APPENDIX 7

Aboriginal Cultural Heritage and Archaeological Assessment

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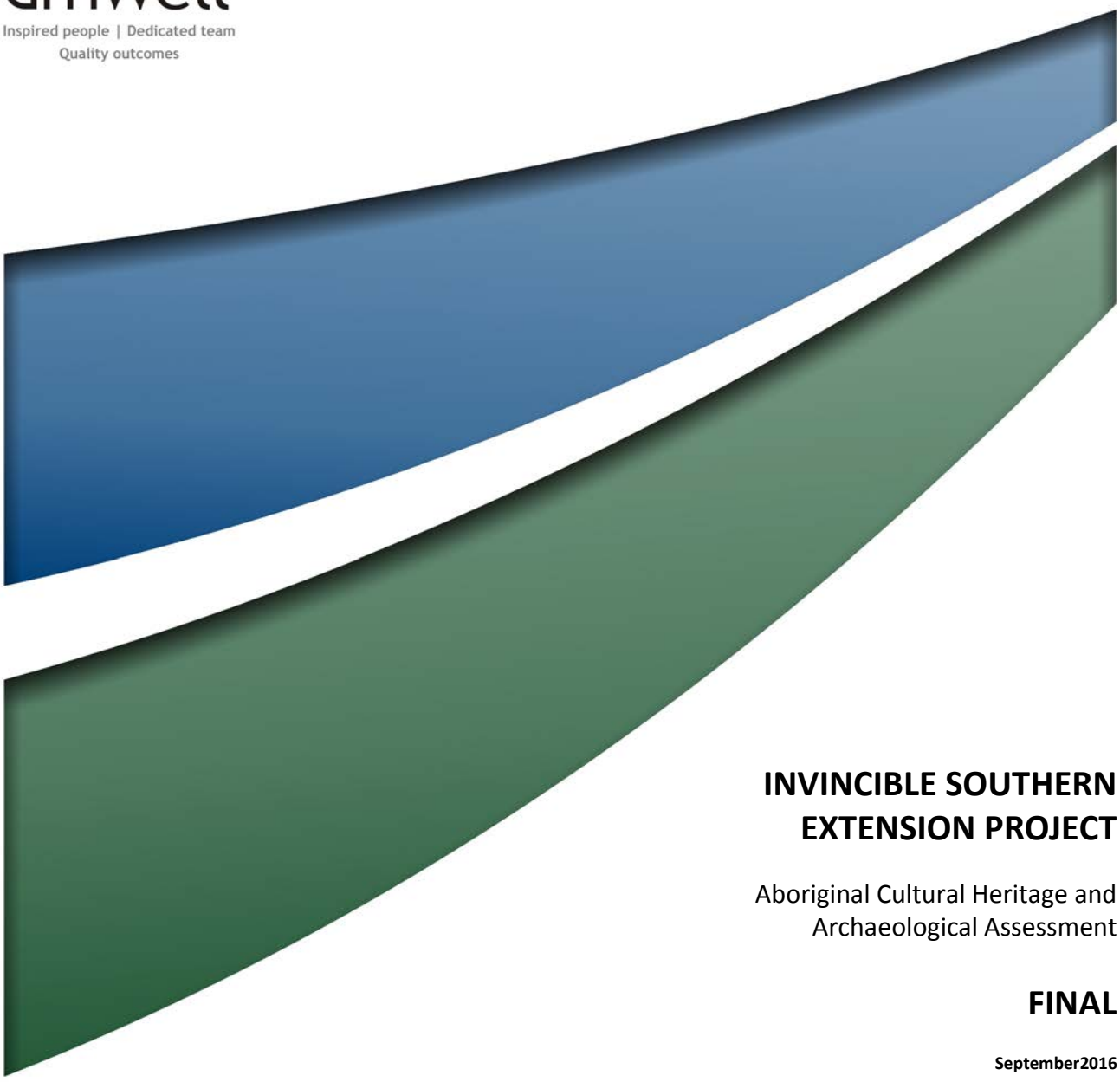

INVINCIBLE SOUTHERN EXTENSION PROJECT

Aboriginal Cultural Heritage and Archaeological Assessment

FINAL

September2016

INVINCIBLE SOUTHERN EXTENSION PROJECT

Aboriginal Cultural Heritage and Archaeological Assessment

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Castlereagh Coal Pty Limited

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This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Executive Summary

Castlereagh Coal Pty Limited (Castlereagh Coal) operates the Invincible Colliery (Invincible), an open cut coal mine located approximately 25 kilometres north-west of Lithgow in NSW. Castlereagh Coal is the trading name for Shoalhaven Coal Pty Ltd which is part of the Manildra Group (Manildra), an integrated and diverse agribusiness. Castlereagh Coal is proposing to modify the Invincible Project Approval to extend the life of mining operations at Invincible and obtain approval to extend the open cut mining operations to an area immediately south of the existing operations (Southern Extension Area). The proposed modification is referred to as the Southern Extension Project. Approval for the proposed modification is being sought under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The area assessed as part of this Aboriginal Cultural Heritage and Archaeological Assessment (ACHAA) consists of the Southern Extension Area, with additional survey undertaken within accessible areas within 500 metres of the Southern Extension Area to identify any sites such as grinding grooves or rock shelters that may be sensitive to indirect impacts such as blasting related impacts. Further targeted surveys were also undertaken along the eastern boundary of Invincible as due diligence for potential sites for mine related infrastructure associated with the existing Invincible operation, with results contained in this report for completeness. Targeted inspections of significant landscape features located to the east and north east of the Southern Extension Area including cliff line and pagoda structures were completed to assess archaeological and cultural significance. This included a site inspection of previously identified rock shelter site located approximately 1.1km from the Southern Extension Area.

Aboriginal party consultation was conducted in accordance with the Office of Environment and Heritage's Aboriginal Cultural Heritage Consultation Requirements for Proponents (Office of Environment and Heritage 2010). Six Aboriginal organisations registered for consultation for the Project. These parties have been consulted regarding the assessment strategy and draft assessment report and were invited to participate in a field survey for the Project.

The Southern Extension Area contains four previously recorded sites containing relatively low numbers and densities of stone artefacts. These sites are primarily located in proximity to minor drainage lines on relatively low gradient landforms and have been disturbed as a result of historical development activities within the Southern Extension Area.

The field survey was conducted from 26-29 April 2016. Eleven sites were recorded within and in the vicinity of the Southern Extension Area both previously identified and newly identified. As the overall visibility of the Southern Extension Area and additional survey area was low there is a possibility for further sites within the Southern Extension Area that were not identified during the survey. However due to the sloping nature of the landforms and level of previous disturbance it is likely any further sites would be small in number and of a similar nature to the currently identified sites. Six sites will be directly impacted by the Southern Extension Project as detailed in this report. The four sites identified in proximity to the existing Invincible operations will be managed in accordance with the Aboriginal Cultural Heritage Management Plan.

Based on a detailed blast assessment completed for the Southern Extension Project a conservative blast vibration limit for Pagoda structures and a cliff line in the vicinity of the Southern Extension Area has been established and all blasting will be below these limits. Therefore the Rock Shelter (45-1-2712) and the Pagodas (although they do not contain any archaeological features they are identified as being of cultural value) are not subject to any direct or indirect impacts associated with the Project.

The recommendations presented below were provided by registered Aboriginal party representatives participating in the survey.

- The scarred tree (IC ST) needs to be recovered from the pile at the windrow and stored in a weather sheltered location, elevated off the ground. The tree could be trimmed either side of the scarred section as part of this process.

- The artefact scatters and isolated finds (IC 1, IC 2, IC 3, IC 4, IC 5, 45-1-0069, 45-1-0070, 45-1-2708 and 45-1-2714) need to be collected, if they are to be impacted.

- Any salvaged artefacts need to be returned to a secure keeping place on country, potentially a shipping container within Invincible that can be accessed by the registered Aboriginal parties.

- As the potential birthing tree is in poor condition it is unlikely that it is possible salvage it. The tree should be recorded thoroughly using techniques such as detailed, high resolution photography and 3D scanning.

The following recommendations have been developed in light of the archaeological context of the region, the findings of the survey, the archaeological assessment of the Southern Extension Area , the cultural assessment of the area by Aboriginal parties; the potential impacts of the Southern Extension Project and current cultural heritage legislation.

- The Aboriginal Cultural Heritage Management Plan for PA 07/0127 should be revised in consultation with the registered Aboriginal parties. The revised ACHMP should be updated to reflect the outcomes of the current assessment and should include the management activities listed below.

- Prior to any impacts, surface collection of sites IC 1, IC 2, IC 3, IC 4, IC 5, 45-1-0069, 45-1-0070, 45-1-2708 and 45-1-2714 should be undertaken in accordance with the methodology provided in **Section 10.1**.

- Prior to any further impacts, the scarred tree (IC ST) should be salvaged in accordance with the methodology provided in **Section 10.2**.

- Rock shelter # 45-1-2712 is located outside the Southern Extension Area, and outside any predicted areas of blasting impacts. However, it is recommended that baseline recording and ongoing periodic monitoring of the shelter should be undertaken to ensure that there are no incidental impacts to the site. The methodology and requirements for monitoring will be subject to consultation with the registered Aboriginal parties.

- The rock formations known as the Pagodas are outside the Southern Extension Area and will not be subject to direct or indirect impacts from the Southern Extension Project. However, given that the these formations have been identified as having high Aboriginal cultural value, it is recommended that consideration be given to involving the registered Aboriginal parties if geotechnical monitoring is required to be undertaken at these locations. Any such monitoring should form part of the revised ACHMP and will be subject to consultation with the registered Aboriginal parties.

These recommendations have been reviewed and comments from the registered Aboriginal parties as part of the review of the draft ACHAA as detailed throughout this report.

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1.0 Introduction

Castlereagh Coal Pty Limited (Castlereagh Coal) operates the Invincible Colliery (Invincible), an open cut coal mine located approximately 25 kilometres north-west of Lithgow in NSW (refer to **Figure 1.1**). Castlereagh Coal is the trading name for Shoalhaven Coal Pty Ltd which is part of the Manildra Group (Manildra), an integrated and diverse agribusiness.

Coal mining at Invincible began in 1901 as an underground operation. Due to the relatively shallow depth of cover in the western part of the mining lease area, open cut mining has also been carried out at Invincible over various times in the long history of the operation. The open cut operations were placed in care and maintenance in 2013. The existing operations are shown in **Figure 1.2**.

Shoalhaven Coal purchased Invincible in 2015 to secure a continued supply of specialty nut coal for Manildra's Shoalhaven Starches Plant at Bomaderry on the NSW South Coast. The available coal within the approved mining area has largely been exhausted and the existing Project Approval 07/0127 (Invincible Project Approval) currently limits mining to eight years from the date of grant of the approval (i.e. to 4 December 2016). The Invincible Project Approval authorises ongoing rehabilitation activities after the date of approved mining.

Castlereagh Coal is proposing to modify the Invincible Project Approval to extend the life of mining operations at Invincible and obtain approval to extend the open cut mining operations to an area immediately south of the existing operations (Southern Extension Area) (refer to **Figure 1.2**). The primary purpose of the operation will be to provide specialty nut coal to Manildra's Shoalhaven Starches Plant. The target seam is the Lithgow Seam which is the lowest of the three coal seams present in the Southern Extension Area. This seam has previously been mined using bord and pillar mining methods as part of the Ivanhoe Colliery workings. The project would extract the remnant coal remaining in the pillars.

The proposed modification is referred to as the Southern Extension Project (the Southern Extension Project). Approval for the proposed modification is being sought under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Umwelt (Australia) Pty Limited (Umwelt) has been engaged by Castlereagh Coal to prepare the necessary environmental assessments for the Southern Extension Project, including this Aboriginal cultural heritage and archaeological assessment (ACHAA). The ACHAA has been prepared to accompany the Environmental Assessment (EA) prepared to support the application to modify the Invincible Project Approval.

1.1 Project description

The Southern Extension Project is a proposed extension of open cut mining operations to the south of the existing approved mining area at Invincible into an area referred to as the Southern Extension Area.

The Southern Extension Project includes:

- Extending the period in which mining can continue for a period of 8 years from approval of the modification application.
- Extending the open cut mining area immediately south of the existing mining disturbance area (refer to **Figure 1.1**). Extraction of coal from all seams down to, and including the Lithgow seam. No highwall mining or open cut mining in any other areas of Invincible is proposed as part of the Southern Extension Project.
- Continued use of existing Invincible infrastructure (including operation of, and maintenance work on, the existing Coal Preparation Plant).
- Use of existing open cut voids and former underground workings for water storage.
- No change to currently approved mining production rates.
- No change to currently approved product coal transport arrangements with coal to be transported from the site by road truck to either the Shoalhaven Starches Plant or Mt Piper Power Station.
- Rehabilitation of the proposed Southern Extension Area and all existing disturbance areas at Invincible by reshaping mining areas to remove voids and revegetating the reshaped landform with locally endemic woodland and forest communities.

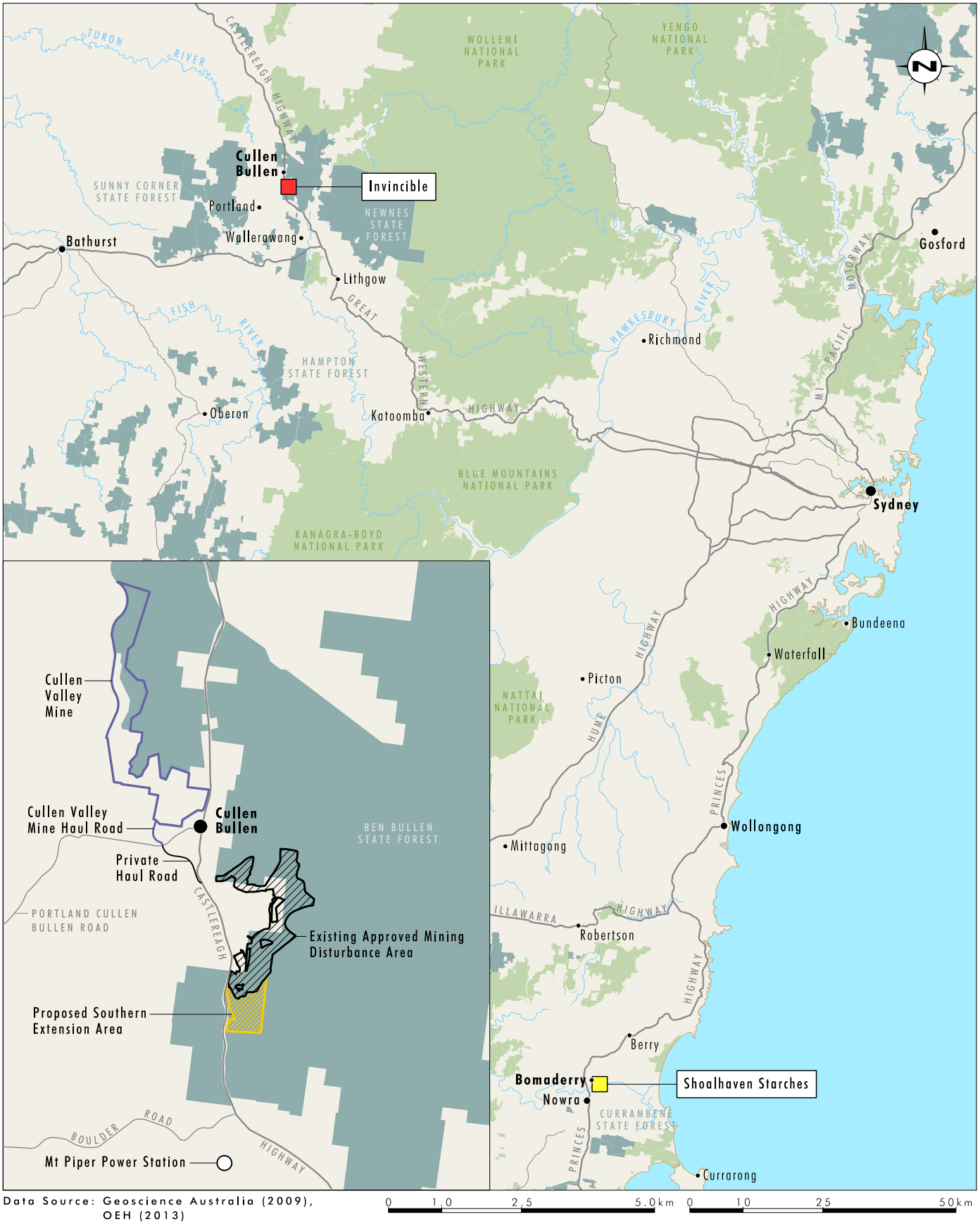

FIGURE 1.1

Locality Plan

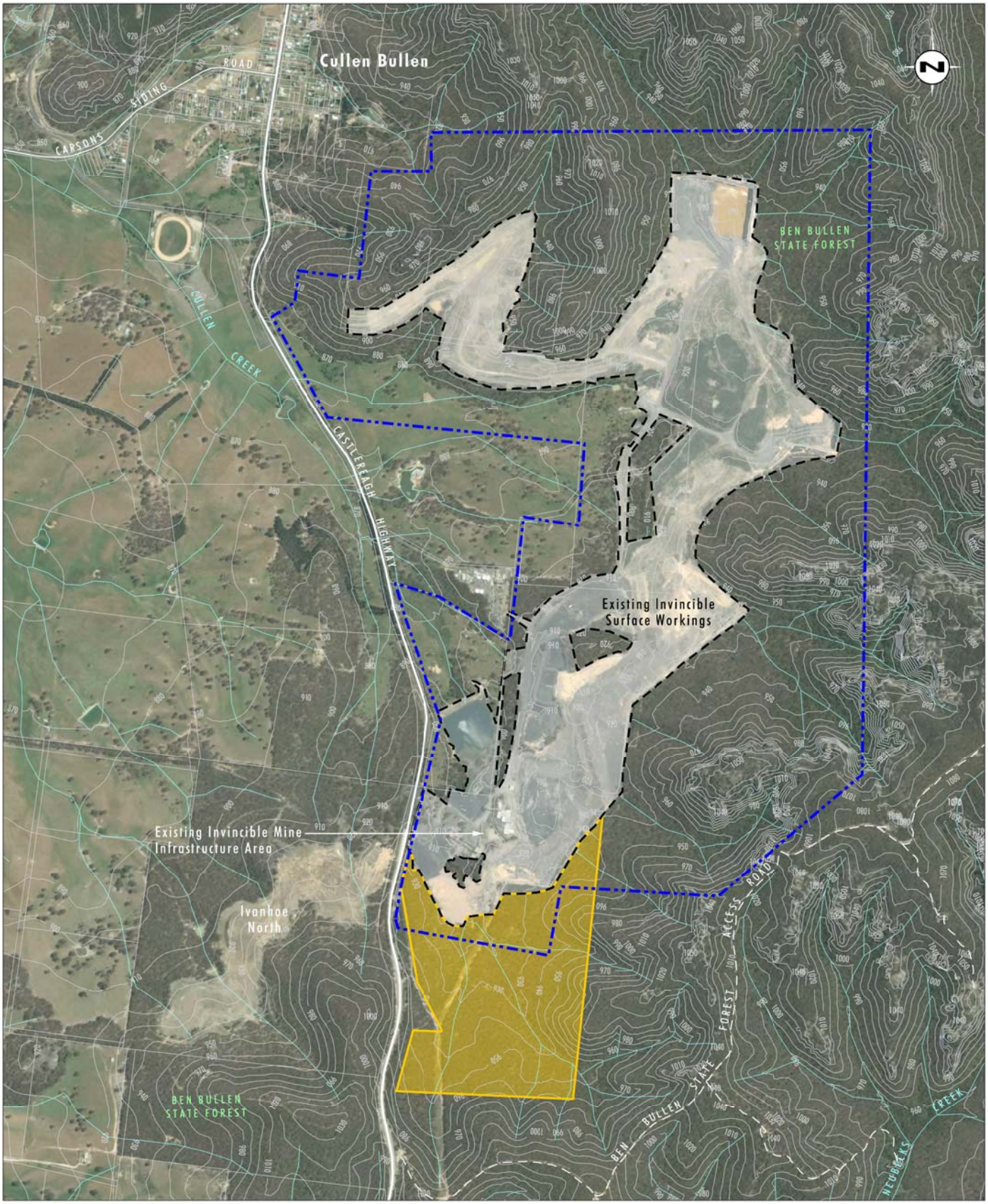

Image Source: Google Earth - CNES/Astrium (Nov 2014)
Data Source: LPI (2016), Forest Corporation of NSW (2015)
Note: Contour Interval 10m

0 0.25 0.5 1.0km

Legend

- Existing Approved Mining Disturbance Area
- Proposed Southern Extension Area
- Invincible Project Approval Boundary (PA07/0127)

FIGURE 1.2

Invincible Southern Extension Project

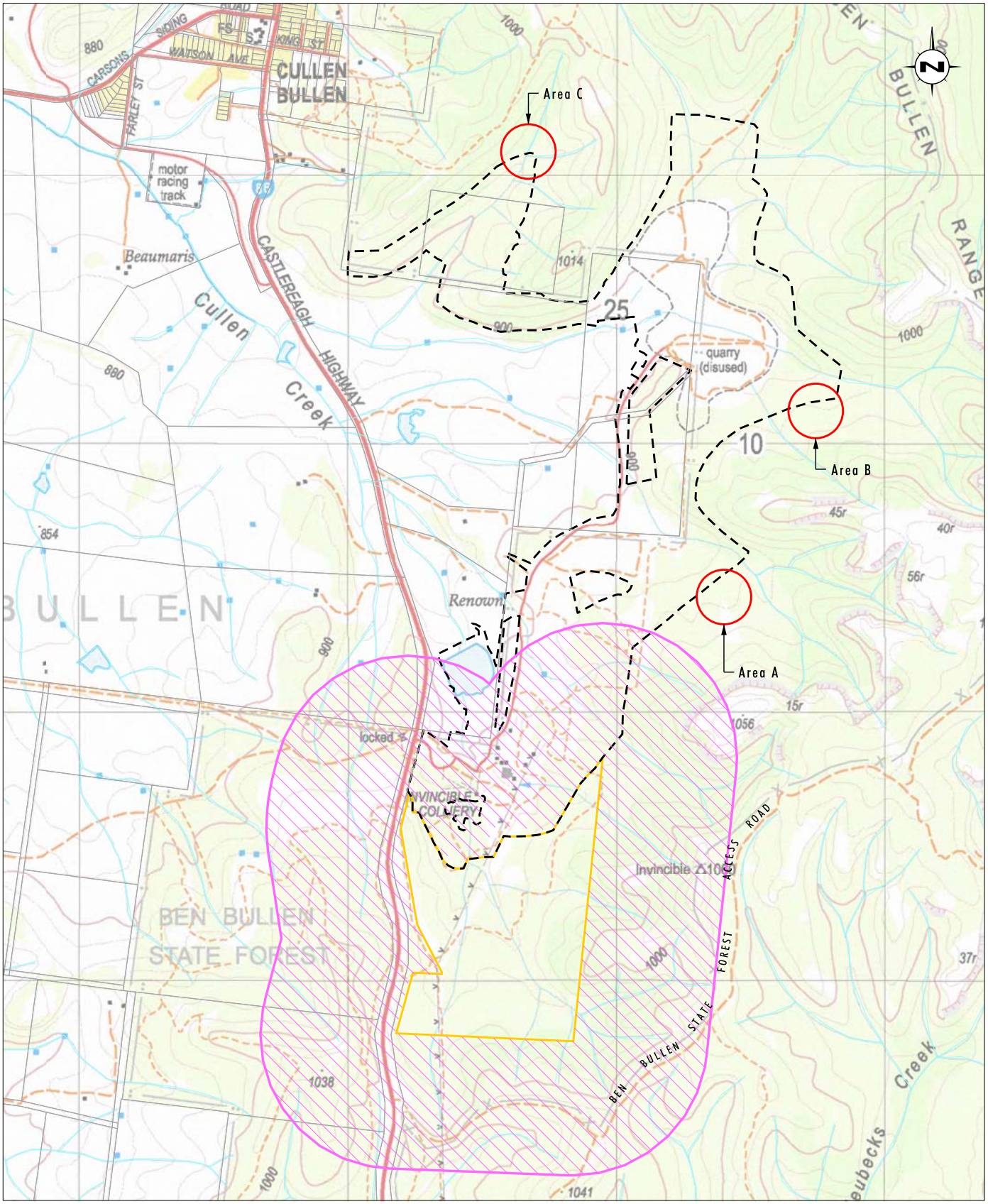

Image Source: Department of Lands (2006)
Data Source: LPI (2016)

0 0.25 0.5 1.0km

Legend

- Existing Approved Mining Disturbance Area
- Proposed Southern Extension Area
- Additional Survey Area
- Existing Operations Due Diligence Survey Area

FIGURE 1.3

Survey Areas

The area assessed as part of this ACHAA consists of the Southern Extension Area, with additional survey undertaken within a number of additional areas as shown in **Figure 1.3** and outlined below:

- Accessible areas within 500 metres of the Southern Extension Area (additional survey area) to identify any sites such as grinding grooves or rock shelters that may be sensitive to indirect impacts such as blasting related impacts.

