

WATERMARK

COAL PROJECT

ENVIRONMENTAL IMPACT STATEMENT

February 2013

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Aboriginal Archaeology
and Cultural Heritage
Assessments Synopsis



WATERMARK COAL PROJECT

ABORIGINAL ARCHAEOLOGY & CULTURAL HERITAGE ASSESSMENTS

SYNOPSIS

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**WATERMARK COAL PROJECT
ABORIGINAL ARCHAEOLOGY & CULTURAL HERITAGE ASSESSMENTS
SYNOPSIS**

for
Shenhua Watermark Coal Pty Limited

1 INTRODUCTION

1.1 BACKGROUND

In October 2008, Shenhua Watermark Coal Pty Limited (Shenhua Watermark) was granted Exploration Licence (EL) 7223. Shenhua Watermark is a subsidiary of the Shenhua Corporation.

The Watermark Coal Project (the Project) is located within EL 7223, approximately 25 km south south-east of the township of Gunnedah and to the immediate west of the village of Breeza, within the Gunnedah Local Government Area (LGA). The Project is approximately 282 km by rail from the export Port of Newcastle. **Figure 1** illustrates the regional locality of the Project in relation to the nearest town centres of Breeza and Gunnedah.

1.2 PROJECT OVERVIEW

Shenhua Watermark is seeking State Significant Development Consent under Division 4.1 of Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) for the Project. An Environmental Impact Statement (EIS) is being prepared by Hansen Bailey Environmental Consultants to support the Project Application. The Project Application Boundary (Project Boundary) is shown on **Figure 2**.

The Project generally comprises:

- The construction and operation of an open cut mining operation extracting up to 10 Million tonnes per annum (Mtpa) of Run of Mine (ROM) coal for a 30 year period;
- An open cut mining fleet of excavators and shovels, supported by haul trucks, dozers, graders, drill rigs and water carts;
- Progressive rehabilitation of all disturbed areas;
- The construction and operation of a Coal Handling and Preparation Plant (CHPP) with a throughput of 10 Mtpa ROM coal;
- The co-disposal of tailings and coarse reject within the Overburden Emplacement Areas (OEA);

- The construction and operation of a rail spur, rail loop, Kamilaroi Highway rail overpass, associated load out facility and connection to the Werris Creek - Moree Railway Line;
- The construction and operation of a Mine Access Road;
- The construction and operation of administration, workshop and related facilities;
- The construction and operation of ground and surface water management and reticulation infrastructure including pipelines, pumping stations and associated infrastructure for access to water from groundwater aquifers, the Mooki River and private dams to the north-east of the Project Boundary;
- The installation of communications and electricity reticulation infrastructure; and
- A workforce of up to approximately 600 full-time equivalent employees during construction and up to 600 full-time equivalent employees during the operation of the Project.

The conceptual layout of the Project is shown in **Figure 2**.

1.3 STUDY TEAM

The study team for the Aboriginal Archaeology and Cultural Heritage assessments for the EIS included:

- Dr Andrew McLaren, with support from Rochelle Coxon, from AECOM, who completed the Aboriginal Archaeology Impact Assessment;
- A/Prof Patricia Fanning from Macquarie University, who completed the Geomorphological Assessment of selected Aboriginal sites;
- Hugh Taylor from Australian Tree Consultants, who completed the assessment of potential Aboriginal scarred trees;
- Luc Daigle from Strata Control Technology, who completed the Geotechnical and Geomorphology Investigation of Grinding Groove Sites;
- Jane Delaney-John from Connect for Effect, who prepared the Aboriginal Cultural Heritage Values Assessment;
- Melissa Walker, Michelle Cavanagh and Kyle Prowse, who project managed the assessments described in this synopsis;
- Melanie Layton from Shenhua Watermark who provided client representation; and
- The local Aboriginal community.

1.4 PROJECT AREA

The Project area was defined as the Project Boundary comprising 9,500 ha as shown on **Figure 2**. The assessment of impacts was defined based on the Disturbance Boundary for the Project, comprising 5,630 ha as shown on **Figure 2**. The Project will generally be undertaken within the Disturbance Boundary.

The Project area is located within the Traditional Kamilaroi Country of the Gomeroi People, and wholly within the Walhallow Local Aboriginal Land Council (WLALC) boundary. The Red Chief Local Aboriginal Land Council (RCLALC) lies to the immediate north of the Project.

1.5 DOCUMENT PURPOSE

This document has been prepared in order to provide a summary of each of the five studies undertaken to assess the Aboriginal Archaeological and Cultural Heritage values and impacts associated with the Project and included in the EIS.

A consolidated list of the relevant management recommendations and commitments for all studies is also presented.

