

## Aboriginal Cultural Heritage Assessment Report

### Longwall 19A

### Dendrobium Area 3A

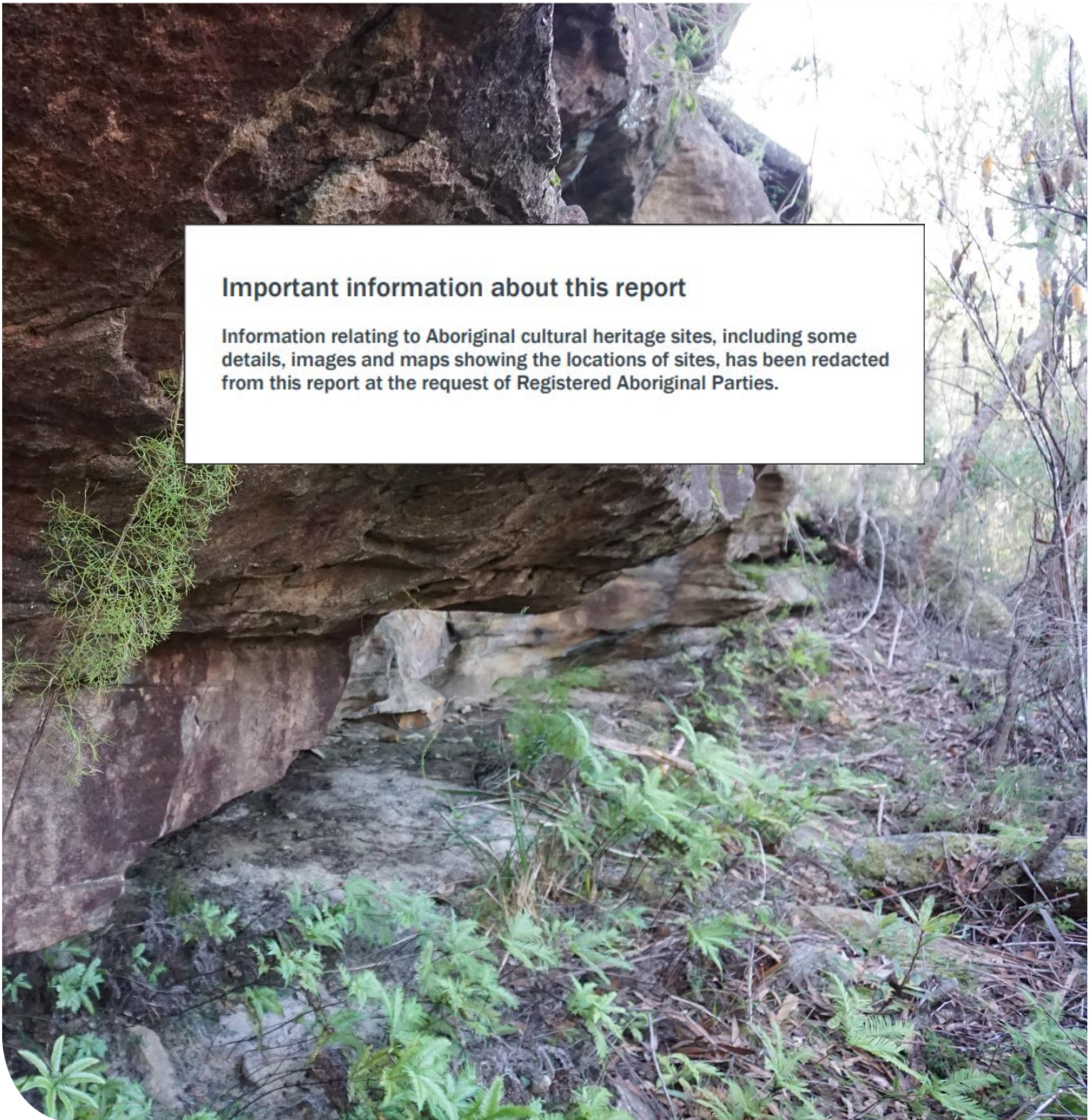
LGA: Wollongong City Council

Prepared for South32 – Illawarra Metallurgical Coal

Prepared by Niche Environment and Heritage | 20 July 2022

#### **Important information about this report**

Information relating to Aboriginal cultural heritage sites, including some details, images and maps showing the locations of sites, has been redacted from this report at the request of Registered Aboriginal Parties.



## Document control

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## Executive summary

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This report presents the Aboriginal Cultural Heritage Assessment (ACHA) for the Longwall 19A Subsidence Management Plan (SMP) application; that is being sought by South32-Illawarra Metallurgical Coal (IMC) in accordance with Schedule 3 Condition 7 of the Dendrobium Mine Development Consent 60-03-2001. The Dendrobium Mine (the 'Subject Area') is located approximately 13 kilometres (km) to the northwest of the Wollongong Central Business District, within the WaterNSW Metropolitan Special Catchment Area. The Subject Area is defined by the 600 metre (m) boundary around the extent of the proposed Longwall 19A.

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by IMC to complete an ACHA using the following regulation and guidelines:

- *The National Parks and Wildlife Regulation 2009* (NPW Regulation)
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW Department of Environment, Climate Change and Water [DECCW]2010a)
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b)
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (Office of Environment and Heritage [OEH] 2011) and;
- *The Burra Charter: The Australian ICOMOS Charter for Places of Cultural Significance* (Australia International Council on Monuments and Sites [ICOMOS] 2013).

In addition to the comprehensive reassessment of the Aboriginal Heritage Information Management System (AHIMS) registered sites that fall within the Subject Area, this ACHA has included a review of the previous surveys and assessments from within the Dendrobium 3A Area and surrounds. Biosis Research's previous assessment *Dendrobium Area 3 Archaeological and Cultural Heritage Assessment* (Biosis Research 2007) was sourced as a foundation for this assessment as a previous AHIP (ID# 1098243) had been approved within the existing Subject Area (Appendix E).

A total of 11 separate Aboriginal stakeholders (including groups and individuals) have been previously identified and consulted with as part of the Dendrobium Consent process (DA-60-03-2001, Navin Officer 2000 and Biosis Research 2007). As a result of this previous consultation process, there is no requirement to commence the formal process under the *Aboriginal cultural heritage consultation requirements for proponents 2010* (Section 3). Stages 2 to 4 of the consultation process were followed for the remainder of the Registered Aboriginal Parties (RAP) engagement for this ACHA.

A total of seven (7) Aboriginal cultural heritage sites are located within the Subject Area, including Browns Road Site 32 (AHIMS ID#52-2-1646) that has been included in Condition 12 of the Dendrobium Development Consent. The majority of the sites (6 of 7) have a low scientific (archaeological) significance. One site is of moderate scientific (archaeological) significance. The RAPs have advised during previous assessments completed by Biosis Research (2007) and Niche Environment and Heritage (2021 and 2022) that all sites have a high cultural significance.

### Summary of Impacts

The proposed extraction of Longwall 19A (the Project) will result in vertical and horizontal subsidence at the surface, which may result in impacts to the sites and associated landscape elements. Subsidence predictions detailed by Mine Subsidence Engineering Consultants ([MSEC] 2022) suggest that three (3) Aboriginal cultural heritage sites located above the proposed Longwall 19A have the potential to experience direct impacts from the extraction of Longwall 19A. These sites include:

- DM 15 (AHIMS ID#52-2-3639)
- DM 20 (AHIMS ID# 52-2-3644)
- Sandy Creek Road 21 (AHIMS ID#52-5-0273)

Four (4) Aboriginal cultural heritage sites within the Subject Area are not predicted to experience subsidence related effects (MSEC 2022). These Aboriginal cultural heritage sites include:

- Browns Road Site 30 (AHIMS ID#52-2-1644)
- Browns Road Site 31 (AHIMS ID#52-2-1645)
- Browns Road Site 32 (AHIMS ID#52-2-1646)
- Sandy Creek Road 20 (AHIMS ID#52-5-0272)

## Regulatory requirements and recommendations

The following draft recommendations have been made by Niche in consultation with the RAPs:

Draft Recommendations	
1.	IMC should continue to consult with the Aboriginal community for the life of the Project in accordance with the consultation guidelines.
2.	<p>A subsidence monitoring program to be implemented progressively over the life of the Project. The subsidence monitoring program should include monitoring of all Aboriginal sandstone shelter sites and grinding groove sites located within the angle of draw of the Project. The program should include (but not be limited to) the following:</p> <ul style="list-style-type: none"> <li>• A schedule for undertaking the subsidence monitoring at the nominated sites.</li> <li>• Appropriately detailed baseline and archival site recordings, including high resolution digital photographs.</li> </ul> <p>An impact TARP specific to each of the sites being monitored.</p>
3.	<p>The following Aboriginal cultural heritage site cards should be updated on the AHIMS to include revised photographs and co-ordinates as those currently registered are incorrect:</p> <ul style="list-style-type: none"> <li>• DM 15 (AHIMS ID#52-2-3639)</li> <li>• Browns Road Site 29 (AHIMS ID#52-2-1643)</li> <li>• Browns Road Site 30 (AHIMS ID#52-2-1644)</li> <li>• Browns Road Site 31 (AHIMS ID#52-2-1645)</li> <li>• Sandy Creek Road 19 (AHIMS ID#52-5-0271)</li> <li>• Sandy Creek Road 20 (AHIMS ID#52-5-0272)</li> </ul>
4.	<p>The Aboriginal Heritage Plan for Dendrobium Area 3A should be revised to consider recommended management strategies determined by the outcomes of this assessment, and any further recommendations provided by Heritage NSW. Baseline recording for the following sites will need to be completed for that Management Plan, as they have not previously been baseline recorded:</p> <ul style="list-style-type: none"> <li>• Browns Road Site 32 (AHIMS ID# 52-2-1646)</li> <li>• Sandy Creek Road 19 (AHIMS ID# 52-5-0271)</li> </ul>
<b>General</b>	
5.	All workers should have cultural awareness training, so they are made aware of their obligations under the NPW Act and the ACHMP.
6.	<p>In the unlikely event that suspected human remains are encountered, all work in the area that may cause impact to the remains, must cease immediately and:</p> <ul style="list-style-type: none"> <li>• The location, including a 20 m curtilage, should be secured using barrier fencing to avoid harm.</li> <li>• The NSW Police must be contacted immediately.</li> <li>• No further action is to be undertaken until the NSW Police provide written notification to IMC.</li> <li>• If the skeletal remains are identified as Aboriginal, then IMC or their agent must contact: <ul style="list-style-type: none"> <li>▪ The Heritage NSW, of the Enviroline on 131 555; and representatives of the RAPs.</li> <li>▪ No works are to continue within the 20 m curtilage until Heritage NSW provides written notification to the proponent or their Agent.</li> </ul> </li> </ul>

## Glossary and list of abbreviations

Term or abbreviation	Definition
Aboriginal cultural heritage	The tangible (objects) and intangible (dreaming stories, legends and places) cultural practices and traditions associated with past and present-day Aboriginal communities.
ACHA	Aboriginal Cultural Heritage Assessment.
Aboriginal object(s)	The legal definition for material Aboriginal cultural heritage under the NSW <i>National Parks and Wildlife Act 1974</i> .
Aboriginal stakeholders	Members of a local Aboriginal land council, registered holders of Native Title, Aboriginal groups or other Aboriginal people who may have an interest in the Project.
AHIP	Aboriginal Heritage Impact Permit.
Angle of draw	<p>This is a subsidence engineering term used to define the limits of the subsidence movements in a landscape caused by mine workings, that leads to vertical displacement on the surface.</p> <p>The angle of draw is determined through a series of geometric parameters in which the angle between two lines drawn from the edge of the mine workings. One being a vertical line, and the other a line to the limit of vertical displacement on the surface. Because surface movements can also be caused by natural effects such as seasonal variations or drought leading to swelling or shrinkage of near-surface soil and sediment, it can be very difficult to identify where vertical movement due to mining ceases. Therefore, it is standard practice to specify a limiting value for vertical displacement which might be attributable to mining. In New South Wales, this value is usually 20 mm of vertical subsidence. It should be noted that, in some environments, up to 50 mm or more of vertical movement may occur due to seasonal climatic changes.</p>
Archaeology	The scientific study of material traces of human history, particularly the relics and cultural remains of past human activities.
Archaeological deposit	A layer of soil material containing archaeological objects and/or human remains.
Archaeological investigation	The process of assessing the archaeological potential of an impact area by a qualified archaeologist.
Archaeological site	An area that contains surface or sub-surface material evidence of past human activity in which material evidence (artefacts) of past activity is preserved.
Artefact	An object made by human agency (e.g. stone artefacts).
Assemblage	<p>A group of artefacts found in close association with one another.</p> <p>Any group of items designated for analysis that exist in spatial and/or vertical context – without any assumptions of chronological or spatial relatedness.</p>
Avoidance	A management strategy which protects Aboriginal sites within an impact area by avoiding them totally in development.
BCD	the Biodiversity Conservation Division of the Department of Planning, Industry and Environment, previously known as the Office of Environment and Heritage.
Code of Practice	<i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i> .

Term or abbreviation	Definition
Cumulative impacts	Combination of individual effects of the same kind due to multiple actions from various sources over time.
DECCW	The Department of Conservation, Climate Change and Water, now the Office of Environment and Heritage.
DA	Development Application.
DCP	Development Control Plan
Drainage	Natural or artificial means for the interception and removal of surface or subsurface water.
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979.</i>
Flake	A piece of stone detached from a core, displaying a bulb of percussion and striking platform.
Harm	With regard to Aboriginal objects this has the same meaning as the <i>NSW National Parks and Wildlife Act 1974.</i>
Heritage NSW	Heritage NSW of the Department of Premier and Cabinet, previously known as the Biodiversity Conservation Division.
ILALC	Illawarra Local Aboriginal Land Council
IMC	The proponent South32-Illawarra Metallurgical Coal
Impact	Influence or effect exerted by a project or other activity on the natural, built and community environment.
Impact area	An area that requires archaeological investigation and management assessment.
In situ	Latin words meaning ‘on the spot, undisturbed’.
Isolated artefact / find	A single artefact found in an isolated context.
Landscape character	The aggregate of built, natural and cultural aspects that make up an area and provide a sense of place. Includes all aspects of a tract of land – built, planted and natural topographical and ecological features.
Landform	Any one of the various features that make up the surface of the earth.
LEP	Local Environmental Plan.
Management plans	Conservation plans which identify short- and long-term management strategies for all known sites recorded within a (usually approved) Subject Area.
Methodology	The procedures used to undertake an archaeological investigation.
Mitigation	To address the problem of conflict between land use and site conservation.
NPW Act	National Parks and Wildlife Act 1974.
NPW Regulation	National Parks and Wildlife Regulation 2009.
Open camp site	An archaeological site situated within an open space (e.g. archaeological material located on a creek bank, in a forest, on a hill, etc.).
PAD	Potential Archaeological Deposit. A location considered to have a potential for subsurface archaeological material.
RAP	Registered Aboriginal Party.
SHI	State Heritage Inventory
Statutory controls	control or regulation provided for by legislation

Term or abbreviation	Definition
Site recording	The systematic process of collecting archaeological data for an archaeological investigation.
Site	A place where past human activity is identifiable.
SMP	Subsidence Management Plan
Spit	A unit of archaeological excavation with an arbitrary assigned measurement of depth and extent.
Survey coverage	A graphic and statistical representation of how much of an impact area was surveyed and therefore assessed.
TARP	Trigger Action Response Plan



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## 1. Introduction

### 1.1 Project background and aims

Illawarra Metallurgical Coal (IMC), a wholly owned subsidiary of South32 Limited (South32), has proposed to extract Longwall 19A (The Project) within Area 3A of the Dendrobium Mine, as part of Consolidated Coal Lease (CCL) 768 under the Development Consent 60-03-2001 (DA 60-03-2001). The Subject Area is defined by the 600 metre (m) boundary around the proposed Longwall 19A which forms this Project (Figure 1 and Figure 2).

This report presents an Aboriginal Cultural Heritage Assessment (ACHA) to accompany the Longwall 19A Subsidence Management Plan (SMP) application and is necessary to satisfy the requirement to manage Aboriginal cultural heritage sites and objects under the *National Parks and Wildlife Act 1974* (NPW Act) and *Environmental Planning and Assessment Act 1979* (EP&A Act) as part of the proposed development. This assessment will inform the SMP for Longwall 19A. IMC has engaged Niche Environment and Heritage (Niche) to assist with the development of an ACHA that:

- Determines the archaeological and cultural significance of Aboriginal objects and /or places relevant to the Subject Area.
- Prepares an impact assessment and provides appropriate management recommendations for any identified Aboriginal objects that might be identified during the process.
- Details the community consultation process and any Aboriginal cultural heritage values identified, in compliance with the *Aboriginal cultural heritage consultation requirements for proponents 2010*.

### 1.2 Proposed activity

Longwall 19A is located within Dendrobium Mine Area 3A (here after referred as the “Subject Area”). Dendrobium Mine is an existing underground coal mine located in the Southern Coalfield NSW within the WaterNSW managed Sydney Metropolitan water catchment area within Lot 14 / DP 1233164. IMC have previously completed longwall mining in Dendrobium Areas 1 and 2 and are currently mining Longwall 19 within the Dendrobium Area 3A domain.

The following Aboriginal Heritage Information Management System (AHIMS) registered sites listed in Table 1 are located within the Subject Area.

**Table 1 AHIMS registered sites are located within the Subject Area**

AHIMS ID	Site Name	Site Type
52-2-1644	Browns Road Site 30	Shelter with Art
52-2-1645	Browns Road Site 31	Shelter with Art
52-2-1646	Browns Road Site 32	Shelter with Art
52-2-3639	DM 15	Shelter with Art
52-2-3644	DM 20	Shelter with Art and Potential Archaeological Deposit (PAD)
52-5-0272	Sandy Creek Road 20	Shelter with Art
52-5-0273	Sandy Creek Road 21	Shelter with Art

### 1.3 Statutory Controls

Dendrobium Mine was approved in 2001 and longwall mining has been in operation since 2005. The previous operator of this mine was BHP Billiton- Illawarra Coal. A number of changes to planning, development and mining legislation has occurred during this period. As a result, the consents and approvals in place for IMC to operate the Dendrobium Mine are numerous.

All subsidence related impacts are managed in accordance with the approved SMP and the *Dendrobium Coal Mine – Area 3A Aboriginal Heritage Plan* (Biosis Research, 2010).

The initial Development Application (DA 60-03-2001) for Dendrobium was assessed and determined under the EP&A Act in 2001 (**Error! Reference source not found.**).

The previous ACHA for Dendrobium Area 3 (Biosis Research, 2007) was produced to modify the Dendrobium Mine DA-60-03-2001 to incorporate a revised Area 3 footprint and longwall layout pursuant to section 75W of the EP&A Act, as well as inform the broader environmental assessment documents required to support the SMP application process for Aboriginal cultural heritage sites that were to be impacted by longwall mining.

### 1.4 Objectives

This assessment has been prepared to identify the Aboriginal cultural heritage values and provide recommendations for the Subject Area in accordance with the following regulations and guidelines:

- *The National Parks and Wildlife Regulation 2009*
- *Aboriginal cultural heritage consultation requirements for proponents 2010 (NSW Department of Environment, Climate Change and Water [DECW]2010a)*
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b)*
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011)*
- *The Burra Charter: The Australian ICOMOS Charter for Places of Cultural Significance (Australia International Council on Monuments and Sites [ICOMOS] 2013)*

The assessment requirements and objectives for the ACHA are provided in the Table 2.

**Table 2: Assessment requirements and objectives**

Objectives:	Addressed in:
<ul style="list-style-type: none"> <li>• Identify whether Aboriginal objects could be present within the Subject Area.</li> </ul>	ACHA, Project methodology and Appendix A
<ul style="list-style-type: none"> <li>• Undertake further investigation within areas identified as having potential high sensitivity.</li> </ul>	ACHA, Project methodology and Appendix A
<ul style="list-style-type: none"> <li>• Provide a description of the Aboriginal objects and declared Aboriginal places located within the area of the proposed activity.</li> </ul>	Section 2, and Appendix A
<ul style="list-style-type: none"> <li>• Provide a description of the cultural heritage values, including the significance of the Aboriginal objects and any declared Aboriginal places, that exist across the whole area that will be affected by the proposed activity and the significance of these values for the Aboriginal people who have a cultural association with the land.</li> </ul>	Section 5, Section 6 and Appendix A
<ul style="list-style-type: none"> <li>• Demonstrate how the requirements for consultation with Aboriginal people have been met (as specified in clause 80c of the NPW Regulation).</li> </ul>	Section 3, Appendix B and Appendix C

Objectives:	Addressed in:
<ul style="list-style-type: none"> <li>Present the views of those Aboriginal people regarding the likely impact of the proposed activity on their cultural heritage (if any submissions have been received as a part of the consultation requirements, the report must include a copy of each submission and response).</li> </ul>	Section 3, Appendix A, Appendix B and Appendix C
<ul style="list-style-type: none"> <li>Provide an assessment of actual or likely harm posed to the Aboriginal objects or declared Aboriginal places from the proposed activity, with reference to the cultural heritage values identified.</li> </ul>	Section 6
<ul style="list-style-type: none"> <li>Provide any practical measures that may be taken to protect and conserve those Aboriginal objects or declared Aboriginal places and any practical measures that may be taken to avoid or mitigate any actual or likely harm, alternatives to harm or, if this is not possible, to manage (minimise) harm.</li> </ul>	Section 7, Section 8, Appendix A

### 1.5 Authorship and acknowledgments

This report has been written by Renée Regal (NSW Heritage Principal Consultant, Niche). Original data sourced from Navin Officer (2000) and Biosis Research (2007) contributed to the outcomes of this assessment. Figures included in this report have been prepared by Penelope Geering (GIS Consultant). Unless otherwise attributed, images used in this report are produced by Niche.

Copyright for this assessment is retained by IMC.

## 2. Description of the area

### 2.1 Location

The Subject Area is located within Dendrobium Mine Area 3A, within the Wollongong Local Government Area and Parish of Camden. Dendrobium Mine is an existing underground coal mine located in the Southern Coalfield of NSW within the WaterNSW managed Sydney Metropolitan Water Catchment Area. The area included in the mining operations encompasses 487 hectares (ha) area to the south-west of Lake Cordeaux, to the immediate south of the previously approved Longwall 19. The Subject Area is approximately 8 km west of Wollongong (Figure 1: Location of Subject Area within regional context (Source: IMC, LPI and Niche) and **Error! Reference source not found.**).

### 2.2 Description of land where Aboriginal cultural heritage sites are proposed to be harmed

Longwall 19A is a continuation of mining that extends into the Dendrobium Mine Area 3A. The area that could be affected by mining related impacts includes:

- Longwall 19A void;
- 600 m Boundary; and
- 35-degree Angle of Draw.

Table 3 details the Aboriginal cultural heritage sites identified within the Subject Area and the possible harm expected from the proposed works.

**Table 3: Details of the Aboriginal objects identified by this ACHA**

Estimated harm**	AHIMS ID#	Site Name	Site Features	Easting (GDA 56)	Northing (GDA 56)
None. Will not be impacted by proposed works	52-2-1644	Browns Road Site 30	Shelter with Art	291584	6191639
None. Will not be impacted by proposed works	52-2-1645	Browns Road Site 31	Shelter with Art	291340	6191650
None. Will not be impacted by proposed works.	52-2-1646	Browns Road Site 32	Shelter with Art	291447	6192467
<b>Direct harm.</b> Subsidence movements at the ground surface will cause impacts.	52-2-3639	DM 15	Shelter with Art	292104	6191319
<b>Direct harm.</b> Subsidence movements at the ground surface will cause impacts.	52-2-3644	DM 20	Shelter with Art and Potential Archaeological Deposit (PAD)	292054	6191569

Estimated harm**	AHIMS ID#	Site Name	Site Features	Easting (GDA 56)	Northing (GDA 56)
None. Will not be impacted by proposed works	52-5-0272	Sandy Creek Road 20	Shelter with Art	291294	6192139
Direct harm. Subsidence movements at the ground surface will cause impacts.	52-5-0273	Sandy Creek Road 21	Shelter with Art	292407	6192471

\* AHIMS sites in Table 3 highlighted in dark grey have potential to be impacted by the extraction of Longwall 19A.

\*\*The definitions for these categories can be described as:

Type of harm: Direct- may occur as the result of an activity which disturbs the ground including, but not limited to, site preparation activities, installation of services and infrastructure, roadworks, excavating, draining and flood mitigation methods or changes to waterflows affecting the value of cultural site. Indirect-affect sites or features located immediately beyond or within the area of the proposed activity. This may include increased impact on art in shelter from increased visitation, destruction from increased erosion and changes in access to wild food resources. (OEH, 2011).

Degree of harm: Total: the object(s) will be directly harmed in their entirety. Partial- some objects will be directly or indirectly harmed; however a portion of a site may remain unaffected. None- there will be no harm.

Consequence of harm: Total loss of value- Tangible heritage values will remain subsequent to the harm. Partial loss of value- intangible heritage values will remain subsequent to the harm. No loss of value- there will be no harm, and no loss of value

## 2.3 Environmental context

Understanding the past and present environmental contexts of an area is requisite in any Aboriginal archaeological and cultural heritage investigation (DECCW 2010a). The nature and distribution of Aboriginal archaeological sites are closely related to the environmental context. This section provides a broad overview of the environmental setting of the Subject Area.

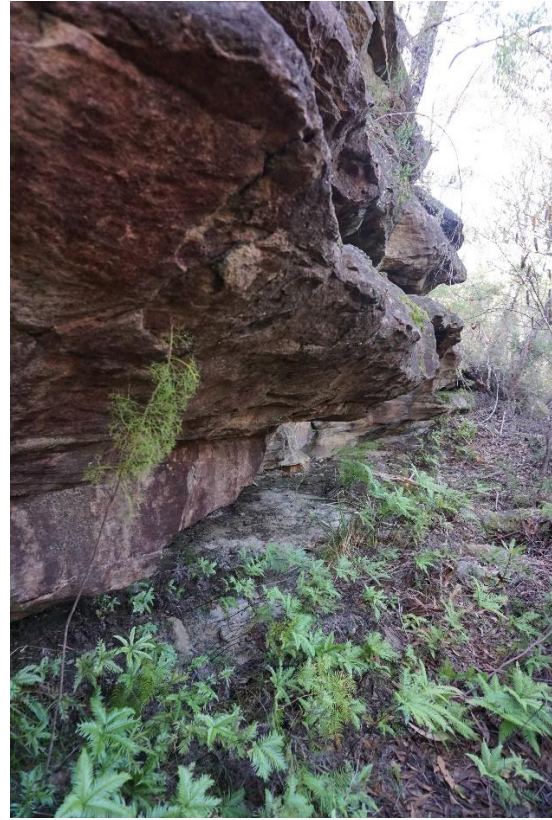
Analysis of soil landscapes are a useful tool in identifying environmental proxies for the likely preservation and burial of Aboriginal objects within a landscape. Such analysis provides insight into resources that may have been available by Aboriginal people in the past; such as the presence of rock outcrops to provide surfaces for Art or to sharpen and prepare implements, stone for the manufacture of stone tools and plant species.

Broadly the Subject Area is located within the Upper Nepean Catchment of the southern Woronora Plateau. The Plateau is deeply incised by the Wongawilli and Sandy Creeks.

Valley slopes that surround these water bodies are generally narrow and steep and frequently cliff lined (Plate 1 and Plate 2). The terrain of the Subject Area is characterised by middle Triassic Hawkesbury Sandstone that comprises overlapping beds of quartz-rich sandstone. The Hawkesbury Sandstone soil landscape within the Subject Area is an eroding landscape that is highly vulnerable to natural weathering and granular loss. Active erosion has led to the development and collapse of sandstone overhangs and shelter formations with sandy deposits (**Error! Reference source not found.**). The subsurface sandstone formations and substrates comprise of deep Permian Coal Measures that consist of shale sandstone, conglomerates, tuff, chert and coal (Branagan and Packhan 2000).



**Plate 1: An example of the valley slopes within the Subject Area**



**Plate 2: An example of the sandstone formations within the Subject Area**

## 2.4 Aboriginal occupation of the Upper Nepean Catchment

A search of the AHIMS of the Subject Area was conducted by Carly Todhunter on 1 February 2022 (AHIMS Client ID# 655699). A total of 24 registered Aboriginal cultural heritage sites were identified within a 6 km<sup>2</sup> search area (Appendix A). There were no Aboriginal Places identified.

A search of the State Heritage Inventory (SHI) was also completed. Cordeaux Dam (SHR ID# 01360) is a built heritage item listed on the State Heritage Inventory and is located 400 m to the north-west of the Subject Area. The proposed project will not impact this heritage item. A detailed description of previous archaeological assessment in the region is provided in Appendix A.

The Subject Area is the traditional country of the Dharawal people. Tindale (1974) has identified the Dharawal boundaries extend from the south side of Botany Bay to north of the Shoalhaven River to the south, running inland to the Campbelltown and Camden area (Attenbrow 2010: 34; SA Museum 2010). Attenbrow (2010:35) points out that such boundary mapping, undertaken as it was in the nineteenth century is indicative at best, however, there appears to be reasonably strong agreement between those who have mapped language boundaries that the area is Dharawal country. The Wodi Wodi were also Dharawal speakers, and they inhabited the coastal plains and escarpment around Wollongong. Dharawal people distinguished themselves as Fresh Water, Bitter Water or Saltwater depending on where in the wider language boundary their traditional lands were – the inland hills and valleys, the plateaus' and swamps or the coastal plain respectively (DECC 2005: 6).

