90% visibility, anthills and cattle disturbance'.	5 m from tributary of Quarry Creek.	Approximately 8 flakes in a 30m by 15 m erosion area. Silcrete recorded included 3 flakes, 2 snapped flakes and 1 core. Mudstone consisted of 1 flake and 1 snapped flake.
37-2-0675	LCC4	Artefact Scatter	Scatter was recorded as having eroded out of a gully bank.	The site condition was recorded as '0-95% visibility, erosion and cattle disturbance'.	20 m from tributary of Quarry Creek.	Site contents were recorded as consisting of an area of 35 m by 5 m on an erosion gully with at least 10 artefacts. These artefacts include 1 basalt flake, 4 mudstone flakes, 4 mudstone snapped flakes and 3 mudstone flaked pieces.
37-2-0676	LCC5	Artefact Scatter	Scatter was recorded on sheet erosion area on hill slope.	The site condition was recorded as '50-90% visibility, anthills, cattle disturbance and erosion'.	100 from tributary of Quarry Creek.	Site contents consisted of at least ten artefacts. Mudstone recorded included 1 flake, 3 snapped flakes, 1 flaked piece and 1 tranchet retouch. Silcrete consisted of 1 core. Quartz consisted of 2 flakes and 1 core.
37-2-0677	LCC6	Artefact Scatter	Scatter was recorded as eroding out of the creek bank.	The site condition was recorded as '40% visibility, anthills, cattle disturbance and erosion'.	5 m from tributary of Quarry Creek.	Site contents consisted of at least 29 artefacts. Mudstone recorded included 7 flakes, 2 snapped pieces, 4 flaked pieces, 2 cores, 2 backed blades and 1 tranchet retouch. Silcrete recorded included 5 flakes and 1 snapped flake. Quartz recorded included 1 flake, 2 snapped flakes and 1 flaked piece. Sedimentary recorded included 1 snapped flake.
37-2-0678	LCC7	Artefact Scatter	Scatter was recorded as eroding out of hill slope on sheet erosion area.	The site condition was '90% visibility, sheet erosion and cattle disturbance'.	20 m from tributary of Quarry Creek.	Site contents consisted of at least 12 artefacts. Mudstone recorded as 2 flakes, 2 snapped flakes, 3 flaked pieces and 2 cores. Silcrete was recorded as consisting of 1 flake, 1 snapped flake. Petrified wood consisted of 1 flake.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0679	LCD1	Artefact Scatter	Scatter was recorded on a creek bank stretching up slopes. Slope was characterised as 5 degrees or 9%.	Site condition was recorded as '30% visibility, obscured by rocks and boulders, erosion. Ploughing'. **Consent to Destroy issued 1994 attached to the site card.**	0 m from tributary of Quarry Creek.	Site contents consisted of at least 57 artefacts. Mudstone recorded consisted of 17 flakes, 5 snapped flakes, 6 flaked pieces, 4 cores and 1 tranchet retouch. Silcrete included 5 flakes, 2 snapped pieces, 2 flaked pieces and 4 cores. Petrified wood included 2 flakes and 1 core. Quartz included 2 flakes. Basalt included 1 snapped flake and 2 cores. 2 hammerstones of sedimentary goethite with grind marks (yellow ochre) were identified. 1 silicified sandstone boulder and 1 petrified wood 'trunk piece' which had flakes removed.
37-2-0684	LDC1	Artefact Scatter	Site was located on the creek bank.	Site condition was recorded as '90% visibility, dam construction, anthills, and cattle disturbance'.	0 m from tributary of Quarry Creek.	Site contents consisted of at least 95 artefacts with an area of 300m by 25 m. Mudstone recorded included 18 flakes, 25 snapped flakes, 18 flaked pieces, 4 cores and 1 tranchet retouch. Silcrete recorded included 3 flakes, 9 snapped flakes, 4 flaked pieces and 1 core. Quartz included 1 flake, 3 snapped flakes and 2 flaked pieces. Silicified sandstone consisted of 1 flaked piece. Basalt included 2 snapped flakes. Porcellanite included 1 flake and 1 flaked piece.
37-2-0710	LFF01	Artefact Scatter	The site was located on a creek bank.	The condition of the site was recorded as 'erosion, cattle disturbance, 30% visibility'.	10 m from tributary of Saddlers Creek after rain.	Site contents were recorded as '1 silcrete flaked piece, 1 mudstone flaked piece and 1 quartz flaked piece'.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0710	LFF01	Artefact Scatter	The site was located on a creek bank.	The condition of the site was recorded as 'heavily eroded gully, wash down from hilltop… visibility range from 100% - 10%. **Site Destroyed based on information provided on site card.**	750 m upper tributary of Saddlers Creek	Site contents were recorded as having 2 artefacts, both mudstone flakes.
37-2-0732	LHH01	Artefact Scatter	Site was located on a creek bank.	10-90% visibility, erosion, anthills, cattle disturbance.	0 m/200 m, gully/Saddlers Creek (permanent waterhole)	At least 41 artefacts were recorded. Mudstone: 10 flakes, 4 broken flakes, 4 flaked pieces, 1 core; silcrete: 9 flakes, 7 broken flakes, 2 cores; 1 sedimentary flake; 1 porcellanite broken flake and 1 grinding dish.
37-2-0733	LHH02	Artefact Scatter	Site was located on slopes/creek bank.	10-80% visibility, anthills, cattle disturbance, erosion.	5 m, permanent tributary of Saddlers Creek below.	At least 328 artefacts were recorded. Mudstone: 83 flakes, 105 broken flakes, 34 flaked pieces, 5 cores, 5 backed blades, 2 broken backed blades, 13 tranchet retouch; quartzite: 1 broken flake, 1 flaked piece, 1 core; basalt: 1 flake, 1 broken flake; silcrete: 16 flakes, 39 broken flakes, 4 flaked pieces, 1 core, 1 backed blade, 2 tranchet retouch; quartz: 2 flakes, 3 broken flakes, 3 flaked pieces; Silicified sandstone: 1 flake, 1 broken flake; porcellanite: 1 tranchet retouch, 1 core; 1 petrified wood tranchet retouch.
37-2-0751	HR2	Artefact Scatter	Upper slope/hilltop.	Site condition was poor, situate on road. Surface visibility 100% (was noted that 'suspect artefacts introduced from elsewhere during upgrading of road surface).	1.2 km, tributary of Saddlers Creek.	2 mudstone flaked pieces were recorded.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0759	HR10	Artefact Scatter	This site was located along the ridge top.	This site was recorded as in poor condition due to its location on a vehicle track.	This site was identified approximately 600 m from Saddlers Creek.	15 Artefacts Flakes: 2 quartz, 6 silcrete, 1 mudstone. Flaked pieces: 3 silcrete, 1 chert, 2 mudstone were recorded.
37-2-0760	HR11	Artefact Scatter	This site was located along an existing track within lower slopes landform element.	This site was recorded as in fair condition due to its location on a vehicle track.	This site was identified approximately 100 m from Saddlers Creek.	This site included 9 chert flaked pieces, 1 mudstone flaked piece, 2 silcrete flaked pieces, 4 mudstone flakes, 1 basalt flake, 3 silcrete flakes and 1 chert flake.
37-2-1426	McDonalds Pit 2	Artefact Scatter	Hill top	Erosion from graded road on hill top, for mining purposes.	Not recorded.	2 artefacts were recorded.
37-2-1427	McDonalds Pit Dump Site 1	Artefact Scatter	Lower slope	Site was in eroded waterway on contour bank and dam bank. Visibility average 25% with 100% in places.	Not recorded.	3 artefacts: 1 mudstone flaked piece, 1 pink silcrete flaked piece and 1 grey silcrete flaked piece (on dam) were recorded.
37-2-1444	Edderton Road 2	Artefact Scatter	Creek line/Lower slope	Visibility ranged from 0-100%, erosion, cattle grazing, past farming practices.	0-250 m, from Quarry Creek (springs).	Not provided on site card.
37-2-1840	No Name Creek	Artefact Scatter	Creek bank	Well eroded, surface visibility 80-90%.	7 m, from Quarry Creek.	1 chalcedony core, 1 silcrete flake, 1 mudstone scraper, 1 mudstone flake were recorded.

The following sites were also identified from the Edderton Catena survey. These sites are not registered on the AHIMS sites database based on advice received by David Gordon (AHIMS, DEC) on 30 November 2006. Site co-ordinates for sites EC10 to EC24, EC26 to EC27 were mapped on **Figure 5.1.** No co-ordinates exist for these remaining sites in documentation reviewed to date.

Table A.8 - Sites from BARP (2006) located within the survey area which are not registered on AHIMS database

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
	EC1	Artefact Scatter	This site on gentle simple slope, north of McDonalds Road.	No description provided.	Over 200 m from tributary of Saddlers Creek.	A total of 6 artefacts which includes 1 indurated mudstone flaked piece, 3 silcrete complete flakes, 1 silcrete flake fragment and 1 silcrete flaked piece.
Not registered.	EC2	Artefact Scatter	This site on gentle simple slope, north of McDonalds Road.	No description provided.	Less than 100 m from tributary of Saddlers Creek.	A total of 21 artefacts which includes 1 hornfels complete flake, 8 indurated mudstone complete flakes, 1 quartz complete flake, 1 silcrete complete flake, 1 silcrete core, 5 indurated mudstone flake fragments, 3 indurated mudstone used and/or retouched artefacts and 1 porcellanite used/and or retouched artefact.
Not registered.	EC3	Artefact Scatter	This site was recorded in a disturbed/modified terrain unit.	No description provided.	Over 200 m from tributary of Saddlers Creek.	A total of 6 artefacts which include 1 indurated mudstone artefact, 1 indurated mudstone core, 2 indurated mudstone flake fragments, 1 quartz complete flake and 1 quartz flake fragment.
Not registered.	EC4	Artefact Scatter	This site was recorded in a gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 13 artefacts which include 5 indurated mudstone complete flakes, 2 indurated mudstone cores, 1 indurated mudstone flake fragment, 1 quartz complete flake, 1 silcrete core, 1 silcrete flake fragment and 2 silcrete used/retouched artefacts.
Not registered.	EC5	Artefact Scatter	This site was recorded in a gentle simple slope archaeological terrain unit.	No description provided.	Less than 100 m from tributary of Saddlers Creek.	A total of 4 artefacts which include 4 indurated mudstone complete flakes.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
Not registered.	EC6	Artefact Scatter	This site was recorded in a gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 42 artefacts which include 1 chert core, 21 indurated mudstone complete flakes, 1 indurated mudstone core, 3 indurated mudstone flakes, 1 indurated mudstone used and/or retouched artefacts, 3 quartz complete flakes, 10 silcrete complete flakes and 2 silcrete flake fragments.
Not registered.	EC7	Artefact Scatter	This site was recorded in a gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 62 artefacts which include 1 hornfels complete flake, 18 indurated mudstone complete flakes, 2 other types of complete flakes, 5 quartz complete flakes, 5 silcrete complete flakes, 1 chert core, 2 quartz cores, 1 quartzite core, 2 silcrete cores, 4 indurated mudstone flake fragments, 6 silcrete flake fragments, 2 indurated mudstone flaked pieces, 1 other flaked piece, 1 quartz flaked piece, 2 silcrete flaked pieces, 4 indurated mudstone used and/or retouched artefacts, 1 other used and/or retouched artefact and 3 silcrete used and/or retouched artefacts.
Not registered.	EC8	Artefact Scatter	This site was recorded in a gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 63 artefacts were recorded which include 16 indurated mudstone, 6 quartz, 9 silcrete complete flakes, 4 indurated mudstone cores, 1 quartz core, 2 silcrete cores, 14 indurated mudstone, 1 quartz, 2 silcrete flake fragments, 3 indurated mudstone flaked pieces, 1 silcrete flaked pieces, 2 used and/or retouched indurated mudstone and 1 silcrete artefacts.
Not registered.	EC9	Artefact Scatter	This site was recorded in a gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of three artefacts were recorded which included 2 indurated mudstone and 1 silcrete complete flakes.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
Not registered.	EC10	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 13 artefacts were recorded which included 6 indurated mudstone and 2 silcrete complete flakes, 1 indurated mudstone and 1 silcrete core, 1 indurated mudstone and 1 silcrete flake fragment and 1 indurated mudstone flaked piece.
Not registered.	EC11	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 79 artefacts were recorded which included 20 indurated mudstone, 1 other, 1 quartz and 9 silcrete complete flakes, 3 indurated mudstone and 8 silcrete cores, 16 indurated mudstone and 18 silcrete flake fragments, 1 hornfels and 2 indurated mudstone used and/or retouched artefact types.
Not registered.	EC12	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 12 artefacts were recorded which included 5 indurated mudstone and 1 quartz complete flakes, 1 indurated mudstone core and 5 indurated mudstone flake fragments.
Not registered.	EC13	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 52 artefacts were recorded which included 1 chert, 12 indurated mudstone, 1 other and 5 silcrete complete flakes, 2 indurated mudstone, 1 quartz and 2 silcrete cores, 10 indurated mudstone and 9 silcrete flake fragments, 4 indurated mudstone and 3 silcrete flaked pieces and 2 indurated mudstone used and/or retouched artefacts.
Not registered.	EC14	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 3 artefacts were recorded which included 1 silcrete flake fragment and 2 silcrete flaked pieces.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
Not registered.	EC15	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 10 artefacts were recorded which included 3 indurated mudstone, 1 quartz, 1 quartzite and 1 silcrete complete flakes, 1 indurated mudstone core, 1 quartz and 1 silcrete flake fragment and 1 quartz flaked piece.
Not registered.	EC16	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of three artefacts were recorded which included 2 other complete flakes and 1 silcrete flaked piece.
Not registered.	EC17	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 7 artefacts were recorded which included 2 indurated mudstone complete flakes, 1 silcrete core and 3 indurated mudstone flake fragments and 1 used and/or retouched artefact.
Not registered.	EC18	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 7 artefacts were recorded which included 4 indurated mudstone and 1 silcrete complete flakes, 1 indurated mudstone and 1 silcrete core.
Not registered.	EC19	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 2 artefacts were recorded which included 1 indurated mudstone complete flake and 1 silcrete flaked piece.
Not registered.	EC20	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 5 artefacts were recorded which included 4 indurated mudstone complete flakes and 1 silcrete complete flake.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
Not registered.	EC21	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 41 artefacts were recorded which included 11 indurated mudstone, 1 other, 3 quartz, 1 quartzite and 5 silcrete complete flakes, 1 hornfels, 1 indurated mudstone, 1 other and 1 silcrete core, 5 indurated mudstone and 4 silcrete flake fragments, 5 indurated mudstone flaked pieces, 1 indurated mudstone and 1 quartzite used and/or retouched artefacts.
Not registered.	EC22	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 10 artefacts were recorded which included 2 indurated mudstone and 1 quartz complete flakes, 4 indurated mudstone and 1 silcrete flake fragments, 1 hornfels core and 1 quartz flaked piece.
Not registered.	EC23	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 23 artefacts were recorded which included 1 indurated mudstone, 1 quartz and 3 silcrete flake fragments, 1 silcrete core, 1 chert, 4 indurated mudstone, 1 quartz and 4 silcrete complete flakes, 5 indurated mudstone and 2 silcrete flaked pieces.
Not registered.	EC24	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 3 artefacts were recorded which included 1 indurated mudstone complete flake and 2 used/retouched mudstone artefacts.
Not registered.	EC26	Artefact Scatter	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	A total of 43 artefacts were recorded which included 15 indurated mudstone, 1 quartzite and 9 silcrete complete flakes, 1 indurated mudstone and 3 silcrete cores, 4 indurated mudstone and 4 silcrete flake fragments, 3 indurated mudstone and 1 silcrete flaked pieces, 2 used and/or retouched artefacts.

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
Not registered.	EC27	Isolated Find	This site was recorded in a level to very gentle drainage depression terrain unit.	No description provided.	Less than 50 m from tributary of Saddlers Creek.	One complete silcrete flake was recorded at this site.
Not registered.	EC28	Artefact Scatter	None provided.	No description provided.	No description provided.	A total of three artefacts were recorded which included 1 indurated mudstone flake fragment and 2 silcrete flake fragments.

1.5 Dagg (1997) Umwelt (Australia) Pty Limited

Dagg as an employee of Umwelt (1997) carried out an archaeological assessment for the proposed modifications to the coal preparation plant (CPP) and transportation system for the Bayswater Coal Mine Project. This assessment included survey of the proposed CPP and infrastructure complex, the proposed haul road within Bayswater No 3 lease area to the CPPP, proposed access road to the CPP via Thomas Mitchell Drive, and the proposed easement for an overland conveyor from the CPP to the existing Ravensworth Coal Terminal. The survey included coverage of sections of Saddlers Creek which are part of the current survey area (refer to **Figure 5.2**). The assessment included resurvey of areas of Saddlers Creek already surveyed by Koettig and Hughes (1985). The resurvey included the rerecording of known sites within the current survey area including MAS132, MAS133 and MAS135 (refer to **Table A.9** for a description of site contents). These three sites were identified as part of the proposed 'two options for the haul road crossing of Saddlers Creek'. The extent of these sites is shown on **Figure 5.1** (refer to **Table A.9** for cross reference of site name and AHIMS site number).

A total of 36 Aboriginal sites were recorded during the total survey for this project. These sites were predominantly artefact scatters (20 sites) with the remainder identified being isolated finds (16 sites).

MAS 132 was assessed as having high scientific/archaeological significance and MAS 133 and MAS 135 were assessed as having low scientific/archaeological significance. MAS 132 had a higher assessment as this site indicated 'repeated occupation' and although disturbed, 'remnants of knapping floors could be identified' (1997:31). No evidence was observed at this site for heat treatment pits and there was a restricted range of other types of evidence such as grindstone fragments or hammerstones (1997:31). MAS 133 and MAS 135 were argued in comparison, to only be indicative of low density occupation over a broader area (1997:60). Dagg (1997:67) recommended that the proposed haul road crossing of Saddlers Creek 'be designed to avoid the site MAS 132' and a Consent to Destroy application submitted for partial destruction of MAS 133 and MAS 135. The remaining sections of MAS 133 and MAS 135 which would not be impacted, were to be fenced off prior to construction in consultation with the Wonnarua Tribal Council and/or the Wanaruah Local Aboriginal Land Council (1997:67).