1.6 DOCUMENT STRUCTURE

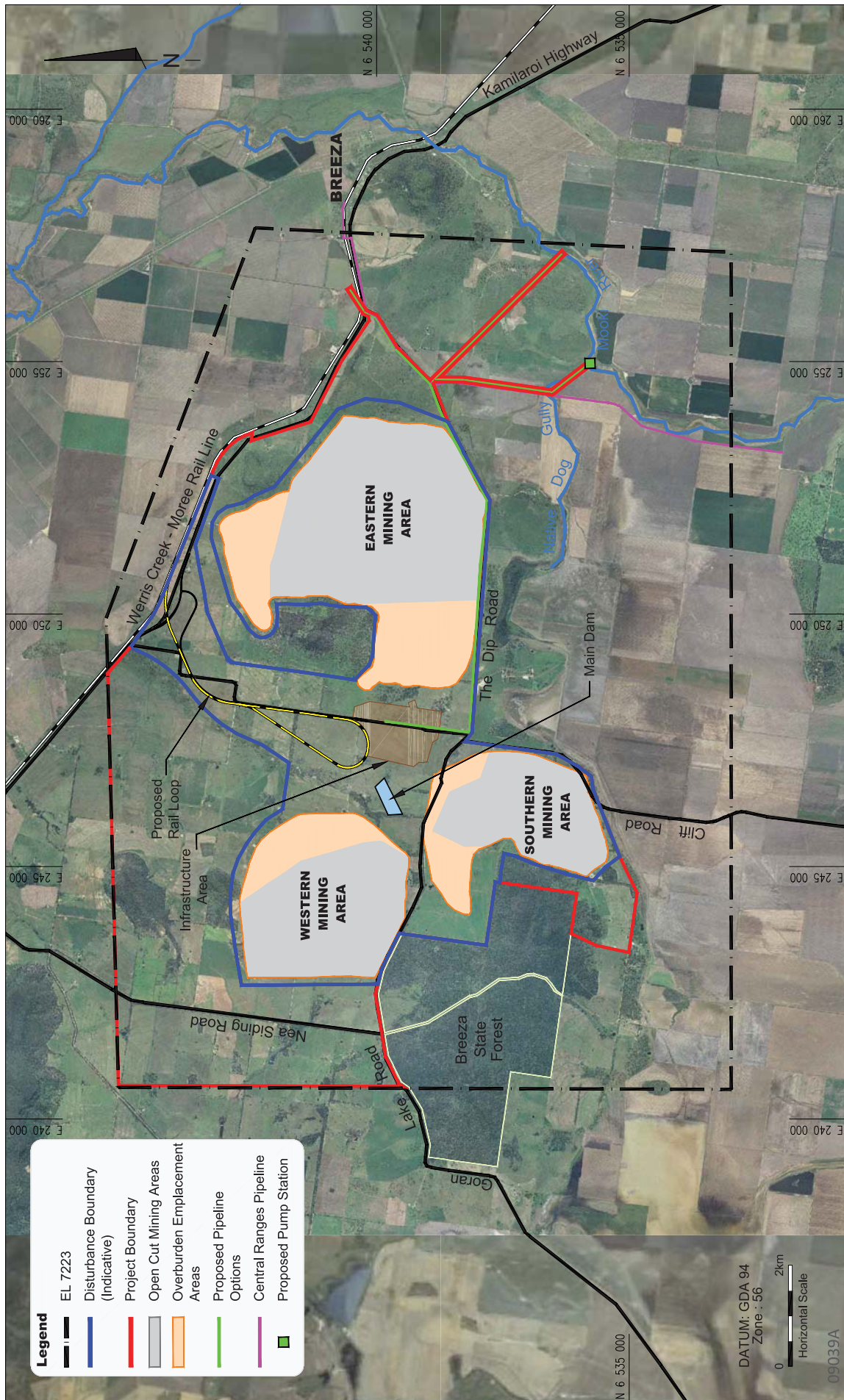
This document is structured as follows:

- **Section 2** describes the aims of each assessment completed for the EIS Aboriginal Archaeological and Cultural Heritage assessment and their interactions;
- **Section 3** provides a summary the stakeholder engagement work undertaken for the EIS Aboriginal Archaeological and Cultural Heritage assessment;
- **Section 4** presents an overview of the assessment methodologies utilised for each of the Aboriginal Archaeological and Cultural Heritage assessments;
- **Section 5** outlines the key results from each of the Aboriginal Archaeological and Cultural Heritage assessments;
- **Section 6** presents a consolidated list of relevant management recommendations and commitments;
- **Section 7** provides a conclusion to the document; and
- **Section 8** lists the documents referenced.



Hansen Bailey
ENVIRONMENTAL CONSULTANTS

WATERMARK
COAL PROJECT



WATERMARK COAL PROJECT

Project Layout

FIGURE 2

2 ASSESSMENTS OVERVIEW

2.1 INTRODUCTION

The purpose of the Watermark Coal Project EIS is to ensure all potential environmental, social and cultural values of the Project area are identified, and to understand how the Project may impact on these values. From this, Shenhua Watermark can then work with the local community to develop appropriate mitigation and management measures to reduce impacts.

Since 2008 when EL 7223 was granted to Shenhua Watermark, local Aboriginal stakeholders have identified the Project area as being one of cultural and archaeological importance.

In recognition of this, a key component of the EIS from early on was the preparation of comprehensive Aboriginal Archaeology and Cultural Heritage Impact Assessments. In light of its importance, it was agreed that a multi-disciplinary approach (as opposed to the regular assessment approach) was needed in this instance to ensure adequate assessment and development of mitigation strategies.

2.2 MULTI DISCIPLINARY APPROACH

In order to identify the Aboriginal archaeology and Cultural Heritage values of the Project area and any potential impacts as a result of the Project, five closely linked assessments were completed. The five assessments collectively produced the Aboriginal Archaeology and Cultural Heritage Assessment for the EIS and included:

- *An Aboriginal Archaeology Impact Assessment*, as prepared by AECOM Australia;
- *A Geomorphological Assessment of selected Archaeological Sites*, as prepared by A/Prof Fanning of Macquarie University;
- *An Aboricultural Assessment of potential Aboriginal scarred trees*, as prepared by Australian Tree Consultants (ATC);
- *A Geotechnical & Geomorphology Investigation of Grinding Grooves Sites*, as prepared by Strata Control Technology (SCT); and
- *An Aboriginal Cultural Heritage Values Assessment*, as prepared by Connect for Effect.

The combined assessment process involved background historical research, archaeological survey and research and consultation with local Registered Aboriginal Parties (RAPs). Each draft report was also provided to RAPs for review and comment.

The interaction and role of each assessment is shown in **Figure 3** and described further below.