The records and histories of the Dharawal and their country at the time of contact with Europeans are subject to bias and are generally fragmented, providing misunderstood accounts of the way Aboriginal people were living prior to European interference. Nevertheless, it is understood that the Dharawal



regularly communicated, moved, traded and participated in ceremonies between their country and neighbouring areas. It is most likely family or tribal groups would ‘intermingle and interact along both physical and social boundaries’ rather than be strictly confined to the ‘tribal’ borders that were to be artificially imposed by European anthropologists (Organ 1990: xliii).

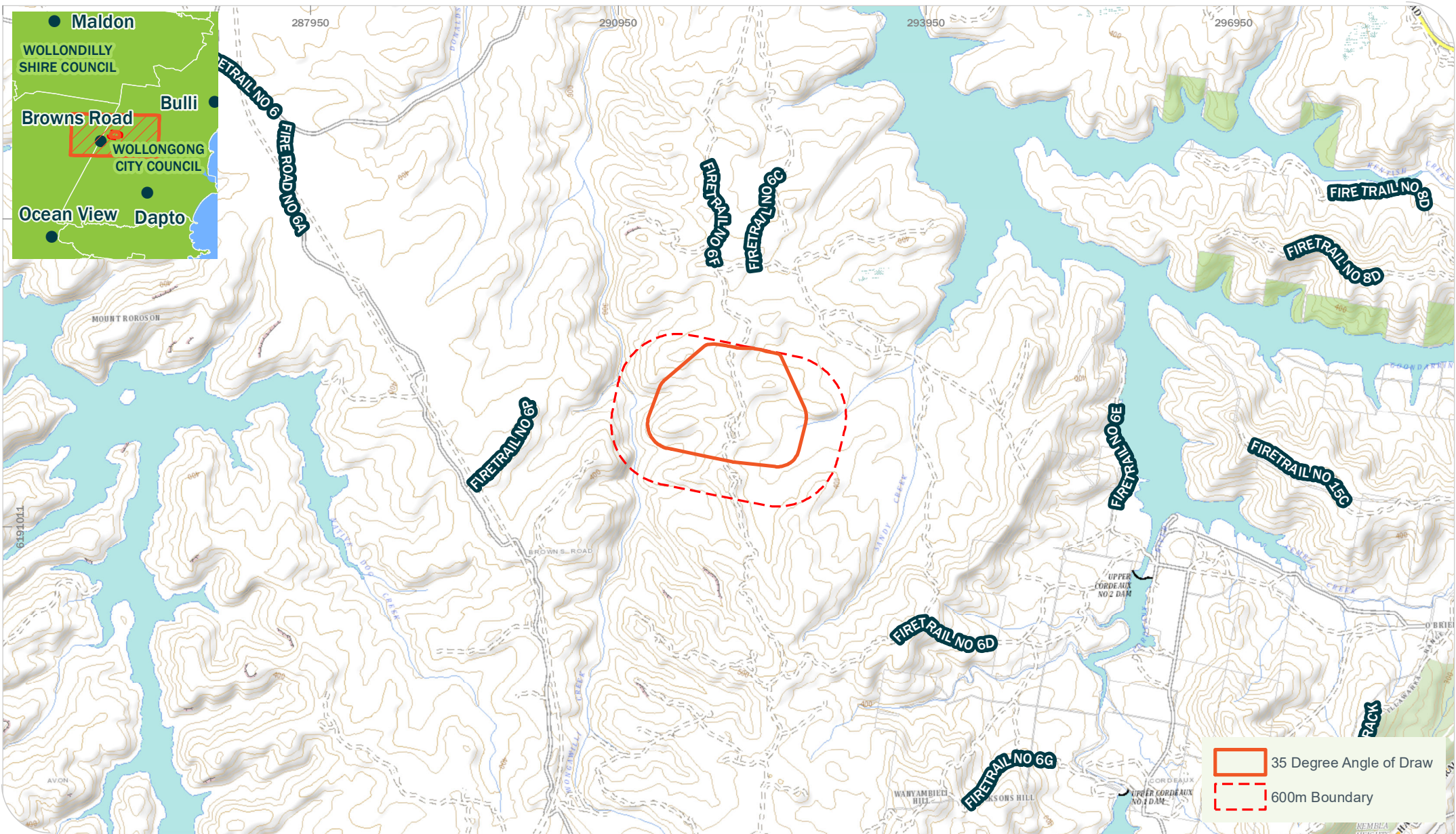
It is generally accepted that Aboriginal occupation of Australia dates back at least 50,000 years (Allen and O’Connell 2003). The result of this extensive and continued occupation of the Sydney Basin of which the Lake Illawarra region is a part has left a vast amount of accumulated depositional evidence. The oldest date generally considered to be reliable for the earliest occupation around the region comes from excavations at Parramatta where archaeological material has been dated to 30,735 ± 407 BP (McDonald et al 2005). The site of Bass Point at Shellharbour has been dated to 17,101+/- BP (Flood 1999). Within closer proximity to the current Subject Area on the Woronora Plateau the oldest date for Aboriginal occupation is at Curracurrang 1 Sandstone Shelter at 7,450 +/- 180 BP (Dibden 2019:38). Previous assessment (McDonald 1994: 348) considers that a dramatic population density occurred at approximately 3,000 BP, and that this and associated social pressures provided the impetus for the development of ‘social mechanisms to control interaction and to make such interaction less stressful’. Others have noted that population growth within this period is not easily demonstrated using qualitative evidence (Hiscock 2008:158).

The arrival of the First Fleet in Sydney Cove in 1788 was followed the next year by a smallpox epidemic, which spread to the neighbouring regions and, although the exact effects are not known, killed over half the Aboriginal population of the areas effected (Organ 1990: 5).

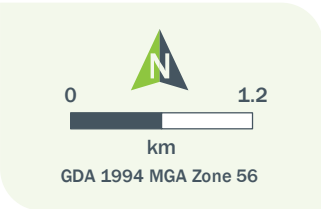
Up until 1880, majority of the Upper Nepean Area was alienated crownland, avoided by graziers due to the rugged terrain and sterile soils. Historical records do not clearly suggest that Aboriginal use of this land continued during the early colonial period. However, Dibden (2019) suggest that there is evidence that indicates Aboriginal people did retreat to the Woronora Plateau to recover from introduced disease. The presence of permanent water sources in the forms of major rivers, upland swamps (also known as dells) had the potential to be resourced as a long-term water source during drought periods (Young 1985). The presence of water availability in the Upper Nepean region would have acted as a favourable landscape to host occupation of Aboriginal people.

As land grants were passed out and graziers and farmers started to occupy areas of Appin, clashes between the local Aboriginal people and colonisers became frequent. A number of attacks were recorded in the area, such as the massacre of 14 Aboriginal people that were killed in a single event during 1816 (Whittaker 2005).

Despite the massive changes that were so quickly brought to the Aboriginal people of the region, they maintained a sense of community, traditional customs and practices, cultural knowledge and continued to care for significant sites and the land in general. Today there are many thousands of Aboriginal people living in the Wollongong and Wollondilly LGA’s surrounding the upper Nepean Catchment. They continue to be custodians of the land, whilst traditional owners maintain cultural knowledge (DEC 2005).



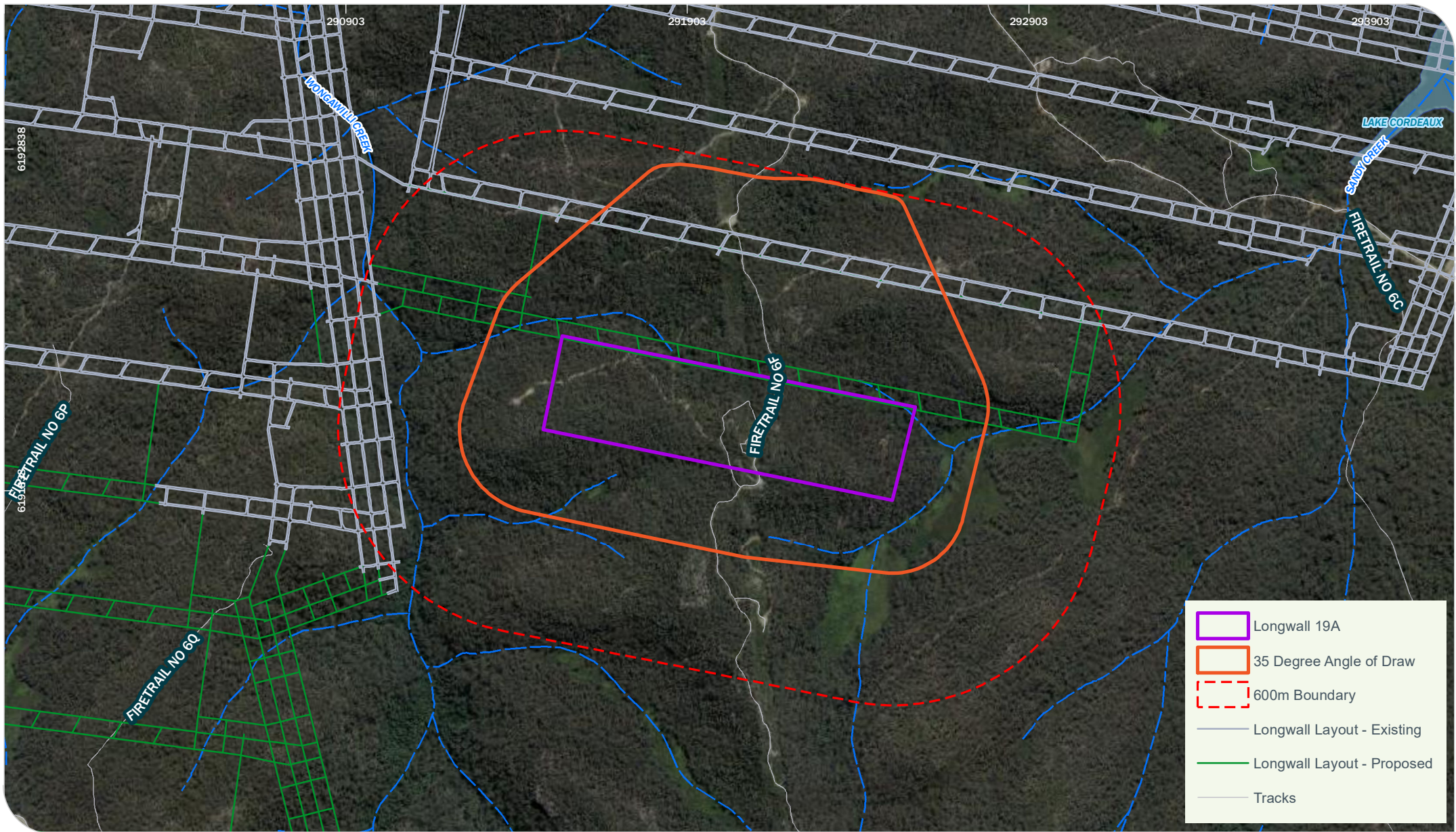
Drawn by: Penelope Geering Last updated: 09-Feb-22 4:42:31 PM File: T:\spatial\projects\7100\ar7164\_Longwall19A\_ACHA\_NSWMaps\report\ACHA7164\_Figure\_1\_LocationMap.mxd



Niche PM: Morgan Disspain  
Niche Proj. #: 7164  
Client: South 32- Illawarra Metallurgical Coal

Location Map  
Longwall 19A SMP ACHA

Figure 1



Drawn by: Penelope Geering Last updated: 09-Feb-22 3:01:47 PM File: T:\spatial\projects\7100\7100a\7100a\_19A\_Longwall19A\_ACHA\_NSWMap\report\ACHA\7164\_Figure 2\_SubjectArea.mxd

**This information has been redacted**

For more information please contact South 32 Illawarra Metallurgical Coal.

### 3. The consultation process

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In administering its statutory functions under Part 6 of the NPW Act, Heritage NSW requires that proponents consult with Aboriginal people about the Aboriginal cultural heritage values (cultural significance) of Aboriginal objects and/or places within any given development area, in accordance with Clause 80c of *NSW National Parks and Wildlife Regulation 2009*.

The Heritage NSW maintains that the objective of consultation with Aboriginal communities about the cultural heritage values of Aboriginal objects and places is to ensure that Aboriginal people have the opportunity to improve ACHA outcomes (DECCW 2010a). This is ensured by:

- Providing relevant information about the cultural significance and values of Aboriginal objects and /or places;
- Informing the design of the methodology to assess cultural and significance of Aboriginal objects and/or places;
- Actively contributing to the development of cultural heritage management options and recommendations for any Aboriginal objects and/or places within the proposed Subject Area; and
- Commenting on draft assessment reports before they are submitted by the Proponent to the Heritage NSW.

Consultation in the form outlined in the Aboriginal Cultural Heritage Consultation Requirements for proponents 2010 (DECCW 2010a) is a formal requirement in cases where a proponent is aware that their development activity has the potential to harm Aboriginal objects or places. The Heritage NSW also recommends that these requirements be used when the certainty of harm is not yet established but a proponent has, through some formal development mechanism, been required to undertake a cultural heritage assessment to establish the potential harm their proposal may have on Aboriginal objects and/or places.

The Consultation Requirements outline a four-stage consultation process that includes detailed step-by-step guidance as to the aim of the stage, how it should proceed, and what actions are necessary for it to be considered successfully completed. The four stages are:

- Stage 1 – Notification of project proposal and registration of interest.
- Stage 2 – Presentation of information about the proposed project.
- Stage 3 – Gathering information about the cultural significance of the project area.
- Stage 4 – Review of the draft ACHA report.

The Consultation Requirements also outline the roles and responsibilities of the Heritage NSW, RAPs including Local and State Aboriginal Land Councils, and proponents throughout the consultation process. As this assessment's consultation follows on from Navin Officer (2000) and Biosis Research (2007) and consultation has been continuous with the RAPs during this process there is no requirement to recommence the formal process at Stage 1

To meet the requirements of consultation Stage 2 through to 4 it is expected that IMC will:

- Bring the RAPs (or their nominated representatives) together and be responsible for ensuring appropriate administration and management of the consultation process.

- Consider the cultural perspectives, views, knowledge and advice of the RAPs involved in the consultation process when they assess cultural significance and work together to develop any heritage management outcomes for Aboriginal object(s) and/or place(s).
- Provide evidence to the Heritage NSW of consultation by including information such as cultural perspectives, views, knowledge and advice provided by the RAPs.
- Accurately record and clearly articulate all consultation findings in the final cultural heritage assessment report; and
- Provide copies of the final ACHA report to the RAPs who have been consulted.

The consultation process undertaken to seek active involvement from appropriate Aboriginal representatives for the project followed the current NSW statutory guidelines – the Consultation Requirements. Section 1.3 of the Consultation Requirements describes the guiding principles of the document, which have been derived directly from the principles section of the Australian Heritage Commission’s *Ask First: A guide to respecting Indigenous heritage places and values* (Australian Heritage Commission, 2002). Both documents share the aim of creating a system where advice can be sought from the Aboriginal community.

The following sections outline the process and results of the consultation conducted during this assessment to ascertain and reflect the Aboriginal cultural heritage values of the Subject Area. Further detail in regard to the Aboriginal community consultation process is outlined in Appendix B.

### **3.1.1 Registered Aboriginal Parties**

As a result of the consultation process undertaken for Navin Officer (2000) and Biosis Research (2007) the following organisations and/or individuals have become RAPs for this assessment (Table 4), and a consultation log of all correspondence is included in Appendix C.

**Table 4: RAP organisations and contacts**

Organisation	Contact Name
Bellambi Aboriginal Tent Embassy	Kim Moran
Cubbitch Barta Native Title Claimants	Glenda Chalker
Individual	Gary Caines
Individual (formerly represented by the Northern Illawarra Aboriginal Corporation)	Norma Simms
Illawarra Local Aboriginal Land Council	Paul Knight / Donna Hiscox
Korewal Elouera Jerrungurah Tribal Elders Council	Uncle Rueben / George Villaflor
Kullila Welfare and Housing Aboriginal Corporation	Maria Maher
La Perouse Aboriginal Corporation (formerly represented by the Northern Illawarra Aboriginal Corporation)	Yvonne Simms
The Wadi Wadi Coomaditchie Aboriginal Corporation (formerly represented by the Northern Illawarra Aboriginal Corporation)	Keith Ball
The Woronora Plateau Gundungarra Elders Corporation (formerly represented by the Northern Illawarra Aboriginal Corporation)	Kayla Williamson
Tharawal Local Aboriginal Land Council	Rebecca Ede (CEO)
Tocomwal (formerly Aboriginal and Historic Archaeological Solutions)	Scott Franks

### 3.1.2 Notification of Heritage NSW and LALC

Notification of RAPs to Heritage NSW, Illawarra Local Aboriginal Land Council (ILALC), and Tharawal Local Aboriginal Land Council (TLALC) as per Section 4.1.6 of DECCW 2010a was sent via email on the 30 March 2022 (included in Appendix B).

## 3.2 Stage 2 - Presentation of project information

Project information was emailed and posted to the RAPs on 2 March 2022. A copy is provided in Appendix B.

## 3.3 Stage 3 - Gathering information about the cultural significance of the Subject Area

### 3.3.1 Assessment methodology

The RAPs were provided with a letter outlining information about the project and an assessment methodology in accordance with the Consultation Requirements (DECCW, 2010a) and the Code of Practice (DECCW, 2010b).

The purpose of the provided documents was to:

- Describe the project, outline the project scope, timeframe and proposed works.
- Describe the environment of the Subject Area and information relevant to the ACHA process.
- Provide an opportunity for the RAPs to understand the process and comment on the proposed methodology.
- Set a time frame for providing feedback and comments on the methodology and project information.

The draft methodology was submitted to the RAPs on 2 March 2022 and the closing date for comments was at 5 pm, 29 March 2022 (28 days). A copy of the cover letter and methodology is included in Appendix B.

There was no feedback received regarding the draft methodology by the RAPs.

### 3.3.2 Cultural heritage survey

A notice for the survey was presented to all RAPs on the 22 March 2022 to invite participation in the five-day site survey planned for the 1-22 and 26 April 2022. Due to weather restrictions, the site inspection was postponed to the 14, 20, 21, 23 and 24 June 2022. Those who participated are provided in Table 5. A copy of the site inspection notice is included in Appendix B.

**Table 5: Cultural heritage survey participants**

Organisation	Representative	Contribution	Attendance
Cubbitch Barta Native Title Claimants	Rebecca Chalker	Site Officer	21 and 23 June
Cubbitch Barta Native Title Claimants	Dean Boney	Site Officer	20 June
Cubbitch Barta Native Title Claimants	Kirsty-Lee Chalker	Site Officer	23 June
Illawarra Local Aboriginal Land Council	Blake Greenup	Site Officer	23 June
Tocomwall	John Phillips	Site Officer	14 June
Woronora Plateau Gundungara Elders Council	Paul Cummins	Site Officer	23 June
Woronora Plateau Gundungara Elders Council	Kayla Williamson	Site Officer	14 and 24 June

### 3.4 Stage 4 – Review of draft Aboriginal cultural heritage assessment report

A draft of this report was provided to the RAPs for their review and comment in accordance with DECCW, (2010a). A statutory timeframe of a minimum of 28 days for responses was provided to all RAPs, with a request for comments to be provided by 5 pm 22 August 2022.

As of this time, 29 August 2022, the following responses have been received from the RAPs. Table 6 details the comments made, as well as Niche’s response, and copies of all submissions made are included in Appendix B.

**Table 6: Details of RAP feedback on the draft Aboriginal cultural heritage assessment report**

Registered Aboriginal Party	Stakeholder	Comment made	Response from IMC/ Niche
Illawarra Local Aboriginal Land Council	Aara Welz	See attachment in Appendix B for full details.  Archaeological deposits and/or Potential Archaeological Deposits (PADs) within rock shelters have not been investigated. As the nature of these deposits is unknown, a true scientific significance value cannot be attributed. If the deposit is a highly stratified deposit, this will	Your point has been noted.



Registered Aboriginal Party	Stakeholder	Comment made	Response from IMC/ Niche
		significantly increase the scientific value of the sites.	
		The consultation process was started in 2001 (by Navin Officer), and the RAP group for consultation was established at this time. As this was 21 years ago, there have been many changes that mean that this RAP group should no longer be considered relevant. To adequately determine the cultural values of the Aboriginal cultural heritage ILALC suggest that due to the cultural sensitivity of this landscape, an updated RAP group be created, and a new RAP group provided an opportunity to comment on this project.	Your point has been noted. The consultation process will continue in accordance with the consultation guidelines for this project.
		There are inconsistencies in the significance rating. For example, page i suggest six sites have low scientific significance and one moderate. Page 35-37 (Table 10) suggests four have low scientific significance, two moderate and one high. A well-considered and valid assessment of the significance of the sites needs to be undertaken to determine appropriate management actions.	Noted. The inconsistencies have been corrected.
		There are inconsistencies in the number of sites within the Subject Area. For example, section 4.3 states there are seven, while section 4.3.1 states that the Subject Area contains eight shelters with Art sites. Is DM 16 (AHIMS ID #52-2-3640 within the area (as suggested in section 4.3.1)?	Noted. The inconsistencies have been corrected.
		There are inconsistencies in how many sites will be impacted. For example, Page i states that there will be three Aboriginal cultural heritage sites that have the potential to experience direct impact from extraction. Tale 12 (page 33) states that there are four sites present within the Subject Area that may result in irreversible and direct harm.	Noted. The inconsistencies have been corrected.
		Four sites are determined to have no potential for impact. However, previous reports by Niche (Dendrobium Mine Expansion) have identified that sites located up to 600 m buffer area have a 1% chance of direct harm, and typically those located within the 35 angle of draw have a less than 5% chance of direct	MSEC has determined that these sites will not be harmed by the proposed Project.

Registered Aboriginal Party	Stakeholder	Comment made	Response from IMC/ Niche
		<p>impact. Therefore ILALC questions the accuracy of this statement and considers that there may be an underrepresentation of actual potential harm being presented.</p>	
		<p>Subsidence monitoring should include the following:</p> <ul style="list-style-type: none"> <li>a. Complete and accurate baseline recording for all seven sites located within the Subject Area prior to any mining activity. This should include: <ul style="list-style-type: none"> <li>i. High-resolution images of all motifs, motif panels and the shelter itself,</li> <li>ii. Detailed plans of each shelter and rock art panel,</li> <li>iii. Detailed and complete notes taken for each shelter, including details of each crack, fracture etc that already occurs within the shelter.</li> <li>iv. Photogrammetry undertaken for each shelter.</li> </ul> </li> <li>b. TARPs specific to each site monitored should be developed and approved by RAPS prior to the approval of an AHIP.</li> </ul>	<p>Noted and already included in the recommendations for this assessment.</p>

## 4. Summary and analysis of background information

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### 4.1 Relevant information obtained since Development Consent

An Aboriginal Heritage Management Plan was implemented for Dendrobium Area 3A in 2010. Monitoring Assessments were undertaken for Longwalls 6 to 8 by Biosis until completion in 2013, to monitor the impacts and environmental consequences of Project related subsidence on Aboriginal cultural heritage sites. The monitoring programs were undertaken by a suitably qualified archaeologist (with experience in rock art recording and management) and representatives of the Aboriginal stakeholders.

IMC acknowledges that all Aboriginal cultural heritage sites are culturally significant to the Aboriginal people who have a traditional connection to Country. Aboriginal cultural heritage sites will be monitored for subsidence impacts by the observation and recording of any and all changes at the sites over the monitoring period.

Archaeological monitoring programs undertaken by Sefton between 1990 and 2000 have continued in the Southern Coalfield at the majority of underground mine sites. Monitoring programs have been undertaken at the Dendrobium Mine and at Tower, Appin, West Cliff, Elouera, Cordeaux, Tahmoor and Metropolitan Collieries. During the past 17 years monitoring programs have been developed and implemented using a similar methodology to Sefton (2000) by (Biosis research 2008, 2009a, 2009b, 2012, 2013a, 2013 and 2015; Gun, and Kayandel Archaeological Services 2007; Kayandel Archaeological Services 2012; Niche 2011, 2012, 2013a, 2013b, 2013c, 2014a, 2014b, 2014c, 2015a, 2015b, 2015c, 2016a, 2016b, 2016c, 2017, 2019, 2020a and 2020b; and Sefton 2000, 2002a, 2002b, 2002c and 2002d).

Initial baseline recording is completed on those Aboriginal cultural heritage sites that are identified by subsidence consultants as having potential to be affected by subsidence. Site types that are subject to baseline recording in the Southern Coalfield include sandstone shelter sites with art and or potential archaeological deposit, stone artefacts deposits, engravings and sandstone platforms that include engravings (often of animals, humans, anthropomorphic figures and ancestral beings) and or axe grinding grooves.

At the completion of baseline recording, Aboriginal cultural heritage sites are often monitored a second time in line with the individual projects monitoring requirements, generally within 3 months of the completion of a longwall extraction. Monitoring programs are generally continued in this fashion until the Aboriginal cultural heritage site is no longer subject to subsidence movements.

Within the Southern Coalfield a total of 244 Aboriginal cultural heritage sites have been monitored since 1990. Of the 244 Aboriginal cultural heritage sites monitored, 25 sites were identified as having impacts or changes that may be attributable to subsidence, environmental factors or a combination of both. This number equates to approximately 10.2 % of all the Aboriginal cultural heritage sites monitored. The observed impacts at each Aboriginal cultural heritage site are outlined in **Table 7**.

**Table 7: Aboriginal cultural heritage sites within the Southern Coalfield observed to have subsidence related changes during monitoring programs.**

AHIMS number	Site name	Site type	Observed changes/ impacts	Is the art panel or heritage value affected	Reference
52-2-0094	Flat Rock Creek 4	Sandstone shelter with art	Opening of existing bedding planes, along the roof/ rear wall and minor roof fall.	No	Kayandel Archaeological Services 2008
52-2-0106	Flat Rock Creek 10	Sandstone shelter with art	Cracks in rear wall, potential for altered seepage to impact art- mitigated with an artificial dripline.	No	Kayandel Archaeological Services 2008
52-2-0089	Flat Rock Creek 11	Sandstone shelter with art	Exfoliation and block fall at rear wall.	No	Kayandel Archaeological Services 2008
52-2-0154	Flat Rock Creek 49	Sandstone shelter with art	Minor block fall from rear wall and ceiling.	No	Kayandel Archaeological Services 2008
52-2-0258	Flat Rock Creek 57	Sandstone platform with engraving and axe grinding grooves	Crack in sandstone platform.	No	Kayandel Archaeological Services 2008
52-2-0176	Flat Rock Creek 152	Sandstone shelter with art	Cracking and minor block fall at rear wall.	No	Sefton 2000 and Kayandel Archaeological Services 2008
52-2-1638	Browns Road Site 24	Sandstone shelter with art	Minor block fall at rear wall.	No	Sefton 2000
52-2-1625	Browns Road Site 10	Sandstone shelter with art	Cracking and minor blockfall at rear wall.	No	Sefton 2000
AHIMS number could not be confirmed	Wedderburn Road 1	Sandstone shelter with art	Cracking in floor and rear wall.	No	Sefton 2000

AHIMS number	Site name	Site type	Observed changes/ impacts	Is the art panel or heritage value affected	Reference
52-2-1300	Wedderburn Road 2	Sandstone Shelter with art	Opening of crack in back wall.	No	Sefton 2000
52-2-1162	Stokes Creek Site 67	Sandstone shelter with art	Opening of the bedding plane above the art and increased water seepage as a result.	No	Sefton 2000
52-2-2252	Dendrobium 4	Sandstone shelter with art	Opening of crack along the back wall.	No	Comur 2009
52-2-0195	Flat Rock Creek 34	Sandstone shelter with art	Horizontal cracking visible on the ceiling of the shelter. Cracking occurred over the most southern hand stencil on the back panel. Crack across hand stencil 40cm long. Crack along the roof of the shelter 1-2.5 m off ground, and 5 m long.	Yes <sup>1</sup>	Niche 2017b
52-2-3083	Flat Rock Creek 281	Sandstone shelter with art	Thin cracking adjacent to the hand stencil at the northern end of the shelter.	Yes <sup>1</sup>	Kayandel Archaeological Services 2012
52-2-3086	Flat Rock Creek 284	Sandstone shelter with art	Fractured a corner of a buttress-like formation on the rear wall.	No	Kayandel Archaeological Services 2012
52-2-2243	Georges River No. 2	Sandstone shelter with art	Thin vertical cracking in the shelter ceiling, adjacent to the art panel.	No	Niche 2013a
52-2-0396	Flat Rock Creek 15	Sandstone shelter with art	The large vertical fissure in the central back wall had increased in width (opened) and shifted laterally.	No	Niche 2013b
52-2-2244	Georges River No.3	Sandstone shelter with art and axe grinding grooves	Opening of the horizontal bedding plane. Cracking and exfoliation along the back wall.	No	Niche 2014
AHIMS number could not be confirmed	MET 1	Sandstone shelter with art	Vertical cracking and cracks along the roof.	No	Niche 2015a
52-2-0826	Flat Rock Creek 176	Sandstone shelter with art	Vertical cracking at the northern and southern ends of the shelter.	No	Niche 2015b
52-2-3077	Flat Rock Creek 275	Sandstone shelter with art	The horizontal bedding plane joins along the back of the shelter have been noted as opening, three hairline cracks have formed, running vertical from the bedding plane.	No	Niche 2016a

AHIMS number	Site name	Site type	Observed changes/ impacts	Is the art panel or heritage value affected	Reference
52-2-3486	Flat Rock Creek 301	Sandstone platform with axe grinding groove	A large crack was observed running east to west along the entire rock platform. Crack is approximately 3.08 m to the north of the grinding groove and is approximately 25 m long and continues past the rock platform.	No	Niche 2017a
52-2-3645	DM 21	Sandstone Shelter with Art	The landscape surrounding the shelter site has experienced a range of subsidence impacts from the extraction of Longwall 15 such as localised rockfalls to the upper ridgelines (South 32 2020). The northern exterior of the shelter has experienced fracturing as result of subsidence from the extraction of Longwall 15. Four main instances of vertical and diagonal cracking were observed. The largest crack at the base of the ridgeline measures 3.7 cm in width.  The interior cavern of the shelter did not have any direct impacts from subsidence.	No	Niche 2019 and Niche 2020
52-2-2068	Stonequarry Creek 1, SC-1	Sandstone platform with axe grinding grooves	Fracturing to the rock bar which has lead to rock shearing off the platform	No	EMM 2021

<sup>1</sup>The sites highlighted have experienced adverse consequences as a result of mining that are highlighted in their individual projects TARP. This means that the art panels at these sites have experienced cracking.