Table A.9 - Sites from Dagg (1997) within the Survey Area

AHIMS Site #	Site Name	Site Type	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0485	MAS132	Artefact Scatter	This site is located on the southern bank of Saddler's Creek	This site was eroded to both A and B horizons and disturbed from rill erosion.	10-30 m to Saddlers Creek.	The initial recording included a total of 146 artefacts were recorded including 84 indurated mudstone, 41 silcrete, 11 quartz, 3 chert, 4 fossilised wood and 3 porcellanite artefacts. In 1997 Dagg recorded a total of 776 artefacts which included 2 basalt, 17 chert, 489 mudstone, 17 porcellanite, 1 petrified wood, 26 quartz and 224 silcrete artefacts (1997:31). The predominant artefact types were flakes followed by flaked pieces.
37-5-0486	MAS133	Artefact Scatter	This site was identified on the bank of Saddlers Creek	This site was subject to slope wash and was a small exposure at the edge of the creek bank which had been trampled by cattle.	Less than 5 m to Saddlers Creek.	The initial recording included a total of 12 artefacts including 8 indurated mudstone, 1 silcrete, 2 quartz and 2 chert artefacts. In 1997 Dagg recorded a total of 55 artefacts including 46 mudstone, 1 quartz and 8 silcrete artefacts. The predominant artefact types were flakes followed by flaked pieces.
37-2-0488	MAS135	Artefact scatter	The site is located on land beside western bank of Saddlers Creek	This site was identified within a fence line exposure near a gate picket hole. This site was disturbed by cattle treadage and the construction of the fence.	Approximately 45 m to Saddlers Creek.	The initial recording included a total of 34 artefacts including 19 indurated mudstone, 1 silcrete, 8 quartz, 2 quartzite, 4 igneous and 1 chert artefact. In 1997 Dagg recorded a total of 9 artefacts including 7 mudstone and 2 silcrete artefacts. The predominant artefact type was flakes followed by broken flakes.

1.6 Kuskie (1999) South East Archaeology Pty Ltd

South East Archaeology was commissioned by Dames and Moore as part of the Mount Arthur North (MAN) Coal Mine EIS to carry out an Aboriginal Archaeological Assessment of the proposed development. Field survey of the MAN study area was carried out by South East Archaeology and the Wonnarua Tribal Council over a period of five weeks from December 1998 to February 1999 and several days in September 1999, involving 'a total of 220 person days' (Kuskie 1999:ii) (refer to **Figure 5.2**). Kuskie's (1999) total field study survey area involved 'direct coverage of 244 hectares (6.6%) of the 37 km^2 study area, resulting in an effective survey sample (accounting for archaeological visibility) of 0.69% of the total area' (1999:ii). Kuskie subdivided the study area into 520 survey areas, all of which were sampled including 'different environmental contexts, range of landform elements, classes of slope, archaeological terrain units, geological formations and soil units present' (1999:ii).

Kuskie did not identify survey transects and does note that only areas of visibility (exposure) were inspected within a survey area. Kuskie also notes that some survey areas were inspected by vehicle and not pedestrian survey. Kuskie stated that surface visibility was low on average across the surveyed terrain and very low in the remainder of the property, which was not subject to direct inspection. Vegetation is noted as being the primary detection-limiting factor (1999:ii).

Kuskie identified 305 Aboriginal heritage sites (all artefact scatters except for one grinding groove) 'within 1,188 separate loci' (1999:iii -v). Kuskie reported that 'all 112 previously reported sites within the study area' comprised part of this total. The identified sites occupied 81% of the entire MAN study area (1999:iii).

Kuskie extrapolated his results to the whole of the MAN study area. This extrapolation indicated that a 'substantial body of Aboriginal heritage evidence potentially exists (the potential resource), only a fraction of which has been identified during the surface investigation' (1999:iii). Kuskie (1999:iii) reported:

- Artefacts occur at substantially higher densities within the valley flat landform element, on level to very gently inclined slopes, within 50 metres of a watercourse (particularly if it is a high order stream) and on the level/very gentle valley flat archaeological terrain unit.

- The combined site assemblage is dominated by two stone materials, silcrete (51%) and indurated rhyolitic tuff (also known as mudstone) (34.6%). Thirteen other stone materials occur in much lower frequencies. Sources of silcrete were identified within the study area, mostly in the western portion bordering the Hunter River floodplain. Sources of tuff occur widely across the study area, in association with Jerrys Plains Subgroup geological formation. Alluvial and colluvial gravels and other isolated occurrences of silcrete, tuff and to a lesser extent materials such as quartzite and quartz, were also noted in the study area.

- A total of 37 different types of artefacts were recorded within the MAN study area. The assemblages are dominated by flakes and portions of flakes (53.4% of combined artefact total) and flaked pieces (15.1%). The evidence represents the dominance of non-specific stone flaking activities within the study area. Evidence of micro blade manufacturing is also common, comprising 16% of the total database. A very low frequency of utilised and/or retouched flaked artefacts is present (1.65% of the database). Tuff was preferentially selected over silcrete to manufacture these tools. Very few spear barbs (Bondi points) were identified. Very low frequencies of tools indicative of activities such as the discard of non-microlith tools (e.g. flaked or ground-

edge axes, eloueras) or the discard/accidental loss of microlithic tools (e.g. Bondi points, geometric microliths) was located. The flaked artefacts tend to be small in size (often less than 50 millimetres in maximum dimension).

- The evidence suggests 'that the major watercourses (Whites Creek, Fairford Creek and their main tributaries) were the focus of Aboriginal occupation in the study area. Level to very gently inclined ground was preferred for camping. Camp sites tended to be located within fifty metres of a watercourse, particularly third or fourth order streams. However, the possible importance of vantage points on elevated ground is also noted. The results indicate that the entire landscape was utilised to varying extents, with hunting, gathering and other activities occurring away from, as well within, camp sites').

- Artefacts were made from stone sources within the MAN area and also from alluvial gravels. There was no priority in 'rationing' stone during artefact manufacture.

- Kuskie argues that 'most, if not all, of the cultural evidence within the Mount Arthur North study area relates to the past 5,000 years of human occupation'.

- The cultural significance of the MAN study area was determined by the Wonnarua Tribal Council. The Wonnarua Tribal Council:

> consider that the land and all of the Aboriginal heritage within the study area is of interest and of contemporary value to the Wonnarua people. Aboriginal heritage evidence represents a tangible link with the traditional past and with the lifestyles and values of community ancestors (1999:v).

Kuskie argued that the 'identified and potential Aboriginal heritage evidence located within the MAN study area is not considered to be of sufficient significance or uniqueness within a regional context to warrant its total conservation' (1999:v).

Kuskie's assessment recommended 'two conservation zones in the adjoining Bayswater No. 3 ML, measuring 344 hectares in total' in addition to the establishment of a 122 hectare conservation zone west of Edderton Road (1999:v). The Edderton Road conservation area encompassed eight representative environmental/cultural contexts. The remaining two conservation zones offered 'protection to a sample of twenty-four of the representative environmental/cultural contexts present within the MAN study area' (1999:v).

Salvage was proposed by Kuskie of the remaining '42 representative/environmental cultural contexts' that could not be conserved. The following characteristics were found in the surveyed area:

- Artefact densities were higher than expected on simple slopes with no distinguishing between different classes of slope. Simple slopes occupied almost 57% of the total study area (1999:88).

- Artefacts were lower in number than expected on ridge crests and spur crests but were still widely distributed. Kuskie argues that this may mean that 'ridgelines and spurs…although, frequented to some extent, may not have been the major focal points of activity (at least activity that resulted in evidence being discarded)' (1999:88).

- A very low density of artefacts was identified on flats (other than valley flats), however this unit is only 1% of the total study area.

- Valley flats had a confirmed high artefact density per square metre of effective site area between archaeological terrain units (Kuskie 1999:111).

- Once again, significantly higher densities of artefacts were found in relation to distance from and type of watercourse. Significantly higher densities for units within '50 metres of fourth order watercourses is confirmed. The trend for increased density in units between 50 and 100 metres from third order watercourses is also supported….and the dramatic decrease in density for units 50-100 metres from fourth order watercourses is confirmed' (Kuskie 1999:111).

- Artefact densities appear relatively high within 50 metres of a first and second order watercourse, and within 50-100 metres of first order watercourses, compared to the densities derived from effective survey coverage totals. Kuskie argues that occupation of these first and second order watercourses was due to 'camping by small hunting parties, or people travelling through the landscape… rather than family groups engaged in focused camping' (1999:111). Overall artefact densities were low across the study area.

- The majority of artefacts (86%) were 'identified on surfaces exposed by sheet erosion. Artefacts were also identified within stream bank erosion, gully erosion, rill erosion, dense vegetation, aggrading deposits and modified surfaces. Comparison of artefact density between site loci reveals that the mean densities are very similar between most surfaces, apart from rill erosion (which involves a very small sample), sheet erosion (which has a relatively lower density) and stream bank erosion (which is relatively higher)' (1999:112).

- The results are significantly different by comparison to those obtained using effective survey coverage. This is probably a result of the exclusion from calculations of many *site loci* that comprised multiple land surfaces (Kuskie 1999:112).

- A total of about 17,330 stone artefacts were identified during Kuskie's (1999) survey. A total of 15,970 artefacts were recorded in detail, while summary counts or estimates were made of the remaining 1,360 or so artefacts.

- The mean artefact densities of site loci vary considerably, from 0.00004 to 850 artefacts per square metre of effective site area, with a mean of 0.183 artefacts/m^2. This average artefact density of combined site loci is 2.6 times higher than the average density for all survey components (which includes exposures without artefacts).

- Within individual loci recorded during the MAN study, artefact numbers range from 1 to 670. The artefact totals for sites (all *loci* within a survey/site area combined) range from 1 to 2,602.

- Only 26 distinct knapping floors, (spatially discrete debris from the reduction of one or more cores of the same stone material) were identified. This result was lower than expected, but may reflect the fact that a number of knapping floors have previously been collected (Koettig and Hughes 1985) and most artefacts are present within erosion scours, in which post depositional processes may have obscured, removed or mixed evidence (1999:113).

- A total of fifteen stone material types were identified, two types of tuff and silcrete were divided into four sub-types on the basis of colour (Kuskie 1999:114). Silcrete was the most commonly identified type comprising 8,148 items (51%). Indurated rhyolitic tuff ('tuff') was the second most commonly represented comprising 5,528 items or 34.6% of the combined database. Porcellanite (3.84%), chert (2.67%), quartz (2.44%), acid volcanics (1.77%), other volcanics (1.11%) and quartzite (1.01%) were present in low

frequencies. Other materials such as 'banded rhyolite, porphritic rhyolite, chalcedony, petrified wood, siltstone, sandstone and ochre also occurred in very low frequencies' (1%) (Kuskie 1999:114).

- Silcrete and tuff were dominant as these materials were available locally. Silcrete was found as pebbles, cobbles and boulders:
  - on ridges, spurs, slopes and valley flats in the western portion, near Denman Road and Edderton Road (survey areas CC1, 2 and 3, PK2);
  - around the upper reaches of Whites Creek and adjoining slopes and drainage depressions (survey areas CC59, RP2, 4, 36, 37, 39, 43, 44, 49, 50, 52, 53 and 100);
  - the unnamed watercourse in the northern portion of the study area (survey area RP65); and
  - drainage depressions in the north eastern section (survey areas RP74 and 75) (Kuskie 1999:114).
- A total of 37 different types of artefacts were recorded within the MAN study area.
- Flakes are the dominant type in the combined artefact database, comprising 5,653 items (35.4%). Flaked pieces are also common (15.1%) along with lesser frequencies of flake portions (proximal 7.3%, medial 4.2%, distal 6.5%) microblades (4.2%), microblade portions (proximal 3.6%, medial 3.4%, distal 2.8%), microblade cores (2%) and cores (3.7%). Lithic fragments are the fourth most common lithic item type (6.8%), but not all are certain of being artefactual in origin. Much lower frequencies occur of the remaining artefact types (Kuskie 1999:117).
- Dominance of flakes, flake portions and flaked pieces (68.5% of the total database) indicates that the majority of evidence relates to general or non-specific knapping activities. This evidence is indicative of casual and opportunistic behaviour, meeting requirements for stone tools on an 'as needed basis' (Kuskie 1999:117). A total of 264 utilised and/or retouched flakes, microblades and flaked pieces were identified within the study area, comprising 1.65% of the total assemblage. This is a relatively low frequency (Kuskie 1999:118).
- Few Bondi points (0.48% of the combined assemblage) or Bondi point portions (0.52%) were identified within the study area. Bondi points were hafted to spear shafts, with the aid of resin. A total of 12 Bondi points (0.08%) were identified with evidence of retouch or utilisation on the chord. Considering the total quantity of evidence relating to the production of microblades, this is an extremely low tally (Kuskie 1999:118).
- Other backed implements were found, including 30 geometric microliths (0.19%), four of which exhibited use-wear (Kuskie 1999:119).
- Seven eloueras were recorded.
- Only 16 hammerstones were identified.
- Two anvils (one of porphyritic rhyolite and one of quartzite) were located.

- Thirteen flaked axes, eight ground-edge axes and five flakes from ground-edge axes were identified (0.16% of the database) almost all made of hard volcanic stone.

Kuskie surveyed to the northwest boundary of the current survey area. There are no sites identified by Kuskie within the survey area.

1.7 Kuskie (2001), Mount Arthur North Coal Mine: Excavation Permit Application and Research Design South East Archaeology Pty Ltd

Kuskie's (2001) research design focused on the following objectives:

- a mitigation strategy for the entire development area specifically relating to a selected sample of representative Aboriginal sites/contexts to be salvaged as part of that mitigation strategy;

- the research design in conjunction with a Section 90 Consent to Destroy Permit to be submitted to encompass all Aboriginal sites that may be affected by years 3-4 of operations. Permission will be sought to renew the Consent for the Year 0-2 area should relics continue to be in existence in this area; and

- this process is to be repeated every two years until completion of the development. It will involve applications for Section 90 Consent to Destroy Permits to cover the subsequent two years operations and renewal of permits for any relics still in existence in areas for which Consent has previously been granted, but is due to expire, and where further impacts may occur to relics.

Kuskie's design included a strategy relating to all heritage evidence and environmental/cultural contexts located both within the:

- Mine Development Area (entire Mining Lease area, excluding areas at McLeans Hill and west and south-east of Edderton Road); and

- Exclusion Areas (areas excluded from present mine development area, but may be subject to future impact as they occur within the mining lease) (2001:2).

Kuskie reported a total of 307 recorded Aboriginal heritage sites within the MAN EIS study area. Kuskie (2001:2) does state that using the MAN recording system, 'many sites have multiple listings and 429 are recorded on the NPWS register'. Kuskie summarised that:

- 283 sites will probably be impacted during the 21 Year mining period;

- 13 sites occur wholly in the Exclusion Areas of the present mine development (another 32 sites occur partially in these areas), but may be impacted by future mining activities. There is no intention to conserve these sites in a manner consistent with their long-term preservation;

- 11 sites will not be impacted by the proposed mining activity, as they are situated outside of the mining lease application area and/or development area (in Authorisation A171)' (1999:2); and

- proposed conservation areas include the Bayswater No. 3 Edderton Road (BER), Bayswater No. 3 Saddlers Creek (BSC) and Mount Arthur (MTA) areas.

The results of the subsequent salvage are presented in **Section 5.7.11**.

1.8 Kuskie and Clarke (2004) Aboriginal Archaeological Salvage Mount Arthur North

Kuskie and Clarke (2004) carried out archaeological salvage excavations and surface collections for numerous Aboriginal sites located within the MAN ML area. Kuskie and Clarke's (2004) report documents work undertaken under Excavation Permit (#SZ346) which was issued by NPWS (now DEC) to South East Archaeology to permit their program of scientific salvage. A separate Section 90 Consent and Permit to Salvage (#SZ347) was issued by DEC to UHWC for the 'cultural salvage of evidence' (2004:1). The surface collections undertaken by the UHWC are not reported within the Kuskie and Clarke (2004) report.

Kuskie and Clarke's involvement and consultation with the Aboriginal community included only the UHWC who provided 'almost half of the entire workforce during the excavation' (2004:2).

Kuskie and Clarke (2004) excavated a total area of 779.75 m^2 by hand. The total area excavated by surface scrapes was 38 hectares. In summary the 'excavations resulted in a total of approximately 138.7 cubic metres of soil being excavated by hand and wet-sieved' (Kuskie and Clarke 2004:4).

The areas Kuskie and Clarke (2004) salvaged were based on a sampling strategy that used the premises of Kuskie's original predictive model developed as part of the MAN EIS (Kuskie 1999). Kuskie's (2004:276) model for MAN was subdivided into:

> …broad zones on the basis of hypothetical patterns of occupation and smaller environmental/cultural contexts (as defined in the EIS) that encompass the potential range of variation in heritage evidence between different zones or environmental contexts.

Surface scrapes focused on areas closest to the Hunter River, furthest from the Hunter River, on Whites Creek Valley Flat and on the major ridgeline connecting Mt Arthur and the Hunter River (Kuskie and Clarke 2004:278). Additional scrapes were carried out near White Creek's margins after the location of an Aboriginal burial (Kuskie and Clarke 2004:279).

Six locations for open area excavation were selected on two major landform contexts including 'the level-very gentle basal slopes and valley flats along Whites Creek and the major ridgeline, which extends from Mount Arthur north to the Hunter River' (Kuskie and Clarke 2004:282).

Additional hand excavations of 'small localised features of potential significance were uncovered within three Excavation Areas (WCMSE1, WCMSS2 including sub-areas A-D, and WCLSE2)' (Kuskie and Clarke 2004:288). These excavations 'were situated within the Whites Creek alluvial/colluvial catchment and were predominantly focused in the middle portion of Whites Creek at Mount Arthur North' (Kuskie and Clarke 2004:289).

Kuskie and Clarke's (2004:4-7) conclusions can be broadly summarised as:

- the hand excavations and surface scrapes resulted in the location of a total of 32,866 identifiable Aboriginal artefacts. The mean density of artefacts per unit of volume within the main hand excavations was 106.8 artefacts/m^3 and ranged from an average of

271.7/m^3 at the Whites Creek Upper Section to just 11.0/m^3 at the Ridge to Hunter Upper Section;

- 16 raw materials were identified in the combined assemblage. Silcrete was the most common (59.37%), tuff (19.42%), porcellanite (10.03%) and much lower frequencies of quartz (4.27%), petrified wood (3.51%), volcanic 1 (2.01%), quartzite, volcanic 2, chert, chalcedony, basalt, volcanic 3, sandstone, volcanic glass, glass and ochre are all less than 1%. Most materials are from local sources apart from quartz which appears to be have been used infrequently and in an opportunistic manner;

- the mean artefact density in the localised hand excavations within the scrapes ranged up to a maximum average of 2,713/m^3 for an excavation area (maximum count of 838 or density of 9,469/m^3 in a single square metre unit);

- analysis of site integrity indicated that vertical mixing of the excavated deposit has occurred (probably largely as a result of bioturbation) but that limited post-depositional lateral movement of evidence has occurred;

- proximity to the Hunter River was less of a factor influencing assemblage composition than the proximity of Whites Creek. Kuskie and Clarke (2004:6) argue that occupation of Whites Creek may have predominantly involved small groups of people during the course of the daily/seasonal hunting round and several short term temporary encampments by small parties of both men and women (possibly extended families). In contrast, the evidence along the ridge from Mt Arthur to the Hunter River is indicative of transitory movement; and

- radiocarbon dating, lithic evidence and the geomorphology indicate that much, 'if not the entire suite of cultural evidence at MAN, is mid to late Holocene in age (i.e. <5000 years BP)'. Evidence of older occupation was not identified and was considered very unlikely in the study area.

Kuskie and Clarke's (2004) archaeological salvage investigations thoroughly tested all archaeological terrain units throughout the MAN ML area and adjoining land.