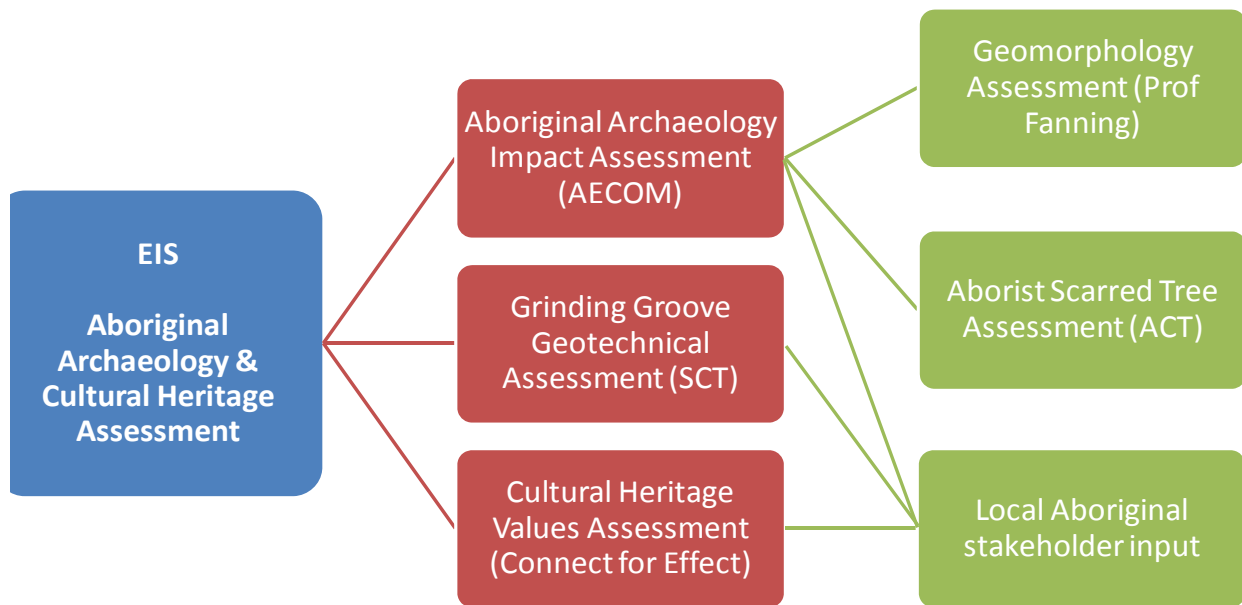


Figure 3
EIS Aboriginal Archaeology and Cultural Heritage Assessments

2.3 OBJECTIVES AND INTERACTIONS

The interaction and role of each assessment to collectively produce the Aboriginal Archaeology and Cultural Heritage Assessment for the EIS is as follows.

2.3.1 Aboriginal Archaeology Impact Assessment

The overarching objectives of the archaeological investigation undertaken by AECOM were to:

- Identify, through background research and targeted archaeological survey, the Aboriginal archaeological values of the Project area; and
- Provide, on the basis of significance and impact assessments, an appropriate management strategy for the known and potential Aboriginal archaeological resource of the Project area.

An understanding of the archaeological resources and values of the Project area allows an assessment of the archaeological (or scientific) significance of recorded Aboriginal archaeological sites within the Project area.

With respect to Aboriginal sites and places, it is possible to identify two major streams in the overall significance assessment process: the assessment of *scientific value(s)* by archaeologists and the assessment of *social (or cultural) value(s)* by Aboriginal people. The latter can only be identified through consultation with RAPs and is addressed in the Aboriginal Cultural Heritage Values report for the Project by Connect for Effect.

Scientific significance ratings are presented as a means of determining, in conjunction with assessed levels of social or cultural significance by RAPs, the most appropriate management / mitigation options for these sites.

2.3.2 Geomorphological Assessment

The aim of the Geomorphological assessment was to identify the potential for archaeological materials to be preserved beneath the surface within the Disturbance Boundary. Selected sites with the potential for subsurface archaeological materials were identified by AECOM following their field survey with RAPs and were the subject of this assessment. The findings of the assessment assisted AECOM in determining scientific significance and also guided the development of management measures for those sites.

2.3.3 Aboricultural Assessment

The aim of the Aboricultural assessment was to inspect potential Aboriginal scarred trees identified by RAPs during the archaeological field survey, to determine the age of potential scarred trees and if the markings were likely to be of Aboriginal origin. The findings of the assessments assisted AECOM in determining the scientific significance and also guided the development of management measures for those sites.

All potential Aboriginal scarred trees identified by RAPs were considered for their cultural significance by Connect for Effect in the Aboriginal Cultural Heritage Values report.

2.3.4 Grinding Groove Geotechnical & Geomorphology Assessment

During the AECOM archaeological field survey with RAPs, two significant grinding groove sites (WM-GG1-11 and WM-GG3-12) were identified within the proposed open cut mining areas.

To assist in determining management measures for these sites, the aim of the Geotechnical & Geomorphology Investigation Grinding Grooves Sites by SCT was to evaluate the effectiveness of relocating these grinding groove sites. The effectiveness of relocation was based on an assessment of rock extent, strength and composite characteristics.

The findings of the assessment assisted Shenhua Watermark and RAPs in developing appropriate management measures for these grinding groove sites (WM-GG1-11 and WM-GG3-12).

2.3.5 Aboriginal Cultural Heritage Values Assessment

The purpose of the Aboriginal Cultural Heritage Values Assessment (ACHVA) was to assess the Aboriginal cultural values and significance of the land within the Project area. This was undertaken in collaboration with the Aboriginal community. The cultural significance of the land within the Project Area was drawn from an analysis of values identified by RAPs.