Aboriginal cultural heritage sites are considered to be “affected by subsidence impacts” if they exhibit one or more of the following consequences that cannot be attributed to natural weathering or deterioration (Sefton 2000, Regal and Reeves 2017):

- overhang collapse;
- cracking of sandstone or soil;
- impacts to Aboriginal art or grinding grooves; and/or
- rock fall that impacts a site, including Aboriginal art.

Of the 244 Aboriginal cultural heritage sites monitored since 1990, 24 Aboriginal cultural heritage sites were identified as having impacts or changes that may be attributable to subsidence, environmental factors induced by mining or a combination of both. This number equates to approximately 10.2% of all Aboriginal cultural heritage sites monitored. Of the 24 Aboriginal cultural heritage sites 22 sustained structural effects to either the sandstone shelter or the sandstone platform. Eight Aboriginal cultural heritage sites sustained environmental effects, while the effects of 2 Aboriginal cultural heritage sites could not be attributed decisively as either subsidence or environmental.

Of the 24 Aboriginal cultural heritage sites, two Sandstone Shelter with Art sites (Table 7 shaded) have been identified as having impacts attributable to subsidence. Flat Rock Creek 34, AHIMS ID# 52-2-0195 and Flat Rock Creek 281, AHIMS ID# 52-2-3083 have been noted as having adverse consequences on Aboriginal cultural heritage values as a result of underground mining. These adverse consequences were cracking that occurred across or adjacent to the art panels (not classified as impacts under the Trigger Action Response Plan for each Aboriginal cultural heritage site). The cracks adjacent to art panels have caused changes to water seepage above the panel, causing water flow to redirect over the art. This indicates that the percentage of Aboriginal cultural heritage sites with impacts to art panels in this instance is approximately 1% of the 144 sites with art assessed across the Southern Coalfield; considerably less than the 10% originally predicted to be affected by subsidence impacts by Sefton (2000) within the mining area. The remaining twenty-three sites have experienced subsidence related impacts to their structure (either the sandstone shelter or rock platform), which equates to approximately 10% of all Aboriginal sites monitored within the Southern Coalfield.

The results of the monitoring to date are consistent with the potential subsidence impacts and environmental consequences predicted in the Project EIS, where it was expected that the majority of identified Aboriginal cultural heritage sites would experience no significant change, particularly when compared to natural weathering processes unrelated to mining and given the conservative nature of the subsidence predictions.

The potential for vehicle-generated dust in the WaterNSW Metropolitan Special Area or rare minor blasting events underground (which is undertaken at significant depths) to impact on Aboriginal cultural heritage sites in the underground mining area is very low. Vehicle access in the WaterNSW Metropolitan Special Area is via formed tracks and existing fire trails. IMC personnel and contractors are required to observe speed limits when using the fire trails, which limits the amount of dust generated. In most cases Aboriginal cultural heritage sites are distant from the tracks and fire trails, and therefore are not subject to direct exposure to any dust generated by vehicles using the tracks and fire trails.

## 4.2 Site Distribution

Site distribution within the Subject Area follows the same pattern that has previously been outlined by Biosis Research (2007) predictive modelling. Analysis of Aboriginal cultural heritage site distribution within Dendrobium Area 3 categorised by slope gradient identifies that shelter sites are common between slopes 20- and 30-degree gradients. Shelter sites rarely occur within gradients less than 20 degrees and never occur in gradients over 40 degrees (Biosis 2007). Analysis of site location based on slope set gradient identify that shelter sites with archaeological evidence of Aboriginal occupation are typically located within the moderate to steep slope set. A number of Aboriginal cultural heritage sites are also present on the gently inclined slopes that move towards open water ways and large open sandstone platforms that may be suitable for Axe Grinding Grooves. Typical features that form the Hawkesbury Sandstone landscape within the Upper Nepean catchment area have influenced and limited human movement throughout the region (Dibden 2019). It is evident that distribution of Aboriginal cultural heritage sites is dependent on environmental variables with identifiable landscape signatures for past Aboriginal occupation of the Subject Area.

## 4.3 Sandstone Shelter Sites

Of the seven (7) Aboriginal cultural heritage sites, all comprise of sandstone shelter sites that have either one or a combination of potential archaeological deposit and/or art. As outlined in Section 2.4, the Hawkesbury sandstone of the Subject Area lends itself to this site type to be used by past Aboriginal peoples for artistic expression, occupation and transient use. These site types are significant to the local Aboriginal community as they evidence the past occupation of the area and can be used as an educational tool for younger generations.

### 4.3.1 Sandstone Shelter with Art

The Subject Area contains eight (8) shelter with Art sites that's art panels comprise of a mixture of pigmented mediums of charcoal and/or ochre. As identified in previous assessments, the most common type of expression is charcoal outline/infill (Biosis 2007 and Biosis 2009). Red and white ochre is used at Browns Road Site 32 (AHIMS ID#52-2-1646) DM 16 (AHIMS ID#52-2-3640). There are notable examples of the use of ochre Art with patterns scratched into the surface; or of stencils of hands, feet or material culture such as boomerangs or axes. Such sites have been previously identified within the areas surrounding Tahmoor (Niche 2019), Dendrobium Area 3B (Biosis Research, 2007) and Helensburgh (Kayandel Archaeological Services 2008, Niche 2016b and Niche 2016c). Analysis of each Aboriginal cultural heritage site located within the Subject Area has been further discussed in section 2.4 of Appendix A.

Whilst the Subject Area is not large enough to detect major trends in motif types, a number of the motif types have previously been observed during assessment within the adjoining Dendrobium mining lease areas. Sefton (1988) suggests that in the area surrounding Avon and Cordeaux Reservoirs, human motifs are relatively more frequent than in the remainder of the region. This trend is representative of the sample reflected in the Subject Area. Examples of human figures within the current Subject Area were assessed at DM 15 (AHIMS ID#52-2-3639). As outlined in Annex 1 of Appendix A. There are several other motif types represented including macropods and other indeterminate motifs.

### 4.3.2 Sandstone Shelter with Deposit

There is one Shelter with Deposit sites located within the Subject Area. A Shelter with Deposit describes a naturally formed sandstone overhang with stone artefacts located within the rock ledges or shallow sandy floor deposit areas. Stone artefacts commonly found within the Upper Nepean catchment and are reflective of the available stone resources such as quartz, petrified wood and other materials traded from distant locations such as chert and silcrete.



#### 4.4 Summary

The Subject Area contains a representative sample of regional archaeological and cultural site trends found in the broader Upper Nepean catchment area which provide information about past Aboriginal land use and settlement of the area. The types and locations of sites can be interpreted to provide an insight into what events took place in the past, and how the landscape was used in the past.

The Aboriginal cultural heritage sites within the Subject Area represent a range of activities and events, such as living places, expression through charcoal outline/infill and red, white and yellow ochre, stone artefact manufacture, and the use of flaked stone artefacts.

The location of the Aboriginal cultural heritage sites in the Subject Area are dependant in many cases on the natural environment –sandstone shelters only occur in areas where there are suitable rock formations, which generally occur on moderate and steeply inclined slopes (Biosis Research 2007). However, within this framework of the landscape Aboriginal people will have used the land in different ways, at different times and for different purposes – dictated by both utilitarian and non-utilitarian influences and objectives. Resource rich areas such as creeks and rivers may have been a focus of occupation when resources were abundant or readily available, and hence we expect to find more archaeological sites in association with these landforms. On the other hand, the nature and timing of occupation may have been dictated by non-utilitarian objectives such as ceremonies, rituals and gatherings and a shift in habitable areas due to colonisation pressures.

In conclusion, the archaeological and cultural values work that has been undertaken for the Project provides an insight into past Aboriginal land use within the Subject Area and the wider region. Some of the largest archaeological sites are located in close proximity to the Cordeaux River (now Cordeaux Dam), which would have provided abundant and reliable resources.

## 5. Cultural heritage values and statements of significance

### 5.1 Methods for assessing heritage significance

Heritage significance is assessed by considering each cultural, or archaeological site, against the significance criteria set out in the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011).

In all cases the assessment of significance detailed below is informed by the RAPs, which is documented in this report. To date there have been no culturally sensitive values identified during this assessment, should any be identified they would be dealt with as per sensitive information protocols outlined in section 5.1.1 of the Appendix A.

### 5.2 Assessment framework

The Burra Charter (Australia ICOMOS 2013) defines the basic principles and procedures to be observed in the conservation of places of importance. It provides the primary framework within which decisions about the management of heritage sites in Australia should be made.

### 5.3 Identifying values

The information collected during the background review of this assessment can be used to identify social, historical, scientific and aesthetic values. The review of background information and consultation with RAPs provides an understanding of past events. These include how the landscape was used and why the identified Aboriginal objects are in this location, along with contemporary uses of the land.

Information gaps are not uncommon and should be acknowledged. They may require further investigation to adequately identify the values present across the Subject Area. It may be helpful to prepare a preliminary values map that identifies, to the extent of information available the:

- Known places of social spiritual, cultural value, including natural resources of significance;
- Known historic places;
- Known Aboriginal objects and/or declared Aboriginal places; and
- Potential places/ areas of social, spiritual, cultural value, including natural resources, historic or archaeological significance.

Places of potential value that are not fully identified or defined should be included as 'sensitive' areas to target further investigation.

#### 5.3.1 Significance as defined by the Burra Charter

The Burra Charter defines cultural significance as being derived from the following values: aesthetic value, historic value, scientific value and social value. However, more precise categories may be developed as an understanding of a particular place or site increases. The values are outlined below in Table 8.

**Table 8: Values from which cultural significance is derived**

Value type	Description
<b>Aesthetic Value</b>	Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.
<b>Historic Value</b>	Historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section.

Value type	Description
	A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place, the significance will be greater where evidence of the association or event survives in-situ, or where the setting is substantially intact, rather than where it has been changed or evidence does not survive. However, some events or association may be so important that the place retains significance regardless of subsequent treatment.
<b>Scientific Value</b>	The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness (conservation value), and on the degree to which the place may contribute further substantial information.
<b>Social Value</b>	<p>Social or cultural value refers to the spiritual, traditional, historical or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them.</p> <p>Places of social or cultural value have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities and individuals can experience a sense of loss should a place of social or cultural value be damaged or destroyed.</p>

## 5.4 Assessing values and significance

This stage is used to assess and discuss the cultural significance of the values identified during the assessment of cultural significance by consulting with RAPs and to prepare a statement of significance. The assessment of values is a discussion of what is significant and why. An assessment of values is more than simply restating the evidence collected during the background review and identification of this information within various stages of the project. Rather, the assessment should lead to a statement of significance that sets out succinct and salient values that have been identified.

The assessment and justification in the statement of significance must discuss whether any value meets the following criteria (NSW Heritage Office, 2001):

- Does the Subject Area have a strong or special association with a particular community or cultural group or social, cultural or spiritual reasons? - Social Value.
- Is the Subject Area important to the cultural or natural history of the local area and/ or region and/ or state? - Historic Value.
- Does the Subject Area have potential to yield information that would contribute to an understanding of the cultural or natural history of the local area and/or region and/ or state? - Scientific (archaeological) Value.
- Is the Subject Area important in demonstrating aesthetic characteristic in the local area and/or region and/ or state? - Aesthetic Value.

Assessment of each of the criteria (above) should be graded in terms that allow the significance to be described and compared; for example, as high, moderate, or low. In applying these criteria, consideration should be given to:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the Subject Area) exists, what is already conserved, how much connectivity is there?

- **Rarity:** is the Subject Area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- **Educational potential:** does the Subject Area contain teaching sites that might have teaching potential?

Thus, the statement of significance is a succinct summary of the salient values drawn from the identification of values.

#### 5.4.1 Grading scientific (Archaeological) values

The following gradations, where a site or zone satisfies at least one criterion, have been applied to provide a measure of the values/significance for Aboriginal cultural heritage sites identified within the Subject Area, and to provide an overall assessment of the significance of each of the zones used that define the Subject Area are included in Table 9 below.

**Table 9: Criteria for grading scientific values**

Gradation	Description
<b>Low</b>	The site or object contains only a single or limited number of features and has no potential to meaningfully inform our understanding of the past beyond what it contributes through its current recording (i.e. no or low research potential). The site or object is a representative but unexceptional example of the most common class of sites or objects in the region. Many more similar examples can be confidently predicted to occur within the Subject Area, and in the region.
<b>Moderate</b>	The site or object derives value because it contains features, both archaeological and contextual, which through further investigation may contribute to our understanding of the past. These features include but are not limited to the relationship with landscape features or other Aboriginal cultural heritage sites or areas of identified heritage importance; diagnostic archaeological or landscape features that inform a chronology. The presence of a diverse assemblage of archaeological features, connectedness with landscape and other notable values provide relatively higher representative and rarity values than sites of low significance.
<b>High</b>	The site or object has value because it contains archaeological and/or contextual features which through further investigation may significantly contribute to our understanding of the past, both locally and on a regional scale. These features include but are not limited to: Aboriginal ancestral remains; the site’s relationship with landscape features or other Aboriginal archaeological sites or areas of identified heritage importance; diagnostic archaeological or landscape features that inform a chronology; and a very large assemblage of stone artefacts associated with other features such as oven remains or shell midden. Such sites will be relatively rare and will be representative of a limited number of similar sites that make up this class; hence they derive high representative and rarity values.

## 5.5 Significance assessment

Table 10 provides an assessment of significance and summarises identified heritage values for individual Aboriginal cultural heritage sites within the Subject Area. Significance assessments for all sites within the Subject Area were previously completed as part of the Dendrobium Area 3 Aboriginal Cultural Heritage Assessment (Biosis Research 2007) as well as the Niche 2021 and 2022. Additional notes regarding the scientific (archaeological) significance have been included below in Table 10.

**Table 10: Significance Assessment – Individual sites**

AHIMS ID	Site Name	Site Type	Social or cultural value	Aesthetic value	Historic value	Scientific (archaeological) value
52-2-1644	Browns Road Site 30	Shelter with Art	High – Aboriginal cultural heritage sites within the Woronora Plateau remain in relatively undisturbed environment with a relatively high density of sites, many being a highly visual cultural resource which creates a strong sense of place and cultural identity	Low – The Shelter with Art of this site is reasonably well-preserved condition with no outstanding features.	None – this site does not contain any historic values.	Low- The art comprises of one charcoal outline/ infill frontal human figure. One artefact has been located within the shelter dripline.
52-2-1645	Browns Road Site 31	Shelter with Art	High – Aboriginal cultural heritage sites within the Woronora Plateau remain in relatively undisturbed environment with a relatively high density of sites, many being a highly visual cultural resource which creates a strong sense of place and cultural identity	Low – The Shelter with Art of this site is reasonably well-preserved condition with no outstanding features.	None – this site does not contain any historic values.	Low – the three charcoal motifs within this Shelter with Art site are poorly preserved and a common site type within the regional area. Additional comment from Niche notes that the two charcoal indeterminates and one kangaroo motif located on the roof of the sandstone shelter site is representative of motif types of the region.

AHIMS ID	Site Name	Site Type	Social or cultural value	Aesthetic value	Historic value	Scientific (archaeological) value
52-2-1646	Browns Road Site 32	Shelter with Art	High – Aboriginal cultural heritage sites within the Woronora Plateau remain in relatively undisturbed environment with a relatively high density of sites, many being a highly visual cultural resource which creates a strong sense of place and cultural identity	Low – The Shelter with Art of this site is reasonably well-preserved condition with no outstanding features	None – this site does not contain any historic values.	High – This shelter provides a diversity of Art motifs with varying pigment types. Additional comment from Niche notes the art depicted in this shelter features a variety of inland native terrestrial and aquatic animal species that would have been present as food resources within the Woronora Plateau. This shelter also presents several red ochre handprints and stencils which are densely layered over charcoal Art. Ochre handprints are a rare motif type for the Dendrobium Area. The density and layering of the handprints over the charcoal art indicated that the site was visited a number of times by the Aboriginal community in the past.
52-2-3639	DM 15	Shelter with Art	High – Aboriginal cultural heritage sites within the Woronora Plateau remain in relatively undisturbed environment with a relatively high density of	Low – The Shelter with Art of this site is reasonably well-preserved condition with no outstanding features.	None – this site does not contain any historic values.	Low – this shelter is an example of the most common type motif in Shelter with Art site types within the region, being a male frontal anthropomorphic figure.

AHIMS ID	Site Name	Site Type	Social or cultural value	Aesthetic value	Historic value	Scientific (archaeological) value
			sites, many being a highly visual cultural resource which creates a strong sense of place and cultural identity			The Art is in a good condition from case hardening preservation.
52-2-3644	DM 20	Shelter with Art and PAD	Low- This shelter features a row of charcoal motifs that are in poor condition. This site is a common site types within the region and contains no outstanding characteristic. Additional Niche 2022 notes that the combination of charcoal motifs and a partial Anthromorphic figure is representative of common motifs within the Subject Area	Low – The Shelter with Art of this site is reasonably well-preserved condition with no outstanding features.	None – this site does not contain any historic values.	Low – this shelter is an example of the most common type motif in Shelter with Art site types within the region.
52-5-0272	Sandy Creek Road 20	Shelter with Art	High – Aboriginal cultural heritage sites within the Woronora Plateau remain in relatively undisturbed environment with a relatively high density of sites, many being a highly visual cultural resource which creates a strong sense of place and cultural identity	Low – The Shelter with Art of this site is reasonably well-preserved condition with no outstanding features	None – this site does not contain any historic values.	Moderate- The art comprises of one dry red ochre male figure with boomerang in hand, and one charcoal indeterminate charcoal outline/ infill motif.
52-5-0273	Sandy Creek Road 21	Shelter with Art	High – Aboriginal cultural heritage sites within the Woronora Plateau	Low – The Shelter with Art of this site is reasonably well-	None – this site does not contain any historic values.	Moderate-This Shelter with Art and Deposit contains notable

AHIMS ID	Site Name	Site Type	Social or cultural value	Aesthetic value	Historic value	Scientific (archaeological) value
			<p>remain in relatively undisturbed environment with a relatively high density of sites, many being a highly visual cultural resource which creates a strong sense of place and cultural identity</p>	<p>preserved condition with no outstanding features</p>		<p>irregular motifs. The Art is in moderate condition and the deposit has potential to inform of archaeological assemblages. Additional comment from Niche notes this site has a combination of indeterminate and anthropomorphic motifs of interest, being a charcoal frontal male figure with large eyes, and small scatter of artefacts representative of materials that were not present within the Subject Area and were likely sourced from distant regions, such as chert and silcrete.</p>



## 6. The proposed activity

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The Subject Area is part of the traditional land of the Tharawal / Dharawal people (Tindale 1940, 1974). Since the arrival of colonisers, the area has changed through the development of Lake Cordeaux and Lake Avon, through the damming of each respective rivers to make the Metropolitan Special Water Catchment Area and the development of underground longwall mining of coal.

### 6.1 Longwall Mining

The proposed activity involves the extraction of coal using longwall mining methods. This assessment will inform a SMP for Longwall 19A. The proposed longwall is located 290 m to 360 m below the ground surface, in an area between Wongawilli Creek to the west and Sandy Creek to the east (Figure 1).

Longwall mining involves the extraction of a rectangular section of coal from between supported underground roadways by cutting a wide, continuously retreating panel of coal (the longwall). The roof of the mine is temporarily held up by hydraulic jacks which are continuously moved behind the retreating face where coal is extracted by longwall shears. When the hydraulic jacks retreat the roof collapses into the void left behind, referred to as the goaf (NSW Minerals Council 2013). This process results in subsidence movements that can result in physical changes to the ground and its surface. These impacts are principally tensile and shear cracking of the rock mass and localised buckling of strata caused by valley closure and subsidence but also include subsidence depressions or troughs. The environmental consequences of these impacts include cracking in rock strata, rock falls, and change of surface water flows which can subsequently result in harm to Aboriginal cultural heritage sites that are located within predicted subsidence zones (NSW Department of Planning 2008). Further description of subsidence movements is outlined in Section 12.1 of Appendix A.

## 7. Avoiding and/or mitigating harm

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### 7.1 Conservation Principles and Management Framework

The two founding principles behind the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011:12) are ecologically sustainable development and intergenerational equity. These principles hold that “the present generation should make every effort to ensure the health, diversity and productivity of the environment – which includes cultural heritage – is available for the benefit of future generations”.

The strong emphasis, as in the Burra Charter, is to quantify and understand the heritage values of a place, a site, or an object and exhaust avenues of avoiding harm to those values. If harm cannot be avoided, then there must be consideration and implementation of strategies to minimise harm (OEH 2011:13).

It follows that the hierarchy for consideration in regard to management strategies available for surface stone artefacts and subsurface stone artefacts and areas of archaeological potential, fall into four general categories, in order of preference from a conservation perspective:

- avoidance and in-situ conservation;
- partial avoidance and partial in-situ conservation (includes partial harm);
- harm caused with mitigating circumstances such as collection or salvage; and
- unmitigated harm.

The four general categories (described above) have been considered in the following subsections with regard to both direct impacts (e.g. surface disturbance) and indirect impacts (e.g. monitoring activities).

The management and mitigation measures have been prepared in consideration of comments received from the RAPs during the consultation process. These comments include those related to cultural considerations surrounding salvage works and the handling of artefactual materials, as well as the cultural significance of all sites. All comments received from the RAPs are considered in Section 3.4.

Where possible, harm to sites will be avoided and sites will be retained in situ.

### 7.2 Designing to avoid

During the design process of the proposed Longwall 19A, as outlined in Section 6, a number of mining layout options were considered based on a range of multidisciplinary factors. The aim of this process is to reduce the potential for impacts to surface features.

Browns Road Site 32 (AHIMS ID#52-2-1646) is located approximately 200 m to the west of the Longwall 19A extent. Longwall 19A was reduced in length such that this site is predicted to not experience subsidence impacts due to the extraction.

This approach is consistent with the Heritage NSW requirements of ecologically sustainable development and intergenerational equity.

### 7.3 Mitigating harm

Management measures are warranted to mitigate the loss of values to the site that would result from the proposed activity. Management and mitigation measures are also warranted to ensure continued compliance with the NPW Act. Several management and mitigation measures have been considered for this Project and are presented in Table 11.

**Table 11: Consideration of management and mitigation strategies**

Management Risk / Impacted Value	Strategies considered	Response
<b>Management Risk – Compliance and Unexpected Finds (excluding human remains)</b>	Communication to employees, site visitors, contractors and landowners	<ul style="list-style-type: none"> <li>Relevant workers should be inducted into the Subject Area, so they are made aware of their obligations in respect of Aboriginal cultural heritage prior and during and after construction activities.</li> </ul>
<b>Management Risk – Unexpected Finds – human remains</b>	Stop work and follow procedure for discovery of suspected human remains	<ul style="list-style-type: none"> <li>The location, including a 20 m curtilage, should be secured using barrier fencing to avoid any harm.</li> <li>The NSW Police must be contacted immediately.</li> <li>No further action is to be undertaken within the curtilage until the NSW Police provide written notification to IMC.</li> <li>If the skeletal remains are identified as Aboriginal, then IMC or their agent must contact: <ul style="list-style-type: none"> <li>The Heritage NSW Enviroline on 131 555; and representatives of the RAPs.</li> </ul> </li> <li>No works are to continue until the Heritage NSW provides notification to the proponent or their Agent.</li> </ul>
<b>Impacted Conservation value – threatened resource</b>	Avoiding or minimising harm	<p>This strategy has been considered and taken into account by IMC during the planning phase of the Area 3A mining domain.</p> <p>The proposed Longwall 19A was reduced in length such that there is a low likelihood to cause harm to Browns Road Site 32.</p>
	Subsidence monitoring	Subsidence monitoring prior to and after longwall mining should be implemented for Aboriginal heritage sites within the underground investigation area subject to impacts from mining induced subsidence. The subsidence monitoring program should be in accordance with the relevant approved SMP and subsequent Aboriginal Heritage Plan. Monitoring should be undertaken by a suitably qualified archaeologist and representatives of the RAPs.
	Mitigating harm through providing educational value	<p>This strategy should be considered. Possible avenues include:</p> <ul style="list-style-type: none"> <li>Providing cultural heritage awareness for employees.</li> <li>Providing public resource material detailing the archaeological significance of the Subject Area.</li> <li>Updating the AHP for Dendrobium Area 3A to ensure harm mitigation is managed during project initiation.</li> </ul>
<b>Impacted Rarity value – threatened resource</b>	Mitigating harm through future management of the coastal dune vegetation	<p>This strategy should be considered. Possible avenues include:</p> <ul style="list-style-type: none"> <li>Continued consideration of impacts to Aboriginal heritage within the Upper Nepean Catchment region through the EP&amp;A Act.</li> </ul>

Management Risk / Impacted Value	Strategies considered	Response
		<ul style="list-style-type: none"><li>• Consideration of minimising impacts during future longwall approval stage.</li></ul>

## 7.4 Consideration of ecological sustainable development

Section 5(vii) of the *EP&A Act* requires proponents to consider the key principles of Ecologically Sustainable Development (ESD) in the design of their projects. The principles of ESD are defined within the *Protection of the Environment Administration Act 1991*. This Act defines the precautionary principle and the principles of inter-generational equity, conservation of biological diversity and ecological integrity. The precautionary principle is defined as:

*“If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation”.*

EDS for the proposed Longwall 19A should consider intergenerational equity, which is fundamental to Aboriginal culture and identity into the future. Although DM 15 (AHIMS # 52-2-3639), DM 20 (AHIMS ID#52-2-3644) and Sandy Creek Road 21 (AHIMS ID #52-5-0273) are all significant sites to the Aboriginal community, the other identified values of these sites are representative but are an unexceptional example of the common features of Aboriginal cultural heritage sites in the region. Many more valuable examples occur within the Subject Area, and in the wider region.

Table 12 considers the key principles of ESD with respect to the results of the literature review, Aboriginal heritage survey results and scientific (archaeological) significance assessment contained within this report.

**Table 12: Assessment of ESD**

Principles of the EIA and ESD Guidelines	ESD Assessment
A fundamental consideration for conservation of biological diversity and ecological integrity	IMC has undertaken an ACHA in consultation with the RAPs and determined that there are four sites (Table 3) present within the Subject Area that may result in irreversible and direct harm, which may also effect biological diversity and ecological integrity and generational equity to the local Aboriginal community.
Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment	
Consideration of intergenerational equity	
<p>Where risk of serious or irreversible harm and lack of scientific knowledge of the nature of environmental harm combine, the precautionary principle applies.</p> <p>Where there is risk of serious or irreversible harm, it is necessary to establish whether there is adequate scientific knowledge of the subject to evaluate the perceived threat.</p>	<p>This assessment has considered a review of all Aboriginal heritage items and their associated scientific report identified in heritage searches of an 6 km radius of the Subject Area. The assessment identified seven Aboriginal cultural heritage sites with values of low archaeological (scientific) significance high cultural significance, three of which may be impacted by the proposed activity.</p> <p>IMC should consider ESD in regard to the Aboriginal cultural heritage sites identified as part of this assessment, including aspects of intergenerational equity; this is fundamental to identifying Aboriginal culture and identity into the future. Though the sites are significant to the Aboriginal community, they are subject to ongoing erosional disturbance and any harm suffered at these sites as a result of subsidence will not cause significant harm to the Aboriginal communities’ connection to country or cultural development within the community.</p>
An assessment of the risk-weighted consequences of various options	Consideration of mitigation strategies is provided in Section 7.

## 8. Recommendations

Niche was commissioned by IMC to complete an ACHA for the extraction of Longwall 19A within Dendrobium Area 3A.

The ACHA was carried out in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) and the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011). It included consultation with RAPs in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a) (details of which are in Appendices 2 and 3).

The estimated harm of the proposed works and associated ground disturbance indicates that AHIMS registered sites DM 15 (AHIMS ID #52-2-3639), DM 20 (AHIMS ID#52-2-3644) and Sandy Creek Road 21 (AHIMS ID#52-5-0273) have the potential to be impacted by the proposed works.