1.9 ERM 2004

In 2004 ERM undertook a review of the archaeology in the Upper Hunter Valley on behalf of Upper Hunter Aboriginal Heritage Trust. Following is a number of ERM's conclusions that are seen to be relevant to the current assessment:

- artefact assemblages will typically be comprised of flaked stone with a component associated with the manufacture of backed artefacts. Backed artefacts typically make up about 1% or 2% (and up to 5% in rare cases) of an assemblage;

- evidence of backed artefacts is generally found wherever large numbers of artefacts have been recorded;

- cores and flakes associated with backed artefact manufacture typically show evidence of platform modification to increase platform angles. This modification is sometimes referred to as faceting, and is typical of open site assemblages between Singleton and Muswellbrook (ERM 2004a:57);

- the backed artefact component may typically include a larger proportion of asymmetric, elongate 'Bondi point' forms and a smaller proportion of symmetric 'geometric microlith' forms in the same assemblage;

- eloueras occur occasionally and sometimes exhibit usewear chipping and polishing along the chord;

- artefact assemblages have, on rare occasions, included small grindstones or fragments thereof, and ground-edge hatchet heads made on flat ovate water rolled small cobbles (McCarthy 1976:47);

- hearths, comprising tight concentrations of heat-retainer stones clearly distinguishable from the natural environment are rare;

- sites along creeklines have potential for sub-surface archaeological deposit. Topsoil is often quite deep, commonly between 100 mm and 300 mm;

- the small numbers of artefacts found on slopes and ridge crests generally do not allow identification of particular activities, but do provide evidence for occupation of these areas and at the very least transient movement over, and use of, all parts of the landscape;

- in areas close to the Hunter River (very likely to have been the major foci of occupation) alluvial deposits may have buried sites, or periods of flooding may have eroded and displaced archaeological material. Nevertheless excavations at a number of sites indicate that high density sub-surface assemblages may occur in this context (Hiscock and Shawcross 2000, Hughes and Shawcross 2000);

- sites on or within colluvial deposits are also rare, however they do occur (for example, Hughes and Hiscock 2000, ERM 2004) and may represent stratified cultural deposits providing evidence of chronological change;

- archaeological sites other than artefact scatters or isolated artefacts are not common;

- quarry sites have been identified where silcrete outcrops; however the vast majority of raw material used in the manufacture of stone artefacts would have been derived (quarried/collected) from the Hunter River;

- axe-grinding grooves often occur where suitable sandstone is located in association with water or a creek line;

- scarred trees are rare, presumably because most trees that may be old enough to have been scarred have been cleared or died naturally (and rotted away or been burnt in fires); and

- art sites, ceremonial sites or Bora grounds are also rare and are either deteriorating or can no longer be located (ERM 2004a:57-58).

1.10 South Pit Extension Project (Umwelt, 2006)

Mt Arthur Coal proposed to extend the currently approved MAN South Pit further south into the Bayswater No. 3 Mining Lease (ML). Umwelt (2006) was commissioned by Mt Arthur Coal to prepare an Environmental Assessment to support the development application for this project. An Aboriginal archaeological assessment was undertaken as part of the Environmental Assessment.

The northern section of the South Pit Extension Area was previously comprehensively surveyed by Kuskie (1999) as part of the MAN Coal Project. Therefore, the Umwelt survey for this project was limited to the area not previously surveyed by Kuskie (1999). Kuskie's 1999 survey identified 15 sites within the South Pit Extension Area. These sites were identified and recorded according to archaeological terrain units and environmental and cultural contexts; with areas in which artefacts were located recorded as site loci (spatially discrete units where archaeological evidence was identified usually due to ground surface exposure within an archaeological terrain unit).

Earlier archaeological survey for the BARP (Davidson et al. 1993) also covered part of the southern section of the South Pit Extension Area and identified eight archaeological sites within this area. Several of these sites have since been destroyed by subsurface investigations and surface salvage under Section 90 Consents (MacDonald and Davidson 2005). The remaining sites were rerecorded as part of the Umwelt 2005 survey. The sites were recorded by Umwelt's 'archaeological terrain units' consistent with Kuskie (1999) to allow comparison of survey results.

The Umwelt (2006) assessment identified eight sites which consisted of 42 site loci within eight archaeological terrain units. A total of 30 loci in six sites was to be impacted by the South Pit Extension Project. The minimisation of impacts on Aboriginal sites was considered during the design of the South Pit Extension Project, including avoiding mining through Saddlers Creek and minimising disturbance by maximising use of existing facilities such as haul roads. Those sites that were not be impacted by the proposed extension were to be conserved *in situ*.

Five of the six sites to be impacted by the development were assessed as having only low to moderate archaeological significance within local and regional context due to their lack of research potential, rarity, representativeness, archaeological integrity, connectedness, complexity and potential for archaeological deposit (PAD). The sixth site (JF/MJS5) was assessed as having moderate to high archaeological significance within a local and regional context due to its larger and more complex assemblage and subsequent potential for that assemblage to assist with answering contemporary research questions.

Surface collection of the site loci was recommended due to the Aboriginal cultural heritage significance of the South Pit Extension Area. Subsurface salvage was not assessed as warranted due to the lack of site integrity and PAD within the site loci and the terrain units in general and in recognition of the comprehensive archaeological investigations undertaken of similar terrain units across the MAN Lease as part of Kuskie and Clarke's (2004) subsurface investigations.

Table A.10 – Aboriginal and Scientific Significance of Sites recorded during Umwelt 2005 Survey within the South Pit Extension Area

Site Name	Aboriginal Cultural Significance	Archaeological or Scientific Significance	Combined Significance
Site Name and Landform Unit			
JF/MJS1 Modified Terrain Including AHIMS #37-2-0763 and 37-2-0722	No specific comments made from any groups about this particular terrain unit.	Low to Moderate	Low to Moderate

Table A.10 – Aboriginal and Scientific Significance of Sites recorded during Umwelt 2005 Survey within the South Pit Extension Area (cont)

Site Name	Aboriginal Cultural Significance	Archaeological or Scientific Significance	Combined Significance
Site Name and Landform Unit			
JF/MJS2 Simple Slope Very Gentle	No specific comments made from any groups about this particular terrain unit.	Low to Moderate	Low to Moderate
JF/MJS3 Simple Slope Gentle	No specific comments made from any groups about this particular terrain unit.	Low to Moderate	Low to Moderate
JF/MJS4 Simple Slope Moderate/Steep	No specific comments made from any groups about this particular terrain unit.	Low to Moderate	Low to Moderate
JF/MJS5 Drainage Depression Gentle Including AHIMS #37 2 0762, 37-2-0761 and 37-2-760	High	Moderate to High	High
JF/MJS6 Drainage Depression Moderate/Steep	No specific comments made from any groups about this particular terrain unit.	Low	Low
JF/MJS7 Ridge Crest Gentle	No specific comments made from any groups about this particular terrain unit.	Low to Moderate	Low to Moderate
JF/MJS8 Spur Crest Moderate/Steep Including AHIMS #37-2-1439 and 37-2-0707	No specific comments made from any groups about this particular terrain unit.	Low to Moderate	Low to Moderate

Site JF/MJS5 (Drainage Depression Gentle archaeological terrain unit) extends into the current survey area. This site was recorded as containing 300-500, artefacts predominately mudstone and silcrete flakes and broken flakes. The location of this site is shown on **Figure 5.1**.

1.11 Surface Collection, Mt Arthur Coal (Umwelt 2005a in preparation)

Mt Arthur Coal Pty Limited sought a Section 90 Consent to cover an area in the northern portion of the Mount Arthur North Mining Lease (ML). The proposed activities in this area were covered by existing development approvals, but were not included in previous Section 90 Consent applications made by Mt Arthur Coal. The area is located adjacent to the McLeans Hill Heritage Management Zone (McLeans Hill HMZ) (refer to **Figure 5.1**).

The proposed open cut mining and associated activities would impact on sections of 14 archaeological sites recorded by South East Archaeology (Kuskie 1999) during their

assessment of the Mount Arthur North ML area for the Mount Arthur North Coal Project Environment Impact Statement (EIS) (URS 2000). Umwelt was engaged by Mt Arthur Coal Pty Limited to coordinate the Section 90 process for the archaeological sites recorded and assessed by Kuskie (1999).

Sites MAN84 (within archaeological terrain unit site CC121), MAN82 and 86 (within archaeological terrain unit site CC124), and MAN83 (within archaeological terrain unit site CC125) had been subject to prior salvage. The remaining sections of these archaeological terrain units which lay in the proposed development impact area (and outside the McLeans Hill HMZ) and sections of archaeological terrain units CC114, CC117, CC118, CC119, CC120, CC121, CC124, CC125, MB41, PK117, PK122, PK126, PK128 and PK129 also required a Section 90 Consent. All impacted sections of sites were salvaged and the results of this salvage are currently in preparation. No remnant sections of these sites (archaeological terrain units) are located within the current survey area.

1.12 Umwelt (2006a) Archaeological Assessment for Downcast Ventilation Shaft and Associated Infrastructure, Proposed Exploration Adit

Umwelt was commissioned to undertake a separate archaeological assessment for the proposed downcast ventilation shaft and associated infrastructure which is part of the proposed exploration adit for the Mt Arthur Underground Project (refer to **Figure 5.1**). The fieldwork for this assessment was concurrent with the survey for the Mt Arthur Underground Project.

The survey area consisted of the area to be impacted by adit construction (Area 1) and an existing access road to be used for construction of a temporary power line (Area 2). Survey area 1 was approximately two hectares in area and was surveyed with representatives from Yarrawalk on Wednesday 8 February 2005. The survey area was within an area of moderate to steep simple slope and also within an existing access track (survey area 2), and was approximately 8000 square metres and was surveyed on Tuesday 7 February 2006 with members of Hunter Valley Cultural Consultants and Muswellbrook Cultural Consultants.

The potential for sites within the moderate to steep simple slope archaeological terrain unit is low based on previous archaeological research (particularly Kuskie 1999). Aboriginal site distribution in the locality and survey area from previous research indicates that Aboriginal occupation favoured terrain units with low slope gradients.

No archaeological sites were located during the survey. This result was attributed to shallow soils and the disturbed context of the proposed impact area. Though it is possible that a very small number of artefacts in a highly disturbed sub-surface context may be present within the proposed downcast shaft area within the moderate to steep simple slope terrain unit, in view of the results of Kuskie (2004), McDonald and Davidson (1998) and Wilson (1995), significant numbers were not expected and subsurface investigation was not considered as warranted.

APPENDIX 8

Summary of Previously Recorded Sites within the Survey Area

Appendix 8 - Summary of Previously Recorded Sites within the Survey Area

Table A.1 provides a summary of the 52 known sites within the current survey area.

Table A.1– Detailed Summary of Sites within Survey Area

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0021	Upper Saddlers Creek	Artefact Scatter	L K Dyall, University of Newcastle, 1976	Creek banks of Upper Saddlers Creek and includes artefacts found on a vehicular track 200 m from the main creek.	The area has been grazed and cropped with wheat. The creek valley is wide and sloping gently. The main creek is permanent, but only puddles remained in the side creeks.	Less than 5 m for majority of site, vehicular track with artefacts is over 200 m from creek.	No total artefact number is given for the site. However, Dyall collected 19 waste flakes (mostly chert), 2 flaking cores, and 6 implements (1 geometric, 5 scrapers). The stone matches the cobbles found in the local alluvial soil.
37-2-0022	Upper Saddlers Creek	Artefact Scatter	L K Dyall, University of Newcastle, 1976	This site was located on the high north bank of the creek in an erosion exposure.	The site is within an exposure which has eroded to clay. The creek is within an area of 'a string of springs and pools' which at the time of the survey was not dry.	Less than 5 m from Saddlers Creek.	No total artefact number is given for this site. However, Dyall has collected artefacts from this site including '57 waste flakes, mostly chert with some tuffs and quartzites…of local origin…and 3 flaking cores and 8 implements (6 scrapers, 1 knife, and 1 hammerstone)'.
37-2-0024	Upper Saddlers Creek	Artefact Scatter	L K Dyall, University of Newcastle, 1976	This site was located on a high eroded north bank of the creek.	This site is highly eroded.	Less than 5 m from Saddlers Creek.	No total artefact number is given for this site. However, Dyall collected artefacts from this site including '150 waste flakes, mostly chert with less amounts of tuff and quartzite, 7 flaking cores and 42 implements (35 scrapers, 5 knives and 2 hammerstones)' which matches local cobbles.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0026	Upper Saddlers Creek	Artefact Scatter	L K Dyall, University of Newcastle, 1976	This site was located along the south-east bank of the creek.	This site is highly eroded including disturbance from ants' nests.	Less than 5 m from Saddlers Creek.	No total artefact number is given for this site. However, Dyall collected artefacts from this site including '130 waste flakes (nearly all chert, with a few tuffs and quartzites), 11 flaking cores and 18 implements (5 Bondi points, 1 geometric, 8 scrapers, 3 knives and 1 broken but used edge)' which matches local cobbles.
37-2-0042	Upper Saddlers Creek	Artefact Scatter	L K Dyall, University of Newcastle, 1976	Creek bank of Upper Saddlers Creek, close to Edderton Road.	Area has been cleared for grazing and wheat cropping, few Casuarinas along creek line. Site condition was described as satisfactory.	On creek bank of permanent creek of one of the major tributaries for the Hunter River.	Artefact numbers are unclear. Although, the study stated that few artefacts were present but that a random collection of artefacts yielded 31 waste flakes (mostly chert), 5 flaking cores and 4 implements (1 scraper, 3 cleavers). It appears material was also found on a dry creek bed running into main creek, yielding 4 waste flakes, 1 core and 1 large used (artefact?).

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0070	Saddlers Creek	Artefact Scatter	L K Dyall, University of Newcastle, 1981	Broad lower valley flat of Saddlers Creek.	The area had been cleared and was ploughed annually for wheat cropping.	On the NE side of large dam. Seasonal creek adjacent to site.	At least 100 artefacts noted including large flaking cores, utilised cobbles and heavy flakes of predominately rhyolite and chert. Also implements including 1 heavily used basalt slice, 1 flat cobble of coarse siliceous material, crudely flaked at ends, 1 heavily utilised slice of the edge of a cobble of indeterminate siliceous material and 1 basalt cobble flake-thinned.
37-2-0106	Upper Saddlers Creek	Artefact Scatter	L K Dyall, 23 October 1976.	Site is located on 'high flat ground in the angle between two creeks' (1976:1). Most likely a terrace in the confluence of two creeks. Site consisted of an area between 30 x 30 m.	Large Eucalypts and stands of Casuarinas are recorded as within the creek area. The area is recorded as having been grazed and cleared with kangaroos and echidnas still located in site. Comments notated by Dyall on site card made orally by Mr HC 'Edderton' who reported 'that stone implements are often ploughed out lower down the creek, but not this high up' (1976:2).	Less than 5 m.	Site was collected and included 'waste flakes 127 (mostly chert, some tuffs and quartzites), 8 flaking cores, 16 implements (6 Bondi Points, 2 geometrics, 4 scrapers and 3 knives, 1 cleaver). Dyall reports collecting 'every stone flake seen. The material is in the Australian Museum' (1976:2).
37-2-0109	Quarry Creek	Artefact Scatter	Sue O'Connor/ L K Dyall	Thin scatter of artefacts along both banks of Quarry Creek for a length of approx 150 m and approx 30 m back.	Disturbed by storm water erosion and ploughing. Suspected amateur collecting	Less than 5 m.	At least 100 flakes on the south bank. At least another 100 on the north bank. Included several blade cores, one micro elouera and one backed blade.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0116	Quarry Creek (Whites Creek)	Artefact Scatter	Dr L K Dyall, 30 August 1980	Dyall has recorded scatter on spur of creek and on east bank of Quarry Creek (1980:1).	The banks of the spur creek are described as severely eroded. Dyall believes that a local has collected artefacts from the site (1980:1).	Less than 5 m.	No numbers are given. Dyall has noted that 'over 50 stone artefacts…the flakes consisted of rhyolites and cherts, no implements were recognized at casual inspection' (1980:1). Site description on another card copied in file 'more than 50 artefacts per 1000 sq. metres' (1981:1). There may have been two edge ground axes on site previously further upstream based on information Dyall collected from the 1980 Owner J Gilder of 'Goruk'.
37-2-0124	Quarry Creek	Artefact Scatter	Dr L K Dyall, 2 August 1980.	The site is located 'in a sweeping bend of the main creek, on the west bank about 100 m upstream from the junction of a spur creek from the west' (Dyall 1980:1).	'Material is disturbed by storm water erosion and ploughing' (Dyall 1980:1). Area has also been 'totally cleared for cattle-grazing and cropping' (1980:2). The site is a scatter 'of waste flakes of honey-coloured chert on a patch of bare ground alongside the creek'.	Less than 5 m.	'There were over 20 flakes' (Dyall 1980:1). Site is defined in separate card recording as 'more than 20 artefacts per 1000 sq. metres' (Dyall 1980:3). According to local informants 'Mr J. Gilder of 'Goruk' on Edderton Road has found two edge-ground axes on Quarry Creek, and Ian Gordon (Sydney St, Muswellbrook) told me he has seen Aboriginal material on this creek' (Dyall 1980:2).

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0174	Quarry Creek	Artefact Scatter	L K Dyall, 30 August 1980	The site is located on the southwest bank of Quarry Creek, opposite a minor spur (Dyall 1980:1). 'The site covers about 200 m of a creek bank, and is not clearly separated from the general thin scatter of stone artefacts all along Quarry Creek' (1980:1).	Site is recorded as 'material has been exposed by water erosion, ploughing and cattle' (1980:1).	Less than 5 m from creek.	The site consists of a 'scatter of 20 or more stone artefacts along patches of bare alluvial soil on the bank of Quarry Creek. The materials are chert, rhyolite and occasional quartz and quartzite. There was one heavy flaked cobble, otherwise no implements were recognised' (Dyall 1980:1).
37-2-0282	Saddlers Creek	Artefact Scatter	L K Dyall, October 1976	The site is recorded as located 'on the fork of a major creek junction' (1976:1).	Site condition is recorded as 'undisturbed' (1976:1). However, there is some mention that the site has been subject to clearing and used for wheat and grazing of cattle. **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m.	Dyall (1976:1) wrote 'a total collection in 1976 obtained 127 waste flakes (98 chert, 11 rhyolite, 14 quartzite and 4 quartz), 8 flaking cores (5 chert, 1 quartzite, 2 quartz) and 16 implements (6 Bondi points, 2 geometrics, 4 scrapers, 3 blades and 1 cleaver)'.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0283	Saddlers Creek	Artefact Scatter	L K Dyall, July 1981	The site is recorded as 'covers 2 hectares on the south bank… The material extends from Saddlers Creek for 70 metres up the west bank of a small creek, and eastwards from there, between the main creek and a farm dam' (Dyall 1981:2).	Site condition is recorded as 'greatly disturbed by ploughing' and 'the material is great disturbed and very thinly scattered' (Dyall 1981:1). The 'area is used for wheat and for grazing of cattle'. **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m.	Site contents are not detailed but site card included the following comments 'The artefacts included 2 (broken) sandstone grinding dishes found above the main creek 70 west of the minor junction. Material extended 300 m up this bank of the main creek. Also noted were 5 large chert cores made on water worn cobbles, and 2 smaller cores of rhyolite. There was one heavy used flake of chert but not other implements were recognised. In all, over 100 stone pieces were seen. Most of the material was chert; then followed quartz, acid volcanics, and quartzites in that order' (1981:1).