- Targeted surveys along the eastern boundary of Invincible as due diligence for potential sites for mine related infrastructure associated with the existing Invincible operations (project design has since confirmed that these areas are not required for mine related infrastructure with results reported in this report for completeness).

- Targeted inspections of significant landscape features located to the east and north east of the Southern Extension Area including cliff line and pagoda structures to assess archaeological and cultural significance. A site inspection of previously identified rock shelter site located approximately 1.1km from the Southern Extension Area was also undertaken as part of this assessment.

1.2 Archaeological Management Plan for the currently approved Mining Activities: Coalpac 2009

Invincible currently operates under the Invincible Project Approval. In accordance with the conditions of this approval, currently approved activities are managed in accordance with an Aboriginal Heritage Management Plan (Coalpac 2009). This document identifies that there is one Aboriginal archaeological site (AHIMS # 45-1-2668 - Invincible OS1) located within the existing approval area. This site is subject to protection in accordance with the requirements of the Invincible Project Approval and management plan.

The management plan provides a protocol to be utilised in the event that further Aboriginal archaeological sites are identified during approved mining activities. In the event that sites are identified in the existing approved mining areas, the management plan outlines the process for inspection and assessment (by the Bathurst Local Aboriginal Land Council and a suitably qualified archaeologist), and the relevant management requirements, focussed on avoidance and protection of sites where possible.

As outlined above and as will be discussed further in this document, the current survey required entry into sections of the current approval area. In accordance with the current approval, any sites within this area are subject to the Aboriginal Archaeological Management Plan (Coalpac 2009) and are discussed as such.

1.3 Legislative context

Key legislation relating to the management of Aboriginal cultural heritage for the Southern Extension Project is discussed below.

1.3.1 Environmental Planning and Assessment Act 1979

The EP&A Act regulates development activity in NSW. Invincible Project Approval was granted under Part 3A and it is proposed to modify this approval under Section 75W of the EP&A Act. Accordingly, it is not necessary to obtain an Aboriginal heritage impact permit under Section 90 of the NPW Act (refer to **Section 2.2.2**) in relation to activities approved under Part 3A of the EP&A Act. Projects approved under Part 3A of the EP&A Act are subject to conditions of approval issued by the Department of Planning and Environment (DP&E) and (where relevant) Aboriginal cultural heritage is addressed by appropriate conditions.

1.3.2 National Parks and Wildlife Act 1974

The Office of Environment and Heritage (OEH) is primarily responsible for regulating the management of Aboriginal cultural heritage in New South Wales under the *National Parks and Wildlife Act 1974* (the NPW Act). The NPW Act is accompanied by the *National Parks and Wildlife Regulation* 2009 (the Regulation), the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010a) and other industry-specific codes and guides.

The NPW Act defines an Aboriginal object as:

> *..any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales.*

Under Section 84 of the NPW Act, an Aboriginal Place must be declared by the Minister as a place that, in the opinion of the Minister, is or was of special significance with respect to Aboriginal culture. Section 86(4) of the NPW Act states that a person must not harm or desecrate an Aboriginal place.

In accordance with Section 86(1) of the NPW Act, it is an offence to harm or desecrate a known Aboriginal object, whilst it is also an offence to harm an Aboriginal object under Section 86(2). Harm to an object or place is defined as any act or omission that:

- destroys, defaces or damages an object or place, or
- in relation to an object – moves the object from the land on which it had been situated, or
- is specified by the regulations, or
- causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c),
- but does not include any act or omission that:
- desecrates the object or place (noting that desecration constitutes a separate offence to harm), or
- is trivial or negligible, or
- is excluded from this definition by the regulations.

Section 87(1) of the NPW Act specifies that it is a defence to prosecution under Section 86(1) and Section 86(2) if the harm or desecration of an Aboriginal object was authorised by an Aboriginal Heritage Impact Permit (AHIP) and the activities were carried out in accordance with that AHIP. As discussed in **Section 2.2.1**, the provisions of the EP&A Act provide an exemption from the requirement for an AHIP under the NPW Act for activities approved as under Part 3A of the EP&A Act, as is the case with the current Invincible Project Approval. However, the other provisions of the NPW Act are still applicable.

1.4 Project team

All Aboriginal cultural input for this report has been provided by the registered Aboriginal parties and their representatives, as noted through the text. The inspection of the survey area was completed by Amy Armstrong (Bathurst Local Aboriginal Land Council), Bradley Bliss (Wellington Valley Wiradjuri Aboriginal Corporation), Coral Williams (Warrabinga Native Title Claimants Aboriginal Corporation) and Shaen Morgan (Warrabinga Native Title Claimants Aboriginal Corporation). The archaeological component of the inspection was undertaken by Alison Lamond and Jillian Huntley (Umwelt).

This report (including facilitating the recording of Aboriginal cultural input) was prepared by Alison Lamond (Archaeologist – Umwelt), Jillian Huntley (Senior Archaeologist – Umwelt) and Nicola Roche (Manager Cultural Heritage – Umwelt).

2.0 Aboriginal Party Consultation

Consultation with Aboriginal parties regarding this assessment has been undertaken in accordance with Part 8A, Clause 80C of the Regulation. A detailed Aboriginal party consultation log and all correspondence is included in **Appendix A**. Notifications were developed with reference to the requirements of Clause 80C Sub-clause (4), and the registration of Aboriginal parties was completed in accordance with Clause 80C Sub-clause (5). As a result of this process, six Aboriginal parties registered an interest in ongoing consultation regarding the Southern Extension Project.

The registered Aboriginal parties are:

- Ann Glassenbury
- Bathurst Local Aboriginal Land Council (BLALC)
- Mingaan Aboriginal Corporation
- Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC)
- Wiray-duraa Maing-gu
- Warrabinga Native Title Claimants Aboriginal Corporation (WNTCAC).

A draft methodology for the ACHAA was provided to all registered Aboriginal parties on 15 December 2015 and 29 January 2016. It was requested that all Aboriginal parties provide comment on the proposed assessment methodology, particularly in relation to the Aboriginal cultural values of the Southern Extension Area and the way in which the assessment may or may not contribute to documenting these values and assisting in their management.

Further to their identification as a registered party, WNTCAC are joint signatories to an ancillary deed of agreement with Gundungurra Tribal Council Aboriginal Corporation and Coalpac. Under this deed, the Southern Extension Area is designated as 'other areas to which the agreement applies' and is located outside the Gundungurra Tribal Council Aboriginal Corporation Native Title Application area and in proximity to the Warrabinga – Wiradjuri Claim Group Native Title Application area. A meeting was held with representatives of WNTAC, Castlereagh Coal and Umwelt on 22 April 2016 to discuss the ancillary deed and its requirements as it related to the ACHAA process. At this time, it was agreed that the proposed methodology for the assessment met the requirements of the deed and that the assessment report should address all relevant aspects of the deed. This ACHAA has been prepared in accordance with this understanding and includes all cultural information and management recommendations provided to date by representatives of the Warrabinga Native Title Claimants Aboriginal Corporation.

All registered Aboriginal parties were provided with the opportunity to be involved in the pedestrian survey of the survey area. The inspection of the survey area was conducted on the 26, 27, 28 and 29 April 2016 by Amy Armstrong (BLALC), Brad Bliss (WVWAC), Coral Williams (WNTCAC) and Shaen Morgan (WNTCAC).

A draft version of this ACHAA report was supplied to all the registered Aboriginal parties on 29 July 2016 with an invitation to review all aspects of this document, particularly those related to mitigation and management. Registered Aboriginal parties were asked specifically to provide any cultural information they deemed appropriate to the preferred management of the Southern Extension Area.

Verbal Comment that they were satisfied with the report was provided by Ann Glastonbury, indicating that she was very pleased with the including the Black fellows hand information in the report.

BLALC provided via email that they were satisfied with the report and agree with the recommendations and methodologies.

WVWAC provided a detailed response to the report including confidential information; as a result this response is not included in public copies of this report.

WNTCAC provided verbal comment via phone call which have been addressed throughout this report.

Information provided by the registered Aboriginal parties is summarised in **Sections 7.1, 7.2** and **9.1** and provided in full in **Appendix A (excluding the WVWAC response in public copies of this report)**.

2.1.1 Fieldwork participation

In recognition of the essential involvement of registered Aboriginal parties in the fieldwork program, the opportunity to participate in the survey was provided all registered Aboriginal parties. Only BLALC, WNTCAC and WVWAC were able to provide representatives for the survey. Registered Aboriginal party participation in the fieldwork program is detailed in **Section 6.2**.

An opportunity was provided on the final day of the survey for members of registered Aboriginal parties, unable to attend the survey to attend targeted inspection of the Southern Extension Area and onsite meeting to discuss the survey's findings. Only the registered Aboriginal party representatives already participating in the survey attended.

2.2 Native title

A search of the Native Title Tribunal register was undertaken on the 10 March 2016. No Native Title Claims and no Indigenous Land-Use Agreements (ILUAs) have been registered or notified by the National Native Title Tribunal as being in place over the Southern Extension Area.

However, as noted above, the WNTCAC are joint signatories to an ancillary deed of agreement with Gundungurra Tribal Council Aboriginal Corporation and Coalpac. Under this deed, the Southern Extension Area is designated as 'other areas to which the agreement applies' and is located outside the Gundungurra Tribal Council Aboriginal Corporation Native Title Application area and in proximity to the Warrabinga – Wiradjuri Claim Group Native Title Application area.

3.0 Environmental Context

The decisions that people make regarding such things as where they live, the range of resources they use and other aspects of daily life may be influenced by the environment in which they live. The preservation and visibility of sites is also affected by environmental factors such as vegetation cover, past land-use and disturbance. A review of the environmental context of the Southern Extension Area and additional survey area is therefore integral to considerations of site visibility, preservation and occurrence within the Southern Extension Area and additional survey area.

3.1 Geology

The Southern Extension Area and additional survey area is located within the upper Turon River catchment, which typically consists of steeply incised hills on Permian sediments (King 1993). The Southern Extension Area and additional survey area is located within the Western Coalfield which comprises of Palaeozoic metamorphosed rocks of the Lachlan fold belt, late carboniferous granites and early Permian Rylstone; overlayed by Permian Shoalhaven group, the Illawarra Coal Measures and the Triassic Narrabeen and Wiannamatta Groups. Within the Southern Extension Area and additional survey area the Illawarra Coal Measures dominate the surface geology and comprise shale, tuff, claystone, mudstone, siltstone, sandstone, conglomerate and coal (AECOM 2011). This surface geology includes sandstone cliffs and 'pagoda' formations in proximity to the Southern Extension Area and additional survey area (refer to **Figure 3.1**). The Pagoda formations are conical rock formations formed by differential weathering and erosion of the local sandstones. The 'platy 'pagodas, typical of the region surrounding the Southern Extension Area and additional survey area , include erosion resistant ironstone bands that can Project from the pagoda for tens of centimetres creating stepped unique shapes. While various types of rock pinnacles and 'beehive' formations occur all over the world, it has been suggested that these 'platy' pagodas with their distinctive iron stone banding are rare and hence the entire group of platy Pagodas (within the Blue Mountains National Park, Gardens of Stone National Park and Ben Bullen State Forest) have been assessed as significant (Washington and Wray 2011).

The geology of this area is particularly relevant with reference to the types of sites that may occur in the local area. Sandstone cliff formations may provide rock shelters utilised by Aboriginal people for occupation. Archaeological investigations in the wider region demonstrate the use of rock shelters for a wide range of activities including food preparation and consumption, stone tool manufacture, and the maintenance and the creation of art (AECOM 2011). In addition, horizontal sandstone platforms, particularly in association with creeklines, are often associated with sites referred to as grinding grooves, where the sandstone shelf has been used in the preparation of ground edge stone/wood implements resulting in the presence of distinctive grooves. Other stone materials available in the region such as the conglomerate and tuff strata in the escarpment areas, and cobble loads in rivers and many creeklines, have been identified as sources of raw material for stone tools. The main raw material utilised for stone tool production within previously recorded Aboriginal sites are cherts, silcrete, quartz, quartzite and basalt (Kelleher 2002).

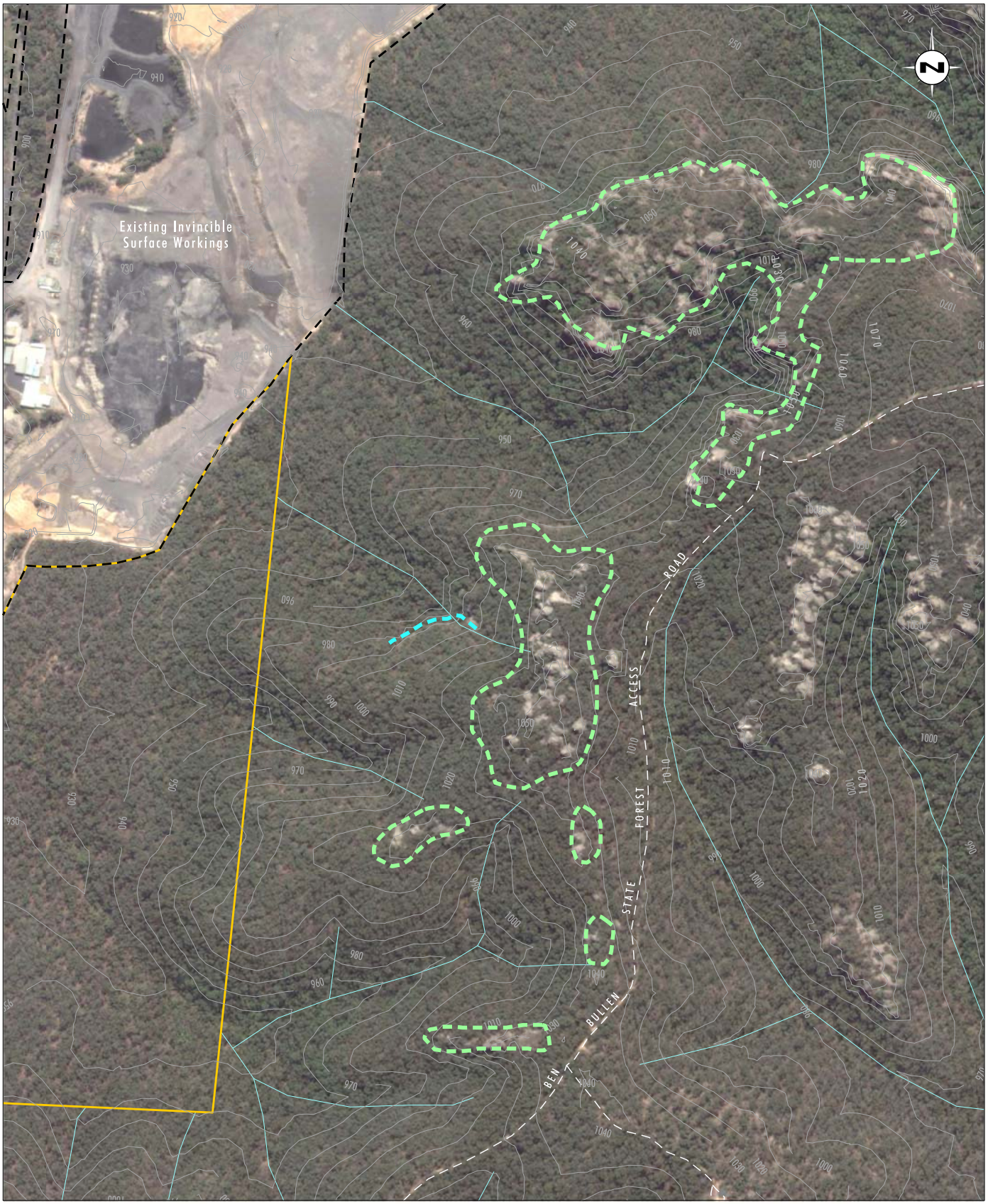

Image Source: Google Earth - CNES/Astrium (March 2015)
Data Source: LPI (2009)
Note: Contour Interval 10m

Legend

- Existing Approved Mining Disturbance Area
- Proposed Southern Extension Area
- Pogodas
- Cliffline

FIGURE 3.1

Nearby Pagodas

3.2 Topography and soils

While the Southern Extension Area and additional survey area is located within the Upper Turon Catchment, it only includes ephemeral drainage lines that are minor tributaries of Cullen Creek on the western edge of the Great Dividing Range. Cullen Creek is an ephemeral stream that rises in the steep hills of the Ben Bullen Range. It flows in a north-westerly direction before joining Delhuntys Creek approximately 4 kilometres downstream of Invincible, which in turn joins Williwa Creek before discharging into the Turon River. The confluence with the Turon is some 25 kilometres downstream of the Project. The Southern Extension Area consists of areas of ridge, slopes and gullies, surrounded outside the Southern Extension Area by steep sided gullies associated with the sandstone escarpment of the western extent of the Blue Mountains.

The central portion of the Southern Extension Area is located within the Cullen Bullen soil landscape which comprises rolling low hills and rises on Illawarra Coal measures. Rock outcrops occur in small isolated rock benches and ramps. The Southern Extension Area has been subject to vegetation clearing, however, typical native vegetation in this soil landscape consists of open woodland and commonly includes scribbly gum (*Eucalyptus rossii*), snow gum (*Eucalyptus pauciflora*), brittle gum (*Eucalyptus mannifera* ssp*. mannifera*), broad-leaved peppermint (*Eucalyptus dives*), red stringybark (*Eucalyptus macrorhyncha*), tussock grass (*Poa labillardieri*), blown grass (*Agrosits avenacea*), wallaby grass (*Danthonia* spp.), kangaroo grass (*Themeda australis*), wattle (*accia* spp.), guinea flower (*Hibbertia* spp.) and tea-tree (*Leptospermum* spp.) (King 1993).

The remainder of the Southern Extension Area is located within the Hassans Walls soil landscape which comprises cliffs of Narrabeen Group sandstones and steep colluvial talus slopes developed on Illawarra Coal Measures. Typical native vegetation within this soil landscape consists of open forest and open woodland and commonly includes scribbly gum (*Eucalyptus rossii*), red stringybark (*Eucalyptus macrorhyncha*), broad-leaved ironbark (*Eucalyptus fibrosa*), red box (*Eucalyptus polyanthemos*), mountain grey gum (*Eucalyptus eugenioides*), grey gum (*Eucalyptus punctata*), yellow box (*Eucalyptus melliodora*), and tea-tree (*Leptospermum* sp.) (King 1993).

Many plants utilised by Aboriginal people are identified as a part of these vegetation communities. Examples of useful plant species common in the area include bracken fern (*Pteridium esculentum*), flax-leaved riceflower (*Pimelea linifolia*), geebungs (*Persoonia* sp.), dianella (*Dianella* sp.) and mat rush (*lomandra longifolia*) (AECOM 2011). These communities also provide habitat for many types of fauna (AECOM 2011).

3.3 Climate

Presently the Southern Extension Area and additional survey area has a cool-temperate climate with mild summers and cold winters. Rainfall peaks in January and February, and is lowest during the winter months. Temperature maximums also occur in January, with July minimums. The low winter temperatures also inhibit plant growth (King 1993). During the Late Glacial Maximum (17000 to 24000 years ago) the Blue Mountains region experienced severe climate conditions, with average temperatures at least 8 degrees colder and 50% lower rainfall. The area comprised of semi arid grassland. The climate conditions in the Southern Extension Area and additional survey area improved in the late glacial period (17000 to 11500 years ago) with a rapid increase in temperature and the re-expansion of tree dominated vegetation communities. Records from the early Holocene (11000 to 6500 years ago) indicate the gradual development of warmer wetter conditions, while the climate oscillated between wetter and drier periods during the mid Holocene (6500 to 5000 years ago). Between 400 and 2000 years ago the areas experienced drier conditions, with present climatic conditions emerging over the last 1000 years (AECOM 2011).