This assessment has determined that the proposed works **do not** have the potential to harm AHIMS registered sites:

- Browns Road Site 30 (AHIMS ID#52-2-1644)
- Browns Road Site 31 (AHIMS ID#52-2-1645)
- Browns Road Site 32 (AHIMS ID#52-2-1646)
- Sandy Creek Road 19 (AHIMS ID#52-5-0271)

Based on community consultation to date with the RAPs for the Project, and with the completion of this ACHA by Niche, the following Draft recommendations have been made:

**Table 13: Draft Recommendations**

Draft Recommendations	
1.	IMC should continue to consult with the Aboriginal community for the life of the Project in accordance with the consultation guidelines.
2.	<p>A subsidence monitoring program to be implemented progressively over the life of the Project. The subsidence monitoring program should include monitoring of all Aboriginal sandstone shelter sites and grinding groove sites located within the angle of draw of the Project. The program should include (but not be limited to) the following:</p> <ul style="list-style-type: none"> <li>• A schedule for undertaking the subsidence monitoring at the nominated sites.</li> <li>• Appropriately detailed baseline and archival site recordings, including high resolution digital photographs.</li> </ul> <p>An impact TARP specific to each of the sites being monitored.</p>
3.	<p>The following Aboriginal cultural heritage site cards should be updated on the AHIMS to include revised photographs and co-ordinates as those currently registered are incorrect:</p> <ul style="list-style-type: none"> <li>• DM 15 (AHIMS ID#52-2-3639)</li> <li>• Browns Road Site 29 (AHIMS ID#52-2-1643)</li> <li>• Browns Road Site 30 (AHIMS ID#52-2-1644)</li> <li>• Browns Road Site 31 (AHIMS ID#52-2-1645)</li> <li>• Sandy Creek Road 19 (AHIMS ID#52-5-0271)</li> <li>• Sandy Creek Road 20 (AHIMS ID#52-5-0272)</li> </ul>

## Draft Recommendations

4.	<p>The Aboriginal Heritage Plan for Dendrobium Area 3A should be revised to consider recommended management strategies determined by the outcomes of this assessment, and any further recommendations provided by Heritage NSW. Baseline recording for the following sites will need to be completed for that Management Plan, as they have not previously been baseline recorded:</p> <ul style="list-style-type: none"> <li>• Browns Road Site 32 (AHIMS ID# 52-2-1646)</li> <li>• Sandy Creek Road 19 (AHIMS ID# 52-5-0271)</li> </ul>
<b>General</b>	
5.	<p>All workers should have cultural awareness training, so they are made aware of their obligations under the NPW Act and the ACHMP.</p>
6.	<p>In the unlikely event that suspected human remains are encountered, all work in the area that may cause impact to the remains, must cease immediately and:</p> <ul style="list-style-type: none"> <li>• The location, including a 20 m curtilage, should be secured using barrier fencing to avoid harm.</li> <li>• The NSW Police must be contacted immediately.</li> <li>• No further action is to be undertaken until the NSW Police provide written notification to IMC.</li> <li>• If the skeletal remains are identified as Aboriginal, then IMC or their agent must contact: <ul style="list-style-type: none"> <li>▪ The Heritage NSW, of the Enviroline on 131 555; and representatives of the RAPs.</li> <li>▪ No works are to continue within the 20 m curtilage until Heritage NSW provides written notification to the proponent or their Agent.</li> </ul> </li> </ul>

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## Appendix A Archaeological Report

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**Appendix A: Archaeological Report**  
**Longwall 19A: Dendrobium Area 3A**  
Lake Cordeaux Catchment LGA: Wollongong City Council

Prepared for South32 – Illawarra Metallurgical Coal  
Prepared by Niche Environment and Heritage | 20 July 2022



## Document control

Project number	Client	Project manager	LGA
7176	South32 – Illawarra Metallurgical Coal	Renée Regal	Wollongong City Council

Version	Author	Review	Status	Date
D1	Renée Regal	Renée Regal	DraftREV01	1 July 2022
FNL	Renée Regal	Cody Brady and Gary Brassington	Final	23 August 2022

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## Executive Summary

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### Project Outline

This report presents the Archaeological Report (AR) for the Longwall 19A Subsidence Management Plan (SMP) application; that is being sort by South32-Illawarra Metallurgical Coal (IMC) in accordance with Schedule 3 Condition 7 of the Dendrobium Mine Area 3A mining lease (approved under Development Consent 60-03-2001, Consolidated Mining Lease 768). The Subject Area is located approximately 13 kilometres (km) to the north west of the Wollongong Central Business district, within the WaterNSW Metropolitan Special Catchment Area. The Subject Area is defined by the 600 metre (m) boundary around the extent of the proposed Longwall 19A.

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by IMC to complete an ACHA. To complete this assessment Niche has used the following regulation and guidelines:

- *The National Parks and Wildlife Regulation 2009* (NPW Regulation);
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW Department of Environment, Climate Change and Water [DECW]2010a);
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b);
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011); and
- *The Burra Charter: The Australian ICOMOS Charter for Places of Cultural Significance* (Australia International Council on Monuments and Sites [ICOMOS] 2013).

A total of 11 separate Aboriginal stakeholders (including groups and individuals) have been previously identified and consulted with as part of the Dendrobium Consent process (DA-60-03-2001, Navin Officer 2000 and Biosis Research 2007). As a result of this previous consultation process, there is no requirement to commence the formal process under the *Aboriginal cultural heritage consultation requirements for proponents 2010* (Section 3). Stages 2 to 4 of the consultation process were followed for the remainder of the Registered Aboriginal Party (RAP) engagement for this ACHA.

In addition to the comprehensive reassessment of the Aboriginal Heritage Information Management System (AHIMS) registered sites that fall within the Subject Area, this AR has included a review of the previous surveys and assessments from within the Dendrobium 3A Area and surrounds. Biosis Research's previous assessment *Dendrobium Area 3 Archaeological and Cultural Heritage Assessment* (Biosis Research 2007) has been used as a foundation for this assessment as a previous AHIP (ID# 1098243) has been approved within the exiting Subject Area (Appendix E of the ACHA). This AHIP expired on 27 March 2017.

A total of seven (7) Aboriginal cultural heritage sites are located within the Subject Area, including Browns Road Site 32 (AHIMS ID#52-2-1646) that has been included in Condition 12 of the Dendrobium Development Consent. The majority of the sites (6 of 7) have a low scientific (archaeological) significance. One site of moderate scientific (archaeological) significance. The RAPs have advised during previous assessment completed by Biosis Research (2007) and Niche Environment and Heritage (2021 and 2022) that all sites and associated landscape attributes have high cultural significance.

## Summary of Impacts

The extraction of coal by longwall mining will result in vertical and horizontal subsidence at the surface which has impacts to the natural and built environments. It has been predicted by Mine Subsidence Engineering Consultants (MSEC 202) that three (3) Aboriginal cultural heritage sites located within the Subject Area have been identified that will experience related effects from the extraction of Longwall 19, with additional movements predicted to occur as a result of the extraction of Longwall 19A. These sites include:

- DM 15 (AHIMS ID#52-2-3639)
- DM 20 (AHIMS ID# 52-2-3644)
- Sandy Creek Road 21 (AHIMS ID#52-5-0273)

Four (4) Aboriginal cultural heritage sites within the Subject Area are not predicted to experience subsidence related effects (MSEC 2022:62). These Aboriginal cultural heritage sites include:

- Browns Road Site 30 (AHIMS ID#52-2-1644)
- Browns Road Site 31 (AHIMS ID#52-2-1645)
- Browns Road Site 32 (AHIMS ID#52-2-1646)
- Sandy Creek Road 20 (AHIMS ID#52-5-0272)

## Regulatory requirements and recommendations

The following draft recommendations have been made by Niche in consultation with the RAPs:

Draft Recommendations	
1.	IMC should continue to consult with the Aboriginal community for the life of the Project in accordance with the consultation guidelines.
1.	<p>A subsidence monitoring program to be implemented progressively over the life of the Project. The subsidence monitoring program should include monitoring of all Aboriginal sandstone shelter sites and grinding groove sites located within the angle of draw of the Project. The program should include (but not be limited to) the following:</p> <ul style="list-style-type: none"> <li>• A schedule for undertaking the subsidence monitoring at the nominated sites.</li> <li>• Appropriately detailed baseline and archival site recordings, including high resolution digital photographs.</li> </ul> <p>An impact TARP specific to each of the sites being monitored.</p>
2.	<p>The following Aboriginal cultural heritage site cards should be updated on the AHIMS to include revised photographs and co-ordinates as those currently registered are incorrect:</p> <ul style="list-style-type: none"> <li>• DM 15 (AHIMS ID#52-2-3639)</li> <li>• Browns Road Site 29 (AHIMS ID#52-2-1643)</li> <li>• Browns Road Site 30 (AHIMS ID#52-2-1644)</li> <li>• Browns Road Site 31 (AHIMS ID#52-2-1645)</li> <li>• Sandy Creek Road 19 (AHIMS ID#52-5-0271)</li> <li>• Sandy Creek Road 20 (AHIMS ID#52-5-0272)</li> </ul>
3.	<p>The Aboriginal Heritage Plan for Dendrobium Area 3A should be revised to consider recommended management strategies determined by the outcomes of this assessment, and any further recommendations provided by Heritage NSW. Baseline recording for the following sites will need to be completed for that Management Plan, as they have not previously been baseline recorded:</p> <ul style="list-style-type: none"> <li>• Browns Road Site 32 (AHIMS ID# 52-2-1646)</li> <li>• Sandy Creek Road 19 (AHIMS ID# 52-5-0271)</li> </ul>
	<b>General</b>
4.	All workers should have cultural awareness training, so they are made aware of their obligations under the NPW Act and the ACHMP.
5.	<p>In the unlikely event that suspected human remains are encountered, all work in the area that may cause impact to the remains, must cease immediately and:</p> <ul style="list-style-type: none"> <li>• The location, including a 20 m curtilage, should be secured using barrier fencing to avoid harm.</li> <li>• The NSW Police must be contacted immediately.</li> <li>• No further action is to be undertaken until the NSW Police provide written notification to IMC.</li> <li>• If the skeletal remains are identified as Aboriginal, then IMC or their agent must contact: <ul style="list-style-type: none"> <li>▪ The Heritage NSW, of the Enviroline on 131 555; and representatives of the RAPs.</li> <li>▪ No works are to continue within the 20 m curtilage until Heritage NSW provides written notification to the proponent or their Agent.</li> </ul> </li> </ul>

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## 1. Introduction

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### 1.1 Project background and aims

This report presents the findings of archaeological investigations of the proposed extraction of Longwall 19A within Area 3A of the Dendrobium Mine within Consolidated Coal Lease (CCL) 768, under the Development Consent 60-03-2001 (DA 60-03-2001). Dendrobium Mine is an existing underground coal mine located in the Southern Coalfield NSW within the Sydney Metropolitan Water Catchment Area (Figure 1 and Figure 2; hereafter referred to as the 'Subject Area'). Niche Environment and Heritage (Niche) was commissioned by South32-Illawarra Metallurgical Coal (IMC) to produce this Archaeological Report (AR) to inform an Aboriginal Cultural Heritage Assessment (ACHA).

The Subject Area encompasses 480 hectares (ha) area within Lot 14 / DP 1233164 to the south west of Lake Cordeaux, located within the Local Government Area (LGA) of Wollongong and the Illawarra Local Aboriginal Land Council (ILALC) as outlined in Figure 1 and Figure 2.

Niche has prepared this AR in accordance with the following guidelines:

- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (Department of Environment, Climate Change and Water NSW, 2010)*

The objectives of this report are as follows:

- To identify if Aboriginal cultural heritage sites within the Subject Area are predicted to be impacted by the proposed works;
- Assess the cultural significance of Aboriginal Cultural Heritage sites via consultation with Registered Aboriginal Parties (RAPs);
- Provide appropriate mitigation and management recommendations in accordance with the relevant legislation; and
- To meet the approval requirements, in accordance with the Subsidence Management Plan (SMP).

## 2. Investigators and Contributors

The contributors to this AR and their project roles are listed in Table 1.

**Table 1: Contributors, affiliations and contributions**

Contributor	Affiliation	Contribution	Qualification	Years' experience
<b>Renée Regal</b>	Niche- Senior Heritage Consultant	Project Director, Field Archaeologist, Author and Internal Document Review	BA (Hons)	17
<b>Carly Todhunter</b>	Niche- Heritage Consultant	Author, Field Archaeologist and Aboriginal community consultation	BA (Hons)	2
<b>Stella Quast</b>	Niche-Heritage Consultant	Field Archaeologist and Aboriginal community consultation	BA (Hons)	2
<b>Penelope Geering</b>	Niche- GIS Consultant	GIS, Mapping	BA Sc.	5 years
<b>Gary Brassington</b>	IMC – Manager Mining Approvals	Document Review		
<b>Cody Brady</b>	IMC – Principal Approvals	Document Review		
<b>Kai Whitaker</b>	Niche – Approvals Consultant	Document Review		
<b>Dr James Barbato</b>	MSEC	Mine Subsidence Engineering Consultant		
<b>Kim Moran</b>	Bellambi Aboriginal Tent Embassy	Registered Aboriginal Party		
<b>Glenda Chalker</b>	Cubbitch Barta Native Title Claimants	Registered Aboriginal Party and Document Review		
<b>Rebecca Chalker</b>	Cubbitch Barta Native Title Claimants	Registered Aboriginal Party and survey assistant.		
<b>Kirsty-Lee Chalker</b>	Cubbitch Barta Native Title Claimants	Registered Aboriginal Party and survey assistant.		
<b>Dean Boney</b>	Cubbitch Barta Native Title Claimants	Registered Aboriginal Party and survey assistant.		
<b>Blake Greenup</b>	Illawarra Local Aboriginal Land Council	Registered Aboriginal Party, document review.		
<b>Gary Caines</b>	Individual	Registered Aboriginal Party		
<b>Norma Simms</b>	Individual	Registered Aboriginal Party		

Contributor	Affiliation	Contribution	Qualification	Years' experience
<b>Rueben Brown</b>	Korewal Elouera Jerrungarugh Tribal Elders Council	Registered Aboriginal Party		
<b>Yvonne Simms</b>	La Perouse Botany Bay Corporation	Registered Aboriginal Party		
<b>John Phillips</b>	Tocomwall	Registered Aboriginal Party and survey assistant.		
<b>Keith Ball</b>	The Wadi Wadi Coomaditchie Aboriginal Corporation	Registered Aboriginal Party		
<b>Paul Cummins</b>	Woronora Plateau Gundungara Elders Council	Registered Aboriginal Party and survey assistant.		
<b>Kayla Williamson</b>	Woronora Plateau Gundungara Elders Council	Registered Aboriginal Party and survey assistant.		

### 3. Description of development proposal

Dendrobium Mine is an existing underground coal mine located in the Southern Coalfield NSW. Dendrobium Mine Area 3A is within Consolidated Coal Lease 768 and is approved under DA 60-03-2001. IMC has prepared a SMP application in accordance with Schedule 3 Condition 7 of DA60-03-2001 for the proposed extraction of Longwall 19A (Appendix G of the ACHA).

The location of the proposed project includes 480 Ha, within the area to the south west of Lake Cordeaux, to the immediate south of the previously approved Longwall 19. The Subject Area is approximately 8 km west of Wollongong, NSW.

The works proposed by IMC includes the longwall mining of the Wongawilli Seam. The proposed longwall mining activities will occur approximately 290 m to 360 m subsurface. The activity that has the potential to harm Aboriginal cultural heritage sites is the extraction of coal below the ground surface, which will result in mining induced ground movements (subsidence) at the surface (further explained in Section 12.2). Longwall 19A is a continuation of mining that extends into the Dendrobium Mine Area 3A. The area that may be affected by mining related impacts includes:

- Longwall 19A void;
- 600 m Boundary; and
- 35-degree angle of draw.

The following previous assessments within the Subject Area have been used to develop this report:

- Dendrobium Area 3 Archaeological and Cultural Heritage Assessment (Biosis Research, 2007) (Appendix E of the ACHA);
- Dendrobium Coal Mine- Area 3A Aboriginal Heritage Plan (Biosis Research, 2009) (Appendix E of the ACHA);
- Subsidence predictions and impact assessments. Dendrobium – Longwall 19 (Mine Subsidence Engineering Consultants 2020) (Appendix D of the ACHA);
- Longwall 19 Dendrobium Area 3a Aboriginal Cultural Heritage Assessment Report (Niche Environment and Heritage 2020); and
- Aboriginal Cultural Heritage Management Plan LW 19 Dendrobium Area 3A (Niche Environment and Heritage 2022).

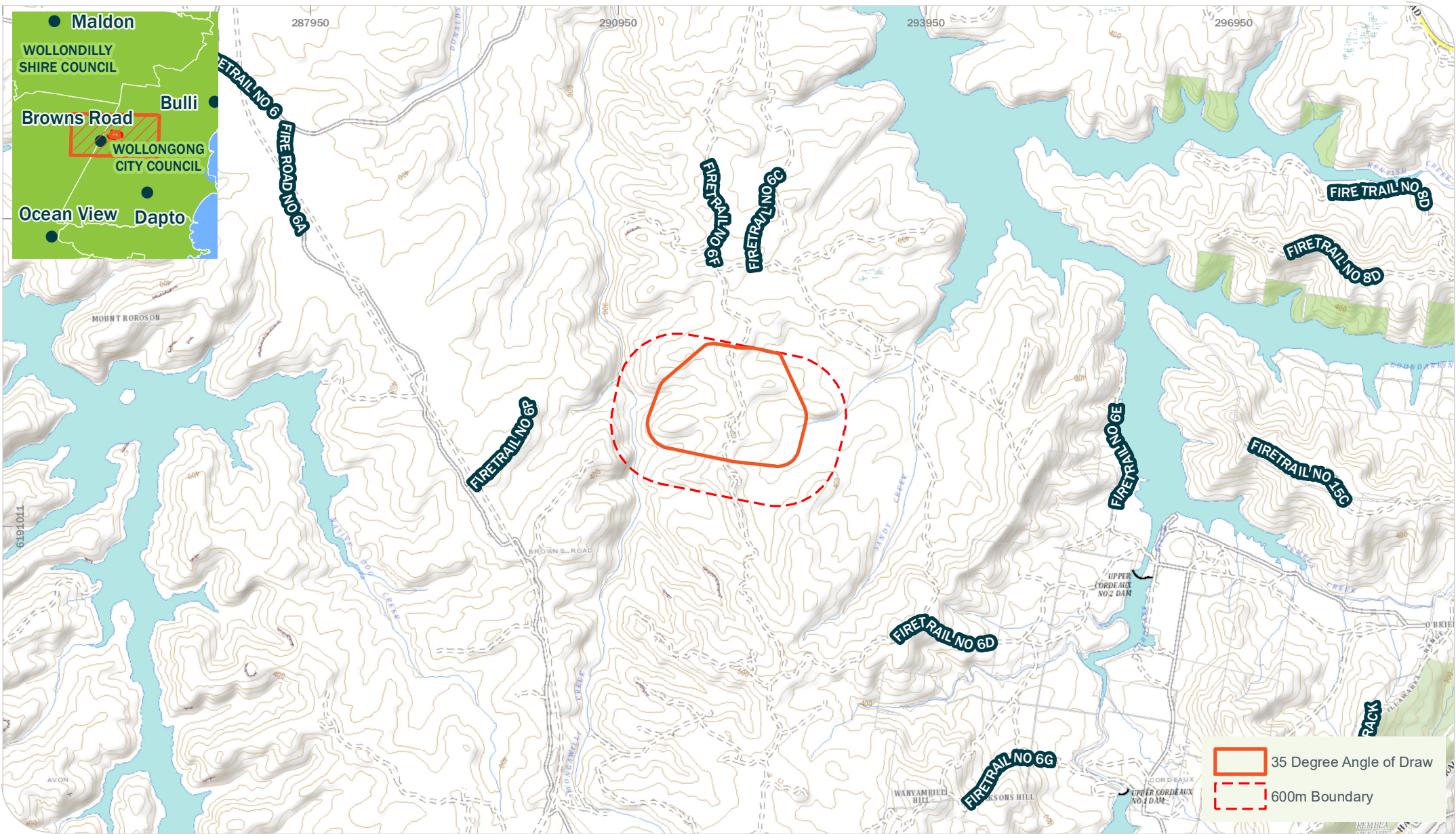
Through this review process it has been determined that the extraction of Longwall 19A may have the potential to impact the following Aboriginal cultural heritage sites (Table 2) registered on the Aboriginal Heritage Information Management System (AHIMS).

**Table 2: AHIMS registered sites are located within the Subject Area**

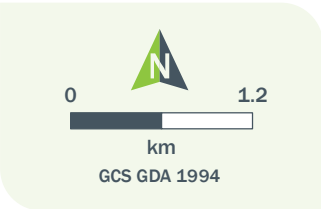
AHIMS ID	Site Name	Site Type
52-2-1644	Browns Road Site 30	Shelter with Art
52-2-1645	Browns Road Site 31	Shelter with Art
52-2-1646	Browns Road Site 32	Shelter with Art
52-2-3639	DM 15	Shelter with Art
52-2-3644	DM 20	Shelter with Art and PAD
52-5-0272	Sandy Creek Road 20	Shelter with Art
52-5-0273	Sandy Creek Road 21	Shelter with Art



The proposed extraction of Longwall 19A MSEC (2022) could result in impacts to the sites and associated landscape elements, such as block fall, exfoliation, cracking, opening and/or closing of existing faults and fissures (Biosis Research 2009 and MSEC 2022).



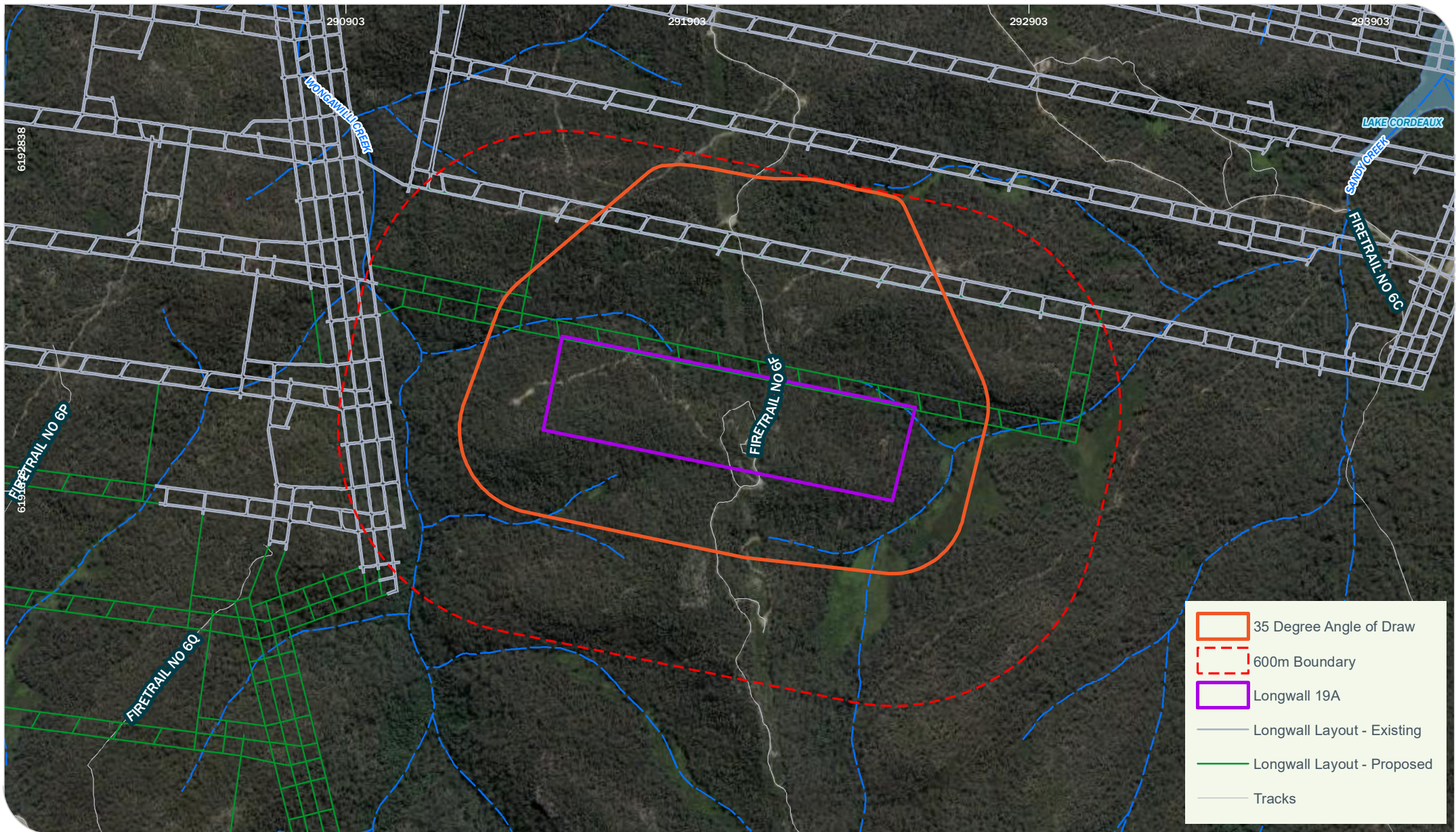
Drawn by: Penelope Geering Last updated: 09-Feb-22 4:10:17 PM File: T:\spatial\projects\7100\ar7164\_Longwall19A\_ACHA\_NSWMaps\report\AR7164\_Figure\_1\_LocationMap.mxd



Niche PM: Morgan Disspain  
 Niche Proj. #: 7164  
 Client: South 32- Illawarra Metallurgical Coal

**Location Map**  
 Longwall 19A SMP Archaeological Report

**Figure 1**



Drawn by: Penelope Geering Last updated: 09-Feb-22 4:09:02 PM File: T:\spatial\projects\7100\ar7164\_Longwall19A\_ACHA\_NSWMaps\report\AR7164\_Figure\_2\_SubjectArea.mxd

## 4. Previous archaeological work

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

A search of the AHIMS of the Subject Area was conducted by Carly Todhunter on 1 February 2022 (AHIMS Client ID# 655699). A total of 24 Aboriginal cultural heritage sites and no Aboriginal Places were identified within a 6 km<sup>2</sup> search area (Figure 4).

The frequencies of site types within the search area are consistent with regional trends identified during previous studies that encompass the wider region (Sefton 1990, Bosis Research 2007, Bosis Research 2009, Navin Officer 1996, Niche 2011, Niche 2019, Dibden 2019 and Niche 2021). Sandstone outcropped ridgelines and deeply incised creek landforms dominate the Subject Area which has shaped occupation within the region over time. Ridgetops act as vantage points and sandstone ridgelines and outcropping in proximity to creeks and swamps are noteworthy locations for shelter sites, which Aboriginal archaeological objects and occupation and resource sites are identified within the regional area.

The majority of the Aboriginal cultural heritage sites within the Subject Area were originally recorded by the Illawarra Prehistory Group (IPG) between 1980 and 1990 during their systematic surveys of the Cordeaux and Avon catchment areas, which included Sandy Creek and Wongawilli Creek and their associated tributaries. Many sites were reassessed by Navin Officer (2000) and more recently Bosis Research (2007) for the completion of the Dendrobium Mine AHIP application. The eight (8) Aboriginal cultural heritage sites recorded within the Subject Area have all been reassessed as part of this assessment. A summary of each of the site's details are outlined in Table 3 below. The complete site recordings are outlined in Annex 2 of this assessment.