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0284	Saddlers Creek	Artefact Scatter	L K Dyall, July 1981	The site is located on the west bank of Saddlers Creek, extending 120 m up both banks of the spur creek.	Site condition is recorded as 'undisturbed except for erosion' (1981:1). **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m.	Site contents described as 'a thin scatter of about 50 stone flakes, extending back from the creek junction along the minor creek for 120 metres on both banks…The lithology is chert, quartzite, quartz and rhyolite in decreasing order of occurrence. The material included two small horse hoof cores, a small blade core of glossy cream chert, and a Bondi Point of this same glossy cream chert' (Dyall 1981:1).
37-2-0285	Saddlers Creek	Artefact Scatter	L K Dyall, July 1981	The site is located at the 'junction of two major arms of Saddlers Creek' (1981:1).	Site condition was recorded as 'undisturbed except by erosion' (1981:1). The land has been 'cleared for grazing, but a number of eucalypts grow along the creek channels. The area would originally have carried an open woodland cover' (1981:2). **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m up to 50 m from watercourse	No detailed site recording. The material is described as 'all waste flakes, mostly of glossy, cream chert but with occasional flakes of quartz and quartzite. No implements were recognized among the flake material. There was one utilized cobble' (1981:1).

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0286	Saddlers Creek	Artefact Scatter	L K Dyall, July 1981	The site is located at the 'junction of a small creek meeting Saddlers Creek from the west, stone scatters extend 200 metres down the west bank of Saddlers Creek and 150 metres up the south bank of the side creek' (1981:1).	Site condition was recorded as 'undisturbed except for erosion' (1981:1). Dyall recorded that 'there are scores of eucalypts in the creek channel, and these probably indicate the original vegetation. Otherwise, the broad valley is totally cleared for grazing' (1981:2). **Consent to Destroy issued August, 1986. The site card is stamped SITE DESTROYED.**	Less than 5 m.	Site contents are recorded as 'over 100 stone flakes on these two areas, and only 10 on the north bank of the smaller creek. There was no sign of material more than 10 m back from the banks, thought that may be a function of erosion depth. The 1981 material was noted to include one chert elouera scraper of micro size, and a utilized water worn cobble…Most material was chert, followed by rhyolite, jasper and quartz. The waste flakes included microlithic blades but there was no sign of backed blades. In 1976 I made a total collection over this area, obtaining 150 waste flakes (108 chert, 15 rhyolite, 19 quartzite, 8 quartz), 7 cores (5 chert, 2 quartzite) and 42 implements (35 scrapers, 5 knives, 2 hammerstones)' (1981:1).
37-2-0293	MAN93	Artefact Scatter	M Koettig 1984	Site is located on the creek banks of a Quarry Creek. Slope is characterised as flat (less than 2 degrees).	Site condition was recorded as being subject to slope wash and rill erosion in the A and B units. Cattle tracks are also recorded as disturbing the site. The site is 20 by 20 m.	30 m from Quarry Creek.	Site contents are recorded as stone artefacts with a density of 1/10 m^2. There are a total number of 40 artefacts. Indurated mudstone and silcrete are recorded as predominant raw materials used for artefact manufacture.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0294	MAN92	Artefact Scatter	M Koettig 1984	The site is located on Quarry Creek on the creek banks. Slope is characterised as flat (less than 2 degrees).	Site condition was recorded as being subject to slope wash and rill erosion in the A and B units. Cattle tracks are also recorded as disturbing the site. The site is 20 by 5 m.	30 m from Quarry Creek.	Site contents were recorded as stone artefacts with a density of an average of ½ sqm. There are a total of 50 artefacts estimated. Silcrete and indurated mudstone are co-dominant and quartz is uncommon. Three silcrete flakes with R/UW noted.
37-2-0331	MAN87	Artefact Scatter	Koettig 1984	The site is located on creek flats on the valley floor. Slope is characterised as flat (less than 2 degrees).	Site condition was recorded as being subject to slope wash, rill and gully erosion to both the A and B units. The site has been subject to ploughing. Comments about site condition included 'Unit A exposed over entire site except small portion of Unit B in NW corner, distinct A/B horizons, Unit A, 10 to 15 cm. Unit B is exposed in the gully of Creek Gat 50-100 cm. Some accumulated sand and gravel on surface of exposure, Vegetated patch with grasses and little visibility' (1984:2).	5 m from Creek G.	Site contents include seven indurated mudstone flakes and six indurated mudstone flaked pieces, 2 porcellanite flakes and 1 flaked piece, 1 porcellanite core, 1 quartz core, 1 chert flake, 4 silcrete flakes and 3 silcrete flaked pieces. Two indurated mudstone flaked pieces had retouch and were broken.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0428	MAN93	Artefact Scatter	Koettig 1984	This site was identified as a on the northern bank of Saddlers Creek.	At the time this site was recorded, A unit was still intact and the ground did not appear to be ploughed.	Less than 5 m from creek.	A total of eleven artefacts were recorded on site. These included 4 indurated mudstone and 6 silcrete artefacts and also 1 siltstone hammerstone.
37-2-0429	MAN94	Artefact Scatter	Koettig 1984	This site was identified as on the horseshoe bend in Saddlers Creek.	This site is partially disturbed as it is near an artificial wall/dyke across the northern end of Saddlers Creek.	Less than 10 m from Creek.	A total of 58 artefacts were recorded including 14 indurated mudstone artefacts, 28 silcrete artefacts, 10 chert and six quartzite artefacts.
37-2-0481	MAS129	Artefact Scatter	Koettig 1984	This site was identified as on a peninsula between the junction of two creeks.	This site at the time it was recorded had partial disturbance to the A unit from erosion.	Less than 10 m from creek.	A total of 11 artefacts were recorded including indurated mudstone, silcrete, quartz and quartzite artefacts.
37-2-0482	MAS128	Artefact Scatter	Koettig 1984	The site is recorded as located on the creek banks and creek junction in a valley floor. Slope is characterised as flat (less than 2 degrees).	The condition of the site has been recorded as cultivated with gully erosion. Vehicle tracks have disturbed some of the site.	100 m to Saddlers Creek. Less than 50 m to nearest watercourse.	A total number of 25 artefacts were recorded on site. These included 18 IM and 7 silcrete stone artefacts.
37-2-0483	MAS130	Artefact Scatter	Koettig 1984	This site was identified within the creek bed of Saddlers Creek.	This site at the time it was recorded was partially eroded and disturbed by cattle treadage.	20 m to Saddlers Creek.	A total of 19 artefacts were recorded including 6 indurated mudstone and 13 porcellanite artefacts.
37-2-0484	MAS131	Artefact Scatter	Koettig 1984	The site was identified within the lower slopes of Saddlers Creek.	The site is described as being in good condition.	Less than 50 m to Saddlers Creek.	A total of 22 artefacts were recorded.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0485	MAS132	Artefact Scatter	Koettig 1984 Dagg 1997	This site is located on the southern bank of Saddlers Creek.	This site was eroded to both A and B horizons and disturbed from rill erosion.	10-30 m to creek.	The initial recording included a total of 146 artefacts were recorded including 84 indurated mudstone, 41 silcrete, 11 quartz, 3 chert, 4 fossilised wood and 3 porcellanite artefacts. In 1997 Dagg recorded a total of 776 artefacts which included 2 basalt, 17 chert, 489 mudstone, 17 porcellanite, 1 petrified wood, 26 quartz and 224 silcrete artefacts (1997:31). The predominant artefact types were flakes followed by flaked pieces.
37-5-0486	MAS133	Artefact Scatter	Koettig 1984 Dagg 1997	This site was identified on the bank of Saddlers Creek.	This site was subject to slope wash and was a small exposure at the edge of the creek bank which had been trampled by cattle.	Less than 5 m to creek.	The initial recording included a total of 12 artefacts including 8 indurated mudstone, 1 silcrete, 2 quartz and 2 chert artefacts. In 1997 Dagg recorded a total of 55 artefacts including 46 mudstone, 1 quartz and 8 silcrete artefacts. The predominant artefact types were flakes followed by flaked pieces.
37-2-0487	MAS134	Artefact Scatter	Koettig 1984	This site was identified on the flats besides Saddlers Creek.	This site was on the edge of a creek bank and was a small exposure in the A unit.	Les than 50 m to watercourse.	A total of 33 artefacts including 24 indurated mudstone, 4 silcrete, 2 quartz and 1 porcellanite artefact.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0488	MAS135	Artefact scatter	Koettig 1984 Dagg 1997	The site is located on land beside western bank of Saddlers Creek.	This site was identified within a fence line exposure near a gate picket hole. This site was disturbed by cattle treadage and the construction of the fence.	Approximately 45 m to Saddlers Creek.	The initial recording included a total of 34 artefacts including 19 indurated mudstone, 1 silcrete, 8 quartz, 2 quartzite, 4 igneous and 1 chert artefact. In 1997 Dagg recorded a total of 9 artefacts including 7 mudstone and 2 silcrete artefacts. The predominant artefact type was flakes followed by broken flakes.
37-2-0489	MAS136	Artefact scatter	Koettig 1984	This site was identified on the southern banks near a bend in Saddlers Creek.	This site was identified on the edge of a creek bank and had no A/B horizons intact due to ploughing these deposits were mixed.	Approximately over 100 m to creek.	A total of 34 artefacts including 14 indurated mudstone, 17 silcrete, 1 quartz, 1 igneous hammerstone and 1 porcellanite artefact.
37-2-501	BMP2	Artefact Scatter	Koettig 1984	This site was identified on the eastern, eroded bank above Saddlers Creek.	This site was identified on the eastern bank of Saddlers Creek in an area where erosion into the valley fill is up to a depth of up to 10 m.	Approximately 20 m from a creek.	A total of 5 artefacts including 3 indurated mudstone flakes, 1 quartz flaked piece and 1 silcrete flake.
37-2-0503	BMP4	Artefact Scatter	Koettig 1984	The site was recorded on the banks of an ephemeral stream.	Site condition was recorded as ‘exposed by erosion’. Water action has ‘cut into an orange deposit to a depth of approximately 1 m. Erosion of 1-3 cm has exposed the deposits on the banks, leaving a sparse gravel lag’.	1 m from a creek.	One silcrete flake, one silcrete flaked piece and one quartz Bondi point. One silcrete flaked piece had retouch/usewear on edge. The quartz Bondi point had retouch.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0504	BMP5	Artefact Scatter	Koettig 1984	The site is recorded as located on lower hill slope.	The site consisted ‘of an extensive area of sheet wash erosion 50 x 50 m in area consisted of 3 artefacts found scattered over an area of 20 x 10 m, where erosion had cut from 2-50 cm into a reddish clay-rich deposit which overlay a sandy reddish-yellow lower University of t’ . Site is mapped underneath a transmission tower.	15 m form a stream.	Site contents include 1 silcrete flake and 2 silcrete flaked pieces.
37-2-0506	BMP6	Artefact Scatter	M Moore, 1987	Creek Flats, found on a gentle slope on the southern side of westward flowing creek.	Localised erosion exposure in well grassed paddock with regrowth vegetation, poor visibility.	15 m from temporary creek.	1 silcrete flake, 2 mudstone flakes and 1 mudstone core.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0670	LBD1	Artefact Scatter	R James, UNE, 1994	The site is recorded as eroding out of a creek bank.	The site dimensions were 185 m long by 50 m wide. The condition of the site is recorded as '50% visibility, cattle disturbance, erosion and anthills'.	10 m from Quarry Creek.	Site contents included at a minimum of 106 artefacts. Silcrete found on site included 17 flakes, 11 snapped flakes, 4 flaked pieces, 5 cores, 2 tranchet retouch and 1 pirri graver. Mudstone consisted of 20 flakes, 9 snapped flakes, 8 flaked pieces, 3 cores, 5 tranchet retouch and 1 tranchet retouch snapped. Quartz included 4 flakes, 4 snapped flakes, 4 flaked pieces and 1 core. Petrified wood included 1 core and 1 snapped flake. Silicified sandstone included 1 flake and 2 cores. 1 translucent chert flake was recorded. 1 topstone.
37-2-0671	LBD2	Artefact Scatter	R James, UNE, 1993	Site is located on a creek bank.	Site condition is recorded as being '40% visibility, ploughed and cattle disturbance'.	0 m from creek.	Site has at least 63 artefacts for total number. Mudstone recorded on site included 12 flakes, 7 snapped flakes, 4 flaked pieces, 3 cores and 1 tranchet retouch. Basalt recorded included 3 flakes and 2 cores. Silcrete included 9 flakes, 4 snapped flakes, 3 flaked pieces and 6 cores. Quartz included 1 flake, 1 snapped flake, 2 flaked pieces, 1 core and 1 backed blade. 1 porcellanite flake, 1 silicified sandstone core and 1 muller with polish.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0673	LCC1	Artefact Scatter	R James, UNE 1993	Finds are recorded on near knolls near dam. The landform element is defined as creek bank on site card with a slope of 6 degrees or 11%.	Site condition is recorded as '60% visibility, pebbles on slope obscure visibility, cattle disturbance, anthills and erosion'.	O m from creek i.e. less than 5 m.	1 basalt flake with potlids. 2 basalt snapped flakes in 75 m by 30 m.
37-2-0674	LCC3	Artefact Scatter	R James, UNE 1993	Scatter is recorded on a creek bank under casuarinas.	Site condition is recorded as '90% visibility, anthills and cattle disturbance'.	5 m from creek.	Approximately 8 flakes in a 30 m by 15 m erosion area. Silcrete recorded included 3 flakes, 2 snapped flakes and 1 core. Mudstone consisted of 1 flake and 1 snapped flake.
37-2-0675	LCC4	Artefact Scatter	R James, UNE 1993	Scatter is recorded as having eroded out of a gully bank.	The site condition was recorded as '0-95% visibility, erosion and cattle disturbance'.	20 m from a creek.	Site contents were recorded as consisting of an area of 35 m by 5 m on an erosion gully with at least 10 artefacts. These artefacts include 1 basalt flake, 4 mudstone flakes, 4 mudstone snapped flakes and 3 mudstone flaked pieces.
37-2-0676	LCC5	Artefact Scatter	R James, UNE 1993	Scatter was recorded on sheet erosion area on hill slope.	The site condition was recorded as '50-90% visibility, anthills, cattle disturbance and erosion'.	100 m from a creek.	Site contents consist of at least ten artefacts. Mudstone recorded includes 1 flake, 3 snapped flakes, 1 flaked piece and 1 tranchet retouch. Silcrete consisted of 1 core. Quartz consisted of 2 flakes and 1 core.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0677	LCC6	Artefact Scatter	R James, UNE 1993	Scatter was recorded as eroding out of the creek bank.	The site condition was recorded as '40% visibility, anthills, cattle disturbance and erosion'.	5 m from a creek.	Site contents consisted of at least 29 artefacts. Mudstone recorded included 7 flakes, 2 snapped pieces, 4 flaked pieces, 2 cores, 2 backed blades and 1 tranchet retouch. Silcrete recorded included 5 flakes and 1 snapped flake. Quartz recorded included 1 flake, 2 snapped flakes and 1 flaked piece. Sedimentary recorded included 1 snapped flake.
37-2-0678	LCC7	Artefact Scatter	R James, UNE 1993	Scatter was recorded as eroding out of hill slope on sheet erosion area.	The site condition was '90% visibility, sheet erosion and cattle disturbance'.	20 m from a creek.	Site contents consisted of at least 12 artefacts. Mudstone recorded as 2 flakes, 2 snapped flakes, 3 flaked pieces and 2 cores. Silcrete is recorded as consisting of 1 flake, 1 snapped flake. Petrified wood consisted of 1 flake.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0679	LCD1	Artefact Scatter	R James, UNE 1993	Scatter was recorded on a creek bank stretching up slopes. Slope is characterised as 5 degrees or 9%.	Site condition was recorded as '30% visibility, obscured by rocks and boulders, erosion. Ploughing'. **Consent to Destroy issued 1994 attached to the site card.**	0 m from creek.	Site contents consisted of at least 57 artefacts. Mudstone recorded consisted of 17 flakes, 5 snapped flakes, 6 flaked pieces, 4 cores and 1 tranchet retouch. Silcrete included 5 flakes, 2 snapped pieces, 2 flaked pieces and 4 cores. Petrified wood included 2 flakes and 1 core. Quartz included 2 flakes. Basalt included 1 snapped flake and 2 cores. 2 hammerstones of sedimentary goethite with grind marks (yellow ochre) were identified. 1 silicified sandstone boulder and 1 petrified wood 'trunk piece' which had flakes removed.
37-2-0684	LDC1	Artefact Scatter	R James, UNE, 1993	Site is located on the creek bank.	Site condition was recorded as '90% visibility, dam construction, anthills, and cattle disturbance'.	0 m from creek.	Site contents consisted of at least 95 artefacts with an area of 300 m by 25 m. Mudstone recorded included 18 flakes, 25 snapped flakes, 18 flaked pieces, 4 cores and 1 tranchet retouch. Silcrete recorded included 3 flakes, 9 snapped flakes, 4 flaked pieces and 1 core. Quartz included 1 flake, 3 snapped flakes and 2 flaked pieces. Silicified sandstone consisted of 1 flaked piece. Basalt included 2 snapped flakes. Porcellanite included 1 flake and 1 flaked piece.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0710	LFF01	Artefact Scatter	R James, UNE, 1993	The site was located on a creek bank.	The condition of the site was recorded as 'erosion, cattle disturbance, 30% visibility'.	10 m from creek after rain.	Site contents were recorded as '1 silcrete flaked piece, 1 mudstone flaked piece and 1 quartz flaked piece'.
37-2-0710	LFF01	Artefact Scatter	P Purcell, UNE 1995	The site was located on a creek bank.	The condition of the site was recorded as 'heavily eroded gully, wash down from hilltop… visibility range from 100% - 10%. **Site Destroyed**	750 m upper tributary of Saddlers Creek.	Site contents were recorded as having 2 artefacts, both mudstone flakes.
37-2-0732	LHH01	Artefact Scatter	R James, UNE, 1993	Site was located on a creek bank.	10-90% visibility, erosion, anthills, cattle disturbance.	0 m/200 m, gully/Saddlers Creek (permanent waterhole).	At least 41 artefacts. Mudstone: 10 flakes, 4 broken flakes, 4 flaked pieces, 1 core; silcrete: 9 flakes, 7 broken flakes, 2 cores; 1 sedimentary flake; 1 porcellanite broken flake and 1 grinding dish.
37-2-0733	LHH02	Artefact Scatter	R James, UNE, 1993	Site was located on slopes/ creek bank.	10-80% visibility, anthills, cattle disturbance, erosion.	5 m, permanent creek below.	At least 328 artefacts. Mudstone: 83 flakes, 105 broken flakes, 34 flaked pieces, 5 cores, 5 backed blades, 2 broken backed blades, 13 tranchet retouch; quartzite: 1 broken flake, 1 flaked piece, 1 core; basalt: 1 flake, 1 broken flake; silcrete: 16 flakes, 39 broken flakes, 4 flaked pieces, 1 core, 1 backed blade, 2 tranchet retouch; quartz: 2 flakes, 3 broken flakes, 3 flaked pieces; Silicified sandstone: 1 flake, 1 broken flake; porcellanite: 1 tranchet retouch, 1 core; 1 petrified wood tranchet retouch.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
37-2-0751	HR2	Artefact Scatter	N Curran, Resource Planning, 1994	Upper slope/hilltop.	Site condition was poor, situate on road. Surface visibility 100% (was noted that 'suspect artefacts introduced from elsewhere during upgrading of road surface).	1.2 km, creek.	2 mudstone flaked pieces.
37-2-0759	HR10	Artefact Scatter	N Curran, Resource Planning, 1994	This site was located along the ridge top.	This site was recorded as in poor condition due to its location on a vehicle track.	This site was identified approximately 600 m from a creek.	15 Artefacts Flakes: 2 quartz, 6 silcrete, 1 mudstone. Flaked pieces: 3 silcrete, 1 chert, 2 mudstone.
37-2-0760	HR11	Artefact Scatter	N Curran, Resource Planning, 1994	This site was located along an existing track within lower slopes landform element.	This site was recorded as in fair condition due to its location on a vehicle track.	This site was identified approximately 100 m creek.	This site included 9 chert flaked pieces, 1 mudstone flaked piece, 2 silcrete flaked pieces, 4 mudstone flakes, 1 basalt flake, 3 silcrete flakes and 1 chert flake.
37-2-1426	McDonalds Pit 2	Artefact Scatter	P Purcell, UNE, 1995	Hill top.	Erosion from graded road on hill top, for mining purposes.	Not recorded.	2 artefacts.
37-2-1427	McDonalds Pit Dump Site 1	Artefact Scatter	J Wilson, UNE, 1995	Lower Slope.	Site was in eroded waterway on contour bank and dam bank. Visibility average 25% with 100% in places.	Not recorded.	3 artefacts: 1 mudstone flaked piece, 1 pink silcrete flaked piece and 1 grey silcrete flaked piece (on dam).
37-2-1444	Edderton Road 2	Artefact Scatter	Staff and Students, UNE, 1996	Creek line/Lower slope	Visibility ranged from 0-100%, erosion, cattle grazing, past farming practices.	0-250 m, Quarry Creek (springs).	Not provided on site card.
37-2-1840	No Name Creek	Artefact Scatter	No name recorded on the site card.	Creek bank.	Well eroded, surface visibility 80-90%.	7 m, creek.	1 chalcedony core, 1 silcrete flake, 1 mudstone scraper, 1 mudstone flake.