3.4 Land-use history

European settlement of the Lithgow region did not occur until the crossing of the Blue Mountains by Blaxland, Lawson and Wentworth in 1813 and the construction of Cox's Road across the Blue Mountains from Windsor to Bathurst in 1815. Lithgow and the surrounding region did not begin to develop until the arrival of the railway and both the need for coal to power steam engines and their ability to transport the coal. From 1869 mining in the western coalfields rapidly increased to supply the ever growing demand (Heritage Office 1996).

The Southern Extension Area and additional survey area is located within the Ben Bullen State Forest which has been historically utilised for forestry, mining and grazing. The Ben Bullen State Forest is also currently used for recreational activities that have resulted in formal and informal tracks and trails being established throughout this area. The Castlereagh Highway is located on the western boundary of the Southern Extension Area and the northern boundary adjoins the existing Invincible open cut pit. Mining associated with Invincible began in approximately 1901. Parts of the Southern Extension Area have previously been subject to underground mining as a part of the Ivanhoe Underground operations and the abandoned Renown Colliery. This historic bord and pillar mining has resulted in significant subsidence within parts of the Southern Extension Area. Large sinkholes have been described on drainage lines within this area, and subsidence cracks are present throughout the Southern Extension Area. The Southern Extension Area is also crossed by an electricity easement.

3.5 Summary

The Southern Extension Area consists of areas of ridge, slopes and gullies, surrounded by steep sided gullies associated with the sandstone escarpment of the Western Blue Mountains and in proximity to significant sandstone formations (pagodas). The area has previously subject to forestry, grazing and mining activities with significant subsidence as a result of historic underground coal mining activities.

4.0 Cultural Context

Ethnohistoric information and previous archaeological research is considered to provide the cultural context for the Project. Ethnohistoric information such as official historic records, personal observations recorded in diaries or publications and paintings can provide information on Aboriginal lifestyles at the period of European contact. However these sources of information must be considered with the knowledge that colonial observers tended to record the unusual rather than the everyday, religious and social activities rather than economic and men's behaviour rather than women and children. These records are far from complete and include significant bias and the observers often did not understand the meaning/background of the events they witnessed and thus may have drawn conclusions/made assessments that were not accurate.

Available archaeological information for the region is also reviewed to assist in the identification of the typical nature and distribution of archaeological sites. This is limited by the availability of the information and the aims and geographical locations of previous surveys.

4.1 Ethno-historic context

The Southern Extension Area and additional survey area sits within in region that has been the subject to debate regarding cultural affinities. Tindale (1974) describes the area as within the eastern limits of Wiradjuri Country. However, as a result of its location on the westernmost edge of the mountains, the area is often referred to as a zone of interaction between the Wiradjuri, the Darug (alternatively spelt Dharug) and the Gundungurra (alternatively spelt Gandangara) (OzArk 2009). Another possibility is the area was part of a large 'neutral' travel corridor between the Newnes Plateau and Cox River Valley east of the Southern Extension Area and the Cullen Valley and Western Plains west of the Southern Extension Area (AECOM 2011). It is not the place of this assessment to attempt to provide further clarification on traditional ownership of the Southern Extension Area. We note that these theories do not agree in all cases with the understanding of Aboriginal parties in the area.

4.1.1 Wiradjuri

The Wiradjuri Nation was known as the land of the Three Rivers., namely The Wambool (now known as the Macquarie River), the Kalare (now known as the Lachlan River) and the Murrumbidjeri (modern spelling - Murrumbidgee). The southern boundary of the Wiradjuri Nation was formed by the Murray River, the western boundary by the vegetation change from woodland to grassland in the vicinity of Hay and the eastern boundary by the western extent of the Blue Mountains. The Wiradjuri had an estimated population of 12,000 people and were the largest tribe in New South Wales (Coe 1989:3).

Descriptions of Wiradjuri people at the time of first contact with Europeans are not common, however, limited records include description of raised cicatrices (scarring) on both men and women, and clothing of possum skins and kangaroo tails (Green 2002). Based on a review of available sources, Coe (1989:4) describes the Wiradjuri as fit people who took great pride in their appearance, wore cockatoo feathers in their hair, kangaroo teeth in their ears for jewellery and rubbed their bodies with animal fat. In summer they wore woven grass belts to hold their weapons and cloaks of possum and kangaroo skins in winter. The cloaks were sewn with dried kangaroo tail sinew. Wiradjuri women would use digging sticks (sharpened) to dig for yams, roots and to catch smaller game. They would carry a wooden dish or grass basket to hold any food gathered (Coe 1989:8).

Coe (1989:7) also provides historic accounts of the controlled burn of treeless grassy areas to encourage kangaroos into the area. The men would then hunt as a group with a large net (approximately 40 metres x 5 metres) made by the women. Groups were observed driving the kangaroos through the bush towards the net where they would be hit on the head with a boondi (club). This game was shared with everyone (Coe 1989:7). The use of a variety of spears was described, with heavier spears used to hunt kangaroos and emus and a smaller lighter spear used with a spear thrower for smaller animals and birds. These spears were made by sharpening some quartz or a kangaroo tooth and attaching it to the wood by kangaroo sinew. Early reports also describe boomerang hunting (Coe 1989:7).

Much was recorded between the 1870s and the 1940s about the ceremonial and cultural practices and spiritual knowledge of the Wiradjuri. Most material refers to the Burbung or male initiation ceremonies and rules (law), to 'clever men' or 'men of high degree' collectively referred to now as 'men's business' (Green 2002). The Wiradjuri believed in a central 'culture hero' known as Baiame who created the earth and then ascended into the sky to watch over them to ensure that custom was followed. Baiame gave the Burbung ceremony to the Wiradjuri and boys had to pass this ceremony to become men (Coe 1989:10). Women and the uninitiated were not allowed to witness the ceremony. Ceremonial practices in Wiradjuri Country appear to have declined rapidly from the 1860s (Green 2002).

4.1.2 European contact

Ethnographic reports are problematic for the Blue Mountains area as early explorers had difficulties making contact with Aboriginal people, and their presence was inferred by numerous bushfires that were assumed to be deliberately lit. It was suggested that the area was seasonally occupied by a small population with possible winter abandonment (Gorecki 1983).

Europeans became a permanent presence in the vicinity of the Southern Extension Area in 1824 when Robert Venour Dulhunty was granted 809 hectares of land at Cullen Bullen a name which it is suggested is adapted from the Wiradjuri name for the lyrebird (AECOM 2011). While there no specific accounts of the relationship between the Europeans of Cullen Bullen and the Aboriginal people of the area have been found, other properties such as James Walker's grant on the Marrangaroo Loop of the Cox River and Andrew Brown's grant at Farmers Creek are documented as having Aboriginal camps around 500 metres from their homestead. These camps are described to been in use until the 1880's with the Aboriginal people provided with casual work and handouts (AECOM 2011). While the relationships between Aboriginal people and Europeans in the area are described as cordial, armed conflict between Europeans and the Wiradjuri in Bathurst resulted in Governor Brisbane's declaration of martial law over the entire area in 1824. Aboriginal people who had in all probability had no involvement with the events in Bathurst were subject to reprisals by the groups of soldiers that were patrolling the area enforcing the Governors edict. Another crisis of this period was the small pox epidemic of 1830-31 which substantially decreased the Aboriginal population in the area (AECOM 2011).

4.2 Archaeological context

The following sections discuss the results of previous archaeological investigations that have been undertaken in proximity to the Southern Extension Area and the resulting archaeological implications for the Southern Extension Area and additional survey area. Previous assessments of Invincible have included comprehensive reviews of the archaeological context including the Coalpac Consolidation Project Aboriginal Archaeological and Cultural Heritage Impact Assessment (AECOM 2011). This information is therefore not revisited in detail but summarised below.

4.2.1 Regional context

The archaeological evidence from the region indicates that the Blue Mountains area has been occupied by Aboriginal people for at least the last 15,000 years. It appears that occupation occurred at relatively low intensity up to approximately 6000 years before present. After this time, there may have been a hiatus in occupation but this was followed after 3500 years by an intense phase of occupation (associated with McCarthy's (1967) characteristic Bondaian and Eloueran stone tool assemblages; now known as the Early, Middle and Late Bondaian assemblages) (AECOM 2011).

4.2.1.1 Occupation models proposed for the region

Many models for Aboriginal occupation of the Blue Mountains have been developed and while they have various issues with regard to sample size and site bias, they are still of use to this assessment.

Early studies recognised a link between topography, site types and artefact density. Johnson (1979) identified that large rock shelters on the margins of plateaus include numerous instances of art with low density artefact assemblages. While the frequency of the art within these sites indicates relatively intensive activity and multiple visits, the lithic assemblages indicate brief purposeful visits and not extended occupation by family groups. Johnson notes that intensive occupation occurs within the valleys and that the ridges were subject to sporadic occupation that he attributes to low resource availability.

Gorecki (1983) also recognised the archaeological potential of the escarpments predicting that larger numbers of sites will be identified there in particular in areas above swamps. The site types identified in the escarpment area would include rock shelters with potential archaeological deposit (PAD), paintings, engravings and burials. The ridge tops above the escarpments are predicted to have open campsites (sites containing stone artefacts), engravings and stone arrangements. The ephemeral/seasonal creeklines, in particular in proximity to swamp areas, may have lithic assemblages associated with food gathering and processing.

Further specific investigation of rock shelters determined a correlation between shelter use and aspect. Where the geology is suitable and geomorphological processes have created a high density of rock shelters/overhangs with a northerly or westerly aspect, these demonstrate the highest site frequency and artefact densities (Gollan 1987).

Excavations in the northwest of the Blue Mountains National Park by McIntyre (1990) further developed models for site distribution based on environmental features. McIntyre (1990) identified that large site complexes are typically located at the head of gullies and valleys where there is easy access from the ridge tops to resources and permanent watercourses. Small sites and site complexes are evidence of repeated transit use for purposes of hunting or travel and are found along or near the end of ridge tops, while single use sites are located along access routes between large site complexes and resource areas. The travel of Aboriginal people within the greater Blue Mountains was examined suggesting that water courses were unlikely to be used as access routes due to harsh and difficult terrain. Instead, interconnecting ridges such as those now modified for the Great Western Highway or Bells Line of Road provide the easiest access throughout the plateau. Outside the plateau the major river valleys (for example the Cox or Nepean Rivers) are likely to be key occupation and travel routes as they are both easy access and resource rich.

4.2.1.2 OzArk 2009: Baal Bone Colliery Indigenous Heritage Assessment

A series of assessments for the Baal Bone Colliery (to the north of the Southern Extension Area which includes Baal Bone Creek and Jews Creek catchments) by OzArk (2009) determined that the major drainage systems have a moderate to high possibility to contain archaeological sites. Major creeklines will typically contain evidence of more permanent or repeated occupation whilst areas in proximity to high resource zones such as swamps have a higher likelihood of containing complex sites with a range of activities represented in lithic assemblages. Sites located further from permanent water are likely to be smaller and the result of one off occupation. Culturally modified trees are most frequently identified in close proximity to creeks and rivers. The assessment of escarpment landforms identified that evidence of occupation of rock shelters is likely to occur and factors such as assemblage complexity are dependent on the amount of space within the shelter.

4.2.2 Location context

This section reviews the information specific to the immediate context of the Southern Extension Area and additional survey area with reference to the results of an AHIMS search and the review of a previous assessment that relates to the Southern Extension Area and additional survey area.

4.2.2.1 Aboriginal heritage information management system

The Office of Environment and Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) is a database of Aboriginal sites for which site cards have been submitted. The AHIMS database was searched on 2 September 2015 for sites located in a 5 square kilometres area around the Southern Extension Area and additional survey area (GDA coordinates E222000-227000, N6306000-6311000 - refer to **Appendix B**). General information regarding the sites identified is provided in **Table 4.1** and **Figure 4.1**. An updated search was conducted on 15 September 2016 (refer to **Appendix B**) only one further site (an artefact scatter) had been recorded approximately 1.8 kilometres to the west of the Southern Extension Area.

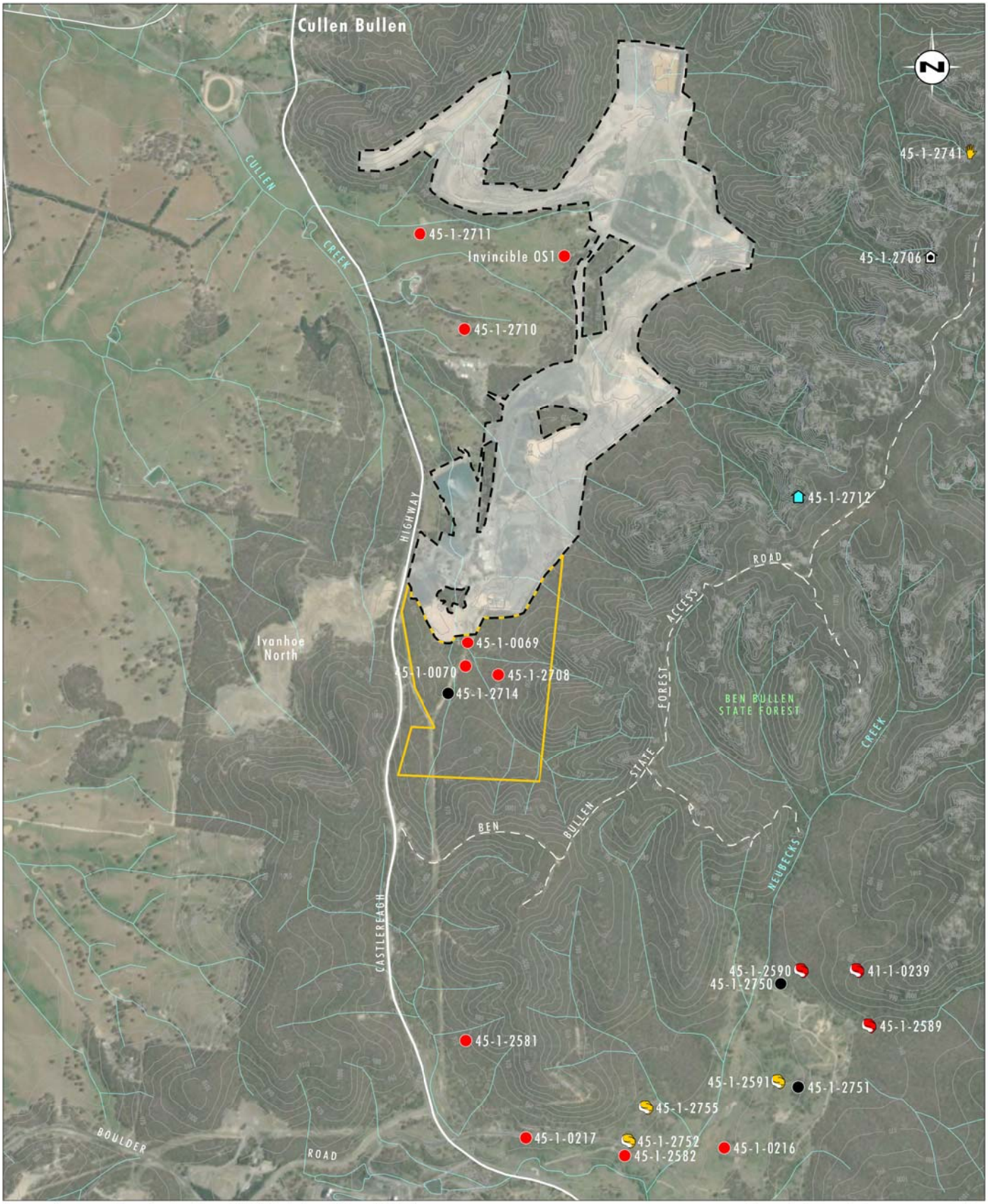

Image Source: Google Earth - CNES/Astrium (Nov 2014)
Data Source: AHIMS (2015)
Note: Contour Interval 10m

0 0.25 0.5 1.0km

Legend

- Existing Approved Mining Disturbance Area
- Proposed Southern Extension Area
- Art Site / Isolated find
- Artefact Scatter
- Artefact and Potential Archaeological Deposit
- Isolated Find
- Isolated Find / Potential Archaeological Deposit
- Rockshelter / Potential Archaeological Deposit
- Rockshelter / Artefact Scatter

FIGURE 4.1

Registered AHIMS Sites in Proximity to Proposed Southern Extension Area

Table 4.1 AHIMS Registered Sites within and in Vicinity of the Southern Extension Area

Site Type	Site Feature	Number of Sites
Artefact Scatter	Multiple stone artefacts in proximity to each other with no other associated features.	11
Isolated Find	A single stone artefact without other associated site features.	3
Rock shelter and PAD	A sheltered area created by a rock overhang within a cliff line possibly used for habitation by Aboriginal people with potential archaeological deposit	1 (none within Southern Extension Area)
Artefact Scatter and PAD	Multiple stone artefacts in proximity to each other and potential archaeological deposit.	6 (none within the Southern Extension Area)
Art and Artefact Scatter	Art created by Aboriginal People and multiple stone artefacts in proximity to each other.	1 (none within the Southern Extension Area)
Rock shelter, PAD and Artefact Scatter	A sheltered area created by a rock overhang within a cliff line possibly used for habitation by Aboriginal people with potential archaeological deposit and stone artefacts.	1 (none within the Southern Extension Area)
Total		**23**

Based upon the locations and distributions of the previously recorded sites listed on AHIMS a cluster of artefact sites are located to the south of the Southern Extension Area and to the north (in proximity to the currently approved mining area). These sites are located in proximity to drainage lines all within low wide valleys; lower and more gently sloped than those within the Southern Extension Area. The rock shelters located in the vicinity of the Southern Extension Area are located to the west of the Project and within the cliff area immediately below the ridges. As outlined in **Table 4.1**, only artefact scatters and isolated finds occur within the Southern Extension Area and survey area.

Details of the previously recorded sites identified within the Southern Extension Area and in proximity to the Southern Extension Area are provided below.

4.2.2.2 AECOM 2011: Coalpac Consolidation Project Aboriginal Archaeological and Cultural Heritage Impact Assessment

AECOM (2011) completed a detailed assessment as part of an Environmental Impact Statement for a previously proposed expansion of Invincible. The area assessed included the current Southern Extension Area and a considerable area to the north of the current approval area. The assessment provides a review of the Aboriginal sites identified in previous assessments in the region surrounding Invincible. The majority of sites identified consisted of artefact scatters and isolated finds. Other site types included rock shelters (including rock shelters with art or PAD), PAD and grinding grooves. The sites, in particular the artefact scatters and grinding grooves, were identified in proximity to waterways including ephemeral drainage lines. The raw materials commonly recorded within stone artefact assemblages include quartz, chert, mudstone, tuff and quartzite. Where they were described, the artefact types commonly included broken flakes, complete flakes and cores (including bipolar reduction) with very small numbers of blades and retouched artefact types.

As part of the assessment, all non disturbed landforms were subject to pedestrian survey, resulting in fairly extensive survey coverage. However, the presence of heavy vegetation coverage resulted in extremely poor ground visibility. The Southern Extension Area was assessed to have low potential to retain any archaeological integrity due past land uses and the erosion typical of the soil landscape.

Fifteen sites, including six previously recorded sites, were identified as a part of the survey, of which four are located within the current Southern Extension Area. The AECOM 2011 report also provides detail of the earlier survey of the area in 1982 by Lelia Haglund when two of the artefact scatters located within the Southern Extension Area were initially recorded (refer to **Section 4.2.3**). The sites located within the Southern Extension Area are listed in **Table 4.2.** The assessments recommended the surface collection of these sites prior to impact, subsurface investigations were not deemed necessary due to the small size and disturbed nature of these sites.

In addition, a rock shelter site was identified approximately 1.1km from the Southern Extension Area, as noted in **Table 4.3**. This is the only previously identified site located that is of a site type that is more vulnerable to indirect impacts such as vibration as a result of mining activity. This site is therefore reviewed as part of the current assessment.

Table 4.2 Previously Registered Sites within Southern Extension Area

AHIMS#	Site Name	Type	Description	Landform
45-1-0069	Invincible Colliery 1	Artefact Scatter	Sparse artefact scatter containing 16 artefacts within a 100 square metre area partially within a 66 kV transmission line parallel to the Castlereagh Highway. Quartz was the dominant raw material with a minor quartzite and chert/ tuff component. Recorded artefact types include mainly flakes and cores. The site condition is disturbed as a result of the construction of the transmission line and drain. The site was recorded by Linda Haglund in 1982 and only 1 artefact identified by AECOM in 2010. AECOM assessed the site as having low significance and low subsurface archaeological potential.	Slope.

AHIMS#	Site Name	Type	Description	Landform
45-1-0070	Invincible Colliery 2	Artefact Scatter	Sparse artefact scatter within a 220 square metre area within a 66 kV transmission line parallel to the Castlereagh Highway. Quartz was the dominant raw material with a minor quartzite and chert/ tuff component. Recorded artefact types include mainly flakes and cores. The site condition is disturbed as a result of the construction of the transmission line. The site was recorded by Linda Haglund in 1982 and 7 artefacts were identified by AECOM in 2010. AECOM assessed the site as having low significance and low subsurface archaeological potential.	Spur ridge within gently to moderately undulating terrain.
45-1-2708	CV-AS1-10	Artefact Scatter	An artefact scatter consisting of a quartz core and broken chert flake 170 metres southeast of Invincible Colliery 2 on a vehicle track within an area of 6 square metres. The site was assessed as highly disturbed with low subsurface archaeological potential. The site was recorded by AECOM in 2010.	Lower slope within gently to moderately undulating terrain.
45-1-2714	CV-IF1-10	Isolated find	An isolated complete chert/ tuff flake within an unsealed vehicle track within the 66 kV transmission line parallel to the Castlereagh Highway. The site was assessed as highly disturbed with low subsurface archaeological potential. The site was recorded by AECOM in 2010.	Mid slope within gently to moderately undulating terrain.