The primary aims and tasks of the assessment were to:

1. Capture the views, cultural values and statements of RAPs relating to the Project area and its regional cultural landscape;
2. Capture the values of RAPs relating to site specific cultural heritage and landscape features;
3. Identify, where possible, ethno historic and historic narrative recording of Aboriginal land use to inform the understanding of past and present Aboriginal associations with the Project area;
4. Provide an assessment of the cultural significance of the Project area, considering cultural, historic, aesthetic and scientific values and using the findings of consultation and research; and
5. Provide a set of suggested management recommendations developed in consultation process with the RAPs, to identify Aboriginal cultural heritage management.

Results of the Aboriginal Archaeology Impact Assessment by AECOM were important inputs to the ACHVA as follows:

- The archaeological field survey of the Project area as undertaken by AECOM identified the Aboriginal sites for which the cultural heritage values were sought from RAPs in point 2 above;
- The scientific significance of archaeological resources as undertaken by AECOM were a key consideration in an assessment of the cultural significance of the Project area, as outlined in Point 4 above; and
- The recommended archaeological management measures by AECOM (as also influenced by the geomorphological, aboriginal and grinding groove geotechnical assessments) were a key consideration in the development and finalisation of management recommendations with RAPs, as outlined in Point 5 above.

2.3.6 Summary

In summary, each of the above assessments had a key role in assisting to determine the Aboriginal archaeological and cultural heritage values and significance of the Project area. Each assessment is intrinsically linked and all should be read in conjunction where possible.

Overall, the assessments combine to provide a complete understanding of the Aboriginal archaeological and cultural heritage resource of the Project area, beyond conventional assessment strategies. This approach has been integral in developing appropriate recommendations and mitigation management measures.

3 STAKEHOLDER ENGAGEMENT

Engagement with Aboriginal community stakeholders for the Project was conducted by a team from Hansen Bailey, AECOM, Shenhua Watermark and Connect for Effect in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010) and the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC, 2005a).

The engagement program for the Project commenced in January 2011 and has been ongoing since that time, with 144 RAPs involved as at October 2012. Key stages in the engagement process to date include:

- Stage 1 – Project Notification and stakeholder registration (commenced 31 January 2011);
- Stage 2 - Project information (commenced 21 February 2011);
- Stage 3 - Survey strategy and conservation values (commenced 21 February 2011); and
- Stage 4 – Draft archaeological and cultural heritage assessment review (commenced 16 August 2012).

The consultation with RAPs during the stakeholder engagement program was used to provide information at each stage in the process and to allow for the ongoing communication and provision of information.

All RAPs were provided the five draft assessment reports for consideration and comment. Feedback from RAPs was included in the relevant Project assessments described in this report, where possible.

Further details on the stakeholder engagement process undertaken for the Project are presented in the ACHVA and EIS Main Volume.

4 ASSESSMENT METHODOLOGIES

4.1 ABORIGINAL ARCHAEOLOGY IMPACT ASSESSMENT

4.1.1 Desktop Assessment

A comprehensive desktop assessment was undertaken and involved:

- A review of existing Aboriginal archaeological assessment reports and publications, to assess the current status of Aboriginal archaeology relevant to the region and local area. This was used to provide a basis for developing a predictive model for the land within the Project Boundary;
- A search of the Office of Environment and Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) database for all registered sites within the vicinity of the Project Boundary; and
- A review of landscape character and land use history, which influences patterning of sites.

The desktop review revealed that previous Aboriginal archaeological investigations within the Project Boundary were limited to a series of targeted field inspections carried out as part of a due diligence assessment for exploratory drilling activities. As part of this assessment, six putative Aboriginal archaeological sites were identified within the Project Boundary. All of these sites are currently registered on the AHIMS database.

Information sourced from the review of previous assessments and the AHIMS database was used to develop a predictive model of site types and associated content, distribution and integrity within the Project Boundary for which the field survey focussed on.

4.1.2 Field Survey

Field surveys were undertaken throughout the Project Boundary to:

- Test the predictive model;
- Locate and re-record all AHIMS registered Aboriginal sites;
- Identify unrecorded Aboriginal sites;
- Identify areas that may contain Aboriginal archaeological deposits, irrespective of the presence or absence of surface archaeology;
- Achieve a survey coverage that adequately reflects the variable archaeological potential of differing landform types within the Project Boundary; and
- Obtain sufficient data to facilitate the development of management and mitigation measures for the Project.

Archaeological survey of the Project area was undertaken with RAPs in two blocks between March 2011 and April 2012. The first and primary block of survey was conducted over a period of 25 days between March and May 2011.

The second block was conducted over a period of six days between March and April 2012 and provided an opportunity for the Senior Elders and Elders group to visit key sites.

A targeted survey strategy was adopted for the Project, which involved the division of the Project Boundary into its constituent landform types. A proportional field emphasis was then placed on those considered to have higher archaeological potential (i.e., level-to-gently inclined undulating/inclined flood/drainage plains, gently inclined foot slopes and level-to-gently-undulating hills on plateau surfaces). The survey effort across the Project Boundary was guided by the predictive model developed on the basis of the desktop review.

The survey was completed by a combined team of two AECOM archaeologists and up to eight RAPs at any one time on foot and by vehicle. The pedestrian survey involved individuals walking a series of linear transects, generally 80 m wide, within the Project Boundary.

All Aboriginal archaeological sites, including areas of subsurface potential and scarred trees, identified during the survey were recorded to a standard comparable to that required by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010). Open artefact sites were defined based on the 'artefacts within 100 m of each other' concept. Associated site attribute data (e.g. location, type and content) was also documented in conjunction with photographic records.

4.2 GEOMORPHOLOGICAL ASSESSMENT

Field survey for the geomorphological assessment was undertaken on 12 and 13 March 2012, under the direction of AECOM archaeologist, Dr Andrew McLaren.