AHIMS Site #	Site Name	Site Type	Site Recorded by	Site Location	Description of Site Condition	Distance from Watercourse	Site Contents
New site	JF/MJS	Artefact Scatter	Umwelt 2006	Gentle drainage depression.	High level of gullying and rill erosion.	Site includes a tributary of Saddlers Creek.	300-500 artefacts with mudstone and silcrete flakes predominating the assemblage.

APPENDIX 9

Draft Research Design and Methodology

Appendix 9 - Research Design and Methodology

1.0 Introduction

The purpose of this Appendix is to provide a research design and methodology for the proposed surface collection, sub-surface testing and sub-surface salvage recommended in **Section 9** of the attached report.

Surface collection (only) or surface collection and sub-surface testing and sub-surface salvage are required for Aboriginal archaeological sites listed in **Table A1.1** and shown on **Figure 8.1** of the main text**.** These sites are within the areas of impact from proposed subsidence (in areas with less than 100 metres depth of cover), tensile cracking, subsidence remediation works and proposed surface infrastructure (the impact area) for the Mt Arthur Coal Underground Project. This area includes archaeological sites identified within the current Umwelt (2006) survey area and sites recorded by prior archaeological investigations including Koettig and Hughes (1985), Dagg, (1997), BARP (1993-2005) and Dyall (1980). The survey history for the previously recorded sites is summarised in **Section 5** of the attached report and provided in detail in **Appendix 7**.

Table A1.1 - Sites to be Salvaged Prior to Impact

Proposed Salvage Methodology	Site Name(s)
Surface Collection Only.	HR01, HR02, HR03, QC03, QC05, QC06, QC07, QC10, QC11, QC12, QC18, SC02, SC03, SC04, SC05, SC06, SC07, SC12, SC13, SC15, SC20, SC26, WC06, WC21
Surface Collection, Sub-surface Testing and Sub-surface Broad Area Excavation.	QC01, QC14, SC01 (Note: no surface collection required for site SC01)
Surface Collection, Sub-surface Testing and Sub-surface Broad Area Excavation and Grader Scrapes.	SC09, WC04

The purpose of the sub-surface testing is to determine the nature and extent of selected archaeological sites within the impact area for the Mt Arthur Coal Underground Project and in some cases to further our knowledge of their geomorphic history. This information will be used to determine the most appropriate locations within sites for sub-surface salvage using manual excavation.

1.1 Location and Nature of the Archaeological Sites Subject to Surface Salvage and Further Sub Surface Investigation

The locations of all sites identified during fieldwork are shown on **Figure 6.2** in the main text. The location of all sites assessed as requiring surface salvage or surface salvage and sub-surface testing and salvage are shown on **Figure 8.1** of the main text. **Table 9.1** of the main text provides details of these sites. As impact by the Underground Project is restricted in area (in comparison to open cut mining), there are no specific investigations of archaeological terrain units proposed that are not site/PAD based.

1.2 Proposed Impacts to Archaeological Sites

The area to be impacted by the proposed the Underground Project is identified on **Figures 2.2** to **2.4** in the main text. The potential impacts to archaeological sites are discussed in **Section 2** and affected sites and mitigation measures for management of these sites are outlined in **Table 8.1** in the attached report.

The current research design and methodology applies to the salvage of archaeological material evidence associated with the sections of the archaeological terrain units/sites that will be within the areas impacted by mining activities (refer to **Figure 7.1** of the main text).

1.2.1 Why is Impact Necessary

The sites are within areas that will be impacted if underground mining proceeds as proposed within the main text.

2.0 Archaeological Context

The archaeological context of the Underground Project area is outlined in **Section 5** of the main text and detailed in **Appendix 6**.

3.0 Research Design

The following research questions have been formulated to direct the salvage program within the Underground Project impact area. The research questions provided below are similar to those approved for prior salvage programs in the Hunter Valley by the majority of the Aboriginal stakeholder groups involved in this project. The questions have been rephrased to incorporate comparisons with the results of prior research associated with the catchments of Saddlers Creek (BARP 1993 – 2005), Whites Creek and Fairford Creek (Kuskie and Clarke 2004). The research theme relates to how, when and why Aboriginal hunter-gatherers used the landscape and how this may differ between the Mt Arthur and Mt Ogilvie areas.

It should be noted that not all of the questions will be able to be addressed until all of the salvages have been undertaken and the artefacts analysed.

3.1 Research Questions

1. What resources were available to the Aboriginal people using Whites Creek, Fairford Creek, Saddlers Creek, Quarry Creek and Western Creek (food, stone and water)?

2. What stone resources were transported into the Mt Arthur and Mt Ogilvie areas and from where?

3. Are the assemblages associated with Mt Ogilvie similar or different to those associated with Mt Arthur?

4. Do the differences/similarities in the assemblages suggest different/similar patterns of landscape and resource utilisation between the Mt Ogilvie and Mt Arthur areas?

5. Is there evidence that Aboriginal people were heat treating/using heat treated stone in the Mt Ogilvie area? If so, how does this compare to that reported for the Mt Arthur area?

6. Can seasonal use of the Mt Ogilvie area be determined from plant residues on artefacts salvaged from this area?

7. Are there hearths in the Mt Ogilvie area that can provide absolute dates for Aboriginal occupation of the area? If so, how does this date/these dates compare with those from the Mt Arthur area?

8. If there are hearths, do they contain remains (animal/plant) that may indicate what people were cooking/eating?

9. Can dates be obtained for the Aboriginal use of the Mt Ogilvie area? If so, do they provide evidence that Aboriginal people where using the Mt Ogilvie area earlier than the mid to late Holocene?

10. Are there burials in the Mt Ogilvie area? If so, how does/do the burial(s) compare with the burial located on White's Creek in the Mt Arthur area (in terms of age of the burial, age and sex of the skeleton, method of burial, grave goods etc.)? In the event that a burial was encountered during the current salvage program [following input from the Aboriginal stakeholder groups, the NSW Police department and the DEC] the same archaeologist (Dr Denise Donlan) employed to study the Mt Arthur skeleton would be asked to participate in the study and a document of a restricted nature prepared).

In general, the questions orient the research firmly in the direction of addressing a landscape use/resource-based model of Aboriginal occupation of the Mt Ogilvie and Mt Arthur areas. This information can then be reviewed in terms of regional models of occupation prepared by earlier researchers such as Kuskie and Clarke (2005), the BARP (1993 to 2005), Dean Jones and Mitchell 1993, Haglund 1992 and Rich 1995.

4.0 Methodology

The methodology presented in this section relates specifically to the sites and site loci within the Underground Project impact area. Methodology is provided for surface collection, sub-surface testing and sub-surface salvage by broad area manual excavation and grader scrapes. Methodology is also provided for manual excavations to be undertaken should hearths; heat treatment pits or areas with significant numbers of artefacts be uncovered by the proposed grader scrapes.

Geomorphic investigation has also been proposed for five sites/areas. The sites discussed are shown on **Figure 7.1** and their salvage recommendations summarised in **Table 9.1** of the main text. The methodology for sub-surface testing is not similar to that recommended by Kuskie (2001) for Mt Arthur North where the area being tested was to be destroyed by open cut mining following salvage. As the current proposed underground mining project results in restricted surface impacts from subsidence, tensile cracking, subsidence remediation works and minor surface infrastructure, the majority of the landscape will remain intact. Thus, using grader scrapes over large areas to identify areas suitable for manual excavation is not appropriate. Furthermore, the A horizon within the majority of the sites to be salvaged in the impact area is generally shallow and discontinuous and not suited to this method of testing (i.e. one scrape would remove the entire remnant A2 horizon and subsequently all the possible artefact bearing layers leaving nothing to excavate). Grader

scrapes have, however, been recommended for sections of the SC09 and WC04 site as a larger area salvage method following subsurface testing and sub-surface salvage by broad area manual excavation.

4.1 Methodology for the Surface Collection of Artefacts

It is intended to collect as many as possible of the surface artefacts recorded during the survey within the impact areas. The collection methodology will include flagging of artefacts so that their distribution can be photographed and recorded for spatial analysis. The artefacts will then be collected, individually bagged, bagged by loci and bagged by site.

Detailed survey plans are not warranted for the majority of the artefact assemblages within the sites/site loci, due to their location within highly eroded and disturbed contexts, the small number of surface artefacts and the displacement of the artefacts. Detailed site plans will be made of the larger/more complex surface artefact loci prior to the commencement of sub-surface investigation/salvage.

4.2 Methodology for Sub-Surface Testing

Sections of sites QC01, QC14, SC01, SC09 and WC04 (refer to **Section 8.2** of main text for specific loci) require sub-surface testing as they have been assessed as having moderate, moderate to high or high Aboriginal cultural heritage and archaeological significance (refer to **Section 7** of the main text) and are within proposed impact areas. The methodology for the sub-surface testing of these sites is provided below.

4.2.1 QC01, QC14, SC01, SC09 and WC04

The sections of sites QC01, QC14, SC01, SC09, and WC04 that fall within the proposed impact areas will be subject to systematic sub-surface test-pitting. The sub-surface test pits will form part of the geomorphic analysis of the sites and will provide information in relation to the most suitable areas for broad area manual excavation. In the case of QC14, the sub-surface test pits will identify if there are areas within the site that would warrant sub-surface testing.

The following methodology for test pitting applies to sites QC01, QC14, SC01, SC09 and WC04:

- 50 cm spade test pits will be excavated every 10 metres for the length of the proposed impact areas along both sides of:
    - Quarry Creek (QC01);
    - Saddlers Creek (specifically within the corridor of impact for the proposed conveyor for SC01) and associated tributary site SC09; and
    - Western Creek (WC04);
- the test pits will be excavated at 5, 10 and 15 metre intervals back from the creek (where possible) to delineate the area of greatest artefact concentration;
- 50 cm spade test pits will be excavated every 5 metres for the length of the proposed impact area for site QC14 following the spur crest landform which overlooks Quarry

Creek. Test pits will be excavated in one transect extending out from the location of known artefacts and where topsoil appears to be the most intact;

- all deposits will be removed as 5 cm arbitrary spits;
- all deposits excavated will be sieved through 5 mm and 2 mm nested sieves. Sieving will be supervised at all times by a qualified archaeologist who will ensure that no artefactual material is discarded. Wet sieving will be used to ensure the sieving methodology is comparable to Kuskie (2001);
- at least one soil sample will be collected from each spit of each 50 cm square for Munsell and pH analysis. Further samples will be collected if features are observed. For consistency the Munsell and pH readings will all be undertaken by one person under the same light conditions after the completion of the test pit excavations;
- all artefacts salvaged will be subject to detailed attribute analysis; and
- if hearths, heat treatment pits, suspected knapping floors and/or artefact concentrations are located, manual excavation will be employed and the area of the test pit excavation increased to salvage the whole feature/artefact concentration (#see below):
    - XYZ coordinates will be recorded within the manual excavations for features and for artefacts associated with features; and
- if any skeletal material is identified all works will cease, the area secured and the NSW Police Department contacted immediately. Further advice will be required by a forensic archaeologist in consultation with the NSW Police Department, DEC and the relevant Aboriginal stakeholder groups.

#If test pits are located with hearths, heat treatment pits, suspected knapping floors and/or artefact concentrations these areas may or may not become one of the large area manual excavations proposed for the site. The choice of area(s) for manual excavation will be made following the completion of the test pitting program and in consultation with the Aboriginal stakeholder groups and the geomorphologist.

4.3 Methodology for the Manual Excavation(S)

Based on the results of the test pitting program and geomorphic analysis and in consultation with the Aboriginal stakeholder groups, an area/areas within QC01, QC14, SC01, SC09 and WC04 will be selected for large area manual excavation. The methodology for the manual excavation presented below has been kept as general as possible as it will be guided by the outcomes of the detailed test pitting/geomorphic investigation. The design of the manual excavation will not be similar to that of Kuskie and Clarke (2004:284) who used rectilinear shaped areas approximately 40 by 2 metres, ‘with minor extensions to trace out the extent of activity areas/features on the margins’. The rationale for these long narrow trenches was to sub-surface salvage a cross-section of contiguous landform units. As the impacts from subsidence, subsidence remediation and minor surface infrastructure from the current project are generally limited to a single landform unit the trenching method was not thought appropriate. Instead the size and shape of the broad area manual excavations will be dictated by the results of the test pitting program. The minimum area excavated, however, will be a 5 metre by 5 metre square. The excavation will be extended from this area if the results suggest that this is warranted. The only site for which this may not be the case is QC14. This ridge crest site will not be manually excavated unless the results of the subsurface testing suggest this is warranted.

The rationale for the manual excavation(s) is to salvage the area(s) of the site with the greatest potential to provide large and statistically meaningful assemblages which can be analysed to provide detailed information in relation to the Aboriginal use of the Mt Oglivie and Mt Arthur landscape and which will allow for comparative analysis between the two areas and with other sites/areas in the locality and region.

The following methodology is proposed for the manual excavations:

- the excavation(s) will be undertaken using trowels and spades as 1 metre squares excavated as 50 cm quadrats and arbitrary 5 cm spits. Stratigraphic excavation will be employed if features are located;

- at least one soil sample will be collected from each spit of each 1 metre square for Munsell and pH analysis. Further samples will be collected if features are observed. For consistency the Munsell and pH readings will all be undertaken by one person under the same light conditions after the completion of the excavations;

- XYZ coordinates will be recorded within the manual excavations for features and for artefacts associated with features (e.g. artefacts associated with a possible heat treatment pit or hearth etc.);

- charcoal/sediments will be collected from hearths/heat treatment pits for radiocarbon or thermoluminescence dating where applicable, using the techniques recommended by the dating laboratories. Samples from hearths/heat treatment pits will also returned to a laboratory to be floated to collect seeds/macroscopic plant material for analysis; and

- if any skeletal material is identified all works will cease, the area secured and the NSW Police Department contacted immediately. Further advice will be required by a forensic archaeologist in consultation with the NSW Police Department, DEC and the relevant Aboriginal stakeholder groups.

4.4 Methodology for the Grader Scrapes

Grader scrapes have been proposed to salvage further sub-surface artefacts from the sections of the SC09 and WC04 impact areas following surface collection and manual excavation. The following methodology applies to the grader scrapes in these sites/areas:

- the grader scrapes will be undertaken within the area proposed for impact and will be restricted to these areas;

- the grader scrapes will be removed as 5 cm scrapes;

- the scrapes will be continued to the clay or to a depth approved by the representatives of the Aboriginal stakeholder groups monitoring the grader scraping process;

- after each pass the scrape and windrow will be inspected for artefacts;

- the location of isolated artefacts or groups of artefacts uncovered by the grader will be recorded using a GPS so that the data is available for the spatial analysis;

- in areas where artefacts are located in the scrape or artefacts are located within the windrow, a section of the windrow will be sieved through nested 5 mm and 2 mm sieves.

The length of windrow to be sieved will be determined in the field in consultation with the grader driver (who will be able to give expert advice on the manner in which the soil will be placed in the windrow - this will be dependent on factors such as angle of the grader blade and depth of the soil) and the Aboriginal stakeholder group representatives;

- if features such as hearths, heat treatment pits or significant artefact densities are located, the grader scraping will cease in that area and a manual excavation undertaken using the methodology described in **Section 4.2.1**;

- if any skeletal material is identified all works will cease, the area secured and the NSW Police Department contacted immediately. Further advice will be required by a forensic archaeologist in consultation with the NSW Police Department, DEC and the relevant Aboriginal stakeholder groups; and

- if any skeletal material is identified all works will cease, the area secured and the NSW Police Department contacted immediately. Further advice will be required by a forensic archaeologist in consultation with the NSW Police Department, DEC and the relevant Aboriginal stakeholder groups.

4.5 Mitigation Protocol for Unspecified Minor Infrastructure Locations

As discussed in **Section 2.1** of the main text, ventilation fan facilities, access tracks, service boreholes (power etc.), gas drainage facilities, dewatering boreholes and other similar infrastructure will be required as underground mining progresses. The exact locations for these facilities will be determined as the project progresses and will be dependant on mining operation needs. Wherever possible, minor surface infrastructure will avoid known sites (refer to **Figure 6.2**) and previously unknown sites. No surface infrastructure will be emplaced without prior inspection of the proposed location by the Management Committee (including at least two of the Aboriginal community representatives) to ensure the precise location of the proposed minor surface infrastructure in relation to known/previously unknown sites.