Table 4.3 Previously Registered Sites in Proximity to the Southern Extension Area

AHIMS#	Site Name	Type	Description	Landform
45-1-2712	CV-RCK1-10	Rock Shelter, PAD and Artefact Scatter	A rock shelter with large overhang approximately 36 x 25 x 20 metres with a westerly aspect. Five artefacts were identified within the shelter, three flakes (2 quartz, 1 chert/ tuff), 1 broken quartz flake and a chert/ tuff scraper. The Deposit within the shelter was assessed as moderate potential to contain further sub-surface deposits. Quartz is available within the shelter and immediately adjacent where it is eroding out of the parent sandstone. An intermittent waterfall on the northern edge of the shelter is a source of fresh water. The site was assessed to have moderate subsurface archaeological potential and moderate scientific significance. It was noted that ongoing natural erosion was occurring within the shelter and impacting the condition of the deposit. The site was recorded by AECOM in 2010.	Head of steep-sided forested valley, base of vertical sandstone cliffs (approximately 1.1 kilometres east northeast of the Southern Extension Area)
45-1-2668	Invincible OS1	Artefact Scatter	A large open artefact scatter on a low rise adjacent to a third order tributary of Cullen Creek. Artefacts were identified in exposures in earthworks for the constructed of two farm dams. The 74 artefacts identified included cores, flakes, blades, flaked pieces, an edge ground axe and a broken grindstone. Raw material types included quartz, quartzite, chert, tuff and volcanics. Less disturbed portions of the rise were assessed by AECOM 2010 as having high subsurface archaeological potential. In accordance with PA07_0127 this site is fenced and managed as part of existing Invincible operations as detailed in the ACHMP.	Low rise adjacent to a third order tributary of Cullen Creek

4.2.3 Blackfellows Hand Aboriginal Place

The Blackfellows Hand Aboriginal Place is a registered Aboriginal place designated by the Minister on 18 July 2008. The area is of high cultural significance to the Wiradjuri people and also highly valued by the wider Aboriginal community including the Gundungurra, Dharug and Darkinjung people. It consists of a complex made up of a rock shelters with painted art, a teaching site and occupation site, located approximately 7 kilometres east northeast of the Southern Extension Area, on the eastern edge of Ben Bullen State Forest on the western edge of the Newnes Plateau. The area was also utilised as an occupation site and includes a men's and women's areas. The greater complex also includes a birthing area (OEH nd.). Given the location of this area approximately 7km from the Southern Extension Area, the Aboriginal Place is not likely to be impacted by the Southern Extension Project, and is described here for broader context of past surveys and identified sites.

4.3 Summary

Ethnohistoric records relate to the people occupying the area in and around the Southern Extension Area provide some relevant information on the resources and landscapes utilised by Aboriginal people within the region. A body of knowledge has also been developed as a result of the completion of a range of archaeological investigations that demonstrate some clear patterning in the nature and distribution of sites within the wider Blue Mountains region, with larger site complexes typically associated with areas with ready access to suitable water resources and transit routes whilst the distribution of rock shelter sites is at least partially dependent on the occurrence of suitable rock overhangs.

The Southern Extension Area has been subject to previous archaeological assessments, the most recent (AECOM 2011) of which involved detailed survey and assessment of the Southern Extension Area. This assessment resulted in the identification of four archaeological sites within the Southern Extension Area and one in proximity of the Southern Extension Area. The body of knowledge with regard to typical site distribution will be applied to the Southern Extension Area in **Section 5.0** and will be used to develop a model for site distribution and the likely characteristics of sites, within the Southern Extension Area.

5.0 Archaeological Implications for the Southern Extension Area

The outcomes of the review of the environmental and cultural context of the Southern Extension Area has a number of key implications for the Southern Extension Area in relation to the potential for additional archaeological sites to be present within the Southern Extension Area and the characteristics of Aboriginal sites and Aboriginal cultural resources that may be contained within the Southern Extension Area.

These are as follows:

- the Southern Extension Area contains four previously recorded sites containing relatively low numbers and densities of stone artefacts. These sites are primarily located in proximity to minor drainage lines on relatively low gradient landforms and have been disturbed as a result of development activities within the Southern Extension Area

- should any additional sites be present within the Southern Extension Area, they are likely to be small artefact scatters and isolated finds resulting from transient use of the area by Aboriginal people, including the commonly recorded artefact raw materials and types for the area. These include broken flakes, complete flakes and cores (including bipolar reduction) with very small numbers of blades and retouched artefact types of quartz, chert, mudstone, tuff and quartzite

- the topography of the Southern Extension Area , and its distance from reliable water, indicate it is more likely to have been used as a resource gathering area, or travel way to nearby resource gathering areas, rather than for camping activities. There is consequently a very low likelihood that archaeological material/sites reflecting intensive use by Aboriginal people will be located in the Southern Extension Area (such as large artefacts scatters, hearths and/or complexes of sites)

- if small artefact scatter sites and isolated finds are present they are most likely to be identified in areas with good ground surface visibility such as high levels of exposure (erosion scars/scours) or in areas of prior disturbance (vehicle tracks/ants nests/subsidence)

- Grinding groove sites, if they occur, are most likely to be associated with the creek lines, if exposed sandstone is found within them

- art sites and PADs may occur within rock shelters if suitable shelters and overhangs are found within the Southern Extension Area.

6.0 Archaeological Survey

6.1 Survey methodology

A pedestrian survey of all landforms within the Southern Extension Area and targeted survey within the survey area was undertaken to assess the potential impacts of the Project, including identification of sites that may be at risk of indirect impacts. Three additional due diligence inspection areas for potential infrastructure works associated with existing Invincible site were also subject to survey and are reported in this ACHAA for completeness (refer to **Figure 1.3**). It is also noted that vehicle transects were undertaken within the Southern Extension Area and the additional survey area. Vehicle transects were used to identify areas of topography that may require further survey (such as areas where rockshelters might occur) and to give consideration to identifying areas of visibility. Vehicle transects are not documented in detail because transects of this type do not meet OEH requirements.

The survey methodology was prepared taking into account the following requirements:

- to survey an adequate, representative sample of all the landforms present in the Southern Extension Area
- to locate and rerecord the condition of four registered Aboriginal sites within the Southern Extension Area
- to revisit the rock shelter site (AHIMS #45-1-2712, CV-RCK1-10) to observe its current condition
- OEH's Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.

The survey transects were walked with the survey participants at roughly 10 metre intervals.

The survey methodology complies with the survey requirements of OEH's Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales. During the survey all participants had the opportunity to discuss any potential impacts of the Project on Aboriginal cultural heritage sites and values. Information recorded during the survey included:

- the nature of the landforms and vegetation
- the levels of visibility and exposure within the survey area
- the effects of erosion and disturbance
- the availability of Aboriginal resources, with a particular focus on the types of resource plants (bush tucker) that may be present in the Southern Extension Area
- detailed records of archaeological sites present
- the likelihood that potential archaeological deposits (PAD) may be present within the Southern Extension Area
- information provided by Aboriginal parties regarding the cultural significance/or cultural values of the area.

All sites and artefacts located were recorded to OEH standards. The archaeological and Aboriginal and cultural significance of the sites/artefacts was discussed with the registered Aboriginal parties participating in the survey and any requirements for subsurface testing of sites and PADs as part of the assessment process/or post approval was also specifically discussed.

6.1.1 Additional survey area

The additional survey area consists of accessible areas within 500 metres of the Southern Extension Area. Targeted survey within this area was undertaken to identify the potential for sites such as grinding grooves or rock shelters that may be sensitive to indirect impacts such as vibrations. Areas located within the currently approved mining areas were not subject to survey as they have been previously assessed. Nor was the additional survey area west of the Castlereagh Highway subject to survey as this area is not subject to direct impact by the Southern Extension Project, property access could not be obtained and the area has been previously subject to approved impacts from underground and open cut mining as a part of the Ivanhoe Colliery.

Survey within the additional survey area was targeted on the drainage lines and pagoda / cliffline formations. This was to identify any grinding grooves within drainage lines and to determine if there were any overhangs or rock shelters within the pagoda / cliff line area which typically occur in the cliffs below the ridges in this area.

6.2 Results of survey

The survey of the Southern Extension Area was undertaken from 26-29 April 2016 by a field team of two archaeologists and representatives of the registered Aboriginal parties, as recorded in **Table 6.1**.

Table 6.1 Field Survey Team

Dates	Organisation	Representative
26 /04/2016	Bathurst Local Aboriginal Land Council	Amy Armstrong
	Umwelt	Alison Lamond
		Jillian Huntley
	Wellington Valley Wiradjuri Aboriginal Corporation	Bradley Bliss
27-29/04/2016	Bathurst Local Aboriginal Land Council	Amy Armstrong
	Umwelt	Alison Lamond
		Jillian Huntley
	Warrabinga Native Title Claimants Aboriginal Corporation	Coral Williams
		Shaen Morgan
	Wellington Valley Wiradjuri Aboriginal Corporation	Bradley Bliss

6.3 Effective coverage

The Southern Extension Area was surveyed in a series of 10 transects, as illustrated on **Figure 6.1**. **Table 6.2** provides the survey coverage and effective coverage for each of the transects (each 60 metres in width) undertaken. There was very little ground visibility throughout the Southern Extension Area with vehicle and motorcycle tracks and the electricity easement the main sources of exposure, and therefore deliberately targeted for inspection during the survey.

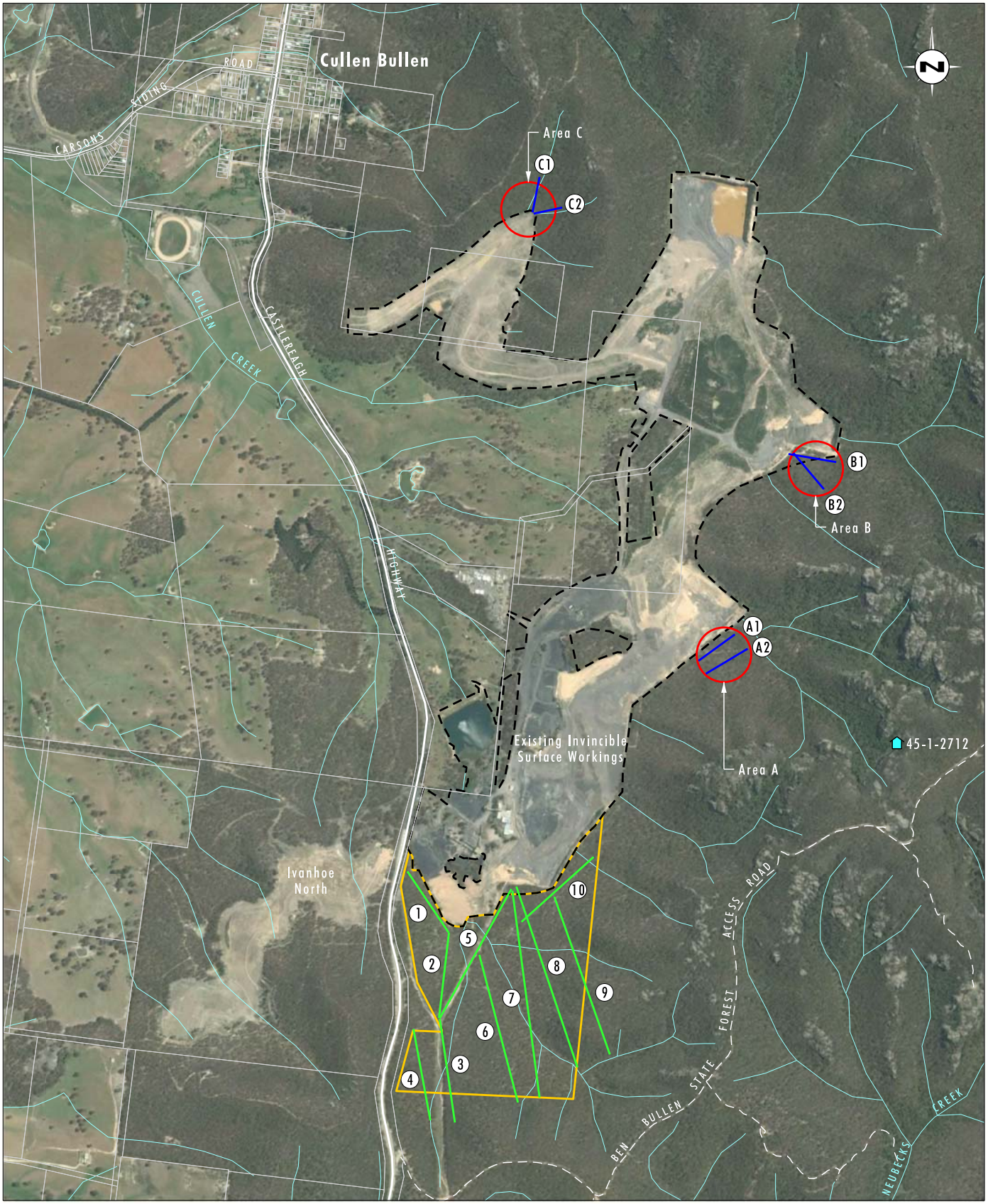

Image Source: Google Earth - CNES/Astrium (Nov 2014)
Data Source: LPI (2016), AHIMS (2015)

0 0.25 0.5 1.0km

Legend

- Existing Approved Mining Disturbance Area
- Proposed Southern Extension Area
- Existing Operations Due Diligence Survey Area
- Due Diligence Survey Location
- Transect
- ③ Transect Number
- Rockshelter / Artefact Scatter

FIGURE 6.1

Survey Transects

File Name (A4): R06/3622_044.dgn
20160916 13.26

Table 6.2 Effective Coverage

Transect	Landform	MGA Start	MGA End	Survey Unit Area (m^2) approx	Visibility %	Exposure %	Effective Coverage	Sites within transect
1	Gentle slope and moderate slope	224220 6308621	224375 6308393	18000 m^2 (300 x 60m)	0	2	0m^2 0%	
2	Gentle slope	224375 6308393	224338 6308074	19500 m^2 (325 x 60m)	2	1	3.9m^2 <1%	
3	Gentle slope, moderate slope, steep slope and drainage line	224338 6308074	224398 6307686	24000 m^2 (400 x 60m)	20	10	480m^2 2%	
4	Moderate slope and steep slope	224242 6308033	224303 6307692	21000 m^2 (350 x 60m)	0	0	0m^2 0%	
5	Gentle slope and drainage line	224627 6308564	224338 6308074	33000 m^2 (550 x 60m)	30	20	1980m^2 6%	IC 1, IC 2 45-1-0069 45-1-2714
6	Spur crest, moderate slope and steep slope	224489 6308310	224634 6307758	36000 m^2 (600 x 60m)	1	3	10.8m^2 <1%	45-1-0070
7	Gentle slope, moderate slope, steep slope and drainage line	224612 6308548	224705 6307777	48000 m^2 (800 x 60m)	0	2	0m^2 0%	45-1-2708

Transect	Landform	MGA Start	MGA End	Survey Unit Area (m^2) approx	Visibility %	Exposure %	Effective Coverage	Sites within transect
8	Gentle slope, steep slope and drainage line	224607 6308556	224855 6307892	43500 m^2 (725 x 60m)	0	0	0m^2 0%	
9	Steep slope and ridge crest	224768 6308525	224974 6307938	37500 m^2 (625 x 60m)	0	0	0m^2 0%	
10	Gentle slope and drainage line	224913 6308675	224646 6308432	22500 m^2 (375 x 60m)	0	3	0m^2 0%	

The three potential infrastructure areas surveyed (A, B and C) consisted of drainage lines and lower slopes. These areas were surveyed in their entirety, with survey information provided in **Table 6.3**.

Table 6.3 Effective coverage of potential infrastructure areas

Transect	Landform	Centre point (MGA)	Survey Unit Area (m^2) approx	Visibility %	Exposure %	Effective Coverage	Sites recorded
Area A	Gentle slopes and drainage line	225480 6309550	32440 m^2	2	4	26m^2 <1%	IC 3
Area B	Gentle slopes and drainage line	225848 6310234	32440 m^2	1	1	3.2m^2 <1%	IC 5 (IC4 is outside area)
Area C	Moderate slopes and drainage line	224671 6311087	32440 m^2	0	0	0m^2 0%	

6.4 Landform coverage

The landforms present within the Southern Extension Area and the additional survey area are identified in **Figure 6.2**. The survey coverage of these landforms is detailed in **Table 6.3**.

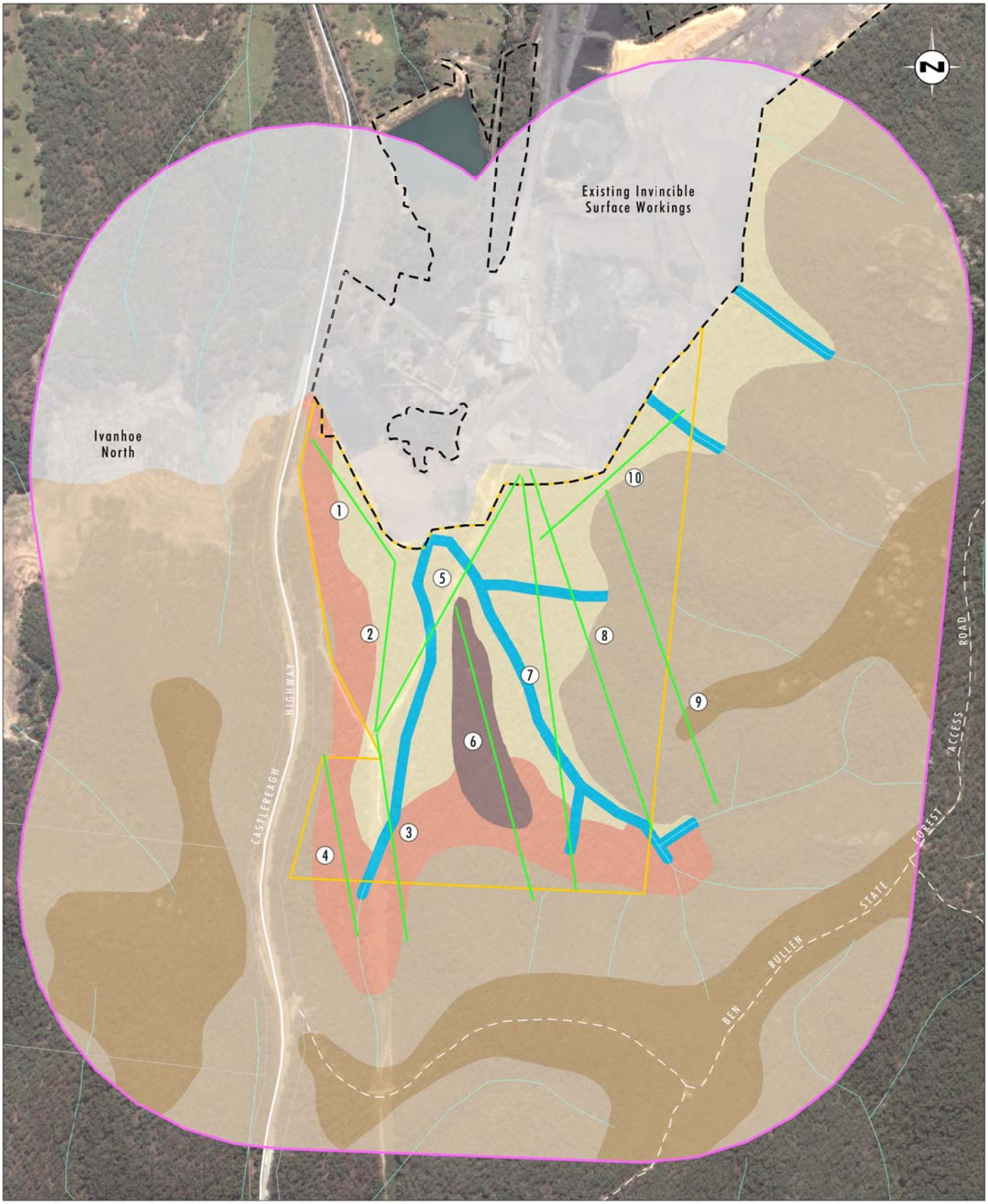

Image Source: Google Earth - CNES/Astrium (March 2015)
Data Source: LPI (2016)

0 100 250 500m

Legend

- Existing Approved Mining Disturbance Area
- Proposed Southern Extension Area
- Additional Survey Area
- Transect
- ③ Transect Number

Landform Elements:

- Drainage Lines
- Gentle Slope
- Moderate Slope
- Modified
- Ridge Crest
- Spur Crest
- Steep Slope

FIGURE 6.2

Landforms within the Survey Area

File Name (A4): R06/3622_045.dgn
20160916 11.19

Table 6.4 Landform Survey Coverage within Southern Extension Area

Landform unit	Area of landform within the Southern Extension Area	Transects covering the landform	Approximate area of landform surveyed within Southern Extension Area	Effective coverage	Number of Sites
Ridge Crest	0m^2 additional survey area only	Transect 9 (outside Southern Extension Area within additional survey area)	0m^2	N/A	0
Spur Crest	33689m^2	Transect 6	20871m^2	0%	1 (previously recorded not reidentified during survey)
Steep Slope	124856m^2	Transects 3 (outside Southern Extension Area within additional survey area), 4,6, 7, 8, and 9	40363m^2	0%	0
Moderate Slope	108193m^2	Transects 1, 2, 3, 5, 7, 8 and 10	29859m^2	0%	0
Gentle Slope	208929m^2	Transects 1, 2, 3, 5, 7, 8 and 10	124568m^2	0.4%	5 (note 3 previously recorded and 2 not reidentified during survey)
Drainage line	36634m^2	Transects 3, 5, 7, 8 and 10	13745m^2	0%	0

6.5 General survey observations

The overall visibility of the Southern Extension Area and additional survey area was low within areas of exposure typically present in the access track and electricity easement. These areas of exposure had generally been subject to high levels of erosion. The access tracks within Southern Extension Area are also currently used for firewood collection and recreationally by vehicles and motorbikes. There was further disturbance throughout the Southern Extension Area as a result of historic mining which resulted in subsidence throughout the Southern Extension Area. This disturbance negatively affects the likelihood for potential archaeological deposits within the Southern Extension Area.

The targeted survey of the additional survey area identified no sandstone exposures within the drainage lines inspected therefore limited potential for grinding grooves to occur. The ridge areas inspected were associated with slopes rather than the steep drops that allow for the formation of rock shelters and overhangs. No archaeological sites vulnerable to indirect impacts were identified in the additional survey area, it is noted that pagodas are present and have been assessed as part of other studies for the EA. The blasting assessment has confirmed that indirect impacts to the pagoda structures are unlikely on the basis of detail blast design meeting relevant criteria.