**Table 3: Description of Aboriginal cultural heritage sites located within the Subject Area**

AHIMS ID	Site Name	Site description
52-2-1644	Browns Road Site 30	<p>This Shelter with Art and Deposit is located approximately 200 m of Fire Road 6F. The site is located along a continuous ridgeline. The sandstone overhang living area measures 11 x 2.7 m. The site was formed by block fall and cavernous weathering. The floor deposit is yellow orange loamy sand up to 5 cm in depth although the floor area.</p> <p>The site was recorded originally by the Illawarra Prehistory Group in 1991. A total of 1 Art motifs were identified within the shelter. The rear wall contained the following:</p> <ul style="list-style-type: none"> <li>• 1 Charcoal indeterminate.</li> </ul> <p>This site was originally recorded by the Illawarra Prehistory Group in 1991.</p>
52-2-1645	Browns Road Site 31	<p>This Shelter with Art was recorded by the IPG in 1991. The site is located under the second ridgeline up from the eastern tributary to Wongawilli Creek on the northern side, approximately 150 m north of a junction of two smaller tributaries. The sandstone overhang area of the sandstone shelter has a living area of 3 x 1 m. The floor deposit comprises of a grey loamy sand, approximately 20 cm deep that has formed from the weathering sandstone of the shelter and slope wash. This recording identified:</p> <ul style="list-style-type: none"> <li>• one charcoal outline and infill of a macropod; and</li> <li>• two charcoal indeterminates.</li> </ul> <p>The Art is in a poor condition. During the previous site inspection conducted by Bosis Research (2007) natural exfoliation was observed, with part of the art being fragmented and flaked of the shelter wall.</p>

AHIMS ID	Site Name	Site description
52-2-1646	Browns Road Site 32	<p>This Shelter with Art is located 200 m southeast of the junction of the eastern tributary of Wongawilli Creek. The site is under the second ridgeline. The sandstone overhang living area measures 8 x 2 m. The site was formed by block fall and cavernous weathering. The floor deposit is yellow orange loamy sand up to 10 cm in depth although the floor area to the north of the shelter is rocky and the deposit is less than 2 to 3 cm due to the rocky floor surface.</p> <p>The site was recorded originally by the Illawarra Prehistory Group in 1991. A total of 30 Art motifs were identified within the shelter. The rear wall contained the following:</p> <ul style="list-style-type: none"> <li>• ten red ochre handprints,</li> <li>• one red ochre hand stencil,</li> <li>• three charcoal outlines of macropods,</li> <li>• seven charcoal indeterminates,</li> <li>• three charcoal outlines of reptiles, one with infill,</li> <li>• two charcoal outlines of bats,</li> <li>• two charcoal partial frontal human anthropomorphs,</li> <li>• two charcoal outlines of fish.</li> </ul> <p>Within Art Panel 2 the charcoal motifs are overlapping the ochre red handprints.</p> <p>This Aboriginal cultural heritage site was resurveyed by Biosis Research in 2007 for inclusion of the Area 3A (ID# 1098243) application. Macro vegetals were observed growing within the shelter and exfoliation was prominent, however, all motifs were relocated. This site will not be included in the AHIP application for Longwall 19 as no impacts related to subsidence movements have been predicted at this site.</p>
52-2-3639	DM 15	<p>This Shelter with Art was recorded by Biosis Research in 2007. The site is situated on the mid slopes of a ridge line above a major tributary of Wongawilli Creek. The small sandstone shelter is located in a sandstone outcrop and has been formed by blockfall and cavernous weathering. The shelter faces south, approximately 150 m from Wongawilli Creek. The floor area measures 2 x 2 m. The shelter deposit consists of medium yellow grey brown sand estimated to be 40 cm deep. No artefacts were identified.</p> <p>The art comprises of a single outline with infill charcoal male anthropomorphic figure. It is situated on a small panel on the eastern end of the shelter and has been well preserved by case hardening.</p>
52-2-3644	DM 20	<p>This Shelter with Art and Potential Archaeological Deposit (PAD) is situated on the mid slope of a moderate ridgeline 300 m east of Fire Trail 6C and 200 m north of the drainage line. The small sandstone overhang has been formed by block fall and cavernous weathering and is situated in a small continuous cliff line. The shelter faces north towards Sandy Creek and comprised a small flat living area approximately 3 x 2 m in size.</p> <p>DM 20 (AHIMS ID#52-2-3644) was originally recorded by Biosis Research during the 2007 for the Dendrobium Area 3 ACHA. The Art identified comprised of a charcoal outline and infill indeterminate motifs across the rear wall of the small cavern. One partial anthropomorphic figure is located on the edge of the cavern area. The motifs are in poor condition due to excessive water seepage, leeching and micro-vegetal growth.</p>

AHIMS ID	Site Name	Site description
		The small, cavernous living area of the shelter was subject to continuous weathering resulting in exfoliation.
52-5-0272	Sandy Creek Road 20	<p>This Shelter with Art is located 10 m off the power easement off an unnamed access track off Fire Trail 6F. It is best accessed off this easement. The site in an isolated overhang formed through cavernous weathering and contains three panels of art. The art comprises of:</p> <ul style="list-style-type: none"> <li>• One charcoal indeterminate on the roof of the shelter</li> <li>• One red ochre outline/ infill frontal male figure holding a boomerang; and</li> <li>• One red ochre indeterminate</li> </ul> <p>The shelter was last visited in 1991 by the Illawarra Prehistory Group.</p>
52-5-0273	Sandy Creek Road 21	<p>This Shelter with Art and Deposit was originally recorded by the IPG in 1991. The site is located on a long narrow sandstone cliff line east of Fire Trail 6F. This shelter has formed through block fall and cavernous weathering; and is situated on the eastern facing overhang on the upper ridge cliff line and located 150 m south east of Sandy Creek. The deposit in the shelter comprises of a dark grey brown sandy loam. A total of seven artefacts were recorded of one which was in the drip line of the shelter:</p> <ul style="list-style-type: none"> <li>• one silcrete flake</li> <li>• one silcrete core fragment</li> <li>• one broken quartz flake</li> <li>• one chert flake</li> <li>• one petrified wood flake</li> <li>• one silcrete flake; and</li> <li>• one chert core (Plate 8).</li> </ul> <p>The Art consists of:</p> <ul style="list-style-type: none"> <li>• one outline and infilled partial human anthropomorph with large eyes</li> <li>• one charcoal outline and infill indeterminate; and</li> <li>• one charcoal outline indeterminate.</li> </ul> <p>The Art is slightly faded, and some surface exfoliation has occurred.</p>

All recorded AHIMS sites within the Subject Area are situated within the Upper Nepean catchment area, part of the Woronora Plateau. The most common identified site type surrounding the immediate Subject Area are Shelter with Art and Shelter with Deposit (see Table 4 for further details of site types within the region).

Within the wider local area, Shelter with Art (n=61), Shelter with Deposit (n=23) and Shelter with Art and Deposit (n=11) were the most common Aboriginal site types recorded on the AHIMS register (outlined in Table 4 and Figure 3). The closest sites were predominantly associated with the Wongawilli and Sandy Creeks, which has historically been suitable for Aboriginal occupation and transient use. It must be noted that care should be taken when using the AHIMS database to reach conclusions about site prevalence or distribution. The distribution of registered sites does not reflect patterns of occupation, but rather is often indicative of survey coverage and conditions.

**Table 4: Summary of AHIMS site features within 6 km<sup>2</sup> of the Subject Area**

Site features	Total
Shelter with Art	60
Shelter with Deposit	23
Shelter with Art and Deposit	12
Axe Grinding Groove	7
Open Camp Site	2
Shelter with Art, Deposit and Axe Grinding Groove	1
Shelter with Art and Axe Grinding Groove	1
Isolated Artefact	1
Stone Arrangement	1
<b>Total</b>	<b>109</b>

#### 4.1 Assessment of robustness AHIMS data

The broader region surrounding the Subject Area has been subjected to extensive archaeological study over the last two decades. Most of the archaeological work has been initiated by impact assessments for various infrastructure, environmental engineering and academic research projects. Archaeological studies provide material evidence of Aboriginal use of the landscape at times both before and after written history and complements the oral histories and cultural knowledge held by the Aboriginal community. As noted in Section 4.2, several archaeological investigations have been undertaken in the Subject Area, including the following:

- a series of surveys undertaken by the IPG
- research assessments undertaken by Dibden, McDonald and Sefton
- due diligence assessments for mining related exploration activities undertaken within the Subject Area by Biosis Research, Navin Officer, Niche and Sefton; and Aboriginal cultural heritage assessments contributing to mining approval processes and post mining monitoring completed by Niche Environment and heritage, Biosis Research and Navin Officer
- The ACHA and ACHMP developed for the f Longwall 19 SMP.

To date, the analysis within these studies has been to do with the presence, absence and disturbance of sites over time, and broad characterisation of where the sites occur in the landscape.

##### 4.1.1 Other registers

Searches of the Australian World Heritage Database, the Commonwealth Heritage List, National Heritage List, State Heritage Register, State Heritage Inventory, the Wollongong City Local Environmental Plan (LEP) (2009) and Wollondilly LEP (2011) and the Wollongong City and Development Control Plan's (DCP) were conducted on 1 February 2022.

**Table 5: Listed heritage items in proximity to the Subject Area**

Heritage Register	Items within the Subject Area	Items within close proximity to the Subject Area
Australian World Heritage Database	None	None
Commonwealth Heritage List	None	None
National Heritage List	None	None
State Heritage Register	None	Cordeaux Dam (SHR ID# 5051470)
State Heritage Inventory	None	None
Schedule 5 of the LEP	Timber Bridge (ID# DHS1)	Cordeaux Dam (ID # I56)
Development Control Plan; Wollongong City	All known sites containing either Aboriginal objects and / or places of Aboriginal cultural heritage significance.	All known sites containing either Aboriginal objects and / or places of Aboriginal cultural heritage significance.

## 4.2 Previous heritage assessments of the Subject Area

Due to the environmental and cultural significance and ongoing mining activity within the Upper Nepean Catchment of the Woronora Plateau, several heritage assessments have been undertaken within the Subject Area. This has built a collection of local knowledge of the cultural heritage values of the Subject Area. The eight Aboriginal cultural heritage sites that have been identified have had minimal disturbance as they are located within the WaterNSW Managed Metropolitan Special Catchment Area.

**Table 6: Review of previous heritage assessments within the Subject Area**

Author and Year	Title and Description
<b>Sefton 1990 1989-1990</b>	<b>Archaeological Survey of the Avon River by the Illawarra Prehistory Group</b> An assessment of the Cordeaux and Woronora Rivers was completed with a grant received from the Australian Institute of Aboriginal and Torres Strait Islander Studies. A total of 89 Aboriginal cultural heritage sites were identified during this assessment. Sefton provided useful statistical data about the site types and art techniques within the Upper Nepean region.
<b>McDonald 1994</b>	<b>Dreamtime Superhighway: An analysis of Sydney Basin Rock Art and Prehistoric Information Exchange</b> McDonald completed a PhD thesis on the prehistoric rock art within the Sydney region. This thesis highlighted that Shelter with Art site types have greater visibility to a broader section of the community and had the potential to function in a different fashion to the engraved art of the region, which is not associated with habitation debris (McDonald 1994: 124). The thesis highlights the motif types present within the region and observes that within inland areas, land animals make up a high percentage of motifs used.  In conclusion, McDonald demonstrates that there are also several major variations in art techniques and motif type between the southern areas of the Woronora Plateau and the eastern and northern areas of the Sydney Basin.
<b>Sefton 1994 1993-1994</b>	<b>Archaeological Survey of the Avon River by the Illawarra Prehistory Group</b> Sefton received a further grant from the Australian Institute of Aboriginal and Torres Strait Islander Studies to complete an assessment of the Avon River. The surveys focused on sandstone outcrops and formed a model of site types that would be present within the



Author and Year	Title and Description
	<p>Subject Area, which is of the same typography as the current Subject Area for the Project. Site types that were highlighted were Stone Arrangements, Axe Grinding Grooves, Groove Channels, Rock Engravings, and Shelter with Art and/or Deposit site types.</p> <p>During this assessment, 53 Shelter sites, 13 Axe Grinding Groove Sites, two Stone Arrangements and one Engraved Channel were assessed.</p>
<p><b>Sefton 1998a</b></p>	<p><b>Site and Artefact Patterns on the Woronora Plateau</b></p> <p>Sefton completed a post graduate thesis that focused on the artefact and Aboriginal archaeological site patterns of the Woronora Plateau. The data used for this assessment had been collected by the Illawarra Prehistory Group between 1970 and 1998.</p> <p>The associations considered by Sefton included the relationship between sites, the material evidence remaining and their location within the landscape. This assessment focussed on Shelter with Art and/or Deposit, Axe Grinding Grooves and Rock Engravings site types.</p> <p>During her assessment, Sefton argues that site density within the Woronora Plateau area can be used to indicate the spatial distribution or density of the Aboriginal population within the study area using multivariate analysis (Sefton 1998a:62).</p> <p>In analysing the shelter sites with their attributes, clear patterns form between shelters, their attributes and the drainage basins of the Woronora Plateau and the inland/coastal associations of the shelter sites (Sefton 1998a:166). According to Sefton, these changes indicate a difference in settlement patterns across the Woronora Plateau.</p>
<p><b>Sefton 2000</b></p>	<p><b>Overview of the monitoring of sandstone overhangs for the effects of mining subsidence in the Illawarra Coal Measures</b></p> <p>Sefton completed an overview of the monitoring of sandstone overhangs for the effects of mining subsidence for Illawarra Coal. The purpose of this assessment was to develop a monitoring program to gauge the effects of subsidence on sandstone overhangs and to relate these effects to the following parameters:</p> <ul style="list-style-type: none"> <li>▪ Topographic location;</li> <li>▪ Overhang shape and size and overhang formation process;</li> <li>▪ The presence of jointing in bedding planes;</li> <li>▪ Mining subsidence;</li> <li>▪ Comprehensive and tensile strains and tilts; and</li> <li>▪ Overhang location relative to longwalls and geological anomalies.</li> </ul> <p>This assessment has been used as a template for Aboriginal archaeological site monitoring programs within the Southern Coalfield and the principles outlined for site recording will be used during this assessment.</p>
<p><b>Sefton 2002</b></p>	<p><b>Archaeological Survey of longwall 9 and 10 Application Elouera Colliery.</b></p> <p>Sefton was commissioned to complete an assessment of previously identified sites for IMC to comment on their archaeological significance and to provide management strategies.</p>
<p><b>Biosis Research 2004</b></p>	<p><b>Dendrobium Area 3 Lake Cordeaux foreshore seismic testing REF: Archaeological survey</b></p> <p>Biosis Research were commissioned to complete a Review of Environmental Factors (REF) for the proposed seismic testing of part of Dendrobium Mine Area 3 and the Lake Cordeaux foreshore. This REF included Aboriginal and European heritage. This assessment was used to assist with the development of the predictive modelling and survey methodology for the Project, as the Subject Area used for the previously completed assessment was also located within a similar landscape area.</p>
<p><b>Biosis Research 2007a</b></p>	<p><b>Dendrobium Area 3 Aboriginal Cultural Heritage Assessment.</b></p> <p>In 2007 Biosis Research was commissioned by BHP Billiton to complete an assessment of Dendrobium Mine Area 3 for Aboriginal and European heritage. During this assessment, a total of 65 Aboriginal cultural heritage sites were identified. Of these 65 sites, 14 were located within Dendrobium Mine Area 3A, the remaining 24 were located within</p>

Author and Year	Title and Description
	<p>Dendrobium Mine Area 3B and 18 were located within Dendrobium Mine Area 3C. Similar to Navin Officer (2000) and the current study, the site types identified comprised of Shelter with Art and/or Deposit, Isolated Artefacts, Axe Grinding Grooves and a suspected Stone Arrangement.</p> <p>As a result of this assessment, it was recommended that an AHIP to be applied for 14 Aboriginal cultural heritage sites.</p>
<p><b>Biosis Research 2010</b></p>	<p><b>Dendrobium Area 3A Aboriginal Management Plan</b></p> <p>This document was completed to satisfy the condition consent conditions for the Dendrobium mine project. The aim of this Management Plan is to describe protocols for ongoing Aboriginal community engagement, establish suitable methods for baseline recording, establish and conduct a monitoring program to detect and measure any changes at sites due to subsidence.</p>
<p><b>Biosis Research 2013</b></p>	<p><b>Longwall 8 End of Panel Monitoring Assessment</b></p> <p>A site assessment and review of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall 8 located in Dendrobium Area 3A, directly above the current Subject Area. A visual inspection of DM 13 (AHIMS ID #48-2-0056) and DM 20 (AHIMS ID #52-2-3639) was undertaken during mining to determine any subsidence impacts as a result of the longwall extraction. No Impacts were observed for any Aboriginal cultural heritage sites.</p>

### 4.3 Previous heritage assessments and ethnographic sources of the region

The broader region of the Woronora Plateau would have been a relatively rich and diverse resource area for Aboriginal people in the past, but modifications such as farming and residential developments are likely to have disturbed large areas containing archaeological materials. Apart for the water reservoirs, the preservation of the Upper Nepean catchment areas for water storage has conserved the natural environment from major modification, resulting in the preservation of many Aboriginal cultural heritage sites.

The region surrounding the Subject Area has been subject to intensive archaeological survey over the last two decades (Biosis Research 2004, 2007a 2007b, 2009a; McDonald 1994; Navin Officer 2000; Niche Environment and Heritage 2009-2017, 2017-2019, 2021 and 2022 and Sefton 1990, 1994, 1998a, 2000 and 2002). The main issues that have been dealt with by these studies have been questions of presence or absence of sites, broad characterisation of where the sites occur in the landscape, and the monitoring of sites for subsidence.

A description of these past archaeological assessments within the wider surrounds is provided below in Table 7. The antiquity of Aboriginal occupation in the region is demonstrated through several archaeological excavations that have been undertaken in the region surrounding the Subject Area (Sefton 1990, 1994, 1998a, 2000 and 2002; McDonald 1994 and Biosis Research 2007a and 2009a). The oldest date generally considered to be reliable for the earliest occupation around the region comes from excavations at Parramatta where archaeological material has been dated to 30,735 ± 407 BP (McDonald et al 2005). The site of Bass Point at Shellharbour has been dated to 17,101+/- BP (Flood 1999). Within closer proximity to the current Subject Area on the Woronora Plateau the oldest date for Aboriginal occupation is at Curracurrang 1 Sandstone Shelter at 7,450 +/- 180 BP (Dibden 2019:38).

**Table 7: Regional heritage assessments considered**

Author and Year	Title and relevance to the Subject Area
Organ 1990	<p><b>A History of Aboriginal People of the Illawarra 1770 to 1970 (DEC, NSW 2005), Illawarra and South Coast Aborigines 1770-1850</b></p> <p>Provides an overview of historical and ethnographic sources for the Illawarra region. This resource provides a depth of information of tribal boundaries, language and occupation of Aboriginal people within the Illawarra.</p>
Sefton 1990 1989-1990	<p><b>Archaeological survey of the Cordeaux River and Woronora River by the Illawarra</b></p> <p>An assessment of the Cordeaux and Woronora Rivers was completed with a grant received from the Australian Institute of Aboriginal and Torres Strait Islander Studies. A total of 89 archaeological sites were identified during this assessment. Sefton provided useful statistical data about the site types and art techniques.</p>
Navin Officer 2000	<p><b>Dendrobium Coal Project: Cultural Heritage Assessment</b></p> <p>In 2000, Navin Officer completed a cultural heritage assessment for the Dendrobium Coal Project, which included Longwalls 1 to 3 within Dendrobium Mine Area 1; which is to the south-east of the current Subject Area. The survey sample for this assessment was confined to areas that were proposed to have impacts associated with them. Like this current assessment, sites that were registered on AHIMS were reassessed. Large trees were assessed for scarring and ridgelines and open sandstone platforms were surveyed. During this assessment, 19 AHIMS accessioned sites were assessed and 11 previously unrecorded sites were identified. These site types comprised of Shelters with Art and/or Deposit and Potential Archaeological Deposit, Open Camp Sites, and a Stone Arrangement.</p>
Department of Environment and Conservation, NSW, 2004	<p><b>Aboriginal Women’s Heritage: Wollongong</b></p> <p>This resource is a collection of Dharawal Women’s oral history from local Elders that have recalled lore, cultural practices, resource gathering and a struggle for land and civil rights within the Illawarra. This resource supports archaeological finds and can be used as a basis for predictive modelling.</p>
Biosis Research 2004	<p><b>Mine Area 3 Lake Cordeaux foreshore seismic testing REF: Archaeological survey</b></p> <p>Biosis Research were commissioned to complete a Review of Environmental Factors (REF) for the proposed seismic testing of part of Dendrobium Mine Area 3 and the Lake Cordeaux foreshore. This REF included assessment of Aboriginal and European heritage sites.</p>
Biosis Research 2007b	<p><b>West Cliff Colliery Stage 3 Coal Wash Emplacement Archaeological and Cultural Heritage Assessment</b></p> <p>This assessment was completed in 2004 as part of the proposed Stage 3 West Cliff Colliery Coal Wash Emplacement works. This assessment was used to assist with the development of the predictive modelling and survey methodology for the project, as the Subject Area used for the previously completed assessment was also located within a similar landscape area.</p>
Biosis Research 2009a	<p><b>Bulli Seam Operations Aboriginal Cultural Heritage Assessment</b></p> <p>Biosis Research was commissioned by BHP Billiton-Illawarra Coal to conduct an ACHA for the proposed Bulli Seam Operations Project. During this assessment a total of 646 previously recorded and 45 newly identified sites were surveyed. The survey methodology for this assessment included targeted survey of previously recorded AHIMS sites and associated ridgelines.</p>
Niche Environment and Heritage 2014b	<p><b>Longwall 9 End of Panel Monitoring Assessment</b></p> <p>A site assessment and review of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall</p>

Author and Year	Title and relevance to the Subject Area
	9 located in Dendrobium Area 3B. It was concluded that minor cracking occurred at Dendrobium 1 (AHIMS ID#52-2-2208) in result of subsidence related movements. The four remaining sites within the Subject Area had not been impacted by subsidence related movements.
<b>Biosis 2015</b>	<p><b>Longwall 10 End of Panel Monitoring Assessment</b></p> <p>The assessment of cultural heritage and archaeological sites potentially impacted by Longwall 10 was conducted by Biosis. Two (2) Shelter with Deposit sites were inspected as part of the assessment. Visual Inspections for Dendrobium 1 (AHIMS ID # 52-2-2208) and DM2 (AHIMS ID # 52-2-3878) concluded that no changes have occurred to DM2 (AHIMS ID # 52-2-3878), however Dendrobium 1 (AHIMS ID # 52-2-2208) had minor expansion and extension of vertical cracking in horizontal bedding plane during Longwall 9 extraction, however no impacts from the mining of longwall 10.</p>
<b>Biosis 2016</b>	<p><b>Longwall 11 End of Panel Monitoring Assessment</b></p> <p>An inspection of Aboriginal cultural heritage sites as part of the impact assessment within 400 m of Longwall 11. A visual inspection of Browns Road Site 12 (AHIMS ID #52-2-1627) and Dendrobium 2 (AHIMS ID #52-2-2209) was undertaken to determine any subsidence impacts as a result of the longwall extraction. No Impacts were observed for any Aboriginal cultural heritage sites.</p>
<b>Niche Environment and Heritage 2009-2017</b>	<p><b>Dendrobium Exploration Review of Environmental Factors (REF): Aboriginal Cultural Heritage Due Diligence Assessments.</b></p> <p>On behalf of IMC, Niche has completed several exploration REF's. These exploration works comprise seismic line and exploration borehole works. These assessments have been carried out within Dendrobium Mine Areas 3B, 3C, 4 and 5. The assessment for these works included assessing all ridgelines and creek beds within close proximity to the proposed works and relocating works within 100 m of AHIMS registered Aboriginal sites. Throughout these investigations, there have been no previously unregistered AHIMS sites located.</p>
<b>Niche Environment and Heritage 2017c</b>	<p><b>Longwall 12 End of Panel Monitoring Assessment</b></p> <p>A site assessment and review of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall 12 at Dendrobium Colliery. It was concluded that none of the five Aboriginal cultural heritage sites had not been impacted by subsidence related movements.</p>
<b>Niche Environment and Heritage 2018d</b>	<p><b>Longwall 13 End of Panel Monitoring Assessment</b></p> <p>A site assessment and review of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall 13 at Dendrobium Colliery. It was concluded that none of the five Aboriginal cultural heritage sites were impacted by subsidence related movements.</p>
<b>Niche Environment and Heritage 2019b</b>	<p><b>Longwall 14 End of Panel Monitoring Assessment</b></p> <p>A site assessment and review of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall 14 at Dendrobium Colliery.</p> <p>This assessment concluded that Browns Road Site 11 (AHIMS ID# 52-2-1626) and Site 1 DB 1 (AHIMS ID #52-2-2229) had been impacted by subsidence related movements caused by mining. Three other Aboriginal cultural heritage sites located within the area of assessment had not been impacted.</p>
<b>Niche Environment and Heritage 2020</b>	<p><b>Longwall 15 End of Panel Monitoring Assessment</b></p>

Author and Year	Title and relevance to the Subject Area
	<p>A site assessment and review of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall 15 within Dendrobium Colliery Area 3B.</p> <p>This assessment concluded that DM 21 (AHIMS ID #52-2-2229) had been impacted by subsidence related movements caused by mining and Browns Road Site 11 (AHIMS ID# 52-2-1626) experienced further impacts from those identified during the Longwall 14 monitoring.</p>
<p><b>Niche Environment and Heritage 2022</b></p>	<p><b>Longwall 17 End of Panel Monitoring Assessment</b></p> <p>A site assessment and review of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall 17 within Dendrobium Colliery Area 3B.</p> <p>This assessment concluded that there had been no impacts at any of the sites assessed due to the extraction of Longwall 17.</p>
<p><b>Niche Environment and Heritage 2017-2019</b></p>	<p><b>Dendrobium Next Domain: Steelmaking for the Future</b></p> <p>Niche were engaged to undertake a systematic survey of the creeks and ridgelines that have potential for Aboriginal cultural heritage within the proposed Dendrobium Mine Area 5 and 6 domains. A total of 37 Aboriginal cultural heritage sites were identified within the Subject Area, including five newly recorded sites and 32 previously recorded sites. The locations of three sites identified on AHIMS could not be confirmed during the assessment. All 37 sites are located within the proposed Dendrobium Mine Area 5 and Area 6 underground mining investigation areas, with one site located in close proximity to a proposed ventilation shaft investigation area.</p>
<p><b>Niche 2019</b></p>	<p><b>Dendrobium Area 3B, Longwalls 20 – 21 Aboriginal Cultural Heritage Assessment</b></p> <p>Niche were engaged to complete an ACHA with community consultation to assess the Aboriginal cultural heritage sites in the area above Longwalls 20 -21 in Area 3B. Eight Aboriginal cultural heritage sites were located within the Subject Area and are predicted by MSEC to experience nil to low levels of tilt and strain related to longwall extraction.</p>
<p><b>Dibden 2019</b></p>	<p><b>Drawing in the land: Rock Art of the Upper Nepean, Sydney Basin New South Wales</b></p> <p>Dibden’s study offers a board analysis of rock art in the Nepean region. The text examines the landscape in connection with the material archaeology and insight to the philosophy in attempt to understand the habitual mode that has led to the Shelter with Art dominated archaeological record.</p>
<p><b>Niche Environment and Heritage 2022</b></p>	<p><b>Aboriginal Cultural Heritage Assessment Dendrobium Extension Project</b></p> <p>Niche were engaged by South 32- Illawarra Metallurgical coal to complete an Aboriginal Cultural Heritage Assessment for Dendrobium Area 5. Within the Subject Area, 28 previously recorded Aboriginal heritage sites were identified, comprising a combination of 12 Axe Grinding Groove sites, 1 Isolated Find and 15 Sandstone Shelters with Art, Deposit, Potential Archaeological Deposit or a combination of all types. A field survey was undertaken to revisit these sites and during the survey an additional 3 sites were identified during the field survey and fall within the Subject Area. They include two rock shelters with art and a Potential Archaeological Deposit (PAD) and one Axe Grinding Groove site.</p>

**This information has been redacted**

For more information please contact South 32 Illawarra Metallurgical Coal.

## 5. Landscape context

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### 5.1 Preamble

Understanding the past and present environmental contexts of a Subject Area is requisite in any Aboriginal archaeological and cultural heritage investigation (DECCW 2010a). This gives an understanding of what activities would have taken place there in the past and the likelihood any trace of them would remain below the surface.

The following section provides details of the environmental characteristics of the Subject Area. The section concludes by considering how the environmental character of the Subject Area affects the way in which the area would have been occupied by Aboriginal people in the past, and how Aboriginal archaeological sites will be distributed across the landscape. It is important to note that the environmental context for inhabitants of the Illawarra region in times past is different to current climates. The major impact of this change in climate was a change in sea-level on the coast which would have had ramifications for the inland river systems.

Consideration of the landscape is essential to define and interpret past Aboriginal land use across a landscape and is a requirement of any Aboriginal archaeological and cultural heritage investigation (DECCW 2010a: 8). The landscape may provide insight as to areas of land that may have been more intensively used by Aboriginal people in the past due to the presence of resources such as water, stone, plants and animals and other raw materials or landscape features associated with sustenance, shelter, tool manufacture and cultural activities. The landscape provides the context within which the material remains of past Aboriginal occupation may be preserved and detectable due to the movement of soil through geomorphic processes such as erosion or its removal from the landscape through past land use and disturbance (DECCW 2010a: 8). By considering these factors, an Aboriginal cultural heritage investigation may develop a sampling strategy for identifying any tangible Aboriginal heritage values within the Subject Area.

The Subject Area has experienced little change since colonisation. The sandstone landscape and low nutrient soils deterred settlers from colonising the area. During the late 1800's the land was gazetted as part of the Sydney Water Metropolitan Catchment Area which has restricted public access and has led to the damming of Avon, Cataract, Cordeaux, Nepean waterbodies (WaterNSW 2019). The consequences from damming and restricted access to continue traditional indigenous burning practices has likely altered streamflow and vegetational communities within the Subject Area (Dibden 2019: 31).

Despite the landscape changes the Subject Area may have faced since colonisation, the restricted access of this area has led the preservation to the native biodiversity and Aboriginal cultural heritage.



**Plate 1: General photograph of a sandstone ridgeline within the Subject Area**



**Plate 2: General photograph sandy deposit in which artefacts are typically located within the Subject Area**

### 5.1.1 Geology, soils and geomorphology

Broadly the Subject Area is located on the southern Woronora Plateau within the Cordeaux and Avon Dam catchment areas (Figure 5). The Project is located within the southern portion of the Permo-Triassic Sydney Basin. The terrain of the Subject Area is characterised by Middle Triassic Hawkesbury Sandstone, which is comprised of overlapping beds of quartz-rich sandstone. Under the sandstone formations the substrates comprise of deep Permian Coal Measures that consist of shale sandstone, conglomerates, tuff, chert and coal (Branagan and Packhan 2000). These formations are divided into colluvial and residual landscapes.