The specific management protocol for sites/site loci/PADs located within areas proposed for minor surface infrastructure will be dependant on their Aboriginal cultural heritage and archaeological significance (as indicated in **Section 7** of the main text for known sites/site loci/PAD; or in the case of a previously unknown sites/Site loci/PADs, by further consultation with the Aboriginal stakeholder groups.

Appendix 8 provides details of the protocol and procedures to be followed when the location of minor infrastructure is decided. **Sections 4.1** to **4.4** (above) discuss the appropriate salvage methodologies to be employed dependant on the assessed Aboriginal cultural heritage and archaeological significance of the site, site loci and/or PAD.

4.6 Artefact Analysis

All artefacts will be analysed using at least x10 magnification. Edges and artefacts suspected of having use-wear or residues will be inspected using at least x30 magnification. At least 50 artefacts will be subject to residue and use-wear analysis.

The artefact analysis will contain intra and inter-assemblage analysis for those assemblages located during the surface collections, grader scrapes and manual excavations.

Inter-assemblage comparisons will be undertaken with assemblages from other areas in the Hunter Valley where comparable data is available. Full details of the artefact data for all of the assemblages will be presented within a report, so that the data will be available for other analysts.

5.0 Discussion of Attributes to be Recorded for Analysis

The attributes to be recorded for the artefacts recovered from the project disturbance area are outlined below. A discussion follows each attribute, detailing the proposed method of recording, potential problems with the method proposed, and the possible behavioural implications of each attribute.

Not all attributes can be measured on all artefacts (e.g. termination type cannot be measured on proximal flake pieces). Therefore, after a discussion of the most basic common attributes, subsequent attributes are divided into sections, with subsections for categories.

5.1 Common Attributes

Artefact Type

Description: Artefact class is a technological category reflecting the mechanical processes which resulted in the physical form of the artefact at the time of recovery. Classes used will include flakes, broken flakes, retouched flakes, flaked pieces, cores, flake-cores, hammerstones, grindstones, ground-edge axes, heat-shattered fragments, and non-diagnostic fragments.

Problems: Classing artefacts does not usually entail significant problems, other than occasional ambiguities between flaked pieces and broken flakes, and between (retouched) flakes and flake-cores (refer to **Retouch** for a further explanation).

Uses: This category will be used to assess differences in provisioning strategies (e.g. core provisioning vs. flake provisioning), differences in site function/use (e.g. presence/absence of grindstones), and the taphonomic effects of fire on site integrity (e.g. differences in the ratio of heat-shattered fragments: other artefact classes).

Raw Material

Description: A largely self-explanatory attribute, raw materials expected to be present include silcrete, indurated mudstone/tuff, quartz, crystalline tuff, quartzite, petrified wood, porcellanite and basic volcanics.

Problems: This category is usually without problems, though it is acknowledged that some disagreement exists as to the appropriate nomenclature for the material most frequently referred to as ‘indurated mudstone’. Strong arguments have been made for replacing the term with indurated rhyolitic tuff, however, as the category is nominal and not technical or geological the only criteria guiding the choice of term here are that the meaning of the term be understandable to others and that it be applied consistently. For these reasons, the term indurated mudstone will be used to make the class more easily compared with other studies and to differentiate this raw material from other tuffs that will have different sources.

Uses: Raw material is an important attribute, which may broadly indicate the place of origin of an artefact. The dominance of one raw material or another may also be used to group or

differentiate sites. Raw material is also frequently used in concert with attributes in the creation of analytic units for more in-depth inter and intra site comparisons.

Artefact Weight

Description: Artefact weight will be measured for all artefacts to one tenth of a gram.

Problems: This attribute does not entail any difficulties.

Uses: One of the most useful artefact attributes, weight is the most effective approximation of volume for a given raw material. As such it most accurately reflects the amount of stone being brought to a site. Average weight within a given artefact class is also a good indication of the amount of 'stress' that has been placed on the provisioned material. Large pieces of stone still retaining usable potential are unlikely to be discarded when people are conserving their technological resources (for example, as they move increasingly away from places where replacement material is available). Alternatively, when people are close to the raw material source, or when they are provisioning larger amounts of material to a site, the pressure on the 'exhaustion threshold' is relieved and there should be a resultant rise in the average weight of discarded artefacts.

Dimensions

- **Percussive Dimensions**

Description: Percussive dimensions measure the length of the flake in the direction of force application from the point that force was applied. In this regard it relates to the length of core face that was removed during the manufacture of the artefact. Width is oriented across the face of the flake from the mid-point of length, and thickness from the mid-point of length and width of the ventral to the corresponding point on the ventral.

Problems: While not as arbitrary as maximum dimensions, there is some uncertainty as to what these attributes are actually measuring in terms of the flake manufacturing process.

Use: Variations in average flake dimensions, and in the distribution of flake sizes in histograms, are expected to correlate with differences in the provisioning and reduction strategies at different places. For example, the reduction of cores at a site will produce a large number of moderate to small flakes and some larger flakes. As a result the histogram of flake length will show a relatively consistent increase in number of flakes from large to small. Contrastingly, when most flakes are the result of retouching or maintenance tasks on other flakes, the majority of the flakes remaining should be very small, with comparably few large to moderate flakes. However, it may be the case that a few moderate to large flakes will be discarded at the site as they are exhausted through excessive/heavy retouch or simply thrown away prior to a reprovisioning event. In such a case, a histogram of artefact size should show a bimodality in regard to length (a small peak in the moderate range and a large peak in the small range), and an even more pronounced bimodality in regard to thickness (most retouching flakes being very thin).

- **Maximum Dimensions**

Description: Maximum length, width and thickness will be measured on all artefacts. 'Length' will arbitrarily be measured along the longest plain, with width the longest of the plains at 90° to length, and thickness measured at 90° to both.

Problems: There are no problems associated with taking this measurement, although it needs to be noted that the definitions of length, width and thickness are entirely arbitrary and do not reflect any aspect of artefact manufacture.

Uses: This measure is most useful as a broad measure of size, and may have a role in assessing fragmentation rates (particularly in the case of heat-shattered fragments) and calculating Minimum Numbers of Artefacts (MNA).

- **Cortex – Amount and Type**

Description: Cortex refers to the 'skin' of a rock – the surface that has been weathered to a different texture and colour by exposure to the elements over a long period. The amount of cortex as a percentage of surface area will be measured on all artefacts (in relation to flakes, cortex can, by definition only occur on the dorsal and platform surfaces). The nature of cortex – its shape and texture – will vary depending on where the raw material was sourced. Cortex will be recorded in all instances where cortex is present.

Problems: This is a relatively unambiguous descriptive category.

Use: When a natural cobble is first selected it will usually be covered in cortex. Therefore the first artefacts produced from it will have a complete coverage of cortex on the dorsal side (primary reduction). As the cobble is increasingly reduced the amount of cortex on each artefact will rapidly decrease (secondary reduction) until it ceases to be present on artefacts (tertiary reduction). As a result of this trend, it should be possible to determine how early in the reduction sequence the artefact was produced. If large numbers of artefacts or a high proportion of the artefacts of a raw material retain cortex it may indicate that the site is located in close proximity to the source. Differences between the proportions of artefacts retaining cortex between different raw material sites indicates relative differences in distance to source. This does not necessarily mean distance in terms of measurable distance across the landscape, it may also reflect length of time since leaving the source. For example, the last campsite when a group is returning to the source of the raw material may be very close to the source in terms of distance, but distant in terms of time elapsed since the group left the source. If artefacts with cortex are occurring in sites a long distance from the place of origin of the natural cobble, them it is likely that cobbles were being transferred to the site when still only slightly reduced. This would imply an attempt to maximise the amount of stone being provisioned with the weight of transported material being a relatively minor concern.

Cortex type may help to clarify the source of the raw material (e.g. from river gravels [rounded, cortex many microscopic conchoidal fractures], surface scree [cortex weathered, porous, often oxidised, can be angular or rounded] or from outcrops [dependent on raw material type, more likely to have flat angular surfaces or recorticated flake scars]).

5.2 Attributes to be Recorded on Flakes

In most circumstances flakes, whether broken or whole, will account for the majority of artefacts in an assemblage. Flakes are frequently produced in large numbers during reduction events, though most are never subject to use. Flakes are generally inferred to be the most utilitarian of the basic artefact categories, usually possessing a sharp edge along

the entire circumference when whole and amenable to reworking patterns which may yield formal 'implements' or 'tools', such as backed artefacts and scrapers.

Knapping Type

Description: Three main knapping methods are used in the production of flakes, resulting in flakes with distinctive characteristics. The first is freehand percussion, where the objective piece is held in the hand and struck with a hard hammer (e.g. a hammerstone), resulting in 'classic' flakes with a single bulb, and a ringcrack/PFA. The second is bipolar, where the objective piece is rested against an anvil and struck. This results in flakes that have straight sheer faces and crushing at both ends. The third is pressure flaking, where an indenter is placed against the edge from which the flake is to be removed and force is applied. The resulting flakes have a characteristically diffuse bulb, with no errailure scar and no PFA.

Problems: Ambiguities do exist in this classification, and the identification of pressure flakes in particular may be difficult, however difficulties are expected to be relatively infrequent.

Use: Freehand percussion, bipolar and pressure flaking are all different approaches to reduction, with different advantages and disadvantages. Pressure flaking is the most controlled method, in terms of how much force is applied and to where. However pressure flaking does not produce large flakes and is usually associated with fine retouching work. Bipolar reduction is usually viewed as a system employed to increase core use-life. As cores become small their inertia thresholds drop making it difficult to reduce flakes via the freehand method. Resting the core and applying bipolar technique allows flakes to be reduced from a core too small to hold or from small round pebbles with no platform angle to initiate reduction. Pressure flaking when undertaken using an anvil often results in a form of bipolar reduction. Patterns in the distribution of flakes resulting from backing may be used to locate areas of backed artefact manufacture. Patterns in the distribution of flakes produced by bipolar knapping maybe used to indicate where there was pressure to maximise core potential.

Artefact Type

Description: Artefact type is a formal (e.g. less strictly technological), nominal category, similar to artefact class. Artefact types expected to be located include bondi points, microliths, scrapers, and adzes.

Problems: Ambiguity is an inherent feature of artefact typology, with the lines between different types frequently imprecise. Working definitions for each class used will be specified in the text of the analysis.

Use: Despite the problem discussed above, typology proceeds on the basis that at different places and at different times people manufactured artefacts with specific shapes and characteristics. As a result, the general period during which an artefact was made can be inferred if it is of a specific form. It is also not uncommon to infer that a given artefact form implies a given artefact function, and that from the shape of the artefact the activities taking place at the site can be specified, though these suggestions so far lack archaeological support. The problems with both of these uses are well documented, and any such inferences drawn here will be sparing. There is, however, some potential benefit in approaches based on subsistence patterns and the organisation of technology. On this basis, it may be possible to make some assertions from artefact typology as to the way subsistence may have been organised at different places through the landscape.

Artefact Breakage

Description: At a basic level, flakes break in six different ways. Three are transverse (at 90° to the direction of percussion) – proximal, medial, distal; two are longitudinal (along the plane of percussion) – left, right (oriented from the ventral view); and one ambiguous – marginal (where dorsal and ventral can be clearly distinguished, but the margin from which the piece has detached is uncertain). All such breaks will be recorded.

Problems: It is occasionally difficult to be certain of the breakage on an artefact. In most cases, however, the kind of breakage can be ascertained.

Use: It is important to differentiate broken from complete flakes for the purposes of analysis, as the two are not comparable in regard to a number of measures. The amount of artefact breakage in an assemblage also indicates the degree of fragmentation to which the assemblage has been subject. In highly fragmented assemblages, the actual number of artefacts represented may be significantly exaggerated. Quantifying breakage allows a more accurate approximation of artefact numbers to be made.

Heat Affect

Description: Heat will affect artefacts in different ways, depending on the way it has occurred. Most heat-affected flakes on fine-grained material will reveal a greasy surface lustre on newly flaked surfaces and some discoloration (e.g. porcellanite turns from white to blue), however as heat becomes excessive signs such as potlidding (the 'popping' of small plate-like pieces off the flake) or crazing (multiple fracture lines in multiple directions across the face of the flake) will occur. The presence of any of these features will be recorded.

Problems: This is a relatively unambiguous descriptive attribute for fine-grained materials – its application to coarse-grained materials is perhaps less certain.

Use: Trends in the spatial distribution of heat-affected artefacts may be used to indicate either heat-treatment (the controlled application of heat to improve flaking qualities) or post depositional burning (uncontrolled heating through bush-fires or stump burning) depending on the signs of heating and associated archaeological features (e.g. hearths).

Platform Size – Width and Thickness

Description: The platform is the surface into which force is applied in the formation of a flake. Platform width is measured across the platform in the same direction as flake width, while platform thickness follows flake thickness.

Problems: Some ambiguity exists on 'where to stop measuring' platform width and thickness, particularly on primary cortical flakes on rounded cobbles (the first flakes removed from a natural cobble), and platform surfaces comprised of multiple flake scars. Despite this the measure appears to work quite well for the majority of flakes.

Use: Platform size is expected to decrease under two circumstances. The first is when flakes are produced from small cores. The second is somewhat more speculative and based on the premise of a correlation between very small (focalised) platforms and the production of parallel-sided flakes (blades) associated with backed artefact manufacture.

Differences in platform size averages within and between sites will be examined to test these correlations and to infer what these mean in terms of human behaviour patterns e.g. curation of stone, expedient use of stone.

Platform Surface

Description: Platform surface will be recorded as one of the following: cortical, single flake scar, multiple flake scars, or facetted.

Problems: This is a largely unambiguous descriptive attribute.

Use: The surface of a platform provides information about the history of the core prior to the detachment of the flake, and also about methods employed to control the flaking process. Faceting in particular has been linked to the systematic production of 'blades'. Patterns in the spatial distribution of these attributes may be used to infer differences in reduction strategies.

Overhang Removal

Description: Frequently prior to the detachment of a flake from a core, the thin overhanging 'lip' of the core was removed in order to stop 'crushing' or force dissipation at the point of force application. This process is known as overhang removal.

Problems: This is a largely unambiguous descriptive attribute.

Use: Overhang removal is often seen as a form of raw material conservation. If a knapper desires to remove thin flakes from the face of the core by striking close to its edge, overhang removal may avoid the platform crushing and the resultant flake ending in a step termination which must be removed from the face of the core before flake production can continue. Thus, raw materials within assemblages, that have high relative proportions of overhang removal, or total assemblages that have high relative proportions of overhang removal, will be used to indicate raw material conservation, which can then be interpreted in relation to human resource use patterns/preferences.

Dorsal Scar Count

Description: The dorsal face of a flake provides a partial record of previous flaking episodes to have occurred down the core face at or near the same point. The number of flake scars on the dorsal surface of a flake which can be oriented relative to their direction of percussion and which are clearly discernable will be recorded.

Problems: There is some ambiguity in this measure, hence the use of the term 'clearly discernable' above. Furthermore, by the nature of the flaking process, each subsequent scar will remove traces of the previous scars, resulting in an incomplete record. For these reasons, this measure needs to be treated with some caution.

Use: Dorsal scar count is a rough indication of how much flaking has occurred prior to the detachment of the flake in question. It also provides a maximum against which to form ratios of 'aberrant to non-aberrantly terminating scars', 'parallel to non-parallel scars' and 'number of scars per rotation' (refer to next three attributes), all of which may assist in clarifying the reduction process and assist in understanding differences in the Aboriginal use of raw materials and sites (within the Proposed Disturbance Area).

Number of Aberrantly Terminating Dorsal Scars

Description: Aberrant terminations are further discussed below under **Terminations**. For the purposes of this description it is sufficient to say that flake scars terminating as steps and hinges will be recorded as aberrant in this assessment.

Problems: The problem(s) with this count are the same as those for the previous.

Use: As cores become smaller and more heavily reduced, the inertia threshold will fall and platform angle will increase, resulting in an increase in the number of aberrant terminations as a percentage of the number of flakes removed. Flakes which have a high number of aberrantly terminating flake scars as a percentage of the total are expected to have been produced towards the exhaustion threshold of the core. This measure will be used to indicate pressure on raw material availability and provisioning strategies.

Number of Parallel Flake Scars

Description: A basic count of the number of parallel flake scars.

Problems: As previous.

Use: Examining the ratio of parallel to non-parallel scars on the dorsal surface of flakes may help to clarify the prevalence of 'blade' production in the reduction systems at different places. It may also be possible from examining this ratio in relation to flake size to test whether blade production occurred at a specific stage in the reduction sequence, or whether it was present throughout the complete reduction sequence.

Presence of Parallel Arrises

Description: Arrises or dorsal ridges are a way of controlling artefact morphology. Flakes struck down an existing ridge will tend to follow the direction that the ridge takes. This attribute will involve noting the presence or absence of dorsal ridges that run parallel to the length of the flake.

Problems: Unlike the previous measures, this attribute is largely unambiguous.

Use: Like faceting, the presence of parallel arrises is associated with more controlled flaking methods such as blade production. The relationship between flake size and the presence of parallel arrises may provide similar information to the previous attribute (while at a lower resolution, being presence/absence based, this attribute is less ambiguous than number of parallel scars), as well as helping clarify the spatial distribution of different reduction strategies.

Dorsal Scar Rotation Count

Description: As a core is reduced it may be turned or rotated to provide new platforms or overcome problems with increasing platform angles. As a result, flakes may be detached which cut across old flake scars. The result should be apparent as dorsal scars in different direction to the direction of percussion of the flake being recorded.

Problems: The problem with this measure is the same as that for dorsal scar counts in general.

Use: Core rotation is increasingly likely towards the exhaustion threshold of cores, when platform angles increasingly approach or exceed 90° (it becomes very difficult to remove flakes from platforms with angles exceeding 90°). If it is possible to show a correlation between flake size and number of dorsal scar rotations then it will become possible infer from differences in the spatial distribution of this data that core exhaustion was more frequently approached in some areas than in others. If it is not possible to show this correlation, then it may be taken to suggest that core rotation was part of the reduction strategy throughout the reduction continuum.

Termination

Description: Termination refers to the way in which force leaves a core during the detachment of a flake. Every complete flake has a termination. There are patterns in the form which terminations will take, with the four major categories (those to be used here) being: feather, hinge, step, and outrepasse (or plunging).

Problems: This is a largely unambiguous descriptive attribute. The only point at which uncertainty does enter is in differentiating some transversely snapped flakes from step terminated flakes. In the majority of cases, however, this problem does not arise.

Use: Different terminations have different implications both for flake and core morphology. A flake with a feather termination (in which force exits the core at a low or gradual angle) will have a continuous sharp edge around the periphery beneath the platform. This has advantages in terms of the amount of the flake edge which can be used for cutting, and also makes the flake far more amenable to subsequent retouching or resharpening activities. Detaching flakes with feather terminations also has minimal impact on the effective platform angle of the core, and so platform angle thresholds are reached relatively slowly while feather terminating flakes continue to be produced.