6.6 Archaeological sites

Previously recorded sites were visited in order to ground truth their locations and assess their current condition. Newly identified sites were recorded in accordance with OEH requirements and this information will be provided to AHIMS for the registration of the sites. The locations of all identified archaeological sites within the Southern Extension Area and its vicinity are detailed in **Figure 6.3**.

6.6.1 Newly identified sites within the Southern Extension Area

Two new sites were identified during the survey and are detailed below and **Figure 6.3**. AHIMS site cards for these sites have been submitted in accordance with the NPW Act.

6.6.1.1 IC 1 (224477E 6308338N)

IC 1 consists of an isolated artefact located on an upper slope below a spur crest and above the confluence of 2 minor drainage lines. The site is located on a gentle slope with a north-westerly aspect within a cleared electricity easement (refer to **Plate 6.1**). The site consists of a single indurated tuff flake with usewear on its right margin (refer to **Plate 6.2**). The area is assessed to have low subsurface archaeological potential due to the shallow soil depth and its position on the slope. The crest also has low subsurface archaeological potential as it is eroded to clay (the B Horizon of the soil profile).

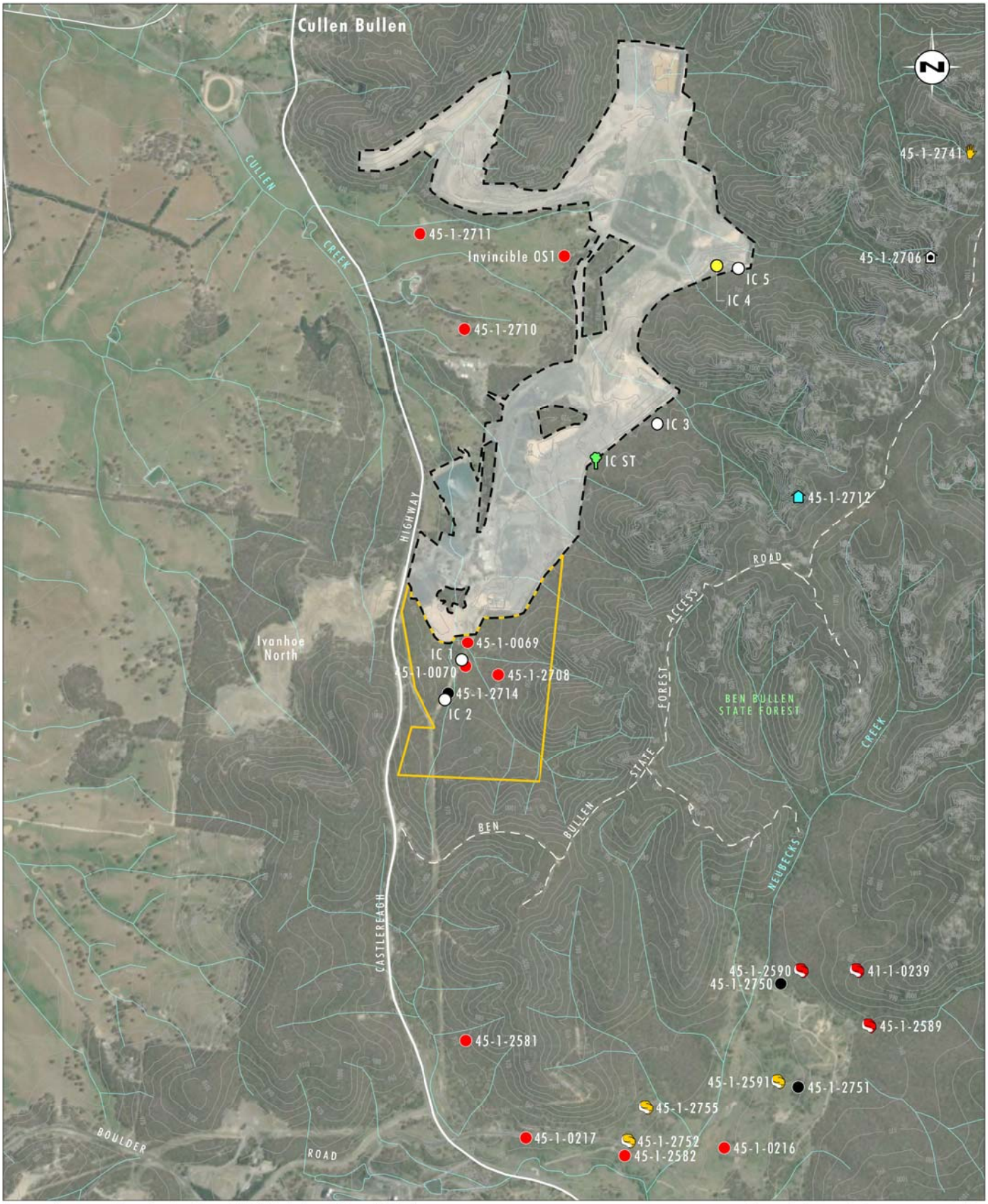

Image Source: Google Earth - CNES/Astrium (Nov 2014)
Data Source: AHIMS (2015)
Note: Contour Interval 10m

0 0.25 0.5 1.0km
1:25 000

Legend

- Existing Approved Mining Disturbance Area
- Proposed Southern Extension Area
- Art Site / Isolated find
- Artefact Scatter
- Artefact and Potential Archaeological Deposit
- Isolated Find
- Isolated Find / Potential Archaeological Deposit
- Rockshelter / Potential Archaeological Deposit
- Rockshelter / Artefact Scatter
- Artefact Scatter (Umwelt)
- Isolated Find (Umwelt)
- Scarred Tree (Umwelt)

FIGURE 6.3

Previously Recorded and Newly Identified Sites

File Name (A4): R06/3622_048.dgn
20160916 9.56

Plate 6.1

IC 1 – View across site location to the north also showing standard visibility within this section of survey transect.

Plate 6.2

IC 1 - Tuff flake, dorsal surface.

6.6.1.2 IC 2 (224399E 6308154N)

IC 2 consists of an isolated artefact located on the mid slope of a gently inclined spur within a cleared electricity easement, adjacent to a vehicle track (**Plate 6.3**). The site has a northerly aspect down slope to the drainage line. It consists of a quartzite scraper with areas of pebble cortex (refer to **Plate 6.4**).The site and surrounding area have been subject to significant sheetwash erosion, resulting in the loss of the majority of topsoil. The artefact was present within an area of gravel lag left after topsoil had been eroded. The area is assessed as having low subsurface potential based on the extent of erosion and loss of topsoil.

Plate 6.3

IC 2 – View across site area, to the north also showing standard visibility within this section of survey transect.

Plate 6.4

Quartzite scraper, dorsal surface.

6.6.2 Previously recorded sites within the Southern Extension Area

Previously recorded sites within the Southern Extension Area are discussed in detail in **Section 4.2.3**. These sites were visited as a part of the survey to ground truth the locations and record their current condition.

6.6.2.1 45-1-0069

This site was originally recorded as containing 16 artefacts however when revisited in 2011, only one artefact was identified (AECOM 2011). During the current survey, six artefacts were identified at the previously recorded location within the electricity easement within an area approximately 15 by 15 metres (refer to **Plate 6.5** and **6.6**). The site is in poor condition as it has been subject to substantial, continuing erosion and as a result of the site is assessed as having low subsurface potential.

Plate 6.5

Site #45-1-0069 – view across site area to the west.

Plate 6.6

Quartz artefact

6.6.2.2 45-1-0070

This site was previously recorded as a 'sparse' artefact scatter, with AECOM (2011) identifying 7 artefacts at a corrected coordinate (224498E 6308336N). During the current survey, no Aboriginal objects were identified at the location recorded by Haglund in 1982, or at the corrected coordinate noted by AECOM in 2011. The newly identified site IC 1 (an isolated artefact not *in situ* on the upper slope refer to **Section 6.6.1.1**) is located approximately 30 metres down slope of the original 1982 registered coordinate of the site and may represent an extension of the same site. However, as the artefact identified at IC 1 does not match the description of any artefacts previous identified at 45-1-0070 and is not located at the corrected AECOM 2011 coordinate; it has been recorded as a separate site. The area has been subject to erosion and a large subsidence crack is located nearby.

6.6.2.3 45-1-2708

No Aboriginal objects were identified at the previously recorded location of this site, the accuracy of which was verified through the photograph attached to the site card (AECOM 2010) (refer to **Plate 6.7 and 6.8**). The site area had reduced visibility when compared to the 2010 AECOM photograph, with an increase in leaf litter and recent depositions of silt on the vehicle track.

Plate 6.7

Across previously recorded site area, view to the south.

Plate 6.8

AECOM 2010 photo of site are a – source 45-1-2708 AHIMS site card

6.6.2.4 45-1-2714

No Aboriginal objects were identified at the previously recorded location of the site, the accuracy of which was verified through the photograph attached to the site card (AECOM 2010) (refer to **Plate 6.9** and **6.10**). The site area has been subject further erosion since 2010. The ground surface visibility during the inspection was 60 per cent and a diversion of the vehicle track had been created since 2010.

Plate 6.9

Across recorded site area, view to the north.

Plate 6.10

AECOM 2010 photo of site are a – source 45-1-2714 AHIMS site card

6.6.3 Newly identified sites outside the Southern Extension Area

Four new sites were identified during due diligence inspections and whilst accessing the potential infrastructure areas associated with currently approved mining activities. Newly recorded sites are detailed below and illustrated in **Figure 6.4**. AHIMS site cards have been submitted for these sites in accordance with the NPW Act.

6.6.3.1 IC 3 (225387E 6309437N)

IC 3 consists of an isolated find located within the eroded tyre rut of previously graded vehicle track (refer to **Plate 6-11**) on a lower slope, gently inclined to the north. The site is located up slope from a small ephemeral drainage line. The site condition is poor and the chert flake is not in its original depositional location but has been moved as a result of erosion and vehicle movements (refer to **Plate 6.12**). The area is assessed as having low subsurface potential as a result of the erosion and previous disturbance of the area.

Plate 6.11

Across site, view to the west.

Plate 6.12

Chert flake, dorsal surface.

6.6.3.2 IC 4 (225664E 6310179N)

IC 4 consists of an artefact scatter located within a highly modified drainage ditch and adjacent windrow at the edge of the current open cut pit (refer to **Plate 6.13**). Six flakes and broken flakes of tuff and chert (refer to **Plate 6.14**) were located in an area of approximately 12 metres by 5 metres, within the ditch and on the windrow which had 40 per cent ground surface visibility. The artefacts were included within areas of material (soil, gravels and leaf litter) that had accumulated as a result of ongoing erosion. Consequently it is likely that the artefacts represent an accumulation that may have come from a considerable area of exposure and are unlikely to have all originated from the immediate location. Outside the ditch there was no general ground surface visibility. The site condition was poor, within a highly modified area subject to vegetation clearance and grading to create the drainage ditch and the artefacts were no longer *in situ*. The area was assessed as having low subsurface potential as it has been severely disturbed as a result of the earthworks and the artefacts were within areas of wash and not located *in situ.* The artefacts could have been subject to significant movement within the drainage ditch.

Plate 6.13

Across site area, view to the east

Plate 6.14

Artefacts, ventral surface

6.6.3.3 IC 5 (225764E 6310167N)

IC 5 consists of an isolated find located on the windrow on the edge of the current open cut pit (refer to **Plate 6.15**). The artefact, a chert flake (refer to **Plate 6.16)** was not *in situ*. It was identified in the leaf and bark litter within the disturbed area, adjacent to the windrow. The area was assessed as having low subsurface potential as the area was disturbed as a result of the earthworks and the artefact was not located *in situ.* The artefact has possibly been subject to movement within the drainage ditch.

Plate 6.15

Across Site area, view to the west.

Plate 6.16

Chert flake, dorsal surface.

6.6.3.4 IC ST (225101E 6309274N)

IC ST consists of a scarred tree located within a pile of pushed over trees, next to the windrow, at the edge of the current open cut pit. The tree is not *in situ* and is poor condition; being dead lying on its side. The bark is gone and there is evidence on damage from insect borers (refer to **Plate 6.17** and **6.18**). The scar is elongated and removed the bark and a small amount of heartwood. The base of the scar was located 112 cm from the ground. The scar is 42 cm long and 13 cm wide at its maximum; 3 cm wide at the top and 6 cm wide at the bottom.

Plate 6.17

Across site, view to the northeast.

Plate 6.18

Detail of the scar.

6.7 45-1-2712 (Rock shelter located outside the Southern Extension Area and additional survey area)

This site, previously recorded by AECOM in 2010, was visited as a part of the survey to ground truth the location and record its current condition. The site is in overall good condition with some slope wash occurring, the same condition as described on the site card (refer to **Plate 6.19**, with site card included in **Appendix B**). A small number of artefacts were identified on the surface of the deposit in the vicinity of the drip line. Some graffiti is present on the back wall of the shelter and the shelter is currently been accessed as there was boot prints in the back of the shelter when visited for the survey demonstrating current access to the site by members of the public.

It is noted that this site visit was for preliminary purposes only. Recommendations for baseline recording and ongoing management of this site are provided in **Section 9**.

Plate 6.19

45-1-2712 rock shelter from southern end.

Plate 6.20

45-1-2712 rock shelter – interior view

Plate 6.21

45-1-2712 rock shelter – interior view

6.8 Summary of sites located within and in the vicinity of the Southern Extension Area

Table 6.5 provides a summary of sites located within and in the vicinity of the Southern Extension Area and the due diligence areas (Areas A-C). **Table 6.5** includes both previously identified and newly identified sites.

Table 6.5 Previously record and newly identified Sites

Site	Features	Location	Survey Unit	Landform
IC 1	Isolated Find	Within the Southern Extension Area	Transect 5	Gentle slope
IC 2	Isolated Find	Within the Southern Extension Area	Transect 5	Gentle slope
IC 3	Isolated Find	Within area of previously approved mining activities	Area A	Gentle slope
IC 4	Artefact Scatter	Within area of previously approved mining activities	Area B	Modified
IC 5	Isolated Find	Within area of previously approved mining activities	Area B	Modified
IC ST	Scarred Tree	Within area of previously approved mining activities	Identified while accessing Area A	Modified
45-1-0069	Artefact Scatter	Within the Southern Extension Area	Transect 5	Gentle slope

Site	Features	Location	Survey Unit	Landform
45-1-0070	Artefact Scatter (no artefacts identified during survey)	Within the Southern Extension Area	Transect 6	Spur crest
45-1-2708	Artefact Scatter (no artefacts identified during survey)	Within the Southern Extension Area	Transect 7	Gentle slope
45-1-2712	Rock shelter with artefacts and PAD	Outside of any impact		Steep slope
45-1-2714	Isolated Find (no artefacts identified during survey)	Within the Southern Extension Area	Transect 5	Gentle slope

As the overall visibility of the Southern Extension Area and additional survey area was low there is a possibility for further sites within the Southern Extension Area that were not identified during the survey. However due to the sloping nature of the landforms and level of previous disturbance it is likely any further sites would be small in number and of a similar nature to the currently identified sites. That is small artefact scatters and isolated finds with low potential for subsurface archaeological deposits as a result of the erosion and subsidence within the Southern Extension Area.

7.0 Significance Assessment

The Burra Charter defines cultural significance in terms of aesthetic, scientific, historic and social values. Aboriginal cultural heritage is typically assessed according to its social and scientific significance; however other values may also be of importance. The assessment of cultural significance is critical in establishing mitigation and management strategies for cultural heritage (refer to Pearson and Sullivan, 1995:21).

The assessment of significance provides a guideline for determining appropriate mitigation and management strategies. The relationship between levels of significance and management strategies can be summarised as follows:

- High significance – the site should be conserved and protected from the impacts of development, where possible.
- Moderate significance – the site should be protected if possible, however, if impacts to the site are unavoidable, appropriate mitigation strategies should be implemented prior to impact.
- Low significance – the site should be protected if possible, however, if impacts to the site are unavoidable, the presence of the site should not impede the proposed development.

7.1 Aboriginal cultural significance

As Aboriginal cultural significance relates to the values of a site, place or landscape to Aboriginal people, it must be determined by Aboriginal people. The registered Aboriginal parties participating in the Project are therefore the appropriate stakeholders to assess the significance of their cultural heritage. In assessing this significance, a range of factors may be considered and this can extend beyond the physical presence of a site and its contents to intangible aspects of the cultural landscapes. Archaeological material, cultural knowledge, natural resources and landscape attributes may all be considered.

WVWAC identified that the Pagoda structures are culturally significant as they:

...appear within Creation Stories and “Travelling” also known as “Song Lines” of the Muddegah Clan. (WVWAC 24/08/2016).

Any additional comments on the cultural significance of the Southern Extension Area (including the sites it contains) and the additional survey area received from the Aboriginal parties are included in full in **Appendix A (note that at request of WVWAC, their confidential response is excluded from the public version of the report).**. In addition, Castlereagh Coal will continue to engage with registered Aboriginal parties through the preparation of an updated Aboriginal Cultural Heritage Management Plan (ACHMP) for the Southern Extension Project as detailed in **Section 9.0**.

7.1.1 Aboriginal cultural values discussed during inspection

Representatives of the registered Aboriginal parties indicated high cultural significance for the pagoda formations located to the east of the Southern Extension Area (refer to **Plate 7.1**) and additional survey area and not subject to direct impact by the Southern Extension Project. Bradley Bliss, representative of WVWAC, relayed that the pagodas feature in songlines and that Shaen Morgan of WNTCAC reported that the pagodas are significant components of creation stories.

Plate 7.1

Pagoda formations to the east of the Southern Extension Area.

During the inspection Bradley Bliss identified a tree as a potential birthing tree (224618E 6308541N). However, as there were no tangible archaeological features, the tree was not registered as a new site by Umwelt. The cultural features consists of a fallen tree with a very large burnt out hollow at the base (refer to **Plate 7.2**). The tree was described as being burned out before and after giving birth to sterilize the site and make it comfortable for the mother and baby. While birthing trees in the region were described by Bradley as typically being in close proximity to fresh water, the landscape surrounding the tree has been modified as a result of its location approximately 30 metres south of the current open cut pit (within the Southern Extension Area) and as a result its proximity to a watercourse cannot be determined. However it is noted that all watercourses in the general vicinity are ephemeral.

Plate 7.2

Potential birthing tree.

Neither of these culturally identified features was formally assessed by Umwelt, as the pagodas are located outside any areas of impact and neither includes any archaeological features.

7.2 Archaeological (scientific) significance

The criteria applied to the assessment of archaeological significance are listed in **Table 7.1**. The significance of the sites identified within the Southern Extension Area is assessed in **Table 7.2** with reference to the criteria described below.

Table 7.1 Criteria for Assessment of Archaeological Significance of the Sites

Criterion	Low	Moderate	High
Rarity	The site within the surrounding landscape, its integrity, contents and/or potential for sub-surface artefacts, are common within the local and regional context.	The site within the surrounding landscape, its integrity, contents and/or potential for sub-surface artefacts, are common within the regional context but not the local context.	The site within the surrounding landscape, its integrity, contents and/or potential for sub-surface artefacts, are rare within the local and regional context.
Representativeness	This site, when viewed in relation to its integrity, contents and/or potential for sub-surface artefacts, 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 integrity, contents and/or potential for sub-surface artefacts, 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 integrity, contents and/or potential for sub-surface artefacts, 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.
Research potential	The site, when viewed in relation to its integrity, contents and/or potential for sub-surface artefacts has limited potential to contribute to a greater understanding of how Aboriginal people lived within this area or region.	The site, when viewed in relation to its integrity, contents and/or potential for sub-surface artefacts has moderate potential to contribute to a greater understanding of how Aboriginal people lived within this area or region.	The site, when viewed in relation to its integrity, contents and/or potential for sub-surface artefacts has high potential to contribute to a greater understanding of how Aboriginal people lived within this area or region.
Education potential	The site is not readily accessible and/or when viewed in relation to its contents, integrity and location in the landscape has limited suitability to be used for educational purposes. Other sites with higher education potential are known to be present in the local area and region.	The site is not readily accessible and/or when viewed in relation to its contents, integrity and location in the landscape provides a tangible example that is suitable to assist in educating people regarding how Aboriginal people lived in this area or region. However, other sites with higher education potential are known or expected to be present in the local area or region.	The site is readily accessible and/or when viewed in relation to its contents, integrity and location in the landscape, provides a very good tangible example that is suitable to assist in educating people regarding how Aboriginal people lived in this area or region. Other sites of higher education potential are generally not known to exist in the local area or region.

Criterion	Low	Moderate	High
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.

Table 7.2 Assessment of Archaeological Significance

Archaeological Site	Rarity Value	Representative Value	Research Potential	Educational Potential	Integrity	Overall Archaeological Significance
IC 1 (Isolated Find)	Low	Low	Low	Low	Low	Low
IC 2 (Isolated Find)	Low	Low	Low	Low	Low	Low
IC 3 (Isolated Find)	Low	Low	Low	Low	Low	Low
IC 4 (Artefact Scatter)	Low	Low	Low	Low	Low	Low
IC 5 (Isolated Find)	Low	Low	Low	Low	Low	Low
IC ST (Scarred Tree)	Low	Low	Low	Low	Low	Low
45-1-0069 (Artefact Scatter)	Low	Low	Low	Low	Low/moderate	Low
45-1-0070 (Artefact Scatter)	Low	Low	Low	Low	Low	Low
45-1-2708 (Artefact Scatter)	Low	Low	Low	Low	Low/moderate	Low
45-1-2712 (Rock shelter with artefacts and PAD)	High	High	High	Moderate	High	High
45-1-2714 (Isolated Find)	Low	Low	Low	Low	Low	Low

8.0 Assessment of Harm Associated with the Southern Extension Project

It is noted that the proposed activities associated with the Southern Extension Project have the potential to harm Aboriginal objects within the Southern Extension Area.

The locations of these sites are detailed in **Figure 6.4**.

Table 8.1 Harm to identified Aboriginal Sites

Harm	Site
Located within the Southern Extension Area subject to impacts as a result of proposed works	IC 1
	IC 2
	45-1-0069
	45-1-0070
	45-1-2708
	45-1-2714
Located within areas that are subject to currently approved mining activities associated with the current open cut pit.	IC 3
	IC 4
	IC 5
	IC ST
Outside any area of impact, including indirect impacts such as blasting	45-1-2712

An assessment of the cliff line including the Pagodas was undertaken (ESC 2016) which determined the sandstone material was of an acceptable strength (in terms of potential vibration impact). The assessment revealed a limited number of cracks and geological intrusions / weaknesses within the Sandstone Pagoda structures, which have been detailed to form a baseline for ongoing monitoring. A conservative vibration limit for the Sandstone Pagodas and the cliff line has been established and all blasting will be below these limits.