In colluvial landscapes the dominant form of landscape formation is mass movement (rock fall) hazard with steep sloped, rock outcrops with shallow stony high permeable soil (Hazelton and Tille 1990:45). The Hawkesbury sandstone soil landscape ranges from rolling and rugged hills to very steep sandstone escarpment and ridges. Within this landscape sandstone outcrops are very common and often occur as horizontal benches and broken scarps up to 10 m high. Rock outcrops and surface boulders and cobbles make up to half of the ground surface (Hazelton and Tille 1990:45-46). This outcropping is evident around Wongawilli Creek and Cordeaux Dam within the Subject Area (Plate 1). The soils comprise of shallow sandy lenses; up to 30 centimetres (cm) deep (Plate 2). The topsoil of colluvial landscapes has low erodibility, consisting of permeable, loose, coarse sands and organic matter. The Hawkesbury soil landscape is highly susceptible to concentrated flow erosion. This landscape is the most archaeologically sensitive within the Subject Area, as the blocks and weathered scarps provide suitable overhangs to be used for shelter. Within these overhangs there is often suitable surfaces for Art, as well as floor space for the accumulation of archaeological deposit. There is, however, limited space for a deep accumulation of stratified subsurface deposits due to the size of many of the overhangs, as evidenced by the number of shelter sites recorded. The distribution of Aboriginal cultural heritage sites within the Subject Area is associated with landforms suitable for overhangs for shelter and art surfaces.

### 5.1.2 Ecology

The vegetation within this landscape comprises of woodland and open forest with some areas of tall open forest, and rainforest within the sheltered gullies. On the open crests and ridges, woodland and open forest contains red bloodwood (*Corymbia gummifera*), narrow leaved stringy bark (*Eucalyptus globoidea*), Scribbly Gum (*Eucalyptus racemosa*), Blue Mountains Mallee (*Eucalyptus stricta*), Old-Man Banksia (*Banksia serrata*). Sheltered side slopes of the landscape are characterised by open forest containing Sydney Peppermint (*Eucalyptus piperita*), Smooth-Barked Apple (*Angophora costata*) and Black She-Oak



(*Allocasuarina littoralis*) with an understorey of *Epacridaceae* spp., *Myrtaceae* spp., *Fabaceae* spp. and *Proteaceae* spp. (Hazelton and Tille 1990: 46). These communities supported a range of resources that would have been utilised by Aboriginal peoples along with those coastal resources that would have been available, both for food as well as to fulfil social and cultural needs.

**Table 8: Flora and fauna species that would have been utilised by the Aboriginal people of the Illawarra region. As described by Stewart and Percival (1997).**

Resource Species	Traditional Uses
Silicified wood, mudstone, quartz, quartzite and Ochre	Such stone sources were used to craft flaked tools, grindstones, hammerstones and resources for art media.
Red Bloodwood ( <i>Corymbia gummifera</i> )	The sap from this tree can be used for toothache and mouth wash, or used for mixing with paints to stain artefacts and rock art. It is also used to tan fishing ropes and nets.
Grey Ironbark ( <i>Eucalyptus paniculata</i> )	The bark is mixed with Bloodwood Gum to tan fishing nets.
Thin-leaved Stringybark ( <i>Eucalyptus globoidea</i> )	Bark was removed using various tool types, such as ground edge axes, and was used for a range of purposes such as coolamons, canoes and shields.
Yellow Stringybark ( <i>Eucalyptus muellerana</i> )	Bark was removed using various tool types, such as ground edge axes, and was used for a range of purposes such as coolamons, canoes and shields.
Banksia species ( <i>proteaceae</i> )	Sweet nectar can be sucked out of the flowers or shaken onto hand and licked off. The flower spikes can also be soaked in water for a 'sweet tea.' Banksias were also used to carry fire as the smouldering cones could be carried long distances.
Grass Tree ( <i>Xanthorrhoea</i> )	Roots are edible and flower stem is nectar rich which can be extracted to make a sweet drink or can be used as a hunting tool to attract birds. The tree sap can be used for resin.

### 5.1.3 Climate

The climate within the suburb of Cordeaux consists of mild summers with an average maximum of 28.5 degrees Celsius and minimum of 16.6 degrees Celsius in February, and cold, wet winters with an average minimum of 1.7 degrees Celsius and a maximum of 11.1 degrees Celsius in July (Bureau of Meteorology 2019, based on records taken between 1907-1975 from (Picton Council Depot station).

Recorded rainfall readings indicate an average annual rainfall of 800 millimetres (Bureau of Meteorology 2019, based on records taken at Picton council depot). Whilst conditions and temperatures are wide ranging, the conditions in the region of the Subject Area can be summarised as being mild and highly suitable for year-round hunter-gatherer occupation of all parts of the region.

### 5.1.4 Land use and disturbance

The landscape has been subject to limited impacts over time, owing to the area being part of WaterNSW Metropolitan Catchment area. Access within the Metropolitan Catchment Area is limited to the public and is restricted by WaterNSW. Land use impacts include:

- Creation of the Avon and Cordeaux dams;
- Installation of services (power lines, pipes, roads); and

- Mining activities, including exploration drilling and seismic activities.

Each of the above land uses and activities impacts the preservation and visibility of the archaeological record within the Subject Area. However, the majority of the Subject Area has been subject to very limited modification and disturbance.

**This information has been redacted**

For more information please contact South 32 Illawarra Metallurgical Coal.

**This information has been redacted**

For more information please contact South 32 Illawarra Metallurgical Coal.

## 6. Regional potential

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### 6.1 Past Aboriginal land use in the Subject Area

The Subject Area is located on the traditional country of the Dharawal nation. Tindale (1974) has identified the Dharawal boundaries extend from the south side of Botany Bay to north of the Shoalhaven River to the south, running inland to the Campbelltown and Camden area (Attenbrow 2010: 34; SA Museum 2010).

The coastal plains and escarpment around Wollongong were inhabited by the Wadi Wadi, a tribe/sub-group of Dharawal-speakers (Tindale 1940:194-195, Tindale 1975:199-201). Other named groups of the Dharawal language group are thought to include the Gweagal, Norongerraga, Illawarra, Tagary, Wandeanega, Wodi Wodi and Ory-ang-ora (Tindale 1974). Attenbrow (Attenbrow 2010:35) points out that such boundary mapping, undertaken as it was in the nineteenth century, is indicative at best, however, there appears to be reasonably strong agreement between those who have mapped language boundaries that the area is Dharawal country. Dharawal people distinguished themselves as Fresh Water, Bitter Water or Saltwater depending on where in the wider language boundary their traditional lands were – the inland hills and valleys, the plateaus and swamps or the coastal plain respectively (DEC, NSW, 2005:6)

Past Aboriginal land use of the Subject Area can be re-traced using previously recorded archaeological resources, historical observations of early settlers and surveyors (though the inherent bias present in historical European observations must be recognised), and contemporary comments from Aboriginal people and consideration of art motifs represented within the Subject Area.

## 7. Predictions

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The predictive model developed for the Subject Area is taken from Biosis Research 2007 and 2009 as these assessments were both undertaken within the current Subject Area for the application of AHIP # 1098243. These predictive models included the consideration of previous archaeological surveys and assessments in the local area and wider surrounds, the distribution and patterning of known sites within the Subject Area and surrounds, the landform units and landscape context of the Subject Area, and the previous known land uses in the area. Due to the rugged nature of the Hawkesbury Sandstone landscape, many of the sites suitable for Aboriginal occupation and transient use comprise of sandstone overhangs; as outlined in Section 5.1.1.

A summary of the known Aboriginal cultural heritage sites listed in the AHIMS database are provided in Section 4 and the complete AHIMS search results are listed within Attachment B of the ACHA.

The predictive model developed for the Subject Area is as follows:

- Sandstone shelters or rock overhangs with archaeological deposits, Art, and / or Artefacts will be the most common site type identified within the Subject Area. This is due to the steep slopes and ridgelines present along the Cordeaux Dam, Wongawilli Creek, as well as Sandy Creek and their associated tributaries. Of the sites identified within the Subject Area, 100% are sandstone shelter sites.
  - Art mediums will most likely consist of charcoal with red, yellow and white ochre being less common likely due to restrictions of the resource.
  - Art motifs are likely to reflect a representation of the utilisation of inland resources, such as eels, fish, possums and macropods.
- Axe Grinding Groove sites are a common site type within the Subject Area:
  - Axe Grinding Groove will most likely occur on sandstone outcrops associated with drainage lines, swamps, creek lines and riverbeds.
  - The bulk of axe grinding groove sites will contain fewer than 50 grinding grooves.
  - Grooves will generally be between 25 cm and 50 cm in length, 5 cm to 8 cm in width and between 2 cm and 5 cm in depth and represent the sharpening or preparing of ground-edge hatchets or fire-hardened points.
  - Axe Grinding Grooves are often located on large sandstone platforms within creek beds and swamp.
- Stone artefact scatters and isolated stone artefacts within an open context will be a less common class of site type or feature within the Subject Area:
  - The identification of this type of site depends on ground surface visibility, as site extent and artefact numbers are only visible on the surface. Due to the vegetation cover of the Subject Area this site type is difficult to relocate. Areas of open ground surface will be assessed for such site types.
  - The majority of these open context artefact sites on level to gently inclined alluvial plains, floodplains, terraces, foot slopes and simple slopes which are rarely present within the Subject Area.
  - The majority of sites will occur within 200 m of temporary or permanent water sources utilised for resource exploitation, with the average distance between a site and water being 70 m.
  - The majority of sites will occur on alluvial and transferral soil landscapes, neither of which are present within the Subject Area.

- Culturally modified trees will be the least represented class of site type in the Subject Area:
  - Culturally modified trees are a site type that is formed from the removal of bark from a tree for use in the manufacture of canoes, shields, shelters and containers for sorting or carrying items.
  - Whilst the area has been protected from large scale timber felling operations, due to public access restrictions, the area is frequently subject to intense bushfires that would significantly reduce this site type's survival.
- Burials, an uncommon site type, are present within soft alluvial sediments, caves or hollow trees. Such sites are more commonly located within the sand dunes of the coast region. It is highly unlikely that this site type will occur within the Subject Area.
- Stone arrangements, a rare although, may be located within the Subject Area. This type of site can include mounds of rocks for burial, or markers, mythological sites or areas of spiritual connection. There are no stone arrangements previously identified within the Subject Area.
- The bulk of archaeological sites within the Subject Area will relate to the last 2,000 years of occupation and the late Holocene period.
- Older archaeological deposits may be present in rock shelters or buried archaeological deposits associated with the infill of drainage lines, swamps and in areas with multiple depositional layers.

## 8. Sampling Strategy and Field Methods

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### 8.1 Sampling Strategy

The following methods were used to identify heritage values and significant cultural themes for the Subject Area:

- Aboriginal community input – this was sought via the consultation process and correspondence and is documented in the ACHAR and Appendix B.
- Reassessment of Aboriginal cultural heritage sites previously identified during the surveys completed by Biosis Research during their 2007 and 2009 assessments.
- Additional gaps analysis through research and literature review of more recent assessments within the Subject Area and region.

The above methods and activities have been ongoing throughout the assessment project and have continuously fed back and informed each other.

### 8.2 Field methods

Survey participants in accordance with the methodology were generally spaced 5 m apart and targeted areas with ground surface visibility such as sandstone outcrops landforms, and shelter sites. The survey methodology is outlined below:

- A handheld GPS unit was used to record all tracks and appropriate site data for the survey.
- Representative photographs were taken of the recorded sandstone shelter sites, different visibility levels, exposures and disturbed areas.
- Different types and levels of exposure was recorded, defined as an estimate of the area which has a likelihood of revealing archaeological evidence on the surface of the ground, i.e. visibility refers to what conceals the exposure (Burke and Smith 2004:78-80).
- Aboriginal cultural heritage sites that were located within the angle of draw of the longwall or are predicted to be impacted by the extraction of Longwall 19A were revisited and surveyed.
- Revised section and plan recordings were completed on sites located during this assessment.
- The previous (Biosis 2007) survey methods utilised a ‘contour surveying’ strategy which involved walking parallel to characteristic topographic features and inspection for suitable sandstone shelters and platforms. This strategy was aimed to target landforms identified for having high archaeological potential based on the formed predictive model.



### 8.3 Sensitive cultural information - management protocol

During the consultation process IMC and Niche provided the opportunity for the RAPs to provide cultural information, including a statement of the value of identified sites and other matters. The input points were listed within the survey methodology that has been included in Appendix B of the ACHA, information will be accepted at any point during the project prior to the finalisation of the ACHA and AR.

RAPs were made aware that IMC and Niche staff would seek cultural information and supporting evidence in regard to matters of cultural value.

In the event that a stakeholder had sensitive or restricted public access information it was proposed that the proponent and Niche would manage this information (if provided by the Aboriginal community) in accordance with a sensitive cultural information management protocol. It is anticipated that the protocol will include making note of and managing the material in accordance with the following key limitations, as advised by Aboriginal people at the time of any information being provided:

- any restrictions on access to the material;
- any restrictions on communication of the material (confidentiality);
- any restrictions on the location/storage of the material;
- any cultural recommendations on handling the material;
- any names and contact details of persons authorised within the relevant Aboriginal stakeholder to make decisions concerning the Aboriginal material and the degree of authorisation;
- any details of any consent given in accordance with customary law; and
- any access and use by the registered Aboriginal stakeholders of the cultural information in the material.

**This information has been redacted**

For more information please contact South 32 Illawarra Metallurgical Coal.

### 8.3.1 Survey coverage results

The previous survey that was completed by Biosis Research (2007) involved a targeted survey of archaeologically sensitive landforms and a transect survey of predetermined areas. The survey was conducted over two weeks with Representatives from the ILALC, Korewal Elouera Jerrungarugh and Cubbitch Barta Native Title Claimants in attendance. All of the Aboriginal cultural heritage sites located within the current Subject Area were assessed during the Biosis Research survey. In addition to this the survey undertaken for the Longwall 19 SMP (Niche 2022a) included a targeted survey of each of the previously recorded AHIMS sites and opportunistic survey of the surrounding landscape.

These assessments revealed that the most suitable sandstone overhangs for Aboriginal occupation occurred within sandstone overhangs of the Hawkesbury soil landscape, usually associated with the Wongawilli Creek and its immediate tributaries. The Hawkesbury soil landscape features incised creeks and drainage lines, thin ridgelines and occasional steep hills. Sandstone outcrop is very frequent, with high cliffs, scarps, slopes and boulders being present. In some places, cliff lines and scraps are not safely accessible on foot. Despite the steep terrain, Dendrobium Area 3 is one of the most intensively surveyed locations on the Woronora Plateau. This provides confidence that the nature and character of the archaeological record of the Subject Area has been robustly determined.

**Table 9: Surface survey coverage as completed by Biosis Research 2007, Niche 2022a and the current assessment**

Survey Unit	Survey unit area (Ha)	Landform	Visibility %	Exposure %	Effective Survey coverage area (Ha)	Effective coverage %
Biosis Survey 2007	214	Sandstone slopes, ridgelines and drainage lines of the Hawksbury soil landscape	10%	20%	437.6	48.90
Niche 2022a Survey	84.7	Targeted sites located within Sandstone slopes, ridgelines and drainage lines of the Hawksbury soil landscape	10%	20%	437.6	19.35
Niche 2022b Survey	2.438	Targeted sites located within Sandstone slopes, ridgelines and drainage lines of the Hawksbury soil landscape	10%	20%	243.88	10.32%

The Biosis Research survey showed empirically that shelter sites are common and generally occur on slopes between 20- and 30-degree gradients. Shelter sites rarely occur on slope ranges less than 20 degrees and never occur on slope gradients greater than 40 degrees. Overall, a lack of ground surface viability within the Hawksbury Sandstone environment results has factored in the lack of recorded open artefact sites. The targeted Niche survey (2022a) completed was successful in relocating all five shelter sites targeted (Table 10). No new sites were located; however, artefacts were located within the dripline of Sandy Creek 21 (AHIMS ID# 52-5-0273) (Plate 8), resulting in the site details being updated on AHIMS and within this report to Shelter with Art and Deposit. During the current survey Browns Road Site 31 (AHIMS ID# 52-2-1645) could not be relocated, a thorough survey was completed of the entire ridgeline that it was recorded on, and it was not found to be located there. As a result, this site has not been assessed as part of this assessment and it is recommended that Heritage NSW are informed that the site is not located where it is registered on the AHIMS.

**Table 10: AHIMS sites visited as part of this assessment**

AHIMS ID	Site Name	Site Features	Survey Unit	Landform	Internal Area of the Rock Shelter
52-2-1644	Browns Road Site 30	Shelter with Art	Biosis and Niche surveys	Sandstone ridgeline of the Hawksbury soil landscape.	As previously recorded. See Annex 2.
52-2-1645	Browns Road Site 31	Shelter with Art	Biosis and Niche surveys	Sandstone ridgeline of the Hawksbury soil landscape.	Could not be relocated during this assessment
52-2-1646	Browns Road Site 32	Shelter with Art	Biosis and Niche surveys	Sandstone ridgeline of the Hawksbury soil landscape.	As previously recorded. See Annex 2.
52-2-3639	DM 15	Shelter with Art	Biosis and Niche surveys	Sandstone ridgeline of the Hawksbury soil landscape.	As previously recorded. See Annex 2.
52-2-3644	DM 20	Shelter with Art and PAD	Biosis and Niche survey	Sandstone ridgeline of the Hawksbury soil landscape.	As previously recorded. See Annex 2.
52-5-0272	Sandy Creek Road 20	Shelter with Art	Biosis and Niche surveys	Sandstone ridgeline of the Hawksbury soil landscape.	As previously recorded. See Annex 2.
52-5-0273	Sandy Creek Road 21	Shelter with Art	Biosis and Niche surveys	Sandstone ridgeline of the Hawksbury soil landscape.	As previously recorded. See Annex 2.

**Table 11: Landform summary**

Landform	Landform area (Ha)	Area effectively surveyed (m <sup>2</sup> )*	% of landform effectively surveyed	Number of Aboriginal sites
Sandstone slopes, ridgelines and drainage lines of the Hawksbury soil landscape.	2.438	243.88	0.99	7

\* This value presents the Biosis Research survey and the Niche Areas effectively surveyed within the Subject Area.

## 9. Analysis and discussion

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Within the Upper Nepean catchment area of the Woronora Plateau, a predictive model has been developed that indicates that Aboriginal cultural heritage sites are likely to be in areas that have abundant resources, are close to permanent water sources and have good vantage points over the surrounding area, as discussed in Section 5.

The diversity of natural resources has allowed for a long history of Aboriginal occupation, as is evidenced by the vast number of archaeological sites identified within the ridgelines of the Hawkesbury Sandstone that defines this region. Ethnographic accounts suggest that Aboriginal groups were mobile, largely dispersed and were moving seasonally for resource exploitation and/or ceremonial activities. Those pathways were documented to exist through the Illawarra escarpment, connecting the highland plateau with the coast. The Upper Nepean catchment was likely a place of transient, though continued occupation throughout colonisation of the region and remains a significant natural asset to the community into current times. It also remains highly valued and utilised by the local Aboriginal community as it contains well preserved art sites that show a network of stories and evidence of complex culture depicted in the archaeological record.

## 10. Scientific values and significance assessment

### 10.1 Assessment framework

The Burra Charter (Australia ICOMOS 1999) defines the basic principles and procedures to be observed in the conservation of important places. It provides the primary framework within which decisions about the management of heritage sites in Australia should be made. The Burra Charter defines cultural significance as being derived from the following values:

**Table 12: Scientific values as outlined by the Burra Charter**

Value type	Description
Aesthetic Value	Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.
Historic Value	Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.
Scientific Value	The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information.
Social Value	Social value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group.

### 10.2 Other approaches

The categorisation into aesthetic, historic, scientific and social values is one approach to understanding the concept of cultural significance. However, more precise categories may be developed as understanding of a particular place increases.

The NSW DECCW guidelines for the significance assessment of Aboriginal archaeological sites are contained within the Aboriginal Cultural Heritage Standards and Guidelines Kit (National Parks and Wildlife Service 1997). The Kit identifies with two main streams in the overall significance assessment process: the assessment of cultural/social significance to Aboriginal people and the assessment of scientific significance to archaeologists.

This approach encapsulates those aspects of the Burra Charter that are relevant to Aboriginal archaeological sites. The guidelines specify the following criteria for archaeological significance, as paraphrased in Table 13.

**Table 13: Criteria specified for archaeological significance**

Criteria	Description
Research potential	It is the potential to elucidate past behaviour which gives significance under this criterion rather than the potential to yield collections of artefacts. Matters considered under this criterion include – the intactness of a site, the potential for the site to build a chronology and the connectedness of the site to other sites in the archaeological landscape.

Criteria	Description
<b>Representativeness</b>	<p>As a criterion, representativeness is only meaningful in relation to a conservation objective. Presumably all sites are representative of those in their class or they would not be in that class. What is at issue is the extent to which a class of sites is conserved and whether the particular site being assessed should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The conservation objective which underwrites the 'representativeness' criteria is that such a sample should be conserved.</p>
<b>Rarity</b>	<p>This criterion cannot easily be separated from that of representativeness. If a site is 'distinctive' then it will, by definition, be part of the variability which a representative sample would represent. The criteria might best be approached as one which exists within the criteria of representativeness, giving a particular weighting to certain classes of site. The main requirement for being able to assess rarity will be to know what is common and what is unusual in the site record but also the way that archaeology confers prestige on certain sites because of their ability to provide certain information.</p> <p>The criterion of rarity may be assessed at a range of levels: local, regional, state, national, and global.</p>
<b>Educational Potential</b>	<p>Heritage sites and areas should be conserved and managed in relation to their value to people. It is assumed that archaeologists have the ability to speak of the value of sites to members of their own profession. Where archaeologists or others carrying out assessments are speaking for the educational value of sites to the public, the onus is on them to go to the public for an assessment of this value, or to reputable studies which have canvassed public demand for education. The danger, otherwise, is that archaeologists would be projecting their values onto a public which is itself given no voice on the matter.</p>
<b>Aesthetics</b>	<p>Archaeologists are not expected to include an assessment of aesthetic significance along with their assessment of scientific significance. In relation to heritage places, aesthetic significance is generally taken to mean the visual beauty of the place. Aesthetic value is not inherent in a place, but arises in the sensory response people have to it.</p> <p>Although the guidelines provide no expectation for archaeologists to consider aesthetic values it is often the case that a site's or a landscape's aesthetic is a significant contributory value to significance. Examples of archaeological sites that may have high aesthetic values would be rock art sites, or sites located in environments that evoke strong sensory responses. For this reason, we consider it appropriate to include aesthetic values as part of the significance assessments for the sites identified during this assessment.</p>



**Table 14: Significance Assessment – individual sites**

AHIMS ID	Site Name	Features	Aesthetic value	Rarity	Representativeness	Scientific (archaeological) value/ Research Potential	Education Potential
52-2-1644	Browns Road Site 30	Shelter with Art	Low	Common	Low	Low	Low
52-2-1645*	Browns Road Site 31	Shelter with Art	Low	Common	Low	Low	Low
52-2-1646*	Browns Road Site 32	Shelter with Art	High – attributed by a large number of stencils (4) and motifs (14)	Rare	High – presence and diversity of motifs provides high representational values	High	Moderate
52-2-3639*	DM 15	Shelter with Art	Low	Common	Moderate	Low	Low
52-2-3644*	DM 20	Shelter with Art and Potential Archaeological Deposit (PAD)	Low	Common	Low	Low	Low
52-5-0272	Sandy Creek Road 20	Shelter with Art	Moderate-This Shelter with Art and Deposit contains notable irregular motifs. The Art is in moderate condition and the deposit has potential to inform	Rare	Moderate	Moderate	Moderate

AHIMS ID	Site Name	Features	Aesthetic value	Rarity	Representativeness	Scientific (archaeological) value/ Research Potential	Education Potential
			<p>of archaeological assemblages. Additional comment from Niche notes this site has a combination of indeterminate and anthropomorphic motifs of interest, being a charcoal frontal male figure with large eyes, and small scatter of artefacts representative of materials that were not present within the Subject Area and were likely sourced from distant regions, such as chert and silcrete.</p>				
52-5-0273*	Sandy Creek Road 21	Shelter with Art and Deposit	Moderate	Moderate – Anthropomorphic figure with large eyes is considered an irregular motif	Moderate	Moderate	Low

AHIMS ID	Site Name	Features	Aesthetic value	Rarity	Representativeness	Scientific (archaeological) value/ Research Potential	Education Potential
				within the Upper Nepean Catchment			

*\* The above significant assessments were determined by Biosis Research (2007a) during the Dendrobium Area 3 Aboriginal Cultural Heritage Assessment*

### **10.3 Assessment of cultural significance**

The entire Subject Area holds cultural significance to the local Aboriginal community. This is the contemporary view held by Aboriginal people that all Aboriginal objects and sites are important within the region, due to their interconnectivity with the natural landscape and past occupation of the region.

The range in Aboriginal cultural heritage sites within the Subject Area are representative of intact and tangible items of cultural heritage, providing a strong cultural link to generations past. These Aboriginal cultural heritage sites are seen to hold high cultural significance based on this strong cultural connection. Any damage that may occur to these sites has an impact to the local Aboriginal Community (Knight, 2020 *per comms.*).

A draft statement of cultural significance has been provided in Section 5 of the Aboriginal Cultural Heritage Assessment associated with this report. Further significance is anticipated to be received during the consultation process for the project.

## 11. Impact assessment

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### 11.1 Potential for harm

*The Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) requires that both direct and indirect harm to Aboriginal objects and Aboriginal places be considered. Generally direct harm refers to occasions where an activity physically impacts a site or objects and therefore affects the heritage values possessed by the site or objects. Indirect harm is usually taken to mean harm stemming from secondary consequences of the activity and may affect sites or objects as an indirect consequence of the activity. Examples of such indirect harm are increased visitors to a site, or increased erosion in an area as a result of an activity.

The potential for mine subsidence induced ground movements to harm Aboriginal objects or areas of Aboriginal cultural value is dependent on many factors, including the nature of the Aboriginal cultural heritage sites or areas of cultural value themselves. MSEC (2022) describes how longwall mining can result in the fracturing, buckling and stepping at the ground surface. The magnitude of these effects is largely dictated by factors such as the mine's geometry, the depth of cover (how deep the coal is below the ground surface), the extracted seam thickness, the geology above the mine, and the presence of geological features such as joints or faults, especially near the ground surface.

In the case of Aboriginal cultural heritage, the nature of the heritage sites and features is also a very important consideration in the potential effects of subsidence induced ground movements. Whether a site is a sandstone shelter sites or a culturally significant area, all tangible and intangible cultural heritage values must be considered in determining the likely impact, if any.

For sandstone shelter sites, the types of changes will be similar or identical to those that would be expected due to natural weathering processes but exacerbated by subsidence. For example, a naturally weathering block which will have detached and fallen at some point in time may be detached and fall sooner due to differential movements of the rock strata induced by subsidence (Biosis Research and The Ecology Lab 2007: 29).

Monitoring of the effects of subsidence induced ground movements to Aboriginal heritage sites (such as rock shelters and grinding groove platforms) has been conducted since the 1990s (see Sefton 2000, Biosis Research 2007a, Biosis Research 2009b, ERM 2010, Kayandel 2008, Niche 2013 to 2022). Previous experience shows that approximately 1 in 10 rock-based sites that have been subjected to subsidence induced ground movements show demonstrable changes that can be attributed to subsidence. These changes take the form of block fall, exfoliation, cracking, opening and/or closing of existing faults and fissures (Biosis Research 2009b).

Preventative management measures can be implemented in some circumstances, but for the most part the management of Aboriginal cultural heritage sites relies on monitoring of the sites and implementing pre-arranged management responses should they be triggered by harm. For most Aboriginal heritage sites there are often no suitable mitigation or remediation measures as these can often be more intrusive and harmful to heritage value than the effects of the subsidence, which as described above is usually an extension or acceleration of pre-existing natural weathering processes. As an example, the process of accessing a site and cutting stress relief slots, which requires heavy drilling or sawing machinery, in close proximity to a grinding groove platform would be likely to be more damaging to the site and its cultural context than the subsidence induced cracking or shearing of surface strata.

### 11.1.1 Consideration of potential harm

For the Project, the consideration of potential harm to Aboriginal cultural heritage sites from subsidence can be divided into two distinct categories:

- Sites susceptible to harm from subsidence from induced ground movements resulting in physical impacts to Aboriginal cultural heritage sites.
- Intrinsic heritage values of Aboriginal cultural heritage sites that are connected through a cultural landscape. Although these sites may not be directly affected through subsidence, the harm of surrounding sites impacts interconnected cultural values of the landscape.

Table 15 present the subsidence predictions for each of the Aboriginal cultural heritage sites located within the Subject Area that have been used to inform sites that will be harmed by the extraction of Longwall 19A. Columns highlighted in dark grey show Aboriginal cultural heritage sites that will be subject to direct subsidence effects (movements). Further explanation of these results has been provided in Section 6 of the ACHA.

### 11.2 Subsidence movements

Subsidence impacts are caused by the compression and extension of localised rock strata that may result in cracking of rock mass and buckling of strata, which can result in harm to Aboriginal cultural heritage sites through the forms of rockfalls and roof collapse, surface cracking and exfoliation and changes in seepage patterns (Department of Planning, 2008). The extent of subsidence movements are dependent on factors such as degree of movement and geology and structure of subsurface rock strata.

Longwall 19A is situated between Wongawilli Creek to the west, Sandy Creek to the east and Cordeaux Dam to the northeast. The valleys associated with the Wongawilli and Sandy Creeks will result in closure and down slope movements in these areas. Three (3) Aboriginal cultural heritage sites are predicted to within the potential subsidence impact zone (MSEC 2022).

In summary the activity that has the potential to harm Aboriginal cultural heritage sites is the extraction of coal approximately between 290 to 360 m below the ground surface, using longwall mining methods which will result in mining induced ground movements (subsidence) at the surface.