Hinge and step terminating flakes have none of these advantages. They result in edges which are amenable neither to cutting nor to retouching. Furthermore, hinge and step terminations lead to rapidly increasing effective platform angles, leading to a requirement for core rejuvenation and core exhaustion. For these reasons, such terminations are considered undesirable or *aberrant*. The number of aberrant flake terminations is expected to increase towards the end of a core's uselife, as reduction in core size and increase in core platform angle make it increasingly difficult to detach feather terminating flakes. In areas where aberrantly terminating flakes are relatively common it may be inferred that core potential was more thoroughly exploited. From this it may in turn be inferred that the pressure to realise core potential (e.g. a strategy of heavy raw material conservation) was greater. Increased mobility/emphasis on portability is one possible explanation of such a pattern.

Outrepasse flakes have the opposite effect on core morphology to step and hinge flakes, in that they remove the entire core face and part of the core bottom. As a result, such flakes may be used to rejuvenate cores in which core angles have become high but which still retain useable potential (e.g. are still quite large). The presence of outrepasse flakes may be taken to indicate core rejuvenation and the requirement to increase core use-life.

Retouch

Description: Retouch is the term given to alterations made to a flake by the striking of subsequent flakes from its surface. Retouching may be done either to alter artefact form or to rejuvenate (resharpen) dulled edges, and possibly both. Degree/amount of will be recorded as presence/absence.

Problems: This is a largely unambiguous descriptive attribute. The only area in which difficulty may arise is in instances where edge damage cannot be differentiated from retouch. This occurs infrequently, as edge damage is usually a modern alteration to artefact form which can be noted through differences in surface colour between the flake scar and the rest of the artefact surface.

Use: The two main uses of retouch need to be separated for the purposes of this discussion. Retouch to achieve form (for example, artefact backing) is distinct from retouch for the purposes of edge rejuvenation. 'Formally retouched' artefacts are anticipated to occur at

places of manufacture and places of discard. Importantly, such artefacts will be manufactured prior to use as part of a gearing up or preparation for activities such as hunting. The presence of concentrations of such artefacts, including incomplete specimens may indicate the base-camp locations from which mobile subsistence activities were conducted. Such artefacts are also expected to be present among very small assemblages at distances from occupational foci, as the result of discard, loss, or breakage.

Edge rejuvenation retouch is expected to increase as the availability of replacement materials decreases. Such artefacts are expected to represent 'personal gear', an implement carried with a person and maintained for repeated use. Unlike formally retouched pieces, artefacts with edge rejuvenation will not be produced *in preparation for* activities. The sharpest and most useful edge is a fresh edge. Rather, rejuvenation will occur as need arises. The presence of such artefacts at occupational foci is likely to represent discard following use and prior to reprovisioning/retooling. The percentage of artefacts exhibiting retouch is expected to increase in systems where large amounts of replacement raw material are not available.

It needs to be noted that a third type of retouch also occurs, aimed at neither formalisation of shape or edge rejuvenation. This is when a flake (usually a large to very large flake) has been used for the subsequent production of utilitarian flakes (e.g. when it has been used as a core). This strategy is quite prevalent in the Hunter Valley. Differentiating such artefacts from other retouched artefacts is empirically difficult, however, is intuitively quite easy. Any such intuitive judgements can, however, be tested during the analysis phase, as such flakes are expected to be quite distinct from other retouched artefacts in size and weight.

Retouch Type

Description: Retouch type is a technological attribute relating the way in which retouch was carried out. Categories to be used are steep, acute, unifacial, bifacial, tranchet and/or used as core.

Problems: This is a largely unambiguous descriptive attribute.

Use: Whether retouch results in a steep or acute edge is important in relation to the possible functions of those edges. Acute retouch results in sharp edges suitable for cutting whilst steep retouch can be used to totally remove a sharp edge (to blunt as in backed artefacts) or to produce thick strong edges suitable for adzing or scraping. Thus, artefact function can be suggested by recording this attribute (residue and use-wear analysis is also planned to substantiate these interpretations). The recording of the technique used for retouch addresses questions related to techniques of implement manufacture and thus another form of human behaviour that can be analysed within and between assemblages.

Retouch Location

Description: Each flake will be divided into eight segments: proximal end, proximal left, proximal right, marginal left, marginal right, distal left, distal right, and distal end; with the presence or absence of retouch in each to be recorded.

Problems: Apportioning sections relies on a visual division of the flake, which may be slightly inaccurate. This is not expected to be a significant effect.

Use: An examination of retouch location may reveal trends in distance decay (e.g. increasing number of margins retouched over distance, or may simply reveal non-random patterns in the way retouching were carried out. If the former, then the trend may be used to suggest trajectories along which flakes were being carried as personal gear. In the case of

the latter, the information would provide an insight into the manufacturing/reduction systems being employed.

5.3 Attributes to be Recorded on Cores

The following attributes are to be recorded on cores. Most information taken from cores concerns the way in which they were reduced – what pressures, controls and systems were applied.

Percentage of Surface Flaked

Description: This attribute involves an estimate of the percentage of the outer surface of the core which has had flake scars removed from it.

Problems: This is a visual estimate and liable to prove reasonably inaccurate and coarse. Nevertheless, it remains useful.

Use: This measure can be useful in assessing degree of core reduction. In particular, it can be useful in locating areas of heavy core reduction, particularly when used in concert with the following two measures.

Number of Flake Scars

Description: This measure mirrors **dorsal scar count** from the previous section. All scars over the length of 10 mm will be measured (there are usually large numbers of flake scars between 10-3 mm, which relate more to platform preparation than flake production.

Problems: Most of the problems with this measure arise from fact that subsequent scars remove traces of former scars, leaving an incomplete record of the past. As a result, this measure will always underestimate the number of flakes removed from the core.

Use: Dorsal scar count provides an estimate of the amount of reduction to which a core has been subject. Used in concert with measures such as **number of rotations** and **percentage of surface flaked**, it may be help to locate differences in the degree of core reduction at different locations.

Number of Rotations

Description: This measure mirrors **dorsal scar rotation count** as discussed above.

Problems: This measure has the same problems as **number of flake scars**.

Use: Different reduction systems use core rotation in different ways. In some systems, cores are rotated only once, after the striking of the initial flake to form a platform. All subsequent scars are removed in one direction from that platform. Other systems will involve repeated rotations between two platforms, or may involve continuous core rotation and numerous platforms. It may be the case that through the use-life of a core a number of different strategies will be used.

Assessing core rotation may help to clarify reduction systems, and the stage in the reduction system at which the individual core was discarded. This can be used to indicate differences in use of raw materials both within assemblages and between assemblages.

Number of Aberrantly Terminating Scars

Description: Flake scars terminating as steps and hinges will be recorded as aberrant in this assessment.

Problems: There should be no problems with this simple count.

Use: As cores become smaller and more heavily reduced, the inertia threshold will fall and platform angle will increase, resulting in an increase in the number of aberrant terminations as a percentage of the number of flakes removed. Flakes which have a high number of aberrantly terminating flake scars as a percentage of the total are expected to have been produced towards the exhaustion threshold of the core. This measure will be used to indicate pressure on raw material availability and provisioning strategies.

Number of Parallel Flake Scars

Description: A basic count of the number of parallel flake scars.

Problems: There should be no problems with this simple count.

Use: Examining the ratio of parallel to non-parallel scars on cores may help to clarify the prevalence of 'blade' production in the reduction systems at different places. It may also be possible from examining this ratio in relation to flake size to test whether blade production occurred at a specific stage in the reduction sequence, or whether it was present throughout the complete reduction sequence.

5.4 Comments

Description: A column will be supplied in the data base for recording comments. This may include comments on attributes such as artefact colour, granularity, presence and nature of inclusions, or other comments that do not fit snugly inside one of the attribute classes.

Problems: There should be no problems.

Use: Descriptions of artefacts can sometimes be useful for assisting in locating conjoins.

6.0 Reporting

A report will be furnished to the DEC within two years of the completion of any part of the salvage program. The report will discuss the following:

- a brief background to the salvage;
- the Conditions of Approval;
- Aboriginal consultation;
- the relevant legislation;
- details of the proposed impact to the site/site loci;
- descriptions of the locality and the relevant sites/site loci;

- the research design and methodology for the salvage (where applicable);
- the results of the salvage;
- the artefact analysis;
- a discussion and interpretation of the results; and
- 'Care' of the artefactual material (i.e. where it has been/will be deposited).

A site card will also be prepared for any new sites located.

Electronic copies of the Research Design and Methodology, the Environmental Assessment report and each salvage report (including the artefact analysis) will be maintained by Mt Arthur Coal so that this data will be available for comparative analysis as the salvage program progress.

7.0 Care of Artefactual Material

Determining the care and control of the artefacts retrieved during the salvage program forms part of the consultation process with the Aboriginal stakeholder groups; however, the final determination is made by the DEC). It should be noted that it is not appropriate to break up the assemblages and that all of the artefactual material should be kept in the one facility/place for future teaching and research purposes. Consultation concerning Care and Control was carried out during the Aboriginal consultation program for the draft Aboriginal archaeological assessment report's review (refer to **Section 9.3** of the report). The following care and control options were presented to the nineteen registered Aboriginal stakeholder groups include placing salvaged artefacts:

- within a fenced area in the Proposed Saddlers Creek Conservation Area; or
- within a fenced area in the Mt Arthur Conservation Area; or
- or within a secure area at the Wanaruah Local Aboriginal Land Council;
- with the Australian Museum;
- or another repository/option of their choice.

Based on the results of this consultation, it is suggested that Mount Arthur Coal have care and control of the salvaged artefacts and place all salvaged artefacts in a Keeping Place within the Proposed Saddlers Creek Conservation Area.

APPENDIX 10

Requirements of the Aboriginal Cultural Heritage Management Plan

Appendix 10 - Requirements of the Aboriginal Cultural Heritage Management Plan

1.0 Introduction

Mt Arthur Coal will prepare an Aboriginal Cultural Heritage Management Plan(s) (ACHMP) for the Mt Arthur Coal Underground Project Area. A separate specific ACHMP may be prepared for the Saddlers Creek Conservation Area. The ACHMPs will provide for the management of Aboriginal cultural heritage sites/site loci/PADs within the Underground Project area. The ACHMPs will discuss the in-situ management of sites/site loci/PADs outside the impact area and within the impact area (including the areas to be impacted by subsidence, tensile cracking, subsidence remediation works and surface infrastructure) and also for the 'in perpetuity' conservation of the Aboriginal cultural heritage sites and values within the Saddlers Creek Conservation Area and the establishment and management of a Keeping Place (refer to Figure 9.1). The ACHMPs will also provide direction for the ongoing management of the previously proposed Quarry Creek Conservation Area prior to and after subsidence and subsidence remediation works.

The ACHMPs for the Mt Arthur Coal Underground Project Area will be additional to the ACHMP prepared for the management of the Mt Arthur Conservation Area, which will be managed under a Voluntary Conservation Agreement (VCA) in partnership with the Department of Environment and Climate (DECC). The provision of the Mt Arthur Conservation Area is in compliance with Project Approval for the Mt Arthur North project and does not form one of the requirements for the current project. The conservation of sites in Mt Arthur Conservation Area will, however, compliment the protection and management of cultural heritage relics and values within the Saddlers Creek Conservation Area.

1.1 Requirements of the Aboriginal Cultural Heritage Management Plan

The ACHMP will be prepared prior to the commencement of construction or operations after Project Approval. The ACHMPs will be prepared in consultation with DECC and relevant Aboriginal stakeholder groups and will address the Conditions of Consent detailed in the Project Approval for the Mt Arthur Coal Underground Project Area and the *Mt Arthur Coal Underground Project Area Environmental Assessment*; specifically the management recommendations detailed in the *Aboriginal Archaeology Assessment* (refer to Section 9 of the main text).

The ACHMPs will be designed to provide guidance to Mt Arthur Coal in relation to:

- management outcomes for the Aboriginal sites/site loci/PADs to be impacted by the Underground Project;
- salvage requirements for the Aboriginal sites/site loci/PADs to be impacted by the Underground Project (including QC01 within a previously proposed Conservation Area);
- the *in-situ* management of the Aboriginal sites/site loci/PADs outside the impact area and within the broader Underground Project area; and
- the *in-situ* conservation of the Aboriginal sites/site loci/PADs and values within the Saddlers Creek Conservation Area.

The ACHMPs will also detail a timeframe for the necessary tasks and clearly indicate the roles and responsibilities of Mt Arthur Coal management and employees to ensure the appropriate management of Aboriginal cultural heritage within the Underground project area.

1.1.1 General Requirements of the ACHMPs

The ACHMPs will address the following:

1. the setting up of a Management Committee to oversee implementation of the ACHMPs. The Management Committee will be made up of the Operations Manager (or representative), the Environment and External Affairs Manager (or representative) from Mt Arthur Coal and five representatives of the Aboriginal stakeholder groups. The position for the five Aboriginal representatives will be advertised and the persons employed by Mt Arthur Coal will be paid on an hourly basis. The five Aboriginal representative positions will be re-advertised every three years. A suitably qualified archaeologist will be an 'on call' member of the Management Committee. The archaeologist will be called upon at times when an archaeological perspective is required;

2. site salvage requirements for the sites to be impacted by the Underground Project (as detailed in Appendix 8);

3. Aboriginal Cultural Heritage Awareness Training for all mine employees and subcontractors as part of the mine surface induction process;

4. any fencing or signage requirements for sites to be managed *in-situ* and the Saddlers Creek Conservation Area and for the scarred tree site QC02 and the Aboriginal cultural site identified by Mrs. Barbara Foot (WC) (refer to Section 8.3 of the main text);

5. the removal of stock from sensitive areas and the Saddlers Creek Conservation Area;

6. procedures and protocols for bush fire hazard reduction;

7. procedures and protocols for erosion control;

8. procedures and protocols for feral animal and noxious and pest weed control;

9. procedures and protocols for management of previously unrecorded sites/skeletal material located during mine works/remediation works;

10. procedures and protocols for access to sites/the Saddlers Creek Conservation Area/the previously proposed Quarry Creek Conservation Area for teaching/research purposes;

11. procedures and protocols for site monitoring (pre-subsidence, post subsidence and in areas outside the subsidence zone);

12. the establishment and requirements for the proposed Keeping Place within the Saddlers Creek Conservation Area;

13. annual Environmental Management Reporting; and

14. reviews of the ACHMPs to include changes to circumstance.

The ACHMP will also address management of the previously proposed Quarry Creek Conservation Area prior to (Years 1 to 12) and after subsidence (Year 13) and subsidence remediation works. The ACHMPs will detail the offsets to the Aboriginal stakeholder groups

for loss of cultural heritage values in this area (refer to Section 1.5 for further details). Mt Arthur Coal management will ensure that these offsets are provided in a timely manner.

The ACHMPs will also address any further matters (if any) arising from the Conditions of Approval within the Project Approval.

1.1.2 Sites to be Impacted by the Project

A total of 31 Aboriginal sites and their associated PAD (where applicable) will be directly impacted by the Mt Arthur Coal Underground Project over its 21 year life. This number may increase when the precise location of minor surface infrastructure such as ventilation fan facilities, access tracks, service boreholes (power etc.), gas drainage facilities, dewatering boreholes and other similar infrastructure are known. In this regard it will be necessary for the ACHMPs to provide site specific detail for management (salvage) of the known sites, site loci and/or PAD to be impacted and protocols and procedures for those sites, site loci and/or PAD (known and unknown) that may be subject to impact (if they cannot be avoided) when the location of all minor surface infrastructure is known (refer to Section 1.1.1.3).

It will also be necessary for the ACHMPs to provide for the *in-situ* management of the sites that will be impacted until such times as their salvage is required (e.g. 12 months prior to impact).

A detailed research design and salvage methodology for the known, and as yet unknown sites, to be impacted within the Underground Project area is provided in Appendix 8. The ACHMPs will include this information and include any further requirements identified by the Conditions of Consent within the Project Approval.

Information required within the ACHMPs related to the sites to be impacted by the Underground Project will include:

- protocols and procedures for *in-situ* management of the sites prior to their salvage. These sites will be managed under the ACHMPs (including items in dot points 1 and 3 to 13 - refer **Section 1.1.2.1**);
- timing of salvage;
- method of salvage;
- 'care' of artefacts salvaged; and
- any other site specific requirements.

1.1.2.1 Mitigation Protocol for Unspecified Minor Infrastructure Locations

As discussed in **Section 1.1.2**, ventilation fan facilities, access tracks, service boreholes (power etc.), gas drainage facilities, Hunter River water abstraction site and associated pipeline, dewatering boreholes and other similar infrastructure will be required as underground mining progresses. The exact locations for these facilities will be determined as the project progresses and is dependant on mining operation needs. Wherever possible, minor surface infrastructure will avoid known sites (refer to Figure 6.2 of the main text).

When the location of the minor infrastructure is determined the following protocol will be followed.

If the proposed minor infrastructure is not in an area with a known site:

- the proposed impact area will be inspected by at least three members of the Management Committee (one from the mine and two of the Aboriginal stakeholder group representatives) set up to oversee the implementation of the ACHMPs;

- if there are no previously unrecorded sites/site loci or PAD within the area the construction of the infrastructure may proceed;

- if there are unrecorded sites/site loci or PAD within areas of proposed infrastructure sites should be avoided if possible;

- if avoidance is not possible, and small numbers of surface artefacts are encountered they will be collected and work may proceed;

- if large numbers of artefacts or a suspected feature such as a hearth or heat treatment pit is encountered, all works should stop and a suitably qualified archaeologist and representatives of the Aboriginal stakeholder groups brought in to assist with the significance assessment of the feature/site; and

- then proceed as for known sites below.

If the proposed minor infrastructure is in an area with a known site/site loci/PAD of low or low to moderate Aboriginal cultural heritage and archaeological significance mitigation of this impact will include the following steps:

- inspection of the area to be impacted by proposed minor infrastructure by the Aboriginal representatives of the Management Committee to ensure its location in relation to the site. If possible, the movement of the proposed minor infrastructure so that it does not impact the site; or where not possible;

- surface collection of artefacts within the proposed impact area by the Aboriginal representatives of the Management Committee; and

- analysis of the artefacts by a qualified archaeologist, small report preparation for the DECC and the Aboriginal stakeholder groups and the placement of the artefacts in the Keeping Place within the Saddlers Creek Conservation Area.

The emplacement of the minor infrastructure may proceed following the collection of the artefacts.

If the proposed minor infrastructure is in an area with a known site/site loci/PAD of moderate to high Aboriginal cultural heritage and archaeological significance mitigation of this impact will include the following steps:

- inspection of the area to be impacted by proposed minor infrastructure by representatives of the Management Committee and a qualified archaeologist to ensure its location in relation to the site. If possible, the movement of the proposed minor infrastructure so that it does not impact the site; or where not possible;

- if avoidance is not possible, inspect proposed disturbance area with Management Committee representatives of Aboriginal stakeholder groups and qualified archaeologist to determine approach;

- if endorsed, the surface collection of artefacts within the proposed impact area by representatives of the Aboriginal stakeholder groups and a qualified archaeologist;

- if endorsed, the sub-surface testing and targeted subsurface investigation within the proposed impact area by representatives of the Aboriginal stakeholder groups and at least one qualified archaeologist (using the methodology provided in Sections 4.1 to 4.4 of Appendix 8); and

- analysis of the artefacts by a qualified archaeologist, large report preparation for the DECC and the Aboriginal stakeholder groups and the placement of the artefacts in the Keeping Place within the Saddlers Creek Conservation Area.