Four of 16 artefact scatter sites and one grinding groove site were surveyed in the field to review their potential for subsurface archaeological material.

Digital historical aerial photography from 1954, 1967, 1976, 1989, 1998 and 2003 as well as the current 2010 image was also reviewed, along with a range of background documentation.

The assessment of each target site was completed based on background material, in addition to field observations of landscapes, current land surface stability, and subsurface materials exposed in creek banks, gully walls and shallow, hand-dug test pits.

4.3 ABORICULTURAL ASSESSMENT

The Aboricultural assessment was undertaken to assess 14 potential Aboriginal scarred trees identified by RAPs during the archaeological field survey.

Scarred trees are trees that have scars present on their trunk that are associated with the production of cultural implements such as coolamons, shields and canoes. Aboriginal scars can, in theory, be distinguished from those created by natural processes (e.g., branch fall, fire damage, lightning, insect activity) on the basis of the following characteristics:

- Aboriginal scars will be more-or-less regular in shape, often with parallel sides and slightly pointed or rounded ends;
- Aboriginal scars will typically terminate above ground level;
- Exposed sapwood on Aboriginal scars will be free of knots or evidence of branches;
- Aboriginal scars may exhibit stone or metal axe marks;
- Aboriginal scars will only occur on native Australian tree species; and
- Aboriginal scars will only occur on trees that are at least 100 years old.

A Visual Tree Assessment was conducted from ground level to assess each potential scarred tree. Tree heights and canopy spreads were visually estimated and trunk diameter was measured at 1.4 m above ground level. Each potential scarred tree was inspected and its location plotted using GPS technology.

4.4 GRINDING GROOVE GEOTECHNICAL & GEOMORPHOLOGICAL ASSESSMENT

A 3D photogrammetric survey of WM-GG1-11 and WM-GG3-12 was completed on 23 April 2012. This survey resulted in a detailed imaged record of the condition of the two sites prior to any subsequent activity. Each grinding groove was digitally recorded and rendered as a highly accurate surveyed three-dimensional surface.

The geotechnical field investigation of WM-GG1-11 and WM-GG3-12 was undertaken on 18 and 20 June 2012, which involved hand auguring and bedrock core samples.

Soil hand auguring was completed at both WM-GG1-11 and WM-GG3-12 and provided a detailed description of the immediate subsurface deposits within the associated landscape. Three lines of auguring were completed at WM-GG1-11 and two lines of auguring were completed at WM-GG3-12.

A single core from the sandstone bed hosting the grinding grooves at WM-GG1-11 and WM-GG3-12 was collected at each site. These cores were obtained through hand tool drilling methods in the presence of the Senior Elders Groups. These cores were required to determine the geotechnical nature of the grinding grooves hosting rock shelves. Features such as the thickness of the host slab, bedding separations, rock strength and durability of the rock slabs were determined through examination of the cored samples. Laboratory testing was then completed to establish the rock properties which were necessary to inform future management strategies of the site. The two bedrock cores have since been returned to WM-GG1-11 and WM-GG3-12 under the supervision of RAPs and AECOM archaeologists.

4.5 ABORIGINAL CULTURAL HERITAGE VALUES ASSESSMENT

The assessment of cultural significance was undertaken in accordance with:

- The *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC, 2005);
- The *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010);
- The *Interim Community Consultation Requirements for Applicants* (DEC, 2004);
- The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011); and
- The principles of the *Burra Charter* (Australia ICOMOS, 1999).

Aboriginal consultation regarding the Project commenced in January 2011. As at January 2012, a total of 132 RAPs were involved in the consultation program for the Project. Consultation was undertaken through a range of inclusive engagement approaches, including a series of RAP workshops, site visits, face to face discussions and telephone discussions.

In December 2011, community workshops, family meetings and Local Aboriginal Land Council discussions were held to provide the opportunity for all RAPs, in particular Senior Elders, to participate in the ACHVA process. RAPs involved identified cultural values and heritage information considering various facets of Aboriginal cultural heritage including:

- The spiritual and social association with the area;
- Historical associations and information passed down through families;
- Flora and fauna and ecosystem considerations;
- Spatial ethnography and use of the land and ecosystems over time;
- Shared land use and unique contributions of Aboriginal people in shaping the current rural context of the region today; and
- Cultural interpretation of the archaeological evidence of the Project Boundary, and its scientific values.

Consultation for the ACHVA continued between January 2012 to October 2012 through various Senior Elder and Elder meetings and site visits and RAP workshops. As at October 2012, 144 RAPs were involved in consultation over the Project.

Cultural significance and values expressed by RAPs in relation to the land in the Project Boundary were recorded with respect of Aboriginal cultural sensitivity, diversity and levels of attachment. Details of the consultation undertaken are presented in the ACHVA.

5 RESULTS

5.1 ABORIGINAL ARCHAEOLOGY IMPACT ASSESSMENT

5.1.1 Survey Results

A total of 55 Aboriginal archaeological sites were identified in the field survey of the Project Boundary, consisting of the 51 new sites and four AHIMS registered sites. The two previously recorded AHIMS sites were assessed as natural occurrences. The newly recorded sites consisted of:

- 17 artefact scatter sites;
- 23 isolated finds;
- Eight potential Aboriginal scarred trees (see **Section 5.3**); and
- Three grinding groove sites.

5.1.2 Significance Assessment

A total of eight sites identified within the Project Boundary were assigned high scientific significance, including three artefact scatters, four scarred trees and a grinding groove site. The most expansive site was that of WM-AS9-11, an artefact scatter located in Watermark Gully, with 358 artefacts identified over an area of approximately 10 ha. WS-AS9-11 is currently the largest and most complex Aboriginal archaeological site known within the 160,000 ha study region assessed by AECOM.