Therefore the Rock Shelter (45-1-2712) and the Pagodas (although they do not contain any archaeological features they are identified as being of cultural value) are not subject to any direct or indirect impacts.

The Potential Birthing tree identified by a RAP is located within the Southern Extension Area and will be subject to impacts as a result of the proposed works.

9.0 Recommendations

It is recognised that recommendations provided from an Aboriginal cultural perspective may differ to those based on an archaeological perspective. Scope is therefore provided for the inclusion of both sets of recommendations.

9.1 Aboriginal parties recommendations

The recommendations presented below were provided by registered Aboriginal party representatives participating in the survey of the Southern Extension Area and additional survey area.

- The scarred tree (IC ST) needs to be recovered from the pile at the windrow and stored in a weather sheltered location, elevated off the ground. The tree could be trimmed either side of the scarred section as part of this process.

- The artefact scatters and isolated finds (IC 1, IC 2, IC 3, IC 4, IC 5, 45-1-0069, 45-1-0070, 45-1-2708 and 45-1-2714) need to be collected, if they are to be impacted.

- Any salvaged artefacts need to be returned to a secure keeping place on country, potentially a shipping container within Invincible that can be accessed by the registered Aboriginal parties.

- As the potential birthing tree is in poor condition it is unlikely that it is possible salvage it. The tree should be recorded thoroughly using techniques such as detailed, high resolution photography and 3D scanning. Note that further confidential recommendations regarding management of this tree have been made by WVWAC, as discussed below.

Further recommendations were provided by registered Aboriginal parties following the review of the draft report are included below.

WVWAC recommend IC ST (the scarred tree) be recovered and moved to a safe storage location on site and stored under cover on reinforced steel racking support not on the ground or on concrete to minimise any future damage.

WVWAC recommend that as a part of the update of the Aboriginal Cultural Heritage Management Plan that a system of 3 monthly Heritage Meetings be implemented.

WVWAC recommend that archaeological testing be implemented at sites where concentrated artefact scatters occur and an area of cultural significance identified by WVWAC.

9.1.1 Castlereagh Coal - response to Aboriginal party recommendations

Castlereach Coal accepts the majority of recommendations provided by the registered Aboriginal parties. However, as noted in **Section 6.6** all of the artefact scatters identified within the project area have low potential for subsurface deposits. Castlereagh Coal does not propose to undertake archaeological excavation within these areas as all of these areas have been subject to high levels of erosion or disturbance resulting in low archaeological potential.

Castlereagh Coal notes that it would be appropriate for WVWAC to undertake the AHIMS recording of the Potential Birthing Tree. This would allow for the provision of only culturally appropriate information within the recording and appropriate restrictions being placed on access to the site recording. All photographs and

information recorded during the survey will be provided to WVWAC for inclusion in the site record if felt appropriate by WVWAC.

9.2 Archaeological recommendations

The following recommendations have been developed in light of the archaeological context of the region, the findings of the survey, the archaeological assessment of the Southern Extension Area , the cultural assessment of the area by Aboriginal parties; the potential impacts of the Southern Extension Project and current cultural heritage legislation.

- The Aboriginal Cultural Heritage Management Plan for PA 07/0127 should be revised in consultation with the registered Aboriginal parties. The revised ACHMP should be updated to reflect the outcomes of the current assessment and should include the management activities listed below. Consideration will also be given in the ACHMP to ongoing consultation mechanisms such as regular consultation meetings with Aboriginal parties, as requested by WVWAC.

- Prior to any impacts, surface collection of sites IC 1, IC 2, IC 3, IC 4, IC 5, 45-1-0069, 45-1-0070, 45-1-2708 and 45-1-2714 should be undertaken in accordance with the methodology provided in Section 10.1.

- Prior to any further impacts, the scarred tree (IC ST) should be salvaged in accordance with the methodology provided in Section 10.2.

- Rock shelter # 45-1-2712 is located outside the Southern Extension Area , and outside any predicted areas of blasting impacts. However, it is recommended that baseline recording and ongoing periodic monitoring of the shelter should be undertaken to ensure that there are no incidental impacts to the site. The methodology and requirements for monitoring will be subject to consultation with the registered Aboriginal parties.

- The rock formations known as the Pagodas are outside the Southern Extension Area and will not be subject to direct or indirect impacts from the Southern Extension Project. However, given that the these formations have been identified as having high Aboriginal cultural value, it is recommended that consideration be given to involving the registered Aboriginal parties if geotechnical monitoring is required to be undertaken at these locations. Any such monitoring should form part of the revised ACHMP and will be subject to consultation with the registered Aboriginal parties.

10.0 Salvage Methodologies

The following methodologies have been included to guide any further archaeological investigations that will be required prior to, and potentially during, any ground disturbing works undertaken within the Southern Extension Area.

10.1 Surface collection

Surface collection will be undertaken within the Southern Extension Area at the sites listed in **Section 6,** and at any other locations within the Southern Extension Area where additional surface materials may be identified over the course of salvage works. The proposed surface collection methodology is:

- the distribution of surface archaeological material will be assessed and where appropriate, archaeological material will be grouped into loci for the purposes of recording and analysis
- all surface archaeological material and/or loci of surface archaeological material will be flagged and photographed
- the location of each loci or isolated area of surface archaeological material will be recorded and mapped using a hand-held 12 channel GPS
- artefacts will be collected and placed in labelled bags with reference to site and locus (where appropriate).

10.2 Scarred tree salvage

Prior to impact the scarred section of the tree will be removed by a qualified arborist using the following methodology:

- the scarred sections of the tree will be heavily padded prior to works commencing in order to prevent accidental damage
- the limbs of the tree above the scar and the section of the trunk above the scar will be removed
- the scarred section of the tree will be supported while the trunk is cut off below the scarred section leaving sufficient trunk above and below the scars to assist with scar preservation
- the scarred section of the trunk will then be transported to a secure storage location on the site of Invincible as recommended by the Registered Aboriginal Parties (refer to Section 9.1).

10.3 Post-salvage analysis and reporting

Should the recovered archaeological assemblage contain enough archaeological material to allow for a statistically viable analysis, the salvaged artefact assemblage will be subject to detailed analysis. This will involve the recording of artefact class and raw material for all artefacts. Additional attributes to be recorded are listed in **Table 10.1** with reference to different artefact classes.

Table 10.1 Artefact Analysis Attributes with reference to Artefact Class

Artefact Class	Attributes to be recorded
Complete flakes	Length Width Thickness % Cortex Cortex Type Heat Treated (yes/no) Visible Use-Wear (yes/no) Visible Residue (yes/no) Comments – description, does it conjoin with another artefact, if used which margin was used, if it has residues on the flake etc.
Retouched Flakes	Retouched/broken retouched flake class Retouch type Visible Use-Wear (yes/no) Visible Residue (yes/no) Comments
Cores	Length Width Thickness % Cortex Cortex Type Heat Treated (yes/no) Rotation (count) Level of exhaustion Visible Use-Wear (yes/no) Visible Residue (yes/no) Comments
Other tool types (e.g. grindstones, axes, hammerstones etc.)	Length Width Thickness % Cortex Cortex Type Heat Treated (yes/no) Visible Use-Wear (yes/no) Visible Residue (yes/no) Comments

Following the completion of salvage activities and subsequent artefact analysis, a report will be compiled that presents the findings of the activities. Reports will be completed in accordance with OEH guidelines and requirements and will include:

- a description of the results of the activities including general environmental information, landscape information, soil descriptions and excavation profiles (where applicable);

- the results of detailed recording and analysis of salvaged archaeological material; and

- the use of recovered data to undertake a comparative analysis with the outcomes of other salvage activities within the local area to identify whether the current assemblage exhibits any significant differences from other salvaged assemblages and whether it can provide any further information on how Aboriginal people used/occupied the area.

11.0 Management of Salvaged Artefacts

During the analysis of any Aboriginal artefacts described in **Section 10.0**, the salvaged materials will be temporarily stored at the offices of the archaeological consultant undertaking the works. Following completion of the analysis and submission of a final report on salvage works to OEH, it is proposed that all artefacts be return to a secure storage location on the site of Invincible as recommended by the Registered Aboriginal Parties (refer to **Section 9.1**).

12.0 References

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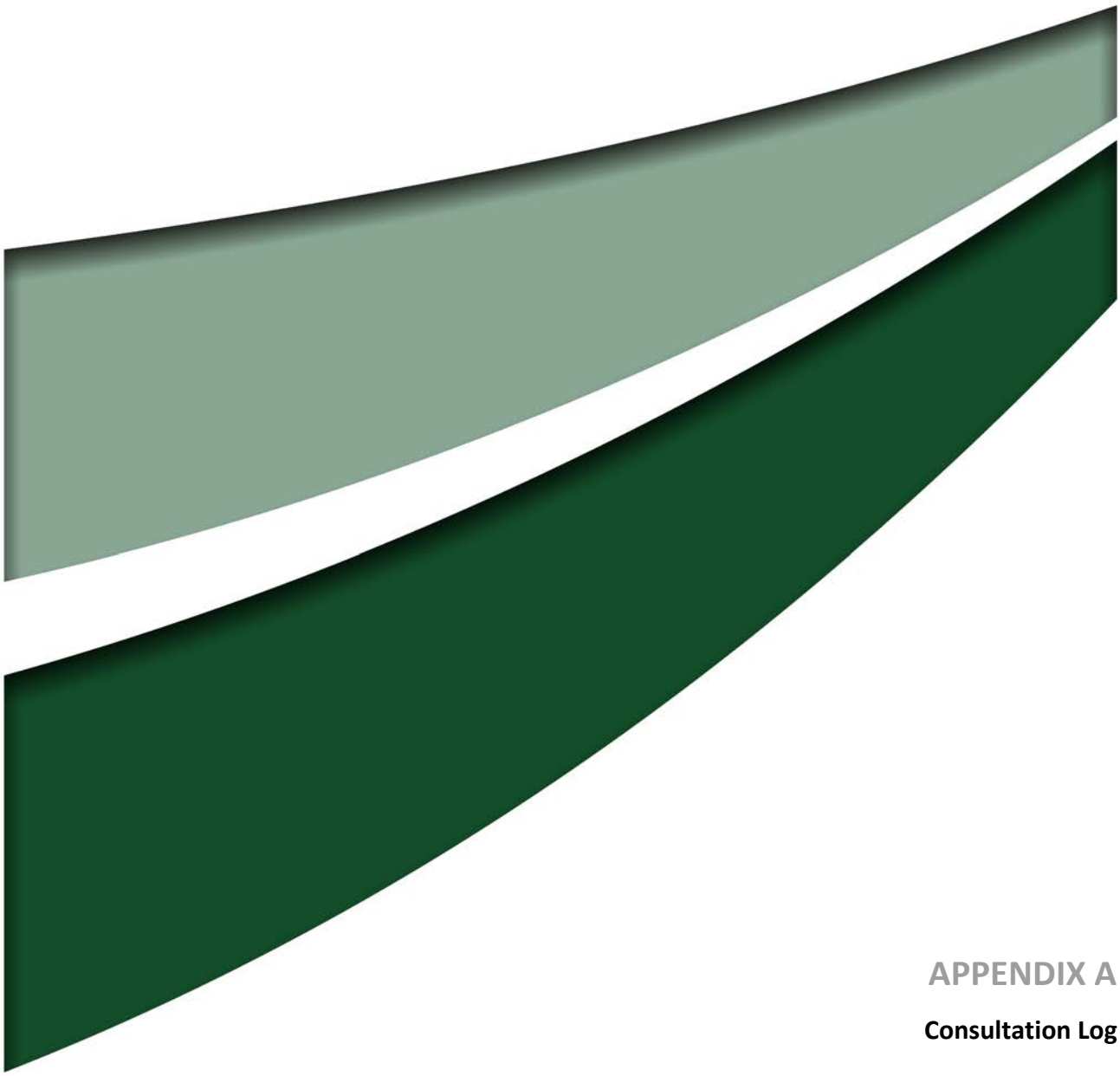

APPENDIX A

Consultation Log

Date	Type of Consultation	Parties Contacted	Outcome
15/12/15	Public advertisement providing notification of assessment and opportunity to register interest for consultation.	Advertisement placed in Lithgow Mercury	Registration of interest received from Ann Glassenbury via email on 17/12/15
15/12/15	Provision of letter to known Aboriginal parties seeking registrations of interest from Aboriginal parties with cultural knowledge/interest in the project area	Bathurst Local Aboriginal Land Council	Registration of interest received via telephone 8/03/16.
		Dhuuluu-Yala Aboriginal Corporation	No response.
		Mingaan Aboriginal Corporation	Registration of interest received via telephone and confirmed via email on 25/01/16
		North-East Wiradjuri Corporation	No response.
		Warrabinga Native Title Claimants Aboriginal Corporation	No response to initial contact.
		Wiradjuri Traditional Owners Central West Aboriginal Corporation	No response.
		Wellington Valley Wiradjuri Aboriginal Corporation	Registration received via email on 5/01/16
		Bathurst Wiradyuri and Aboriginal Community Elders Group	No response.
		Gundungurra Aboriginal Heritage Association Inc	No response.
		Gundungurra Tribal Council Aboriginal Corporation	No response.
		Mooka Traditional Owners	No response.
		Wiradyuri Council of Elders (Bill Allen)	No response.
		Wiray-dyuraa Maying-guwill	Registration of interest received via telephone and confirmed via email on 25/01/16
		Wiray-dyuraa Ngyumbaa-dyil	No response.

Date	Type of Consultation	Parties Contacted	Outcome
		Warrabinga/Wiradjuri People Native Title Claimants	No response.
23/12/15	Provision of letter requesting identification of Aboriginal parties with cultural knowledge/interest in the project area	OEH (Sydney South)	Response received 7/01/16 requesting that the following organisations be contacted • Bill Allen (correspondence already provided) • Dhuuluu-Yala Aboriginal Corporation (correspondence already provided) • Gundungurra Aboriginal Heritage Association (correspondence already provided) • Gundungurra Tribal Council Aboriginal Corporation (correspondence already provided) • Hawkesbury-Nepean Catchment Management Authority • Lyn Syme (North-East Wiraduri) (correspondence already provided) • Mingaan Aboriginal Corporation (correspondence already provided) • Mooka (correspondence already provided) • Trevor Robinson • Warrabinga Native Title Claimants Aboriginal Corporation (correspondence already provided) • Wiradjuri Council of Elders (correspondence already provided) • Wiradjuri Interim Working Party
		Office of the Registrar Aboriginal Land Rights Act 1983	No response.
		National Native Title Tribunal	No response.

Date	Type of Consultation	Parties Contacted	Outcome
		NTSCorp Limited	No response.
		Lithgow City Council	No response.
		Local Land Services	No response.
29/01/16	Additional letter seeking registration of interest from parties identified by OEH	Trevor Robinson	No response.
		Wiradjuri Interim Working Party	No response.
8/03/16	Follow up phone call to parties registered in previous assessment that have not responded	Bathurst Local Aboriginal Land Council	Registration of interest received via telephone.
		Warrabinga Native Title Claimants Aboriginal	Registration of interest received via telephone (9/03/16).
		Wiradjuri Traditional Owners Central West Aboriginal Corporation	No answer.
9/03/16	Follow up phone call to parties registered in previous assessment that have not responded	Wiradjuri Traditional Owners Central West Aboriginal Corporation	No answer.
9/03/16	Follow up email to parties registered in previous assessment that have not responded	Dhuuluu-Yala Aboriginal Corporation	Email address no longer active.
14/04/2016	All Registered Aboriginal parties invited to participate in survey.	Bathurst Local Aboriginal Land Council	Able to provide a representative.
		Ann Glassenbury	Unable to provide a representative.
		Mingaan Aboriginal Corporation	Unable to provide a representative.
		Wellington Valley Wiradjuri Aboriginal Corporation	Able to provide a representative.
		Wiray-duraa Maing-gu	Unable to provide a representative.
		Warrabinga Native Title Claimants Aboriginal Corporation	Able to provide representatives.
26-29/04/16	Survey of project area undertaken		

Date	Type of Consultation	Parties Contacted	Outcome
2/05/16	BLALC provided a survey report	Bathurst Local Aboriginal Land Council	Survey report provided via email,
29/7/16	Provision of Draft Report to Registered Aboriginal Parties for comment	Bathurst Local Aboriginal Land Council	
		Ann Glassenbury	
		Mingaan Aboriginal Corporation	
		Wellington Valley Wiradjuri Aboriginal Corporation	
		Wiray-duraa Maing-gu	
		Warrabinga Native Title Claimants Aboriginal Corporation	
10/8/16	Phone call to all parties to confirm receipt of report and answer any questions.	Bathurst Local Aboriginal Land Council	No answer.
		Ann Glassenbury	Confirmed received the report.
		Mingaan Aboriginal Corporation	No answer.
		Wellington Valley Wiradjuri Aboriginal Corporation	Confirmed received the report.
		Wiray-duraa Maing-gu	Confirmed received the report.
		Warrabinga Native Title Claimants Aboriginal Corporation	Confirmed received the report.
10/8/16	Email to those groups that could not be reached by phone	Bathurst Local Aboriginal Land Council	Provided comment via email (10/8/2016).
		Mingaan Aboriginal Corporation	No answer.
22/8/16	Reminder via email of upcoming close of comments on the draft	Ann Glassenbury	Provided verbal comment via phone call (26/8/2016).
		Mingaan Aboriginal Corporation	No response.
		Wellington Valley Wiradjuri Aboriginal Corporation	Provided comment via email (24/8/2016).

Date	Type of Consultation	Parties Contacted	Outcome
		Wiray-duraa Maing-gu	No response.
		Warrabinga Native Title Claimants Aboriginal Corporation	Provided comment via phone call (15/09/2016).

From: Bathurst LALC
To: Alison Lamond
Subject: Re: Invincible Draft Assessment report
Date: Wednesday, 10 August 2016 4:18:25 PM

Hi Alison,

Yes, we did receive the draft report thank you, I've looked over the recommendations and methodologies and they all look good to us.

regards

Tonilee Scott
Bathurst Local Aboriginal Land Council
149 Russell Street
Bathurst NSW 2795
P: 026332 6835
F: 026332 3623
E: bathlalc2@bigpond.com

From: Alison Lamond <alamond@umwelt.com.au>
Date: Wednesday, 10 August 2016 at 3:33 PM
To: Bathurst LALC user <bathlalc2@bigpond.com>
Subject: Invincible Draft Assessment report

Hi Amy
We mailed out the Draft Invincible Colliery report last week and I just wanted to check that the Land Council had received it. I can email you another electronic copy if you would like?

Thanks

Alison Lamond
Archaeologist

Umwelt (Australia) Pty Limited
75 York Street
Teralba, NSW 2284

Phone: (02) 4950 5322
Mobile: 0427 125 687

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Aboriginal Cultural Heritage Assessment Report.
Invincible Colliery, Cullen Bullen NSW.

Purpose of this assessment

The purpose of this assessment is to determine whether any features of Aboriginal cultural significance occur within the study area for this project, and whether their significance would be affected by the project. This assessment will be used to assist Umwelt to determine whether further assessment and consultation is required for this project.

Project details:

a) Project title:

Aboriginal Cultural Heritage and Archaeological Assessment – Invincible Colliery, Cullen Bullen, NSW.

b) Location of study area:
Invincible Colliery, Cullen Bullen NSW.

c) Name of Aboriginal site officer(s) completing this assessment:
Amy Armstrong

d) Name of Aboriginal organisation(s) represented by this survey:
Bathurst Local Aboriginal Land Council

e) Name of site officer(s) who undertook site survey:
Amy Armstrong

f) Date of survey:
26th- 29th April 2016

Methodology:

a) Approximately how much of the total project study area was surveyed (e.g. 10%-100%) and why? (e.g. certain areas were heavily disturbed, properties were inaccessible, ground visibility was poor, difficult weather conditions, etc.)

Approximately 98% of the survey area was covered on foot. 2% was unsurveyed due to safety concerns. The Rockshelter/Arefact scatter (45-1-2712) was inaccessible from the top of the Pogoda due to shear cliff line.

b) How was the survey undertaken? (e.g.. by foot, by car, individually, in groups, other? If other people were involved in the survey, please provide their names and name of their organisation, if relevant)

The survey was conducted on foot with a group consisting of 7. Due to tough terrain, remote areas were travelled to by car.

Results:

a) **Please provide a description of the area surveyed. Include a description of the total area covered, landforms, built areas, etc. Where appropriate survey areas should be identified on the map/plan.**

The surveyed area took place at Invincible Colliery proposed Southern Extension Area, Additional Surveyed Area, Registered AHIMS Sites, Drainage Lines/ areas and Pogodas / Cliff lines. 85% of the surveyed areas are heavily vegetated and visibility is poor. The 25% of remaining area surveyed has great visibility, producing clear landforms uncovering many artefacts.
Landforms ranged from small rises mostly flat to steep country.

b) **Where any of the following features identified during the survey?**

- [X] **Stone tools or flakes**
- [X] **Scarred Trees**
- [ ] **Bora circles**
- [ ] **Totems**
- [ ] **Other – please state:**
- [ ] **Hearths**
- [X] **Shelters**
- [ ] **Significant spiritual or social areas**
- [ ] **Significant cultural landscape features**
- [ ] **Shell middens**
- [ ] **Art sites**

If any of the above items were ticked, please provide a description including the location, quality, size, condition and significance of the feature, if known. Where appropriate, this information should be identified on the map/plan

Flakes have been previously reordered through AHIMS Database.
New Artefacts have been recorded by the archaeologists leading the team.
Scar Tree was located east of mine wall. Scar tree is dead due to logging and clearing through previous workings. Due to the size of the scar it is recommended to be a scar of a Coolamon. Rock shelter was located at the base of the Pogodas, it was discussed weather shock blasting will effect Rock shelter. Final result was it will not effect Rock shelter.

c) Is it considered likely that any of the above features may be present in the study area despite not being positively identified during the survey?