**Table 15: Aboriginal cultural heritage sites location within the 600 m boundary of the subsidence zone for the Subject Area. Maximum predicted total vertical subsidence, tilt and curvatures for the Aboriginal Cultural Heritage Sites (MSEC 2022)**

Site ID	Site Name	Site Feature	Location relative to Longwall 19A	Maximum predicted total vertical subsidence (mm)	Maximum predicted total tilt (mm/m)	Maximum predicted total hogging curvature (km-1)	Maximum predicted total sagging curvature (km-1)
52-2-1644	Browns Road Site 30	Shelter with Art	Outside the mining area, 350 m south of Longwall 19A	<20	<0.5	<0.01	<0.01
52-2-1645	Browns Road Site 31	Shelter with Art	Outside the mining area, 390 m south of Longwall 19A	<20	<0.5	<0.01	<0.01
52-2-1646	Browns Road Site 32	Shelter with Art	Outside the mining area, 200 m west of Longwall 19A	<20	<0.5	<0.01	<0.01
52-2-3639	DM 15	Shelter with Art	Directly above Longwall 19A, 200 m north-west of Longwall 19A	2350	30	0.05	0.65
52-2-3644	DM 20	Shelter with Art	Directly above pillar for Longwall 19, 350 m north-west of Longwall 19A	1450	5.5	0.15	0.09
52-5-0272	Sandy Creek Road 20	Shelter with Art	Outside the mining area, 320 m south of Longwall 19A	<20	<0.5	<0.01	<0.01
52-5-0273	Sandy Creek Road 21	Shelter with Art	Directly above Longwall 19, 60 m north of Longwall 19A	1400	10	0.35	0.06

The impact assessment is provided below in Table 16.

**Table 16: Impact assessment summary**

AHIMS ID#	Site name	Potential type of harm	Potential degree of harm	Potential consequence of harm
52-2-1644	Browns Road Site 30	<b>None.</b> The proposed activities do not have the potential to impact the site.	<b>None.</b> The proposed activities do not have the potential to impact the site.	Partial loss of values (cultural)
52-2-1645	Browns Road Site 31	<b>None.</b> The proposed activities do not have the potential to impact the site.	<b>None.</b> The proposed activities do not have the potential to impact the site.	Partial loss of values (cultural)
52-2-1646	Browns Road Site 32	<b>None.</b> The proposed activities do not have the potential to impact the site.	<b>None.</b> The proposed activities do not have the potential to impact the site.	Partial loss of values (cultural)
52-2-3639	DM 15	<b>Direct.</b> Potential disturbance from subsidence movements There is potential for cracking at compression points at the site, leading to rock fall and block movement. Large block falls could cover those stone artefacts that have previously been identified at the site.	<b>Direct harm</b>	Total loss of Value
52-2-3644	DM 20	<b>Direct.</b> Potential disturbance from subsidence movements There is potential for cracking at compression points at the site, leading to rock fall and block movement. Large block falls could cover those stone artefacts that have previously been identified at the site.	<b>Direct harm</b>	Total loss of Value
52-5-0272	Sandy Creek Road 20	<b>None.</b> The proposed activities do not have the potential to impact the site.	<b>None.</b> The proposed activities do not have the potential to impact the site.	Partial loss of values (cultural)
52-5-0273	Sandy Creek Road 21	<b>Direct.</b> Potential disturbance from subsidence movements There is potential for cracking at compression points at the site, leading to rock fall and block movement.	<b>Direct harm</b>	Total loss of Value



AHIMS ID#	Site name	Potential type of harm	Potential degree of harm	Potential consequence of harm
		Large block falls could cover those stone artefacts that have previously been identified at the site.		

\*The definitions for these categories can be described as:

Type of harm: Direct- may occur as the result of an activity which disturbs the ground including, but not limited to, site preparation activities, installation of services and infrastructure, roadworks, excavating, draining and flood mitigation methods or changes to waterflows affecting the value of cultural site. Indirect- affect sites or features located immediately beyond or within the area of the proposed activity. This may include increased impact on art in shelter from increased visitation, destruction from increased erosion and changes in access to wild food resources. (OEH, 2011).

Degree of harm: Total: the object(s) will be directly harmed in their entirety. Partial- some objects will be directly or indirectly harmed; however a portion of a site may remain unaffected. None- there will be no harm.

Consequence of harm: Total loss of value- Tangible heritage values will remain subsequent to the harm. Partial loss of value- intangible heritage values will remain subsequent to the harm. No loss of value- there will be no harm, and no loss of value

### 11.3 Potential Cumulative Impacts

The Project would cause a minor increase to the cumulative development impact on the Aboriginal cultural heritage of the region and local area. The Aboriginal heritage of the area has had limited impacts due to the area being used as a water catchment for the past 100 years. Sites that have been impacted within the catchment area have, for the large majority, been impacted by the construction of the dams, subsidence that is a result of mining (including longwall mining) or by environmental processes.

Within the Southern Coalfield, Sefton (2000) conducted a long-term monitoring program that reviewed the effects of longwall mining to sandstone shelter sites over a ten-year period. During the assessment Sefton monitored 52 Aboriginal sites; prior to, during and after longwall mining had been completed (Sefton 2000:15). The results of this study were:

- Five of the 52 sites monitored during the assessment (Sefton 2000) had evidence of impacts that related to longwall extraction methods.
- Impacts associated with longwall mining can be grouped into four distinct categories:
  - cracking;
  - movement along existing joints and/or bedding planes;
  - changes to the water seepage patterns through the sandstone; and
  - blockfalls.
- Elements of shelters that were associated with the highest risk of impact were:
  - Size of the overhang, including the length of the ridgeline.
  - Wetness of the overhang.
  - Location in regard to the valley base.
  - Location of the shelter, in regard to the goaf.
  - Shelters formed through blockfall.
- During Sefton's monitoring program, there were no collapsed shelters identified.
- No shelters with an area of less than 50 cubic metres (m<sup>3</sup>) had been impacted due to subsidence.
- Not all shelters that were identified as being larger than 50 m<sup>3</sup> had been impacted.
- Any impacts caused by subsidence were not observed until at least three months after the completion of extraction.
- 'The over-riding factor which appears to be significant is overhang size, where large overhangs are at greater risk' (Sefton 2000:38).

The *Impacts of Underground Coal Mining on Natural Features in the Southern Coal Field: Strategic Review* (NSW Department of Planning 2008) considered past and potential impacts of mine related subsidence on significant natural features within the Southern Coalfield. The objectives of the inquiry were to:

- Undertake a review of the impacts of longwall extraction within the Southern Coalfield's significant natural features (rivers, significant streams, swamps and cliff lines), concentrating on risks to water flow, quality and ecosystems.
- Provide advice on best practise in regard to subsidence impacts, avoidance and/or minimising impacts on significant natural features; as well as the management, monitoring and remediation of any adverse effects.
- Report on the social and economic significance of the coal resources within the region.

In relation to Aboriginal heritage the summary of the report states that 'Aboriginal heritage sites are most at risk of subsidence impacts where they are located in cliff lines and/or rock overhangs. The Panel was not made aware of any significant impacts having occurred on Aboriginal heritage features in the Southern Coalfields since the 1980s' (NSW Department of Planning 2008: 2).

Impacts on natural features such as cliff lines, watercourses and valleys were described during the inquiry as having been associated with 'non-conventional' subsidence (NSW Department of Planning 2008: 82). The measures for predicting valley closure and upsidence were judged to be the most valuable when determining impacts on these landforms.

The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) defines ecologically sustainable development and inter-generational equity as follows, 'the principle of inter-generational equity holds that the present generation should make every effort to ensure the health, diversity and productivity of the environment – which includes cultural heritage – is available for the benefit of future generations. When considered against the principles of inter-generational equity and ecologically sustainable development, the potential impacts of the Project can be considered relatively minor because they directly harm only a relatively small number of sites, one of moderate scientific value, one of high significance and the remaining being of low scientific value. There is no significant detrimental effect to quality or benefit that the Aboriginal history and archaeology of the Subject Area may provide to future generations. There is reciprocal cumulative growth of the understanding of the Subject Area's history and prehistory which provides some amelioration of any adverse impacts, and which provides knowledge and information for future generations.

### 11.3.1 Potential Cumulative Impacts - Within the Southern Coalfield

Since the monitoring work completed by Sefton between 1990 and 2000, archaeological monitoring programs have continued in the Southern Coalfield at the majority of underground mines. Monitoring programs have been undertaken at the Dendrobium Mine and at Tower, Appin, West Cliff, Elouera, Cordeaux, Tahmoor and Metropolitan Collieries. The following discussion outlines the results of these monitoring programs in comparison to Sefton’s original conclusions.

Aboriginal cultural heritage site monitoring programs have been developed and implemented across the Southern Coalfield in the past 22 years (Biosis Research 2008, 2009a, 2009b, 2009c, 2011, 2013, 2015, EMM 2020, Gun and Kayandel Archaeological Services 2007, Kayandel Archaeological Services 2012, Niche 2011, 2012, 2013a, 2013b, 2013c, 2014a, 2014b, 2014c, 2015a, 2015b, 2015c, 2016a, 2016b, 2016c, 2017a and 2017b, 2019a, 2019b, 2019c, 2020a, 2020b, 2021a, 2021b, 2021c, 2022a and 2022b and Sefton 2000, 2002a, 2002b, 2002c). The methodology of these programs is very similar to that outlined in Sefton (2000). Initial baseline recording is completed on those sites that are identified by subsidence consultants as having potential to be affected by subsidence. Site types that are subject to baseline recording in the Southern Coalfield include sandstone shelter sites with art and/or PAD, stone artefacts, deposits, engravings and sandstone platforms that include engravings (often of animals, humans, anthropomorphic figures and ancestral beings) and/or axe grinding grooves. Sandstone platform sites can be located within creek and riverbeds on large plateaus, often within or at the edge of swamps on platforms that make up shelter roofs. Stone artefact scatters, isolated artefacts and scarred trees are often not monitored routinely as they are highly unlikely to be affected by subsidence, and hence the risk attributed to these site types is negligible.

At the completion of baseline recording, Aboriginal cultural heritage sites are often monitored a second time in line with the individual project’s monitoring requirements, generally within 6 months of the completion of a longwall extraction. Monitoring programs are generally continued in this fashion until the Aboriginal cultural heritage site is no longer subject to subsidence movements.

Within the Southern Coalfield a total of 244 Aboriginal cultural heritage sites have been monitored since 1990. The site types that have been monitored are outlined in Table 17 below.

**Table 17: Aboriginal cultural heritage site types monitored within the Southern Coalfields**

Site type	Number of type	Percentage
Sandstone Shelter with Art	116	48%
Sandstone Shelter with Deposit	38	16%
Sandstone Shelter with Art and Deposit	34	14%
Single Axe Grinding Groove	4	2%
Axe Grinding Grooves	17	7%
Engraving	1	0.4%
Scarred Tree	1	0.4%
Sandstone Shelter with Art, Deposit and Axe Grinding Groove	3	1%
Shelter with Art and PAD	4	2%
Sandstone Shelter with PAD	23	9%
Sandstone Shelter with Art, PAD and Deposit	1	0.4%
Shelter with Art, Axe Grinding Grooves and PAD	1	0.4%
Sandstone Shelter with Deposit and PAD	1	0.4%
<b>Totals</b>	<b>244</b>	<b>100%</b>

Of the 244 Aboriginal cultural heritage sites monitored, 25 sites were identified as having impacts or changes that may be attributable to subsidence, environmental factors or a combination of both (Table 18). This number equates to approximately 10.2 % of all the Aboriginal cultural heritage sites monitored.

**Table 18: Aboriginal sites within the Southern Coalfields observed to have subsidence related changes, during monitoring programs**

AHIMS number	Site name	Site type	Observed changes/ impacts	Is the art panel or heritage value affected	Reference
52-2-0094	Flat Rock Creek 4	Sandstone shelter with art	Opening of existing bedding planes, along the roof/ rear wall and minor roof fall.	No	Kayandel Archaeological Services 2008
52-2-0106	Flat Rock Creek 10	Sandstone shelter with art	Cracks in rear wall, potential for altered seepage to impact art- mitigated with an artificial dripline.	No	Kayandel Archaeological Services 2008
52-2-0089	Flat Rock Creek 11	Sandstone shelter with art	Exfoliation and block fall at rear wall.	No	Kayandel Archaeological Services 2008
52-2-0154	Flat Rock Creek 49	Sandstone shelter with art	Minor block fall from rear wall and ceiling.	No	Kayandel Archaeological Services 2008
52-2-0258	Flat Rock Creek 57	Sandstone platform with engraving and axe grinding grooves	Crack in sandstone platform.	No	Kayandel Archaeological Services 2008
52-2-0176	Flat Rock Creek 152	Sandstone shelter with art	Cracking and minor block fall at rear wall.	No	Sefton 2000 and Kayandel Archaeological Services 2008
52-2-1638	Browns Road Site 24	Sandstone shelter with art	Minor block fall at rear wall.	No	Sefton 2000
52-2-1625	Browns Road Site 10	Sandstone shelter with art	Cracking and minor blockfall at rear wall.	No	Sefton 2000
AHIMS number could not be confirmed	Wedderburn Road 1	Sandstone shelter with art	Cracking in floor and rear wall.	No	Sefton 2000

AHIMS number	Site name	Site type	Observed changes/ impacts	Is the art panel or heritage value affected	Reference
52-2-1300	Wedderburn Road 2	Sandstone Shelter with art	Opening of crack in back wall.	No	Sefton 2000
52-2-1162	Stokes Creek Site 67	Sandstone shelter with art	Opening of the bedding plane above the art and increased water seepage as a result.	No	Sefton 2000
52-2-2252	Dendrobium 4	Sandstone shelter with art	Opening of crack along the back wall.	No	Comur 2009
52-2-0195	Flat Rock Creek 34	Sandstone shelter with art	Horizontal cracking visible on the ceiling of the shelter. Cracking occurred over the most southern hand stencil on the back panel. Crack across hand stencil 40cm long. Crack along the roof of the shelter 1-2.5 m off ground, and 5 m long.	Yes <sup>1</sup>	Niche 2017b
52-2-3083	Flat Rock Creek 281	Sandstone shelter with art	Thin cracking adjacent to the hand stencil at the northern end of the shelter.	Yes <sup>1</sup>	Kayandel Archaeological Services 2012
52-2-3086	Flat Rock Creek 284	Sandstone shelter with art	Fractured a corner of a buttress-like formation on the rear wall.	No	Kayandel Archaeological Services 2012
52-2-2243	Georges River No. 2	Sandstone shelter with art	Thin vertical cracking in the shelter ceiling, adjacent to the art panel.	No	Niche 2013a
52-2-0396	Flat Rock Creek 15	Sandstone shelter with art	The large vertical fissure in the central back wall had increased in width (opened) and shifted laterally.	No	Niche 2013b
52-2-2244	Georges River No.3	Sandstone shelter with art and axe grinding grooves	Opening of the horizontal bedding plane. Cracking and exfoliation along the back wall.	No	Niche 2014
AHIMS number could not be confirmed	MET 1	Sandstone shelter with art	Vertical cracking and cracks along the roof.	No	Niche 2015a
52-2-0826	Flat Rock Creek 176	Sandstone shelter with art	Vertical cracking at the northern and southern ends of the shelter.	No	Niche 2015b
52-2-3077	Flat Rock Creek 275	Sandstone shelter with art	The horizontal bedding plane joins along the back of the shelter have been noted as opening, three hairline cracks have formed, running vertical from the bedding plane.	No	Niche 2016a

AHIMS number	Site name	Site type	Observed changes/ impacts	Is the art panel or heritage value affected	Reference
52-2-3486	Flat Rock Creek 301	Sandstone platform with axe grinding groove	A large crack was observed running east to west along the entire rock platform. Crack is approximately 3.08 m to the north of the grinding groove and is approximately 25 m long and continues past the rock platform.	No	Niche 2017a
52-2-3645	DM 21	Sandstone Shelter with Art	The landscape surrounding the shelter site has experienced a range of subsidence impacts from the extraction of Longwall 15 such as localised rockfalls to the upper ridgelines (South 32 2020). The northern exterior of the shelter has experienced fracturing as result of subsidence from the extraction of Longwall 15. Four main instances of vertical and diagonal cracking were observed. The largest crack at the base of the ridgeline measures 3.7 cm in width.  The interior cavern of the shelter did not have any direct impacts from subsidence.	No	Niche 2019 and Niche 2020
52-2-2068	Stonequarry Creek 1, SC-1	Sandstone platform with axe grinding grooves	Fracturing to the rock bar which has lead to rock shearing off the platform	No	EMM 2021

<sup>1</sup>The sites highlighted have experienced adverse consequences as a result of mining that are highlighted in their individual projects TARP. This means that the art panels at these sites have experienced cracking.



Twenty-one of the Aboriginal heritage sites in Table 18 sustained structural effects<sup>1</sup> to either the sandstone shelter or the sandstone platform, with eight of these sites having also sustained environmental effects such as, root jacking from trees growing on top of the shelter, water seepage as a result of this root jacking and natural wind and bush fire exposure and micro and macro fauna growth within shelters. The effects at two sites could not be attributed decisively as either subsidence or environmental.

Of the 25 sites identified as having impacts attributable to subsidence (Table 18), two are noted as having adverse consequences to the physical fabric which supports the sites heritage values as a result of underground mining. These adverse consequences were cracking that occurred across or adjacent to the art panels. The cracks adjacent to art panels have caused changes to water seepage above the panel, causing water flow to redirect over the art. The percentage of sites with impacts to art panels in this instance is approximately 1% of the 144 sites with art, assessed across the southern coalfield considerably less than the 10% originally predicted by Sefton in 2000. The remaining twenty-three sites have experienced subsidence related impacts to their structure (either the sandstone shelter or rock platform), which equates to approximately 10% of all Aboriginal sites monitored within the Southern Coalfield.

The smaller observed number of adverse consequences on heritage values compared to the predictions of Sefton (2000) could be an indicator of a number of things not originally considered in the study. Sefton's initial sample size was much smaller than the total number of Aboriginal heritage sites currently being monitored within the Southern Coalfield, as sandstone shelter sites with PAD and/or deposit as well as sandstone platforms with engravings and/or axe grinding grooves were not originally considered for monitoring due to the lack of predicted impacts to these site types.

Potential cumulative impacts to Aboriginal cultural heritage values as a result of the Project should consider the aforementioned monitoring programs in conjunction with the data provided for the Subject Area by MSEC (2022) (Section 13.3). There are nine Aboriginal cultural heritage sites located within the Subject Area, none of which are located directly above Longwall 19A. As eight Aboriginal cultural heritage sites identified are within the 600 m buffer of the proposed longwalls for the Subject Area, it is recommended that these sites would be added to future monitoring programs bringing the total number of sites monitored in the Southern Coalfield to 214.

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<sup>1</sup> In the case of Aboriginal Heritage Trigger Action Responses, for the purposes of End of Panel assessments within the Southern Coalfields structural effects are not constituted as harm, as it does not effect the art panel.

### 3.1.1 Potential Cumulative Impacts - Within the Dendrobium Mine Area

As demonstrated in Table 18, there have been three Aboriginal cultural heritage sites (Dendrobium 4 [AHIMS ID #52-2-2252], Browns Road Site 11 [AHIMS ID#52-2-1626] and DM 21 [AHIMS ID#52-2-3645]) impacted as a result of subsidence movements at Dendrobium Mine. Dendrobium 4 (AHIMS ID #52-2-2252) has had impacts recorded along the back wall and horizontal bedding planes of the sandstone shelter (Comur 2009). Browns Road Site 11 (AHIMS ID#52-2-1626) experienced cracking at the southern end of the shelter, as well as some minor block fall (as outlined in Table 27). DM 21 (AHIMS ID#52-2-3645) has had cracking occur on the northern exterior of the shelter, the interior of the cavern did not have any direct impacts from subsidence. This movement did not affect the art located within each of these shelters. Adding the nine sites identified within the Subject Area for this ACHA, there would be a total of 54 sites monitored for the Mine.

## 12. Management and mitigation measures

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### 12.1 Conservation Principles and Management Framework

The two founding principles behind the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011:12) are ecologically sustainable development and intergenerational equity. These principles hold that “the present generation should make every effort to ensure the health, diversity and productivity of the environment – which includes cultural heritage – is available for the benefit of future generations”.

The strong emphasis, as in the Burra Charter, is to quantify and understand the heritage values of a place, a site, or an object and exhaust avenues of avoiding harm to those values. If harm cannot be avoided, then there must be consideration and implementation of strategies to minimise harm (OEH 2011:13).

It follows that the hierarchy for consideration in regard to management strategies available for surface stone artefacts and subsurface stone artefacts and areas of archaeological potential, fall into four general categories, in order of preference from a conservation perspective:

- avoidance and *in-situ* conservation.
- partial avoidance and partial *in-situ* conservation (includes partial harm);
- harm caused with mitigating circumstances such as collection or salvage; and
- unmitigated harm.

The four general categories (described above) have been considered in the following subsections with regard to both direct impacts (e.g., surface disturbance) and indirect impacts (e.g., monitoring activities).

The management and mitigation measures have been prepared in consideration of comments received from the RAPs during the consultation process. These comments include those related to cultural considerations surrounding salvage works and the handling of artefactual materials, as well as the cultural significance of all sites. All comments received from the RAPs are considered in Section 3 of the ACHA.

Where possible, harm to sites will be avoided and sites will be retained *in situ*.

The Aboriginal cultural heritage sites located directly above the proposed Longwall 19A have been assessed to have potential to be directly harmed by its extraction (MSEC 2022), and will require inclusion in an Aboriginal Cultural Heritage Management Plan. The sites include:

- DM 15 (AHIMS ID #52-2-3639);
- DM 20 (AHIMS ID#52-2-3644); and
- Sandy Creek Road 21 (AHIMS ID#52-5-0273).

The predicted impacts of the above Aboriginal cultural heritage sites result in the potential for physical harm.

The remainder of the Aboriginal cultural heritage sites located within the Subject Area may experience partial harm to intangible values due to a loss of cultural connectivity as outlined in Section 11.1.2. The sites include:

- Browns Road Site 30 (AHIMS ID#52-2-1644)

- Browns Road Site 31 (AHIMS ID#52-2-1645)
- Browns Road Site 32 (AHIMS ID#52-2-1646)
- Sandy Creek Road 20 (AHIMS ID#52-5-0272)

The above Aboriginal cultural heritage sites are not predicted to experience physical harm.

The proposed works cannot be avoided. The current longwall design has been subject to predictive modelling and previous design reiterations to achieve minimal cumulative impact to the surface environment.

Management measures are warranted to mitigate the potential partial loss of value to the site that may result from the proposed mining activities. .

#### **12.1.1 Detailed Design to Avoid Harm**

During the design process of the proposed Longwall 19A, as outlined in Section 6, a number of mining layout options were considered based on a range of multidisciplinary factors. The aim of this process is to reduce the potential for impacts to surface features.

Browns Road Site 32 (AHIMS ID#52-2-1646) is located approximately 200 m to the west of the Longwall 19A extent. Longwall 19A was reduced in length such that this site is predicted to not experience subsidence impacts due to the extraction.

#### **12.1.2 Subsidence Monitoring**

Subsidence monitoring prior to and after longwall mining should be implemented for Aboriginal heritage sites within the Subject Area that may be subject to impacts from mining induced subsidence. The subsidence monitoring program should be in accordance with the relevant approved Subsidence Management Plan and Aboriginal Heritage Management Plan (AHMP). Monitoring should be undertaken by a suitably qualified archaeologist and representatives of the RAPs.

## 13. Recommendations

Niche was commissioned by IMC to complete an ACHA for the extraction of Longwall 19A within Dendrobium Area 3A.

The ACHA was carried out in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) and the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011). It included consultation with RAPs in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a) (details of which are in Appendix B).

An assessment of the potential impact of the proposed works and associated ground disturbance indicates that AHIMS registered sites DM 15 (AHIMS ID #52-2-3639), DM 20 (AHIMS ID#52-2-3644) and Sandy Creek Road 21 (AHIMS ID#52-5-0273) have the potential to be impacted by the proposed works.

This assessment has determined that the proposed works **do not** have the potential for direct impact AHIMS registered sites Browns Road Site 29 (AHIMS ID#52-2-1643), Browns Road Site 30 (AHIMS ID#52-2-1644), Browns Road Site 31 (AHIMS ID#52-2-1645), Browns Road Site 32 (AHIMS ID#52-2-1646), Sandy Creek Road 19 (AHIMS ID#52-5-0271) and Sandy Creek Road 20 (AHIMS ID#52-5-0272).

Based on community consultation to date with the RAPs for the Project, and with the completion of this AR by Niche, the following draft recommendations have been made:

**Table 19: Draft Recommendations**

Draft Recommendations	
6.	IMC should continue to consult with the Aboriginal community for the life of the Project in accordance with the consultation guidelines.
7.	<p>A subsidence monitoring program to be implemented progressively over the life of the Project. The subsidence monitoring program should include monitoring of all Aboriginal sandstone shelter sites and grinding groove sites located within the angle of draw of the Project. The program should include (but not be limited to) the following:</p> <ul style="list-style-type: none"> <li>• A schedule for undertaking the subsidence monitoring at the nominated sites.</li> <li>• Appropriately detailed baseline and archival site recordings, including high resolution digital photographs.</li> </ul> <p>An impact TARP specific to each of the sites being monitored.</p>
8.	<p>The following Aboriginal cultural heritage site cards should be updated on the AHIMS to include revised photographs and co-ordinates as those currently registered are incorrect:</p> <ul style="list-style-type: none"> <li>• DM 15 (AHIMS ID#52-2-3639)</li> <li>• Browns Road Site 29 (AHIMS ID#52-2-1643)</li> <li>• Browns Road Site 30 (AHIMS ID#52-2-1644)</li> <li>• Browns Road Site 31 (AHIMS ID#52-2-1645)</li> <li>• Sandy Creek Road 19 (AHIMS ID#52-5-0271)</li> <li>• Sandy Creek Road 20 (AHIMS ID#52-5-0272)</li> </ul>
9.	The Aboriginal Heritage Plan for Dendrobium Area 3A should be revised to consider recommended management strategies determined by the outcomes of this assessment, and any further

## Draft Recommendations

	<p>recommendations provided by Heritage NSW. Baseline recording for the following sites will need to be completed for that Management Plan, as they have not previously been baseline recorded:</p> <ul style="list-style-type: none"><li>• Browns Road Site 32 (AHIMS ID# 52-2-1646)</li><li>• Sandy Creek Road 19 (AHIMS ID# 52-5-0271)</li></ul>
	<b>General</b>
10.	All workers should have cultural awareness training, so they are made aware of their obligations under the NPW Act and the ACHMP.
11.	<p>In the unlikely event that suspected human remains are encountered, all work in the area that may cause impact to the remains, must cease immediately and:</p> <ul style="list-style-type: none"><li>• The location, including a 20 m curtilage, should be secured using barrier fencing to avoid harm.</li><li>• The NSW Police must be contacted immediately.</li><li>• No further action is to be undertaken until the NSW Police provide written notification to IMC.</li><li>• If the skeletal remains are identified as Aboriginal, then IMC or their agent must contact:<ul style="list-style-type: none"><li>▪ The Heritage NSW, of the Enviroline on 131 555; and representatives of the RAPs.</li><li>▪ No works are to continue within the 20 m curtilage until Heritage NSW provides written notification to the proponent or their Agent.</li></ul></li></ul>

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## Annex 1- AHIMS extensive search

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
52-5-0271	Sandy Creek Road 19; <b>Contact</b>	AGD	56	292000	6191130	Closed site	Valid	Art (Pigment or Engraved) : - <b>Permits</b>	Shelter with Art	
52-5-0272	Sandy Creek Road 20; <b>Contact</b>	AGD	56	291950	6191380	Closed site	Valid	Art (Pigment or Engraved) : - <b>Permits</b>	Shelter with Art	
52-5-0273	Sandy Creek Road 21 <b>Contact</b>	GDA	56	292226	6192218	Closed site	Valid	Art (Pigment or Engraved) : -, Artefact : -, Potential Archaeological Deposit (PAD) : - <b>Permits</b>	Shelter with Art	2482
52-5-0274	Sandy Creek Road 22; <b>Contact</b>	AGD	56	293500	6192860	Closed site	Valid	Art (Pigment or Engraved) : - <b>Permits</b>	Shelter with Art	3081,4741
52-5-0277	Sandy Creek Road 25; <b>Contact</b>	AGD	56	292950	6192950	Closed site	Valid	Art (Pigment or Engraved) : - <b>Permits</b>	Shelter with Art	3081
52-5-0278	Sandy Creek Road 26; <b>Contact</b>	AGD	56	292900	6192950	Closed site	Valid	Art (Pigment or Engraved) : - <b>Permits</b>	Shelter with Art	1983,3081
52-2-2043	Sandy Creek Road 28 (Cordeaux Catchment) <b>Contact</b>	AGD	56	293600	6192500	Open site	Partially Destroyed	Artefact : - <b>Permits</b>	Open Camp Site	4120,100453
52-2-1623	Browns Road Site 8 <b>Contact</b>	AGD	56	290600	6191330	Closed site	Valid	Artefact : - <b>Permits</b>	Shelter with Deposit	2171
52-2-1626	Browns Road Site 11 <b>Contact</b>	AGD	56	290100	6191730	Closed site	Valid	Art (Pigment or Engraved) : - <b>Permits</b>	Shelter with Art	2171
52-2-1643	Browns Road Site 29 <b>Contact</b>	AGD	56	291760	6191140	Closed site	Valid	Artefact : -, Art (Pigment or Engraved) : - <b>Permits</b>	Shelter with Art,Shelter with Deposit	2171
52-2-1644	Browns Road Site 30 <b>Contact</b>	AGD	56	291480	6191450	Closed site	Valid	Art (Pigment or Engraved) : - <b>Permits</b>	Shelter with Art	2171
52-2-1645	Browns Road Site 31 <b>Contact</b>	AGD	56	291340	6191650	Closed site	Valid	Art (Pigment or Engraved) : - <b>Permits</b>	Shelter with Art	2171
52-2-2209	DENDROBIUM 2 <b>Contact</b>	AGD	56	290330	6192790	Closed site	Valid	Artefact : - <b>Permits</b>		

Report generated by AHIMS Web Service on 01/02/2022 for Carly Todhunter for the following area at Datum :GDA, Zone : 56, Eastings : 290147.0 - 294147.0, Northings : 6191016.0 - 6193516.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 24

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
52-2-2246	DENDROBIUM 6	AGD	56	290210	6191066	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Doctor.Julie Dibden					<b>Permits</b>		
52-2-2229	SITE 1 - DB1	AGD	56	290240	6191990	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Navin Officer Heritage Consultants Pty Ltd					<b>Permits</b>		
48-2-0056	DM 13	GDA	56	293219	6192609	Closed site	Valid	Artefact : 3		
	<b>Contact</b>	<b>Recorders</b>	Biosis Pty Ltd - Sydney,Niche Environment and Heritage,Miss.Stella Quast					<b>Permits</b>	3081,4741	
52-5-0269	Sandy Creek Road 17;	AGD	56	292330	6190940	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	<b>Contact</b>	<b>Recorders</b>	Mrs.Caryll Sefton					<b>Permits</b>		
52-2-3651	DM 23	GDA	56	293851	6192791	Closed site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Biosis Pty Ltd - Sydney					<b>Permits</b>	3081	
52-2-3638	DM 14	GDA	56	292873	6193135	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Biosis Pty Ltd - Sydney					<b>Permits</b>		
52-2-3639	DM 15	GDA	56	291447	6192467	Closed site	Valid	Art (Pigment or Engraved) : 1		
	<b>Contact</b>	<b>Recorders</b>	Biosis Pty Ltd - Sydney,Niche Environment and Heritage,Miss.Stella Quast					<b>Permits</b>	3081,4741	
52-2-3640	DM 16	GDA	56	290799	6192048	Open site	Valid	Artefact : 20		
	<b>Contact</b>	<b>Recorders</b>	Biosis Pty Ltd - Sydney					<b>Permits</b>		
52-2-3641	DM 17	GDA	56	290809	6192529	Closed site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Biosis Pty Ltd - Sydney					<b>Permits</b>		
52-2-4629	Werri Berri Tree-1	GDA	56	292221	6192214	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	<b>Contact</b>	<b>Recorders</b>	Niche Environment and Heritage,Miss.Chelsea Freeman					<b>Permits</b>		
52-2-4648	SANDY CREEK ROAD 30	GDA	56	292403	6191066	Closed site	Valid	Art (Pigment or Engraved) : -		
	<b>Contact</b>	<b>Recorders</b>	Illawarra Prehistory Group,Mr.Bruce Howell					<b>Permits</b>		

**\*\* Site Status**

**Valid** - The site has been recorded and accepted onto the system as valid

**Destroyed** - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

**Partially Destroyed** - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

**Not a site** - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

## Annex 2 Aboriginal Cultural Heritage Site Descriptions

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**This information has been redacted**

For more information please contact South 32 Illawarra Metallurgical Coal.