The emplacement of the minor infrastructure may proceed following the completion of the sub-surface salvage.

1.1.3 Sites to be Managed *In-situ*

A total of 46 archaeological sites and 2 Aboriginal cultural sites are currently proposed for *in-situ* management within the Underground Project area for the entire 21 years of the project. This number may decrease slightly when the location of minor infrastructure is known. These sites will be managed under the ACHMPs (including items in dot points 1 and 3 to 13 - refer **Section 1.1.1**) and any other items required by the Conditions of Consent within the Project Approval.

Under the ACHMPs the sites will be monitored on a regular basis. The time period between monitoring will be decided in consultation with the Aboriginal stakeholder groups and the DECC. This time period is likely to differ between the sites in areas subject to subsidence, those not yet subsided, and the sites in areas outside the subsidence zone.

Access to the sites to be managed *in-situ* will be possible on a restricted basis. Applications to visit/research (non-destructive) the sites will be considered by the Management Committee and approved based on their merit and in view of the current mining activity in that area and any problems due to constraints on access.

The ACHMPs will be subject to a review process on a regular basis so that management protocols and procedures can be revised (if necessary) to more appropriately address Aboriginal cultural heritage issues.

Mt Arthur Coal will be responsible for ensuring that the Management Committee has the access, time and funds for the *in-situ* management of the sites within the Underground Project area.

1.1.4 The Saddlers Creek Conservation Area

The purpose of the Saddlers Creek Conservation Area is to conserve, for contemporary and future generations, Aboriginal sites (SC01 and SC014) and values that are of high Aboriginal cultural heritage and archaeological significance. The area will be conserved ‘in perpetuity’.

The Saddlers Creek Conservation Area contains the majority of the SC01 site (incorporating 42 artefact loci interspersed by potential archaeological deposits). This area will be managed under the ACHMPs (including items in dot points 1 and 3 to 13 - refer **Section 1.1.1**) and any other items required by the Conditions of Approval within the Project Approval. The management procedures and protocols for this area will be stringent in relation to any activity that has the potential to cause ground surface disturbance. Ground

surface disturbance will not be allowed without approval by the Management Committee and only for minor scale works and in locations where artefacts or other known features of heritage value will not be impacted.

Safe access to the Conservation Area will be provided by Mt Arthur Coal. Visitors to the Conservation Area will be supervised by an inducted member of the Management Committee or their representative and personnel from Mt Arthur Coal.

Applications to undertake non-destructive research will be considered by the Management Committee and approved based on their merit.

It is imperative that the Conservation Area is fenced and sign-posted to avoid any inadvertent damage from mining activities (Note: much of the area is already fenced). As fence construction entails ground disturbance it will be a requirement that any new fencing is located outside the area indicated as the Saddlers Creek Conservation Area on Figure 8.1. Fence construction will be monitored by an inducted otherwise mine escorted member of the Management Committee or their representative. As the Saddlers Creek Conservation Area also has ecological values and provides a fauna corridor, the fencing should be appropriate to allow the passage of native faunal species but to exclude stock.

All stock will be removed from the Conservation Area to allow areas of erosion to revegetate and lessen the impact of trampling on the artefact loci.

Mt Arthur Coal will be responsible for ensuring that the Management Committee has the access, time and funds for the ongoing management of the Saddlers Creek Conservation Area.

1.1.5 The Previously Proposed Quarry Creek Conservation Area

The previously proposed Quarry Creek Conservation Area (incorporating part of QC01) will be subsided by removal of the Bowfield Seam in Year 13 of the Underground Project (refer to Figure 2.2 in the main text). It is predicted that stream remediation works will be required within this area following subsidence. Up until and after the area is subsided it will be managed under the ACHMPs (including items in dot points 1 and 3 to 13 - refer **Section 1.1.1**). Specific management recommendations related to this area include a commitment from Mt Arthur Coal to:

- construct a facility suitable for use by the Aboriginal community when using the area for teaching purposes until such times as the area is subsided;

- provide funding for training for one member of each of the Aboriginal stakeholder groups in relation to site recording and artefact recording and basic analysis. The training package will be devised so that it enables these representatives to train other members of their respective groups and the broader Aboriginal community;

- provide funding for training for five Aboriginal people to undertake ‘Care of Collections Training’ at the Australian Museum in Sydney, or a similar course. This course provides training related to the Management of Keeping Places and Cultural Centres; and

- prior to subsidence, salvage the areas to be impacted by subsidence and subsidence remediation works using the methodology outlined in (Appendix 8).

After subsidence the area will be inspected by the Management Committee and its ongoing use as a teaching place reviewed.

APPENDIX 11

Aboriginal Stakeholder Group Comments on the Revised Offset and Management Strategy

Mt Arthur Underground Project

Proforma for Aboriginal Stakeholder Group Comments – Revised Offset and Management Strategy

The proposed revised management strategy presented today (17 July 2007) includes:

- a new proposed keeping place;
- an increase in the area of the proposed Saddlers Creek Conservation area by 33 hectares;
- an increase in the number of Aboriginal representative positions on the proposed Management Committee to five instead of three;
- salvage of all archaeological sites impacted by proposed subsidence remediation over the life of the mine on a longwall panel basis. Ongoing refinements of the subsidence predictions during operations may allow increases in the number of sites retained *in situ*. However, salvage by longwall panel will result in ongoing salvage work at regular intervals for the majority of the life of the project, providing continued employment opportunities for the registered Aboriginal stakeholder groups; and
- all other original management outcomes as previously provided in Section 9 of the draft report and detailed in Table 9.1.

Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: No comments

Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: No comments

JUL-2007 10:22 From: To:61249505737 P.1/2

Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☑ Yes ☐ No

Comments: ..... NO COMMENTS .....

Proforma Completed By (please print): .....
Position within Organisation: .....
Signed: .....
Dated ..... 14-7-07. .....

If you would like to discuss any matters relating to the provision of comments, or would like to provide verbal comment please call either Mary-Jean Sutton or Jan Wilson at Umwelt on 4950 5322.

Please complete this form today, or if need be:
Post or fax (4950 5737) your comments to
Mary-Jean Sutton or Jan Wilson at Umwelt (Australia) Pty Limited
PO Box 838, Toronto NSW 2283
by close of business on Tuesday 24 July 2006

JUL-2007 10:25 From: To:61249505737 P.1/2

Mt Arthur Underground Project

Proforma for Aboriginal Stakeholder Group Comments – Revised Offset and Management Strategy

The proposed revised management strategy presented today (17 July 2007) includes:

- a new proposed keeping place;
- an increase in the area of the proposed Saddlers Creek Conservation area by 33 hectares;
- an increase in the number of Aboriginal representative positions on the proposed Management Committee to five instead of three;
- salvage of all archaeological sites impacted by proposed subsidence remediation over the life of the mine on a longwall panel basis. Ongoing refinements of the subsidence predictions during operations may allow increases in the number of sites retained *in situ*. However, salvage by longwall panel will result in ongoing salvage work at regular intervals for the majority of the life of the project, providing continued employment opportunities for the registered Aboriginal stakeholder groups; and
- all other original management outcomes as previously provided in Section 9 of the draft report and detailed in Table 9.1.

Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:.....
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Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:.....
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Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☑ Yes ☐ No

Comments:.....
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Proforma Completed By (please print): Michele Stair
Position within Organisation: Worker (Gwirr)
Signed: M Stair
Dated 17/7/07

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Mt Arthur Underground Project

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- all other original management outcomes as previously provided in Section 9 of the draft report and detailed in Table 9.1.

Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:.....
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☑ Yes ☐ No

Comments:.....
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Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☑ Yes ☐ No

Comments:.....
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Proforma Completed By (please print): BARRY SMITH.
Position within Organisation: WORKER (H.V.A.C).
Signed: B. Smith
Dated 17-7-07.

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- salvage of all archaeological sites impacted by proposed subsidence remediation over the life of the mine on a longwall panel basis. Ongoing refinements of the subsidence predictions during operations may allow increases in the number of sites retained *in situ*. However, salvage by longwall panel will result in ongoing salvage work at regular intervals for the majority of the life of the project, providing continued employment opportunities for the registered Aboriginal stakeholder groups; and
- all other original management outcomes as previously provided in Section 9 of the draft report and detailed in Table 9.1.

Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:.....
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Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:.....
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Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☑ Yes ☐ No

Comments:.....
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Proforma Completed By (please print): Colleen Stair
Position within Organisation: Worker Lit.V.C.C.
Signed: C.Stair
Dated 17.7.07

If you would like to discuss any matters relating to the provision of comments, or would like to provide verbal comment please call either Mary-Jean Sutton or Jan Wilson at Umwelt on 4950 5322.

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- all other original management outcomes as previously provided in Section 9 of the draft report and detailed in Table 9.1.

Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:.....
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Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:.....
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Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☑ Yes ☐ No

Comments:.....
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Proforma Completed By (please print): MINGGA CONSULTANTS
Position within Organisation: MANAGER
Signed: Clifford Mason
Dated 17/7/06

If you would like to discuss any matters relating to the provision of comments, or would like to provide verbal comment please call either Mary-Jean Sutton or Jan Wilson at Umwelt on 4950 5322.

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Post or fax (4950 5737) your comments to
Mary-Jean Sutton or Jan Wilson at Umwelt (Australia) Pty Limited
PO Box 838, Toronto NSW 2283
by close of business on Tuesday 24 July 2006

RECEIVED
25 JUL 2007

Mt Arthur Underground Project

Proforma for Aboriginal Stakeholder Group Comments – Revised Offset and Management Strategy

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- all other original management outcomes as previously provided in Section 9 of the draft report and detailed in Table 9.1.

Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☐ Yes ☐ No

Comments: We would like to see a trade off VCA expand it to 800 ha compared to the underground mine.

Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☒ Yes ☐ No

Comments: A good thing for Aboriginal community as a whole, & if DEC comes onboard to push the process, BHP see it through fruition.

Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☐ Yes ☐ No

Comments: again more land should but put aside for a green offset: 100 HA ?

Proforma Completed By (please print): Allen Paget
Position within Organisation: SHCS & Committee
Signed: Al Paget
Dated 17-7-07

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Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:

NO COMMENTS

Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:

NO COMMENTS

18-JUL-2007 10:22 From: To:61249505737 P.2/2

Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☑ Yes ☐ No

Comments:

No comments

Proforma Completed By (please print):
Position within Organisation:
Signed: D. Mathews
Dated 12-7-06

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by close of business on Tuesday 24 July 2006

18-JUL-2007 10:25 From: To:61249505737 P.2/2

0265714889

FAX COVER SHEET

UPPER HUNTER WONNARUA COUNCIL INC
17/174 JOHN ST
PO BOX 184 SINGLETON NSW 2330

PH: 02 65 714 888
FAX: 02 65 714889

Send to: UMWELT AUST	From: UHWC
Attention: JAN Wilson	Date: 7th SEPT 2007
Office Location:	Office Location: Singleton
Fax Number: 49505737	Phone Number:

Urgent.....
Reply ASAP.....
Please comment...✓..
Please review.....
For your information..✓....

Total pages, including cover.....

Comments:

TO JAN Wilson Senior ARCHAEOLOGIST - MT ARTHUR NORTH UNDERGROUND MINE PROJECT / ABORIGINAL HERITAGE MANAGEMENT - OFF-SET'S PROPOSAL ETC

Victor Perry

0265714889

Mt Arthur Underground Project

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Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☐ Yes ☑ No

Comments: SADDlers Creek Conservation Zone's IS Being TRADed OFF For TWO Mining lease AreA's

Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☐ Yes ☑ No

Comments: Should Be 100 DAYS per year and 10 people TRAINED

0265714889

Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☐ Yes ☑ No

Comments: Other Area's Should be look @ TO TRADE OFF for This underground Development

Proforma Completed By (please print): Victor Perry
Position within Organisation: Chairperson
Signed:
Dated 7th Sept 2007

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Mt Arthur Underground Project

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Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: Yes I am pleased with what I have been seeing put forward by Mt Arthur Mine

Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: But the teacher needs to be Culturally aware of what they are teaching and the training of the persons that are having this taught to them

Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☑ Yes ☐ No

Comments:.....
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Proforma Completed By (please print): Barbara Foot Wawaruah Elder,
Position within Organisation: Wanaruah Custodians
Signed: Barbara Foot
Dated 17-4-06

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Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments:.....
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☑ Yes ☐ No

Comments:.....
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☑ Yes ☐ No

Comments:.....
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Proforma Completed By (please print): GORDON GRIFFITHS
Position within Organisation: PUBLIC OFFICER
Signed: .....
Dated ... 13-9-07

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☑ Yes ☐ No

Comments:.....
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☑ Yes ☐ No

Comments:.....
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☑ Yes ☐ No

Comments:.....
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Proforma Completed By (please print): TONY MATTHEWS
Position within Organisation: FIELD OFFICER
Signed:.....
Dated 17/7/06

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Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: Although the proposed strategy is a good start, I believe that the compensation package should better reflect the scope of the mining project. All stakeholders should receive benefit from the project and proportionately more could be done for Aboriginal Cultural Heritage

Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: I would like the selection of candidates for positions to be a joint decision between mine management and registered stakeholders.

02495477511
Jul 07 03:41p Arthur Fletcher 0249547751 p.1

Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☐ Yes ☑ No

Comments: Although the saddlers Creek conservation area will be protected, adjacent land has the potential to be misused in the future. I would like the conservation area to be complemented with protected rehabilitated land. Ideally this would retain the natural context of the preserved land better than if the conservation area was surrounded by an industrial/housing/rural property.

Proforma Completed By (please print): Arthur C Fletcher with assistance from Adam Fletcher
Position within Organisation: Owner/operator / Assistant to owner/operator
Signed: A.C. Fletcher / A. Fletcher
Dated 23/7/07

If you would like to discuss any matters relating to the provision of comments, or would like to provide verbal comment please call either Mary-Jean Sutton or Jan Wilson at Umwelt on 4950 5322.

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02495477S1
23 Jul 07 03:41p Arthur Fletcher 02495477S1 p.2

Mt Arthur Underground Project

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Is this revised management strategy a suitable offset strategy for the Underground Project from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: 5 REPRESENTATIVES IS SUFFICIENT FOR PROPOSED MANAGEMENT COMMITTEE. ALSO SALVAGE OF ARCH. SITES.

Is the proposed Keeping Place and funding for training of five Aboriginal people to undertake "Care of Collections Training" at the Australian Museum in Sydney, (or a similar course) and the establishment and casual staffing of the Keeping Place (approximately 50 days per year), suitable as part of the offset strategy from an Aboriginal Cultural Heritage perspective?

☑ Yes ☐ No

Comments: ALSO AGREE TO THE TRAINING OF 5 REPRESENTATIVES.

Is the revised Proposed Saddlers Creek Conservation Area (that has increased in area by 33 hectares to allow conservation of most of site SC01 and its terrain units) suitable as part of the offset strategy from an Aboriginal Cultural Heritage Perspective?

☑ Yes ☐ No

Comments: I AGREE WITH THE PROPOSED CONSERVATION AREA SADDLERS CK. AREA.

Proforma Completed By (please print): BARRY FRENCH. WARRAMA K. PTY LTD.
Position within Organisation: A. SITES OFFICER.
Signed: Barry. K. French.
Dated 17.7.07

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☑ Yes ☐ No

Comments:.....
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☑ Yes ☐ No

Comments:.....
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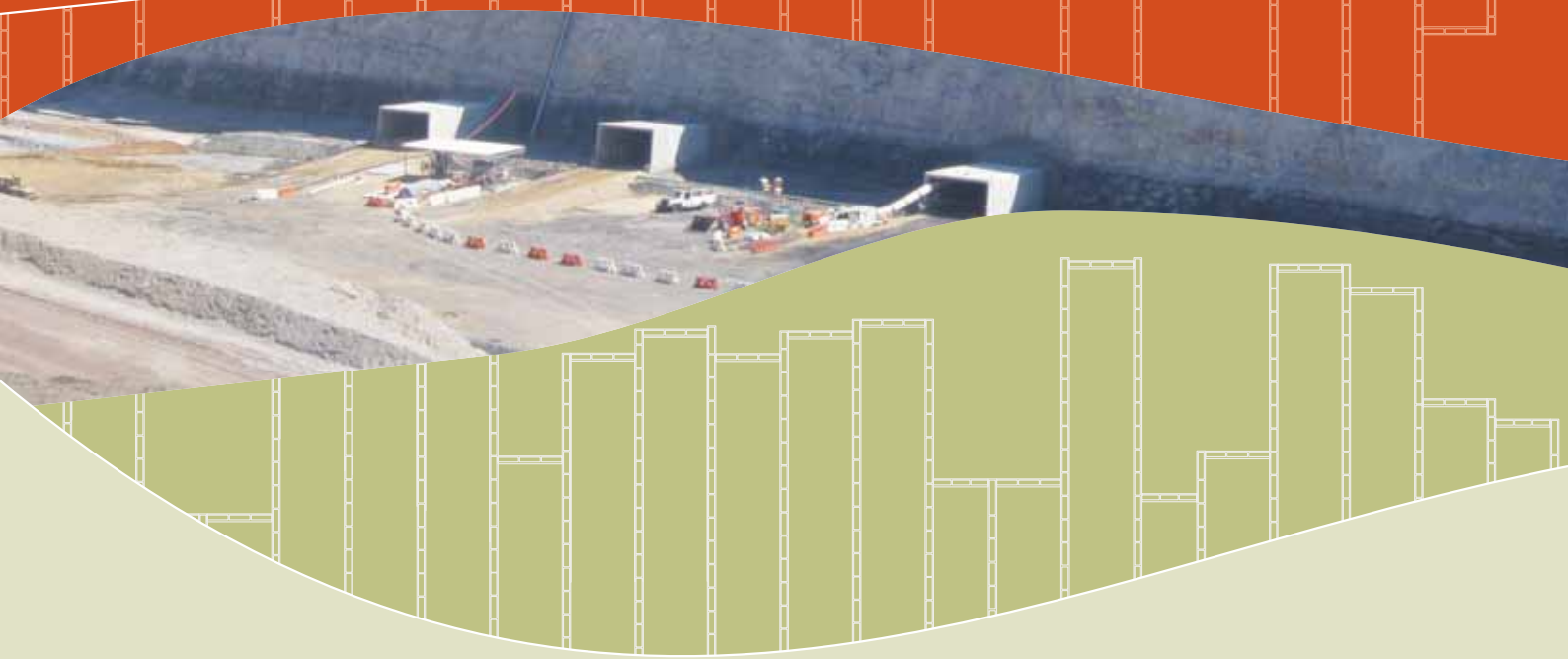
☑ Yes ☐ No

Comments:.....
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Proforma Completed By (please print): Brian Horton
Position within Organisation: Manager
Signed:
Dated 17-7-07

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Mt Arthur Coal

P: 6542 4800
F: 6542 4801

Private Mail Bag 8
MUSWELLBROOK 2333

Umwelt
Environmental Consultants

Umwelt (Australia) Pty Limited
2/20 The Boulevarde
PO Box 838
Toronto NSW 2283

Ph. 02 4950 5322
Fax 02 4950 5737

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