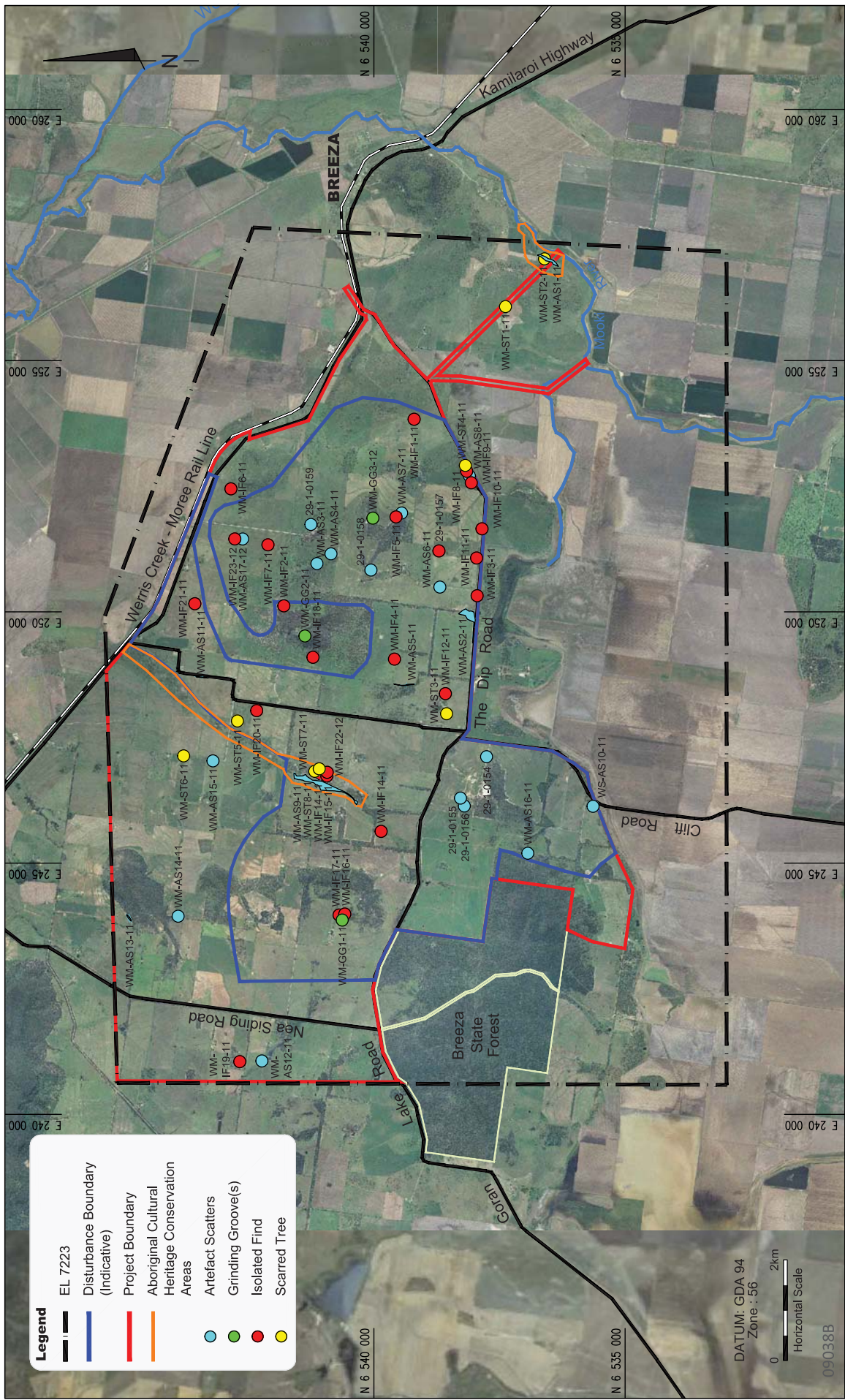
A total of 12 sites identified within the Project Boundary were assigned a moderate scientific significance, including 7 artefact scatters, two isolated finds, one scarred tree and two grinding groove sites.

The remaining 35 sites, which are mostly small artefact scatters, isolated flakes and cores, and poorly preserved scarred trees common to the study region, were assigned a low scientific significance.

5.1.3 Impact Assessment

The assessment found that a total of 29 Aboriginal archaeological sites within the Project Boundary will be directly impacted (**Figure 4**). **Table 1** lists the scientific significance rating associated with each archaeological site identified in the Project Boundary and the proposed management measures for each site.

An Aboriginal Archaeology and Cultural Heritage Management Plan (ACHMP) will be developed in consultation with RAPs and relevant government agencies. This plan will provide detailed salvage methodologies for sites impacted by the Project, including surface collection of 25 artefact scatters, combined surface collection and excavation of two significant artefact scatters and relocation of two significant grinding groove sites.



The ACHMP will also include provisions for the in-situ conservation of an additional 26 Aboriginal archaeological sites and the establishment of the Watermark Gully Aboriginal Cultural Heritage Conservation Area and the Mooki River Aboriginal Cultural Heritage Conservation Area. These proposed conservation areas include both known and potential Aboriginal archaeological resources and cultural values on land owned by Shenhua Watermark within and adjacent to the Project Boundary.