Yes / No YES

Although many Artefacts were discovered it is highly likely that many other Artefacts, Scarred Tree's and Rock shelters are existing within the area.

d) If known, please provide a description of the natural resources used by Aboriginal people that are, or would have been, available within the study area. Please describe the significance of these resources to past and present aboriginal communities.

Although there are naturally occurring resources in that area such as food, water, shelter and abundance of tool making materials, it is believed this was a traveling path for Aboriginal people in the past. This allowed the Aboriginal people of the area places to rest, gather and socialise. The Pogodas have many cultural aspects for Aboriginal People, through means of song lines and mapping. Please see attached photos.

e) Please provide a description of past disturbances to the study area, if known, and how this may affected Aboriginal cultural heritage features.

Invincible Colliery has been in production since the 1920's, overtime the coal mine has expanded. From what has been discovered in this area, it is believed that many features of Aboriginal culture has occupied this area for some time. Natural occurrences such as heavy rainfalls and hazard reductions have caused erosion and changing of the landscape.

Conclusion:

Is the project likely to affect any significant known or potential Aboriginal cultural heritage features as identified by the survey?

☐ **No**

☒ **Yes (if yes, please describe the features and how they would be affected)**

The expansion of the coalmine will affect Artefacts and Scar trees within the area. As discussed with the team of Archaeologists, measures are to be put in place to collect these items of Aboriginal significances. They are to be located and shelved at the mining site kept in a locked storage container.

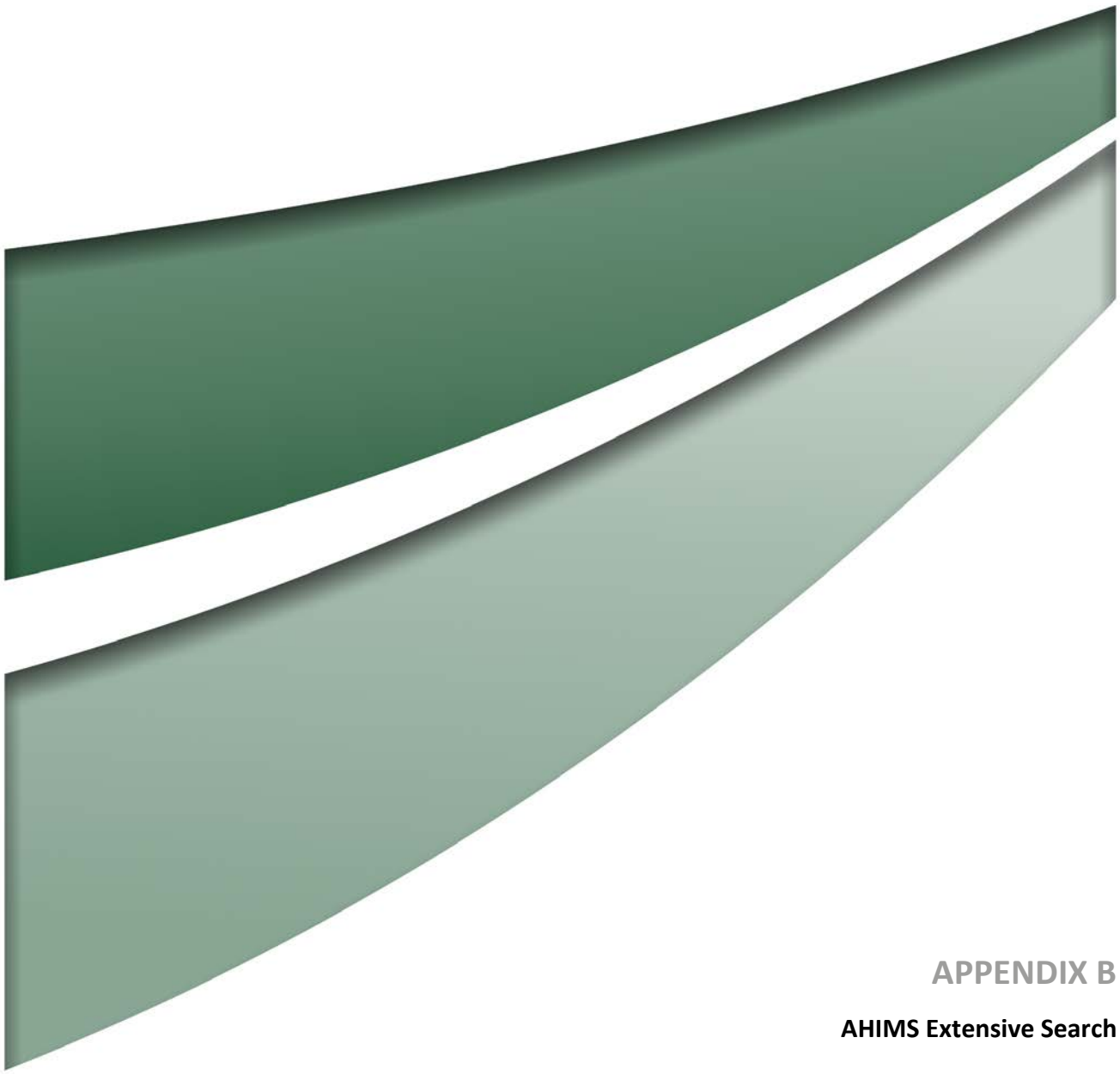
This assessment has been completed by:

Name: Amy Armstrong

Position Title: Sites Officer

Organisation name: Bathurst Local Aboriginal Land Council

On the following date: 2nd of May 2016



APPENDIX B

AHIMS Extensive Search

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville NSW 2220

Office of Environment & Heritage

Office Use Only

Site Number 45-1-2712

Date received / / Date entered into system / / Date catalogued / /

Entered by (I.D.)

Information Access

☐ Gender/male ☐ Gender/female ☐ Location restriction ☐ General restriction ☐ No access

Office Use Only

For Further Information Contact:

☐ **Nominated Trustee**

Title | Surname | First Name | Initials

Organisation

Address

Phone number | Fax

Client on system ☐

☐ **Knowledge Holder**

Title | Surname | First Name | Initials

Organisation

Address

Phone number | Fax

Client on system ☐

Aboriginal Heritage Unit or Cultural Heritage Division Contacts

Geographic Location

Site Name CV-RCK1-10

Easting 226045 Northing 6309097 AGD/GDA GDA

Mapsheet

Zone 56 Location Method Differential GPS

Other Registration

Primary Recorder

Title | Surname | First Name | Initials

Dr | McLaren | Andrew

Organisation AECOM Australia Pty Ltd

Address 8/420 George St Sydney NSW

Phone number 89340547 Fax 89340001

Date recorded November 2010

Client on system ☐

NPWS Aboriginal Site Recording Form - Site Information

OPEN/CLOSE SITE Closed Site

Site Context

Landform

- [x] Mountainous
- [ ] Plain
- [ ] Rolling hills
- [ ] Steep hills
- [ ] Undulating plain

Landform Unit

- [ ] Beach
- [ ] Coastal rock platform
- [ ] Dune
- [ ] Intertidal flat
- [ ] Lagoon
- [ ] Tidal Creek
- [ ] Tidal Flat
- [x] Cliff
- [ ] Crest
- [ ] Flat
- [ ] Lower slope
- [ ] Mid slope
- [ ] Upper slope
- [ ] Plain
- [x] Ridge
- [ ] Tor
- [ ] Valley flat
- [ ] Levy
- [ ] Stream bank
- [ ] Stream channel
- [ ] Swamp
- [ ] Terrace
- [ ] Terrace flat

Slope

[ ] degrees

Vegetation

- [ ] Closed forest
- [ ] Grasslands
- [ ] Isolated clumps of trees
- [ ] Open forest
- [ ] Open woodland
- [ ] Scrub
- [x] Woodland
- [ ] Cleared
- [ ] Revegetated
- [ ] N/A

Land use

- [ ] Conservation
- [ ] Established urban
- [ ] Farming-intensive
- [ ] Farming-low intensity
- [x] Forestry
- [ ] Industrial
- [ ] Mining
- [ ] Pastoral/grazing
- [ ] Recreation
- [ ] Semi-rural
- [ ] Service corridor
- [ ] Transport corridor
- [ ] Urban expansion
- [ ] Residential

Water

Distance to permanent water source	0 metres
Distance to temporary water source	metres
Name of nearest permanent water source	
Name of nearest temporary water	Waterfall at site

Directions for Relocation

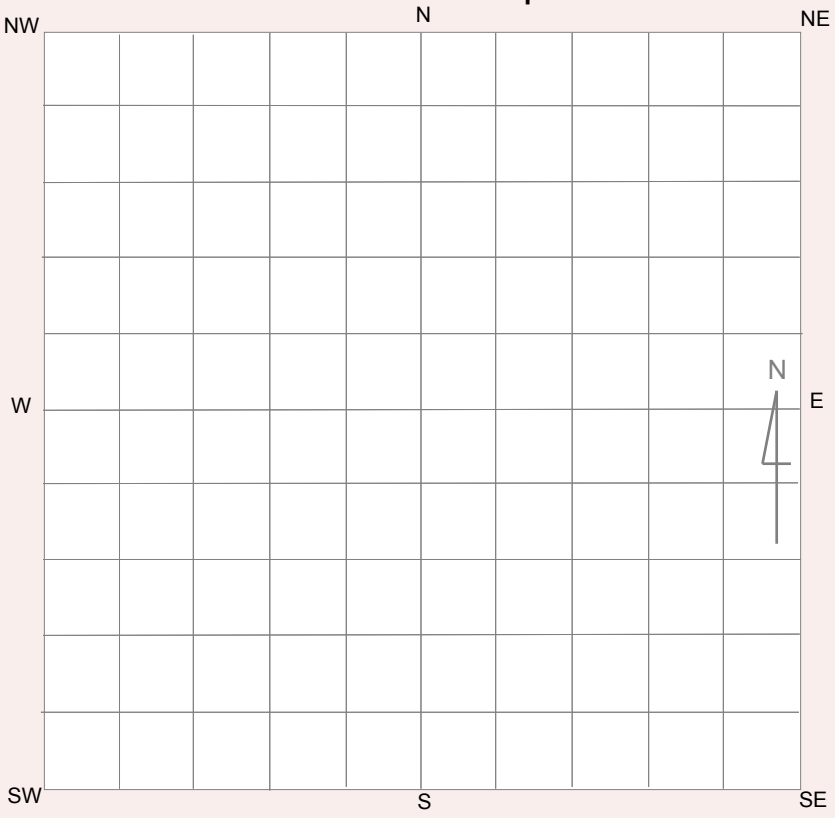
Current Land Tenure

- [ ] Public — National Park / other Government Dept.
- [ ] Private — Ben Bullen State Forest

Primary report **I.D.** [ ] (I.D. Office Use only)

Coalpac Consolidation Project - Aboriginal Archaeological and Cultural Heritage Impact Assessment (AECOM 2011).

Site Location Map



NPWS Aboriginal Site Recording Form - Site Information

General Site Information

Closed Site

Shelter/Cave Formation

- ☐ Boulder
- ☐ Wind erosion
- ☐ Water erosion
- ☐ Rock collapse

Rock Surface Condition

- ☐ Boulder
- ☐ Sandstone platform
- ☐ Silica gloss
- ☐ Tessellated
- ☐ Weathered
- ☐ Other platform

Condition of Ceiling

- ☐ Boulder
- ☐ Sandstone platform
- ☐ Silica gloss
- ☐ Tessellated
- ☐ Weathered
- ☐ Other platform

Shelter Aspect

- ☐ North
- ☐ North East
- ☐ East
- ☐ South East
- ☐ South
- ☐ South West
- ☑ West
- ☐ North West

Open Site

Site Orientation

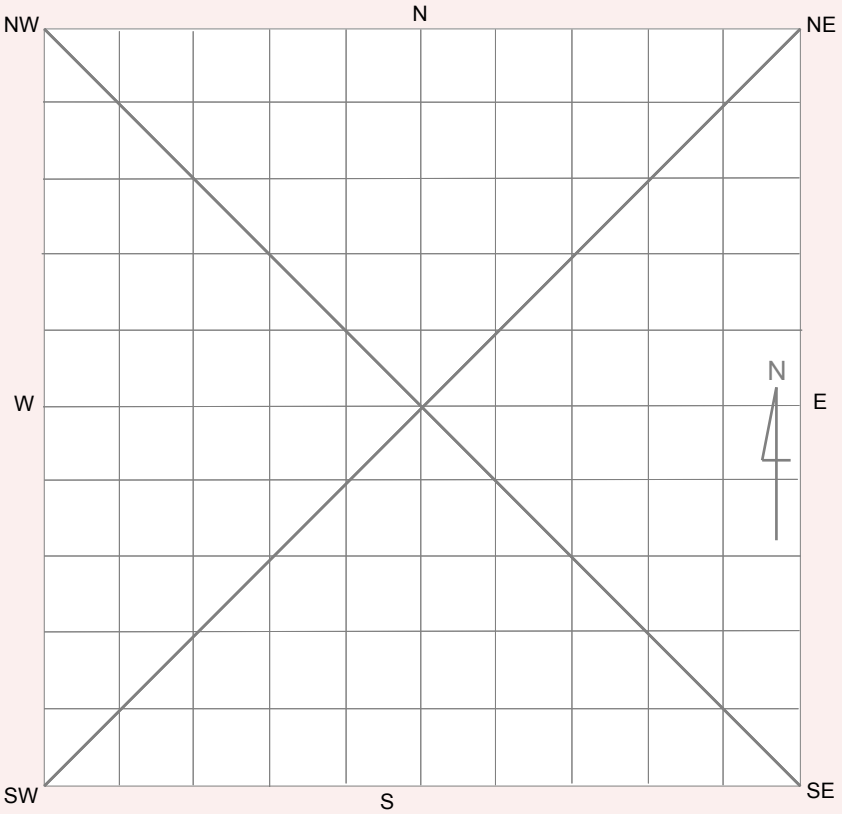
- ☐ N-S
- ☐ NE-SW
- ☐ E-W
- ☐ SE-NW
- ☐ N/A

Features

- ☐ 1. Aboriginal Ceremony & Dreaming
- ☐ 2. Aboriginal Resource & Gathering
- ☐ 3. Art
- ☑ 4. Artefact
- ☐ 5. Burial
- ☐ 6. Ceremonial Ring
- ☐ 7. Conflict
- ☐ 8. Earth Mound
- ☐ 9. Fish Trap
- ☐ 10. Grinding Groove
- ☐ 11. Habitation Structure
- ☐ 12. Hearth
- ☐ 13. Non Human Bone & Organic Material
- ☐ 14. Ochre quarry
- ☐ 15. Potential Archaeological Deposit
- ☐ 16. Stone Quarry
- ☐ 17. Shell
- ☐ 18. Stone Arrangement
- ☐ 19. Modified Tree
- ☐ 20. Water Hole

Site Plan

Indicate scale, boundaries of site, features



Site Dimensions

Closed Site Dimensions (m)

2 5m	Internal length
3 6m	Internal width
2 0m +	Shelter height
	Shelter floor area

Open Site Dimensions (m)

	Total length of visible site
	Average width of visible site
	Estimated area of visible site
	Length of assessed site area

Aboriginal Community Interpretation and Management Recommendations

Preliminary Site Assessment

Site Cultural & Scientific Analysis and Preliminary Management Recommendations

CV-RCK1-10 is a rockshelter with surface artefacts and PAD. It is assessed as possessing moderate scientific significance. The shelter is considered to have moderate subsurface archaeological potential. Stratified floor deposits containing Aboriginal objects deposits are likely. However, erosion has (and continues to) adversely affect the integrity of these deposits. Compared with similar shelter sites to the east (i.e. within the Coxs River Valley), it is anticipated that CV-RCK1-10 would yield a relatively small archaeological assemblage. Nonetheless, excavation of this site has the potential to provide archaeological data that could used to refine our understanding of the nature of past Aboriginal land use practices within and outside the Coxs River Valley.

CV-RCK1-10 may potentially be indirectly impacted by proposed works as a result of vibration and subsidence. To manage potential impacts, it is recommended that the AHMP for the Project contain provisions for long-term archaeological monitoring/management. (Continued in Comments section below).

This section should only be filled in by the Endorsees

Endorsed by: ☐ Knowledge Holder ☐ Nominated Trustee ☐ Native Title Holder ☐ Community Consensus

Title | Surname | First Name | Initials

Organisation

Address

Phone number | Fax

Attachments (No.)

- ☑ A4 location map
- ☐ B/W photographs
- ☑ Colour photographs
- ☐ Slides
- ☐ Aerial photographs
- ☐ Site plans, drawings
- ☐ Recording tables
- ☑ Other
- ☐ Feature inserts-No. ☐

Comments

An initial monitoring assessment should occur prior to commencement of any works and monitoring should continue throughout the operational life of the Project.

Attachments: A4 location map, site description, colour plates.

NPWS FEATURE RECORDING FORM - ARTEFACT

Site I.D.

Site Name: CV-RCK1-10

Importance:

First recorded date: Nov. 2010

No. of instances: 5 artefacts

Recorded by: A.M/G.O

Stone artefacts only: Yes

Artefacts collected: No

Permit issued:

Percentage of Non-stone Artefacts to Percentage of Stone Artefacts

0-9% 10-19% 20-29% 30-39% 40-49% 50-59% 60-69% 70-79% 80-89% 90-100%

Feature Context & Condition

Scatter No.

Easting: 226045

Northing: 6309097

Density (Artefact count per square metre)

Dimensions

Length (m): 36

Width (m): 25

Depth (m)

In situ:

Stratified:

Feature Condition

- [ ] Very good
- [x] Good
- [ ] Poor

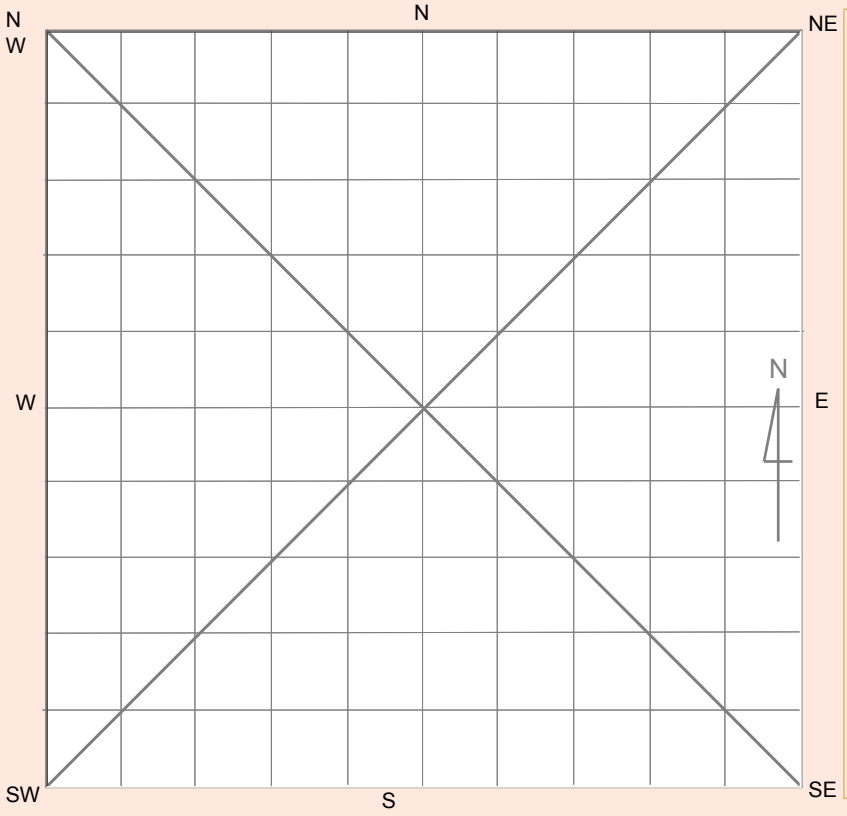
General Condition

- [x] Weathered
- [ ] Vehicle damage
- [x] Surface water wash
- [ ] Fire damage
- [ ] Erosion
- [ ] Stock damage
- [ ] Exposed archaeological material

Recommended Action

- [ ] Boardwalk
- [ ] Fencing
- [ ] Closure to public
- [ ] Continued inspection
- [ ] Fire hazard reduction
- [ ] Expert assessment
- [ ] Meeting with land manager
- [ ] Revegetation
- [ ] Signage
- [ ] Soil erosion control
- [ ] Track closure/re-routing
- [ ] Additional recording

Feature Plan (Indicate scale, location of instances)



Feature Environment

(Complete when *feature* environment differs to *site* environment, use attributes from cover card, p. 2)

Land form: Mountainous

Land form unit: Ridgelines & assoc. cliffs

Slope:

Vegetation: Open woodland

Land use: State forest

Water

Distance to permanent water source: metres

Distance to temporary water source: 0 metres

Name of nearest permanent water source: Small, intermittent waterfall at northern edge of shelter.