Table 1
Aboriginal Archaeology and Management

Site ID	Site Type	Scientific Significance
Surface Collection		
WM-AS11-11, WM-AS4-11, WM-AS6-11, WM-AS7-11	Artefact Scatter	Moderate
WM-IF21-11	Isolated Find	Moderate
WM-AS3-11, WM-AS10-11, WM-AS16-11, WM-AS17-12, 29-1-0154, 29-1-0156, 29-1-0158, 29-1-0159	Artefact Scatter	Low
WM-IF1-11, WM-IF3-11, WM-IF4-11, WM-IF5-11, WM-IF7-11, WM-IF10-11, WM-IF11-11, WM-IF13-11, WM-IF16-11, WM-IF17-11, WM-IF20-11, WM-IF23-12	Isolated Find	Low
Surface Collection and Excavation		
WM-AS5-11	Artefact Scatter	High
WM-AS2-11	Artefact Scatter	Moderate
Relocation		
WM-GG1-11	Grinding Groove	High
WM-GG3-12	Grinding Groove	Moderate
Conservation		
WM-AS9-11*, WM-AS1-11 [†]	Artefact Scatter	High
WM-ST4-11, WM-ST7-11*, WM-ST8-11*, WM-ST2-11 [†]	Scar Tree	High
WM-AS13-11, WM-AS15-11	Artefact Scatter	Moderate
WM-IF9-11	Isolated Find	Moderate
WM-ST3-11	Scar Tree	Moderate
WM-GG2-11	Grinding Groove	Moderate
WM-AS8-11, WM-AS12-11, WM-AS14-11	Artefact Scatter	Low
WM-IF2-11, WM-IF6-11, WM-IF8-11, WM-IF12-11, WM-IF18-11, WM-IF19-11, WM-IF14-11*, WM-IF15-11*, WM-IF22-12*	Isolated Find	Low
WM-ST1-11, WM-ST5-11, WM-ST6-11	Scar Tree	Low

* To be conserved in the Watermark Gully Aboriginal Cultural Heritage Conservation Area

[†] To be conserved in the Mooki River Aboriginal Cultural Heritage Conservation Area

5.2 GEOMORPHOLOGICAL ASSESSMENT

The Geomorphological assessment found that the Project area has had a long history of grazing, cultivation and timber extraction, extending back more than 150 years. This intensive land use, combined with extensive areas of relatively shallow, poor quality soils, resulted in severe soil erosion across most of the Project area prior to the 1960s. Gully, rill and sheet erosion are evident on the earliest air photos of the area (1954). Thus, any archaeological materials are likely to have been severely impacted by these geomorphic processes, resulting in a loss of integrity of artefact deposits, and the complete removal of the smallest items (<20 mm maximum dimension).

Notwithstanding the extent of severe erosion and soil loss in the past, there are several places in the Project area which have been identified to have a relatively high potential for discovery of relatively intact artefact deposits. These include the terraces on the west bank of the Mooki River on the eastern boundary of the Project area, and the valley floor immediately adjacent to Watermark Gully, especially within the unploughed area. The foot slope at the southern end of the WM-AS2-11 site also has relatively high potential for archaeological materials and there are artefacts visible at the surface where topsoil has been removed.

The grinding groove site WM-GG1-11 was assessed as having high potential for subsurface material largely due to the drainage depressions adjacent to the site and the relative depth of the soil cover.

The results of the Geomorphological assessment have assisted AECOM in determining appropriate management measures. In particular, a surface collection and excavation strategy is presented for WM-AS2-11 and WM-AS5-11 both of which were identified to likely contain subsurface archaeological materials.

5.3 ABORICULTURAL ASSESSMENT

The survey of the 14 potential scarred tree sites identified during the archaeological assessment found that six were likely to be non-Aboriginal in origin.

The potential scar trees were identified as mature native species with various scar forms, including four curved (pre-form) scars, three bark slab (sheet) scars, and one resource extraction scar. Of these scar forms, the resource extraction scar is considered rare on a local and regional scale.

Therefore, eight scarred trees were assessed by AECOM as Aboriginal scarred trees. All of these eight scarred trees will be conserved.

5.4 GRINDING GROOVE GEOTECHNICAL & GEOMORPHOLOGICAL ASSESSMENT

The soil hand auguring demonstrated that distinct soil horizons are present at both grinding groove sites, WM-GG1-11 and WM-GG3-12. WM-GG1-11 was shown to have very distinct, readily identifiable soil horizons. Of particular interest at WM-GG1-11 was the identification of an earlier surface which predates modern agriculture and indicates a period of greater erosion and water flow than the present surface. This horizon was buried through sedimentation from sheet flow off the surrounding topography.

Soil auguring at WM-GG3-12 found natural soil horizons derived from the weathering of underlying bedrock completely surrounded this site. The continuity of the bedrock slabs at WM-GG1-11 and WM-GG3-12 was found to consist of highly localised minor channel fills within the Permian aged bedrock. These formed resistant cap stones within the deeply oxidised and weathered profile leaving the sandstone free floating within the soil profiles.

Geotechnical analysis of the cored rock sample shows the sandstone slabs hosting WM-GG1-11 and WM-GG3-12 are low strength but coherent. Their density is approximately 2.25 t/m³ and both sites exhibit moisture contents of 3 % to 6 %. Results also indicated the bed thickness was shown to be greater than 30 cm on the central portion of the main slabs at both sides.

Because the host slabs are fully surrounded by weathered shale, siltstone and mudstone, they are effectively detached in the soil profile. The assessment found that long term management strategies such as relocation of the slabs hosting the grinding grooves are plausible. Relocation will require the development of a management plan in consultation with RAPs and relevant regulatory authorities to determine a procedure that would ensure the safe movement and future conservation of these materials.

Based on the composition of the grinding groove slab and the surrounding soil profile, the field assessment concluded that the sites could effectively be relocated from their current location through manual excavation. The relocation will occur prior to the disturbance of sites.

Detailed salvage methodologies for each grinding groove site will be included in the ACHMP, to be developed in consultation with the RAPs and relevant regulatory agencies.

5.5 ABORIGINAL CULTURAL HERITAGE VALUES ASSESSMENT

5.5.1 Impact Assessment

Concerns raised by RAPs regarding perceived impacts on cultural heritage values included that:

- The Project will impact on recorded cultural sites or landscape features of significant cultural value;
- The Project will impact directly on two sets of grinding grooves identified as having high cultural value;
- The Project may impact unrecorded subsurface cultural sites or items;

- The Project may increase the threat to cultural values, including the loss of animal habitats and the drawdown of watercourses;
- Loss of bush foods, medicinal plants, cultural resources (for art and ceremony), animals and plants;
- Regional inability to access land on which to hunt or gather bush foods and medicinal plants due to changed land tenure. This reflects a core concern regarding the loss of opportunities for knowledge to be passed down from older to younger generations and the inability to retain fundamentally important cultural practices on Country;
- Reassessment of six potential scarred trees and development of management measures relating to these areas;
- Development of protocols for specific areas of heightened cultural sensitivity, particularly the Mooki River Conservation Area; and
- The landscape as a whole becoming unrecognisable as a result of the Project and cumulative development in the region. Such loss of known landscapes is perceived to be a serious threat to Aboriginal cultural heritage, both traditionally and contemporarily, as stories and knowledge are linked to Country.

5.5.2 Cultural Significance Assessment

The RAPs assert that the land in the Project Boundary is of high archaeological significance; particularly given the sites identified during the archaeological field survey. The following sites were deemed to be of high cultural significance and value by Aboriginal people:

- The Watermark Gully area and known sites, including WM-IF14-11, WM-IF15-11, WM-IF22-12, WM-AS9-11, WM-ST8-11 and WM-ST9-11. Three of the sites were also assessed by AECOM to be of high scientific significance;
- Grinding groove complexes;
- Scarred trees; and
- Camping areas along the Mooki River and its significance in terms of the relationship to cultural and ceremonial importance.

Parts of the land within the Project Boundary are also considered to be of moderate to high aesthetic significance, particularly relating to major natural features such as Mt Watermark and the Mooki River and more generally relating to areas that have been less disturbed by agricultural activity.

The cultural significance assessment guided the Project team in developing appropriate mitigation and management measures. In particular, the Watermark Gully and Mooki River areas are to be protected from disturbance by including sites in Conservation Areas (see **Figure 4**). Further, all of the eight verified scarred trees will also be conserved and will not be disturbed as a result of the Project. It is proposed to relocate the grinding groove complexes with the RAPs to a suitable Conservation Area. The details of such relocation will be developed as part of the ACHMP with RAPs and relevant regulatory authorities.

6 RECOMMENDATIONS

Table 2 includes a list of management commitments and recommendations from the Aboriginal archaeology and Cultural Heritage assessments completed as part of the Project EIS.

Table 2
Aboriginal Archaeology & Cultural Heritage Management Summary

Ref	EIS Commitments & Recommendations
1.	In accordance with the ACHMP, Shenhua Watermark will complete a surface collection for 25 artefact scatters and isolated finds, which will be directly impacted by the Project, in consultation with RAPs.
2.	In accordance with the ACHMP, Shenhua Watermark will complete a surface collection and excavation program at two significant artefact scatter sites (WM-AS2-11 and WM-AS5-11). The program will include topographic surveys and a geomorphological assessment, followed by surface collection and test and open area excavations.
3.	In accordance with the ACHMP, Shenhua Watermark will relocate grinding groove sites WM-GG1-11 and WM-GG3-12. The final resting location and detailed salvage methodologies for each site will be developed and outlined in the ACHMP.
4.	In accordance with the ACHMP, Shenhua Watermark will protect 26 sites which will be identified on site plans and fenced, where appropriate.
5.	In accordance with the ACHMP, Shenhua Watermark will establish the Watermark Gully Aboriginal Cultural Heritage Conservation Area and the Mooki River Aboriginal Cultural Heritage Conservation Area.
6.	Shenhua Watermark will develop an ACHMP in consultation with RAPs, OEH and DP&I. The plan will include: • A detailed research design for salvage methodologies; • A staged Aboriginal heritage clearance process for all areas to be disturbed; • Provision for all archaeological salvage work to be undertaken by, or under the supervision of qualified archaeologists and RAPs; • Requirements for annual monitoring of protected sites by a qualified archaeologist and RAPs; • Third party review of arborist assessment of scarred trees (as per RAPs request); • Identification of the storage location (keeping place) and procedure for the care of salvaged artefacts in accordance with the Code of Practice for Archaeological Investigation for Aboriginal Objects in New South Wales (DECCW, 2010); • Provisions to facilitate continuing access to identified non-salvaged Aboriginal archaeological sites identified on Figure 4 for archaeological research purposes; and • Periodic review of the ACHMP.
7.	Shenhua Watermark will continue to consult with the RAPs to develop the management measures and the ACHMP for the project. The consultation will be undertaken and conducted in accordance with the guiding principle of mutual respect for all cultures

7 CONCLUSION

This document presents a summary of the Aboriginal archaeological and cultural heritage consultation and impact studies undertaken for the Project, including the assessment methodologies, key findings and recommended management measures. These assessments included:

- An Aboriginal Archaeology Impact Assessment;
- A Geomorphological Assessment of selected Archaeological Sites;
- An Aboricultural assessment of potential Aboriginal scarred tree sites;
- A Geotechnical & Geomorphological Investigation of Grinding Groove Sites; and
- An Aboriginal Cultural Heritage Values Assessment, prepared in consultation with RAPs for the Project.

It is noted that this report presents a summary only and that the Project EIS document and appended reports should be reviewed further for the full detail on the studies outlined in this Synopsis.

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for

HANSEN BAILEY



Melissa Walker
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James Bailey
Director

8 REFERENCES

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