Name of nearest temporary water:

NPWS FEATURE RECORDING TABLE - ARTEFACT

Stone Artefact

Instance No.	Recording Date	Artefact Material	Artefact Type	Platform Surface	Platform Type	Termination	Cross Section	Length (mm)	Width (mm)	Thickness (mm)
1	Nov. 2010	Quartz	Flake		Cortical	Outrepasse		22.3	13.9	9.3
2	Nov. 2010	Quartz	Flake		Cortical	Feather		18.1	20.4	6.6
3	Nov. 2010	Chert	Flake		Crushed	Feather		10.8	13.5	3.2
4	Nov. 2010	Chert	Scraper					25.4	22.3	10.3
5	Nov. 2010	Quartz	Flake shatter					20.9		

Other Artefact Type

Instance No.	Recording Date	Artefact Material	Artefact Type	Description	Length (mm)	Width (mm)	Thickness (mm)

Material

Basalt
Chert
Fine grained siliceous
Granite
Quartz
Quartzite
Sandstone
Silcrete
Green glass
Amber glass
Amethyst glass
Clear glass
Ceramic
Porcelain
Tin can
Wire
Nail
Button
Shell
Bone
Wood
Resin

Artefact Description

Adze
Anvil
Axe
Backed blade
Blade
Core
Core tool
Cyclon
Distal fragment
Eloura
Flake
Flake tool
Flaked piece
Hammerstone
Manuport
Milling slab
Mortar
Muller
Nuclear tool
Pirri
Proximal fragment
Tula
Other diagnostic type
Modified
Unworked

Platform Surface

Cortex
Flake scar
More than one flake scar
Faceted
Ground
Indeterminate
Bipolar

Termination

Feather
Hinge
Step
Outrepasse
Bipolar

Platform Type

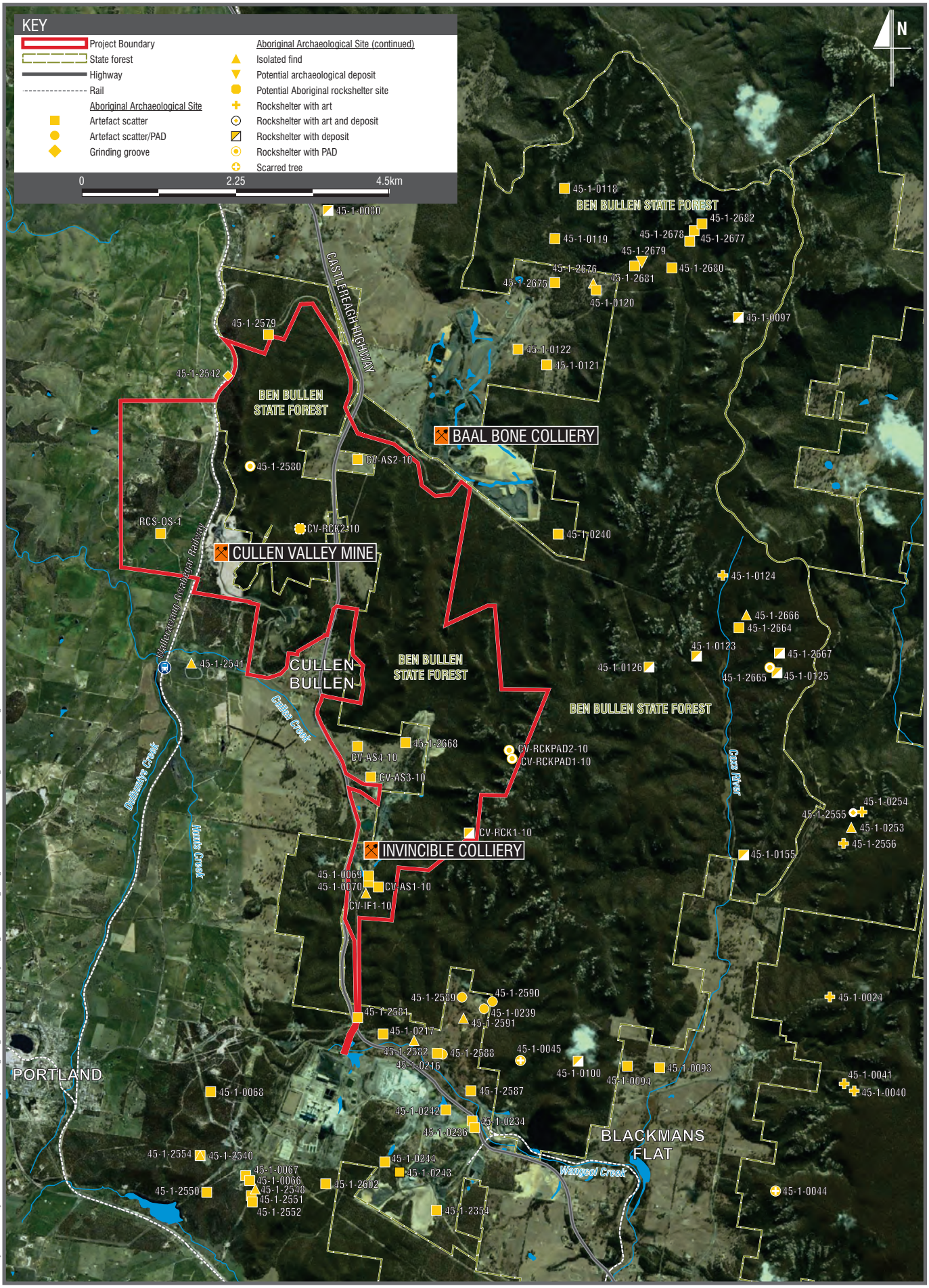
W
Focal
Shattered
Indeterminate
Bipolar

Cross Section

High/strong
High/weak
Low/weak
Irregular

Comments:

An initial monitoring assessment should occur prior to commencement of any works and monitoring should continue throughout the operational life of the Project.



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AECOM

ABORIGINAL ARCHAEOLOGICAL SITES

Coalpac Consolidation Project
Cullen Valley, New South Wales

FIGURE 3

CV-RCK1-10 – Site Description

Site type: Rockshelter with deposit

Co-ordinates: 226045mE 6309097mN GDA 94 (GDA 94, Zone 56)

Survey Landform: Ridgelines and associated cliffs

Site Description: CV-RCK1-10 consists of large rockshelter at the head of steep-sided forested valley approximately 1.5 km east north-east of the main Invincible Colliery site office. The rockshelter is located at the base of a major sandstone cliffline formation at an elevation of approximately 1000 m AHD and has a westerly aspect. CV-RCK1-10 has a maximum width of 36 m and maximum depth of 25 m. The height of ceiling is estimated to be in excess of 20 m. Access to CV-RCK1-10 can be achieved from the valley below but is physically demanding; access to the shelter from the ridgeline above is possible by way of a narrow gully no more than 50 m to the north to the shelter.

Surface rocks from roof fall are common within and outside the shelter. However, large blocks are rare. Exposed floor deposit consists of grey loamy sand. Most of the shelter floor slopes steeply towards the dripline. Extensive slope wash is evident and likely linked to significant seepage, the latter evidenced by extensive fern growth along the base of the shelter's rear wall as well as rear-wall staining. Floor deposits towards the rear of the rockshelter have an estimated depth of approximately 20 cm whilst those closer to the dripline have a minimum estimated depth of 50 cm. A total of five artefacts was identified on the floor of the shelter, with the majority occurring close to the dripline.

These included three complete flakes (one green chert/tuff, two milky quartz), one milky quartz flake shatter fragment and a chert/tuff scraper (dark-grey and finely banded). Quartz is readily available within and adjacent to the shelter in the form of pebbles that have eroded from the parent sandstone and it is highly likely that quartz used for the production of artefacts within the shelter was obtained on-site. The chert artefacts, on the other hand, have clearly been imported. No art is visible on the walls or roof the shelter. In addition to Aboriginal artefacts, a significant quantity of early 20th century (1920-40s) broken bottle glass is present on the floor of the shelter. Faded graffiti on the rear wall likely also dates to this period. Evidence for more recent activity is noticeably rare, however.

Vegetation directly outside the shelter has been mapped as Exposed Blue Mountains Sydney Peppermint – Silvertop Ash Shrubby Woodland. The nearest source of freshwater is a small intermittent waterfall on the northern edge of the shelter. This waterfall was flowing during the Project survey. In addition to Aboriginal artefacts, a significant quantity of early 20th century (1920-40s) broken bottle glass is present on the floor of the shelter. Faded graffiti on the rear wall likely also dates to this period.

CV-RCK1-10 – Plates

Plate 1: CV-RCK1-10: Rockshelter with deposit.

Plate 2: CV-RCK1-10: Rear-wall seepage has resulted in significant fern growth and staining.

Plate 3: CV-RCK1-10: Intermittent waterfall on northern edge of shelter.

Plate 4: CV-RCK1-10: Chert/tuff scraper.

AHIMS Web Services (AWS)

Extensive search - Site list report

Purchase Order/Reference : 3622

Client Service ID : 188228

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-1-2581	BP-OS-1	AGD	56	224391	6306376	Open site	Partially Destroyed	Artefact : -		
	Contact	**Recorders**	Central West Archaeological and Heritage Services Pty Ltd,Mr.Nicholass Harrop					**Permits**		
45-1-2582	BP-IF-1	AGD	56	225130	6305840	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Central West Archaeological and Heritage Services Pty Ltd					**Permits**		
45-1-2708	CV-AS1-10	GDA	56	224646	6308269	Open site	Valid	Artefact : 2		
	Contact	**Recorders**	AECOM Australia Pty Ltd (previously HLA-Envirosciences),Andrew McLaren					**Permits**		
45-1-2710	CV-AS3-10	GDA	56	224490	6309881	Open site	Valid	Artefact : 16		
	Contact	**Recorders**	AECOM Australia Pty Ltd (previously HLA-Envirosciences),Andrew McLaren					**Permits**		
45-1-2711	CV-AS4-10	GDA	56	224282	6310327	Open site	Valid	Artefact : 31		
	Contact	**Recorders**	AECOM Australia Pty Ltd (previously HLA-Envirosciences),Andrew McLaren					**Permits**		
41-1-0239	NC-OS2	AGD	56	226217	6306703	Open site	Partially Destroyed	Artefact : 10, Potential Archaeological Deposit (PAD) : 1		
	Contact Searle	**Recorders**	OzArk Environmental and Heritage Management,Mr.NICHOLAS HARROP					**Permits**	2225	
45-1-2589	NC-OS3	AGD	56	226273	6306444	Open site	Valid	Artefact : 10, Potential Archaeological Deposit (PAD) : 1		
	Contact T Russell	**Recorders**	OzArk Environmental and Heritage Management					**Permits**	2225	
45-1-2590	NC-OS4	AGD	56	225959	6306703	Open site	Partially Destroyed	Artefact : 10, Potential Archaeological Deposit (PAD) : 1		
	Contact T Russell	**Recorders**	OzArk Environmental and Heritage Management,Mr.Nicholass Harrop					**Permits**	2225	
45-1-2591	NC-IF1	AGD	56	225851	6306185	Open site	Valid	Artefact : 10, Potential Archaeological Deposit (PAD) : 1		
	Contact T Russell	**Recorders**	OzArk Environmental and Heritage Management					**Permits**	2225	
45-1-2668	Invincible OS1	GDA	56	224955	6310224	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Mark Cameron,OzArk Environmental and Heritage Management					**Permits**		
45-1-2755	Neubecks Creek Open Site PAD 7	GDA	56	225338	6306253	Open site	Partially Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management,Mr.NICHOLAS HARROP					**Permits**		

Report generated by AHIMS Web Service on 02/09/2015 for Kirwan Williams for the following area at Datum :GDA, Zone : 56, Eastings : 222000 - 227000, Northings : 6306000 - 6311000 with a Buffer of 50 meters. Additional Info : To inform an Archaeological Assessment. Number of Aboriginal sites and Aboriginal objects found is 22

AHIMS Web Services (AWS)

Extensive search - Site list report

Purchase Order/Reference : 3622

Client Service ID : 188228

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-1-2741	BMCS Art site 1	AGD	56	226740	6310519	Open site	Valid	Art (Pigment or Engraved) : 30, Artefact : 1		
	Contact	**Recorders**	Blue Mountians Conservation Society						**Permits**	
45-1-2712	CV-RCK1-10	GDA	56	226045	6309097	Open site	Valid	Artefact : 5		
	Contact	**Recorders**	Andrew McLaren						**Permits**	
45-1-2714	CV-IF1-10	GDA	56	224414	6308183	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	AECOM Australia Pty Ltd (previously HLA-Envirosciences),Andrew McLaren						**Permits**	
45-1-2750	Neubecks Creek Isolated Find 3	GDA	56	225963	6306832	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management						**Permits**	
45-1-2751	Neubecks Creek Isolated Find 4	GDA	56	226044	6306350	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management						**Permits**	
45-1-2752	Neubecks Creek IF-8 with PAD	GDA	56	225257	6306096	Open site	Partially Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management,Mr.NICHOLAS HARROP						**Permits**	
45-1-2706	CV-RCKPAD1-10	GDA	56	226660	6310217	Closed site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	AECOM Australia Pty Ltd (previously HLA-Envirosciences),Andrew McLaren						**Permits**	
45-1-0069	Invincible Colliery;	AGD	56	224400	6308230	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	ASRSYS						**Permits**	
45-1-0070	Invincible Colliery;	AGD	56	224390	6308120	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Ms.Laila Haglund						**Permits**	
45-1-0216	Neubecks Creek 2; same as 45-1-2588	AGD	56	225594	6305876	Open site	Partially Destroyed	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Helen Brayshaw,Ms.Laila Haglund,Mr.NICHOLAS HARROP						**Permits**	
45-1-0217	Neubeck Creek 1;	GDA	56	224774	6306112	Open site	Destroyed	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Helen Brayshaw,Ms.Laila Haglund						**Permits**	2225

Report generated by AHIMS Web Service on 02/09/2015 for Kirwan Williams for the following area at Datum :GDA, Zone : 56, Eastings : 222000 - 227000, Northings : 6306000 - 6311000 with a Buffer of 50 meters. Additional Info : To inform an Archaeological Assessment. Number of Aboriginal sites and Aboriginal objects found is 22

AHIMS Web Services (AWS)

Note: This Excel report shows the sites found in AHIMS on the 15/09/2016. If this date is not the same as the letter.

Site ID	Site name	Datum	Zone	Easting	Northing	Context
45-1-2581	BP-OS-1	AGD	56	224391	6306376	Open site
45-1-2582	BP-IF-1	AGD	56	225130	6305840	Open site
45-1-2708	CV-AS1-10	GDA	56	224646	6308269	Open site
45-1-2710	CV-AS3-10	GDA	56	224490	6309881	Open site
45-1-2711	CV-AS4-10	GDA	56	224282	6310327	Open site
41-1-0239	NC-OS2	AGD	56	226217	6306703	Open site
45-1-2589	NC-OS3	AGD	56	226273	6306444	Open site
45-1-2590	NC-OS4	AGD	56	225959	6306703	Open site
45-1-2591	NC-IF1	AGD	56	225851	6306185	Open site
45-1-2668	Invincible OS1	GDA	56	224955	6310224	Open site
45-1-2755	Neubecks Creek Open	GDA	56	225338	6306253	Open site
45-1-2741	BMCS Art site 1	AGD	56	226740	6310519	Open site
45-1-2712	CV-RCK1-10	GDA	56	226045	6309097	Open site
45-1-2714	CV-IF1-10	GDA	56	224414	6308183	Open site
45-1-2750	Neubecks Creek Isolate	GDA	56	225963	6306832	Open site
45-1-2751	Neubecks Creek Isolate	GDA	56	226044	6306350	Open site
45-1-2752	Neubecks Creek IF-8 w	GDA	56	225257	6306096	Open site
45-1-2706	CV-RCKPAD1-10	GDA	56	226660	6310217	Closed sit
45-1-0069	Invincible Colliery;	AGD	56	224400	6308230	Open site
45-1-0070	Invincible Colliery;	AGD	56	224390	6308120	Open site
45-1-0216	Neubecks Creek 2; san	AGD	56	225594	6305876	Open site
45-1-0217	Neubeck Creek 1;	GDA	56	224774	6306112	Open site
45-1-2787	94M Str10	GDA	56	222482	6307845	Open site

Report generated by AHIMS Web Service on 15/09/2016 for Alison Lamond for the following area at Datum :GDA, Zone : 56, Eastings : 222000 - 227000, Northings : 63

original date of the Search Results letter obtained during the Basic Search, then the search results might be differe

Site status	Primary contact	Site features	Site types	Recorders
Partially Destroyed		Artefact : -		Central West Archaeolo
Valid		Artefact : -		Central West Archaeolo
Valid		Artefact : 2		AECOM Australia Pty Lt
Valid		Artefact : 16		AECOM Australia Pty Lt
Valid		Artefact : 31		AECOM Australia Pty Lt
Partially Destroyed	Searle	Artefact : 10, Potential Archaeological Deposit (F		OzArk Environmental ar
Valid	T Russell	Artefact : 10, Potential Archaeological Deposit (F		OzArk Environmental ar
Partially Destroyed	T Russell	Artefact : 10, Potential Archaeological Deposit (F		OzArk Environmental ar
Valid	T Russell	Artefact : 10, Potential Archaeological Deposit (F		OzArk Environmental ar
Valid		Artefact : -		Mr.Mark Cameron,OzAr
Partially Destroyed		Artefact : 1, Potential Archaeological Deposit (P/		OzArk Environmental ar
Valid		Art (Pigment or Engraved) : 30, Artefact : 1		Blue Mountians Conser
Valid		Artefact : 5		Andrew McLaren
Valid		Artefact : 1		AECOM Australia Pty Lt
Valid		Artefact : 1		OzArk Environmental ar
Valid		Artefact : 1		OzArk Environmental ar
Partially Destroyed		Artefact : 1, Potential Archaeological Deposit (P/		OzArk Environmental ar
Valid		Potential Archaeological Deposit (PAD) : -		AECOM Australia Pty Lt
Valid		Artefact : -	Open Camp Site	ASRSYS
Valid		Artefact : -	Open Camp Site	Ms.Laila Haglund
Partially Destroyed		Artefact : -	Open Camp Site	Helen Brayshaw,Ms.Lail
Destroyed		Artefact : -	Open Camp Site	Helen Brayshaw,Ms.Lail
Valid		Artefact : -		Mrs.Angela Besant,Insit

306000 - 6311000 with a Buffer of 50 meters. Additional Info : To inform an Archaeological Assessment. Number of Aboriginal sites and Aboriginal objects found is 23

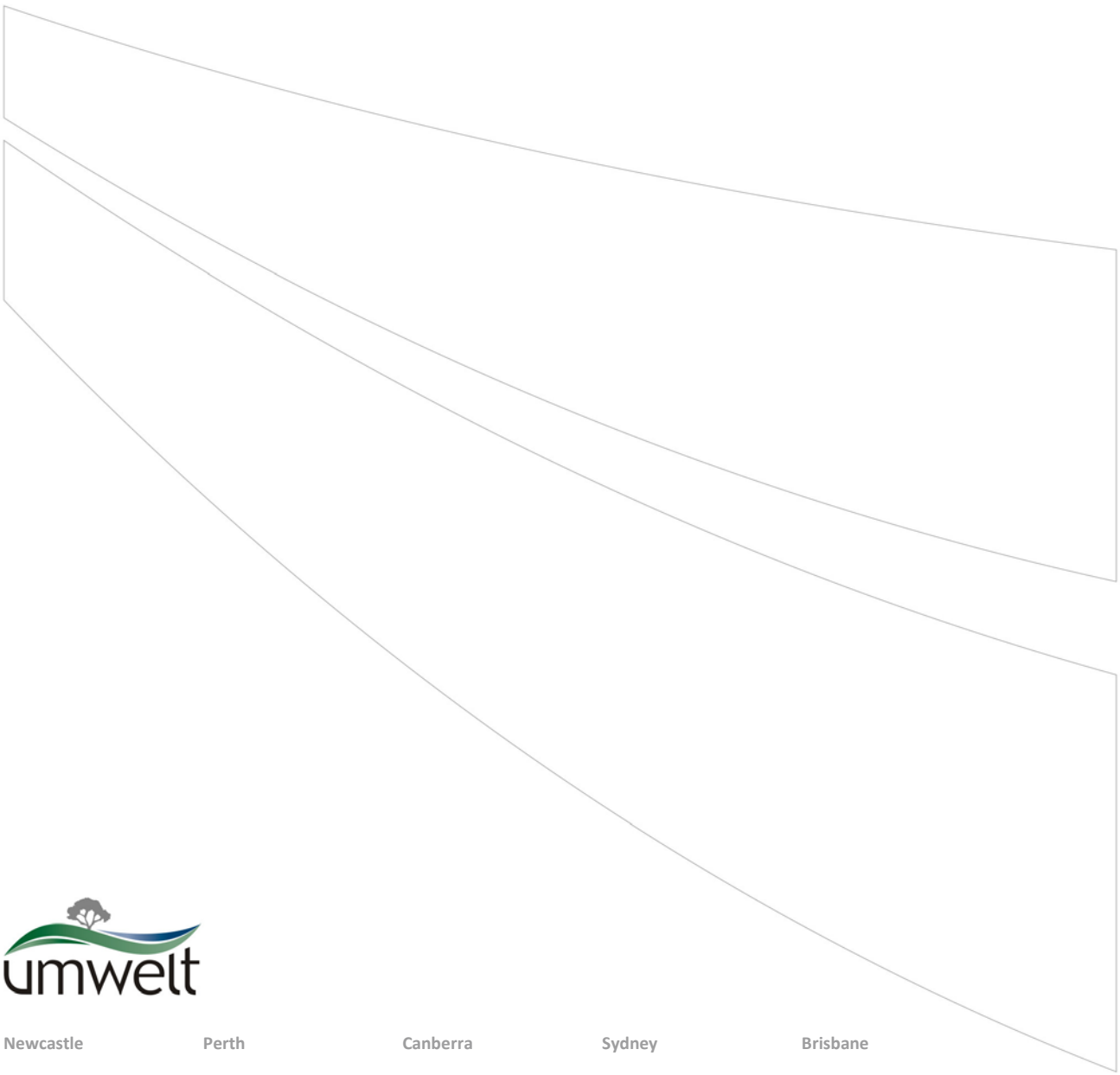
ssion made on the information and consequences of such acts or omission.

Your Ref/PO Number : 3622

Client Service ID : 188228

nt. The PDF version of this report will always coincide with the Basic Search Results

Reports	Permits	Longitude GDA94	Latitude GDA94
gical and Heritage Services Pty Ltd,Mr.Nicholass		150.04	-33.34
gical and Heritage Services Pty Ltd		150.05	-33.35
d (previously HLA-Envirosciences),Andrew McLa		150.04	-33.33
d (previously HLA-Envirosciences),Andrew McLa		150.04	-33.32
d (previously HLA-Envirosciences),Andrew McLa		150.04	-33.31
ıd Heritage Managemen	2225	150.06	-33.34
ıd Heritage Managemen	2225	150.06	-33.34
ıd Heritage Managemen	2225	150.06	-33.34
ıd Heritage Managemen	2225	150.06	-33.35
k Environmental and Heritage Management		150.05	-33.31
ıd Heritage Management,Mr.NICHOLAS HARRC		150.05	-33.35
⁄ation Society		150.07	-33.31
		150.06	-33.32
d (previously HLA-Envirosciences),Andrew McLa		150.04	-33.33
ıd Heritage Management		150.06	-33.34
ıd Heritage Management		150.06	-33.35
ıd Heritage Management,Mr.NICHOLAS HARRC		150.05	-33.35
d (previously HLA-Envirosciences),Andrew McLa		150.06	-33.31
		150.04	-33.33
		150.04	-33.33
a Haglund,Mr.NICHOLAS HARROP		150.05	-33.35
a Haglund	2225	150.04	-33.35
e Heritage Pty Ltd		150.02	-33.33



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