**Annex 3 STC Operations Subsidence Impact Assessment Aboriginal Heritage  
Site 52-2-1646**

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## Contact Us

**Niche Environment and Heritage**  
02 9630 5658  
info@niche-eh.com

NSW Head Office – Sydney  
PO Box 2443 North Parramatta  
NSW 1750 Australia

QLD Head Office – Brisbane  
PO Box 540 Sandgate  
QLD 4017 Australia

Sydney  
Brisbane  
Cairns  
Port Macquarie  
Illawarra  
Coffs Harbour  
Central Coast  
Gold Coast  
Canberra



## Our services

### Ecology and biodiversity

Terrestrial  
Freshwater  
Marine and coastal  
Research and monitoring  
Wildlife Schools and training

### Heritage management

Aboriginal heritage  
Historical heritage  
Conservation management  
Community consultation  
Archaeological, built and landscape values

### Environmental management and approvals

Impact assessments  
Development and activity approvals  
Rehabilitation  
Stakeholder consultation and facilitation  
Project management

### Environmental offsetting

Offset strategy and assessment (NSW, QLD, Commonwealth)  
Accredited BAM assessors (NSW)  
Biodiversity Stewardship Site Agreements (NSW)  
Offset site establishment and management  
Offset brokerage  
Advanced Offset establishment (QLD)



## Appendix B Consultation records

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**This information has been redacted**

For more information please contact South 32 Illawarra Metallurgical Coal.

**Appendix C   Consultation Log**

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Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
Wednesday, 2 March 2022	9:06am	Stage 2	All RAP groups with email	All RAP groups with email	Email	Renee Regal	Niche Environment and Heritage	<p>Dear Sir/Madam,</p> <p>Re: South32 Illawarra Metallurgical Coal Aboriginal Cultural Heritage Assessment (ACHA) Assessment Methodology for the Dendrobium LW 19A Subsidence Management Plan Aboriginal Cultural Heritage Assessment (Niche Ref #7164)</p> <p>In accordance with the Aboriginal community consultation process started by Navin Officer (2001) Dendrobium Coal Project: Cultural Heritage Assessment and continued by Biosis Research (2007) Dendrobium 3 Archaeological and Cultural Heritage Assessment 2007 your group is a Registered Aboriginal Party (RAP) for the Dendrobium Longwall 19A Subsidence Management Plan (SMP) Aboriginal Cultural Heritage Assessment (ACHA).</p> <p>In accordance with Section 4.2 and 4.3 of the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010) (the Consultation Guideline), South32 Illawarra Metallurgical Coal (IMC) must initiate arrangements for presenting information to the RAPs about the proposed Project, and the ACHA methodology.</p> <p>This document provides:</p> <ul style="list-style-type: none"> <li>• a brief description of the Project; and</li> <li>• the proposed methodology for the ACHA.</li> </ul> <p>It would be appreciated if you could please provide any cultural information you wish to share and please don't hesitate to call and discuss any special requirements you may have regarding this information. The purpose of the review is for you to suggest any protocols you may wish to have</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>adopted into the information gathering process and assessment methodology, and to highlight any other matters such as:</p> <ul style="list-style-type: none"> <li>• Whether there are any Aboriginal objects of cultural value to Aboriginal people in the area of the proposed Project.</li> <li>• Whether there are any places of cultural value to Aboriginal people in the area of the proposed Project (whether they are Aboriginal places declared under section 84 of the National Parks and Wildlife Act 1974 or not). This can include places of social, spiritual and cultural value, historic places with cultural significance, and potential places/areas of historic, social, spiritual and/or cultural significance.</li> <li>• Information about the cultural significance and values of the Aboriginal sites that might affect, inform or refine the methodology or assessment.</li> <li>• Influencing the design of the methods to assess cultural and scientific significance of the Aboriginal sites.</li> <li>• Actively contributing to the development of cultural heritage management options.</li> <li>• Commenting on draft assessment reports before they are submitted for assessment.</li> </ul> <p>All comments on the ACHA methodology must be received by 5 pm 29 March 2022. Comments can be provided in writing or by telephone (0488 224 758).</p> <p>We are planning to conduct our archaeological field survey over five (5) days from the 19 April to the 26 April 2022. Registered Aboriginal Parties will need to provide the following information prior to the 29 March 2022 to be</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>considered for any fieldwork:</p> <ul style="list-style-type: none"> <li>• Current insurances (certificate of currency and workers compensation insurance)</li> <li>• Name and contact details of the nominated individual</li> </ul> <p>Once we have finalised numbers for participation in the field survey, we will begin to organise logistics such as time and meeting place.</p> <p>In accordance with Section 3.4 of the Consultation Guideline, the decision on who is engaged for delivering particular services is decided by IMC and will be based on a range of considerations including skills, relevant experience, and providing necessary certificates of currency.</p> <p>Please direct all correspondence to the contact details provided below:</p> <p>Ms Renée Regal  Senior Principal – NSW Heritage  Niche Environment and Heritage  PO Box 31  Fairy Meadow NSW 2519  Tel: 0488 224 758  Email: rregal@niche-eh.com</p> <p>Yours sincerely,</p> <p>Renée Regal BA (Hons)  Senior Principal  0488 224 758  NSW South Coast - Illawarra</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								PO Box 31 Fairy Meadow NSW 2519
Wednesday, 2 March 2022	9:10am	Stage 2	Renee Regal	Niche	Email	Gary Caines	Individual	Delivery has failed to these recipients or groups: grc04@live.com.au The recipient's mailbox is full and can't accept messages now. Please try resending your message later, or contact the recipient directly.
Wednesday, 2 March 2022	9:14am	Stage 2	Renee Regal	Niche	Email	Scott Franks	Tocomwal	Your message  To: Scott Franks Subject: #7164 Dendrobium LW 19A SMP Methodology Sent: Wednesday, March 2, 2022 9:05:58 AM (UTC+10:00) Canberra, Melbourne, Sydney  was read on Wednesday, March 2, 2022 9:07:04 AM (UTC+10:00) Canberra, Melbourne, Sydney.
Wednesday, 2 March 2022	9:20am	Stage 2	Renee Regal	Niche	Email	CEO	Thawarawal Local Aboriginal Land Council	Dear Sir/Madam,  Re: South32 Illawarra Metallurgical Coal Aboriginal Cultural Heritage Assessment (ACHA) Assessment Methodology for the Dendrobium LW 19A Subsidence Management Plan Aboriginal Cultural Heritage Assessment (Niche Ref #7164)  In accordance with the Aboriginal community consultation process started by Navin Officer (2001) Dendrobium Coal Project: Cultural Heritage Assessment and continued by Biosis Research (2007) Dendrobium 3 Archaeological and

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>Cultural Heritage Assessment 2007 your group is a Registered Aboriginal Party (RAP) for the Dendrobium Longwall 19A Subsidence Management Plan (SMP) Aboriginal Cultural Heritage Assessment (ACHA).</p> <p>In accordance with Section 4.2 and 4.3 of the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010) (the Consultation Guideline), South32 Illawarra Metallurgical Coal (IMC) must initiate arrangements for presenting information to the RAPs about the proposed Project, and the ACHA methodology.</p> <p>This document provides:</p> <ul style="list-style-type: none"> <li>• a brief description of the Project; and</li> <li>• the proposed methodology for the ACHA.</li> </ul> <p>It would be appreciated If you could please provide any cultural information you wish to share and please don't hesitate to call and discuss any special requirements you may have regarding this information. The purpose of the review is for you to suggest any protocols you may wish to have adopted into the information gathering process and assessment methodology, and to highlight any other matters such as:</p> <ul style="list-style-type: none"> <li>• Whether there are any Aboriginal objects of cultural value to Aboriginal people in the area of the proposed Project.</li> <li>• Whether there are any places of cultural value to Aboriginal people in the area of the proposed Project (whether they are Aboriginal places declared under section 84 of the National Parks and Wildlife Act 1974 or not). This can include places of social, spiritual and cultural value, historic places with cultural significance, and potential places/areas of historic,</li> </ul>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>social, spiritual and/or cultural significance.</p> <ul style="list-style-type: none"> <li>• Information about the cultural significance and values of the Aboriginal sites that might affect, inform or refine the methodology or assessment.</li> <li>• Influencing the design of the methods to assess cultural and scientific significance of the Aboriginal sites.</li> <li>• Actively contributing to the development of cultural heritage management options.</li> <li>• Commenting on draft assessment reports before they are submitted for assessment.</li> </ul> <p>All comments on the ACHA methodology must be received by 5 pm 29 March 2022. Comments can be provided in writing or by telephone (0488 224 758).</p> <p>We are planning to conduct our archaeological field survey over five (5) days from the 19 April to the 26 April 2022. Registered Aboriginal Parties will need to provide the following information prior to the 29 March 2022 to be considered for any fieldwork:</p> <ul style="list-style-type: none"> <li>• Current insurances (certificate of currency and workers compensation insurance)</li> <li>• Name and contact details of the nominated individual</li> </ul> <p>Once we have finalised numbers for participation in the field survey, we will begin to organise logistics such as time and meeting place.</p> <p>In accordance with Section 3.4 of the Consultation Guideline, the decision on who is engaged for delivering particular services is decided by IMC and will be based on a range of considerations including skills, relevant experience, and</p>



Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>providing necessary certificates of currency. Please direct all correspondence to the contact details provided below:</p> <p>Ms Renée Regal Senior Principal – NSW Heritage Niche Environment and Heritage PO Box 31 Fairy Meadow NSW 2519 Tel: 0488 224 758 Email: rregal@niche-eh.com</p> <p>Yours sincerely,</p> <p>Renée Regal BA (Hons) Senior Principal 0488 224 758 NSW South Coast – Illawarra PO Box 31 Fairy Meadow NSW 2519</p>
Wednesday, 2 March 2022	11:30am	Stage 1 RAP Letters	Glenda Chalker	Cubbitch Barta Native Title Claimants	Post	Stella Quast	Niche Environment and Heritage	Hard copy of draft methodology and cover letter sent. Australia Post tracker ID: 02 07006 43499 10048 50998.
Wednesday, 2 March 2022	11:30am	Stage 1 RAP Letters	Norma Simms	Individual	Post	Stella Quast	Niche Environment and Heritage	Hard copy of draft methodology and cover letter sent. Australia Post tracker ID: 02 07006 43499 20048 50995.

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
Wednesday, 2 March 2022	11:30am	Stage 2	Yvonne Simms	La Perouse Botany Bay Corporation	Post	Stella Quast	Niche Environment and Heritage	Hard copy of draft methodology and cover letter sent. Australia Post tracker ID: 02 07006 43499 30048 50992.
Wednesday, 2 March 2022	11:30am	Stage 2	Rueben Brown	Korewal Elouera Jerrungarugh Tribal Elders Council	Post	Stella Quast	Niche Environment and Heritage	Hard copy of draft methodology and cover letter sent. Australia Post tracker ID: 02 07006 43499 40048 50999.
Wednesday, 2 March 2022	11:30am	Stage 2	Gary Caines	Individual	Post	Stella Quast	Niche Environment and Heritage	Hard copy of draft methodology and cover letter sent. Australia Post tracker ID: 02 07006 43499 50048 50996.
Tuesday, 8 March 2022	1:11pm	Stage 2	Renee Regal	Niche Environment and Heritage	Email	Donna Hiscox	ILALC	<p>Good afternoon Renee,</p> <p>Thank you for your email in regards to the Dendrobium LW 19A Field Survey.</p> <p>ILALC will have a site officer available to take part in the Field Survey in April. I will provide the details of who that officer will be closer to the date.</p> <p>I have attached ILALC's current insurance documents for your records.</p> <p>Kind regards,</p> <p>Donna Hiscox Illawarra Local Aboriginal Land Council Level 2, 38 Young Street</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>Wollongong NSW 2500 Telephone: 4226 3338</p> <p>Hours of Work: Monday to Thursday 10.00am to 2.00pm Out of these hours contact <a href="mailto:stuart.laidlaw@ilalc.org.au">stuart.laidlaw@ilalc.org.au</a></p>
Wednesday, 9 March 2022	10.25am	Stage 2	Donna Hiscox	ILALC	Email	Renee Regal	Niche Environment and Heritage	<p>Many thanks for sending that through Donna.</p> <p>Kind regards,</p> <p>Renée Regal BA (Hons) Senior Principal Consultant 0488 224 758 NSW South Coast – Illawarra PO Box 31 Fairy Meadow NSW 2519</p>
Thursday, 17 March 2022	12:05pm	Stage 2	All RAP groups with email	All RAP groups with email	Email	Renee Regal	Niche Environment and Heritage	<p>Good afternoon,</p> <p>Just wanted to touch base about the below email sent out on the 2 March 2022. Should you have any questions about the project please do not hesitate to get in touch.</p> <p>Kind regards,</p> <p>Renée Regal BA (Hons) Senior Principal Consultant 0488 224 758 NSW South Coast – Illawarra PO Box 31 Fairy Meadow NSW 2519</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								*Sent in chain of last email
Thursday, 17 March 2022	12:40pm	Stage 2	Scott Franks	Tocomwall	Phonecall	Renee Regal	Niche Environment and Heritage	Missed a call from Scott and called back
Friday, 18 March 2022	10:30am	Stage 2	Glenda Chalker	Cubbitch Barta Native Title Claimants	Email	Renee Regal	Niche Environment and Heritage	<p>Hi there Glenda,</p> <p>Just wanted to touchbase to make sure you received this email- as I think I wrote your email address incorrectly on the first mail out.</p> <p>Kind regards,</p> <p>Renée</p>
Friday, 18 March 2022	10:35am	Stage 2	Kayla Williamson	Woronora Gundungarra Elders Corporation	Phonecall	Renee Regal	Niche Environment and Heritage	Called to touchbase about the methodology
Friday, 18 March 2022	10:40am	Stage 2	Kim Moran	Bellambi Aboriginal Tent Embassy	Phonecall	Renee Regal	Niche Environment and Heritage	Called to touchbase about the methodology
Friday, 18 March 2022	10:41am	Stage 2	Gary Caines	Individual	Phonecall	Renee Regal	Niche Environment and Heritage	Called to touchbase about the methodology

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
Friday, 18 March 2022	10:42am	Stage 2	Rueben Brown	Korewal Elouera Jerrungarugh Tribal Elders Council	Phonecall	Renee Regal	Niche Environment and Heritage	Called to touchbase about the methodology
Friday, 18 March 2022	10:43am	stage 2	Maria Maher	Kullilia Welfare	Phonecall	Renee Regal	Niche Environment and Heritage	Called to touchbase about the methodology
Friday, 18 March 2022	10:45am	Stage 2	Heather Ball	Wadi Wadi Coomaditchie	Phonecall	Renee Regal	Niche Environment and Heritage	Called about the methodology
Friday, 18 March 2022	10:47am	Stage 2	Norma and Yvonne Simms	La Perouse Botany Bay Corporation	Phonecall	Renee Regal	Niche Environment and Heritage	Called to touchbase about the methodology- phone number was disconnected, will ask Kayla Williamson for a current number when next speaking to her
Friday, 18 March 2022	10:56am	Stage 2	Renee Regal	Niche Environment and Heritage	Phonecall	Kayla Williamson	Woronora Gundungarra Elders Corporation	Called back and said she will send the insurances and RAP details in the coming weeks and will send through a contact for Yvonne Simms
Friday, 18 March 2022	11:15am	Stage 2	Renee Regal	Niche Environment and Heritage	Phonecall	Gary Caines	Individual	Called to touchbase about the LW 19A. Would like to see LW 19A being the last of these longwalls in the area. Feels like Australia is being quarried by the UK. Would like to know the length and width of the LW and whether or not it was the Wongawilli or Bulli Seam? I currently have anyone to assist with the fieldwork currently. Can you make the longwall smaller? Would like to go out himself, but is worried about having a heart attack. Would like to know a lot more about the interconnectivity of the sites, as the groups are now missing that. Wants to ask for a veto and a round table discussion with Peter Baker. Can you farm gas from the

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								longwall fter extraction? Is worried about the Wongawilli Creek, as its an almost continuous shallow creek access area- I want this to be a push over for the RAPs. Gary will call Amanda to talk to her about it LW 19A is a bit too close to Wongawilli Creek head waters- can it be shortened? Asked about what site types were present- RR responded with Shelters. Ask for details of each of the surveys that have I in the area- IPHG, Sefton, Biosis Research and and Niche Environment and Heritage. He spoke at length about Jukkan Gorge.
Friday, 18 March 2022	11:59am	Stage 2	Maria Maher	Kullilia Welfare	Phonecall	Renee Regal	Niche Environment and Heritage	Called to say they are no longer doing cultural heritage assessments, but to send through the methodology anyways. Can be contacted on 0421 615 782 or <a href="mailto:maria.IWAC@gmail.com">maria.IWAC@gmail.com</a>
Friday, 18 March 2022	12:28pm	Stage 2	Maria Maher	Kullilia Welfare	Email	Renee Regal	Niche Environment and Heritage	Sent the methodology through to her new email address
Tuesday, 29 March 2022	12:45pm	Stage 2	Renee Regal	Regal Heritage	Phonecall	Aara Welz	ILALC	Called to discuss the response to the methodology and ask if the ILALC could have an extra day to review it as she wish to discuss it with Paul Knight and Jade Kennedy, especially in relation to intangible values.
Tuesday, 29 March 2022	12:55pm	Stage 2	All RAP groups with email	All RAP groups with email	Email	Renee Regal	Regal Heritage	Good afternoon all,  Many thanks to everyone who has provided comment on the LW 19A SMP Methodology to date, as well as those of you whom have RSVP'd for the fieldwork. I just thought I would send a reminder to let you know that comments on the draft are due by COB today- please get in contact if you need a little extra time though, as we are not going in the field until

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>after Easter.</p> <p>I also wanted to let you know that these are my contact details moving forward. So if you have any questions or comments relating to the LW 19A SMP I am project managing the ACHA component of this on behalf of Niche Environment and Heritage for South32. Please feel free to call or email if you need.</p> <p>Kind regards,</p> <p>Renée</p>
Tuesday, 29 March 2022	1:00pm	Stage 2	Scott Franks	Tocomwall	Phonecall	Renee Regal	Regal Heritage	Called to touchbase about a site that has been found on the Georges River that he is looking to register as an Aboriginal Place.
Tuesday, 29 March 2022	2:42pm	Stage 2	Renee Regal	Regal Heritage	Email	Aara Welz	ILALC	<p>Thanks Renee,</p> <p>Hopefully the workshop tomorrow can help ILALC create a road map to ensure adequate management strategies are developed in relation to both tangible and intangible cultural heritage.</p> <p>Thanks for your patience.</p> <p>Cheer,</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								Aara
Thursday, 31 March, 2022	10.51am	Stage 2	Renee Regal	Regal Heritage	Phonecall	Glenda Chalker	Cubbitch Barta Native Title Claimants	Called to discuss the field survey and to let RR know that she had no problems with the proposed methodology. RR to call close to field dates with roster
Tuesday, 5 April 2022	11:00am	Stage 2	Renee Regal	Regal Heritage	Phonecall	Kim Moran	Bellambi Tent Embassy	Called to discuss field work dates, RR said she would confirm dates with her this week. Would also need insurance details and she can send 1 RAP out.
Wednesday, 6 April 2022	7:49am	Stage 2	Glenda Chalker	Cubbitch Barta Native Title Claimants	Email	Renee Regal	Regal Heritage	<p>Good morning Glenda,</p> <p>Thank you for registering your interest in the field work for the Longwall 19A SMP (Niche Reference #7164). Your group has been rostered on for the 19, 20 and 21<sup>st</sup> April. Please forward the following details to your representative:</p> <p>Meet: at the Lake Cordeaux Picnic Area Carpark on at 8am each day- we will head back to the cars just before 3 to be out of the catchment by 4pm.</p> <p>PPE: Long Pants, Long shirt (high vis), hat, sturdy boots with ankle support, gloves, hard hat and safety glasses. I won't have spares so please ensure your team member is prepared.</p> <p>Food and Drink: Enough for the day. At least 3 litres of water.</p> <p>Invoicing details: At the end of the job please forward your invoices to Renée Regal, Niche Environment and Heritage (Project Number #7164). The South 32 daily rate is \$875.76 exc. Gst (renee@regalheritage.com.au)</p> <p>Please ensure that your representative is fit for work. We will</p>



Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>be going through some very tough terrain walking up and down ridgelines to look at the shelter sites. Please also send through the name and number of your representative by COB 14<sup>th</sup> April so I can get in contact directly if there are any changes to the field program due to weather.</p> <p>If you have any questions, please feel free to call or email.</p> <p>Kind regards,</p> <p>Renée</p>
Wednesday, 6 April 2022	7:49am	Stage 2	Kayla Williamson	Woronora Gundungarra Elders Corporation	Email	Renee Regal	Regal Heritage	<p>Good morning Kayla,</p> <p>Thank you for registering your interest in the field work for the Longwall 19A SMP (Niche Reference #7164). Your group has been rostered on for the 19, 20 and 21<sup>st</sup> April. Please forward the following details to your representative:</p> <p>Meet: at the Lake Cordeaux Picnic Area Carpark on at 8am each day- we will head back to the cars just before 3 to be out of the catchment by 4pm.</p> <p>PPE: Long Pants, Long shirt (high vis), hat, sturdy boots with ankle support, gloves, hard hat and safety glasses. I won't have spares so please ensure your team member is prepared.</p> <p>Food and Drink: Enough for the day. At least 3 litres of water.</p> <p>Invoicing details: At the end of the job please forward your invoices to Renée Regal, Niche Environment and Heritage (Project Number #7164). The South 32 daily rate is \$875.76</p>

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								<p>exc. Gst (renee@regalheritage.com.au)</p> <p>Please ensure that your representative is fit for work. We will be going through some very tough terrain walking up and down ridgelines to look at the shelter sites. Please also send through the name and number of your representative by COB 14<sup>th</sup> April so I can get in contact directly if there are any changes to the field program due to weather.</p> <p>If you have any questions, please feel free to call or email.</p> <p>Kind regards,</p> <p>Renée</p>
Wednesday, 6 April 2022	7:54am	Stage 2	Donna Hiscock	ILALC	Email	Renee Regal	Regal Heritage	<p>Good morning Donna,</p> <p>Thank you for registering your interest in the field work for the Longwall 19A SMP (Niche Reference #7164). Your group has been rostered on for the 19, 20 and 21<sup>st</sup> April. Please forward the following details to your representative:</p> <p>Meet: at the Lake Cordeaux Picnic Area Carpark on at 8am each day- we will head back to the cars just before 3 to be out of the catchment by 4pm.</p> <p>PPE: Long Pants, Long shirt (high vis), hat, sturdy boots with ankle support, gloves, hard hat and safety glasses. I won't have spares so please ensure your team member is prepared.</p> <p>Food and Drink: Enough for the day. At least 3 litres of water.</p>

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								<p>Invoicing details: At the end of the job please forward your invoices to Renée Regal, Niche Environment and Heritage (Project Number #7164). The South 32 daily rate is \$875.76 exc. Gst (renee@regalheritage.com.au)</p> <p>Please ensure that your representative is fit for work. We will be going through some very tough terrain walking up and down ridgelines to look at the shelter sites. Please also send through the name and number of your representative by COB 14<sup>th</sup> April so I can get in contact directly if there are any changes to the field program due to weather.</p> <p>If you have any questions, please feel free to call or email.</p> <p>Kind regards,</p> <p>Renée</p>
Wednesday, 6 April 2022	7:51am	Stage 2	Scott Franks	Tocomwall	Email	Renee Regal	Regal Heritage	<p>Good morning Scott,</p> <p>Thank you for registering your interest in the field work for the Longwall 19A SMP (Niche Reference #7164). Your group has been rostered on for the 22<sup>nd</sup> and 26<sup>th</sup> April. Please forward the following details to your representative:</p> <p>Meet: at the Lake Cordeaux Picnic Area Carpark on at 8am each day- we will head back to the cars just before 3 to be out of the catchment by 4pm.</p> <p>PPE: Long Pants, Long shirt (high vis), hat, sturdy boots with</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>ankle support, gloves, hard hat and safety glasses. I won't have spares so please ensure your team member is prepared. Food and Drink: Enough for the day. At least 3 litres of water. Invoicing details: At the end of the job please forward your invoices to Renée Regal, Niche Environment and Heritage (Project Number #7164). The South 32 daily rate is \$875.76 exc. Gst (renee@regalheritage.com.au)</p> <p>Please ensure that your representative is fit for work. We will be going through some very tough terrain walking up and down ridgelines to look at the shelter sites. Please also send through the name and number of your representative by COB 14<sup>th</sup> April so I can get in contact directly if there are any changes to the field program due to weather.</p> <p>If you have any questions, please feel free to call or email.</p> <p>Kind regards,</p> <p>Renée</p>
Wednesday, 6 April 2022	7:52am	Stage 2	Kim Moran	Bellambi Tent Embassy	Email	Renee Regal	Regal Heritage	<p>Good morning Kim,</p> <p>Thank you for registering your interest in the field work for the Longwall 19A SMP (Niche Reference #7164). Your group has been rostered on for the 19, 20 and 21<sup>st</sup> April. Please forward the following details to your representative:</p> <p>Meet: at the Lake Cordeaux Picnic Area Carpark on at 8am</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								<p>each day- we will head back to the cars just before 3 to be out of the catchment by 4pm.</p> <p>PPE: Long Pants, Long shirt (high vis), hat, sturdy boots with ankle support, gloves, hard hat and safety glasses. I won't have spares so please ensure your team member is prepared.</p> <p>Food and Drink: Enough for the day. At least 3 litres of water.</p> <p>Invoicing details: At the end of the job please forward your invoices to Renée Regal, Niche Environment and Heritage (Project Number #7164). The South 32 daily rate is \$875.76 exc. Gst (renee@regalheritage.com.au)</p> <p>Please ensure that your representative is fit for work. We will be going through some very tough terrain walking up and down ridgelines to look at the shelter sites. Please also send through the name and number of your representative by COB 14<sup>th</sup> April so I can get in contact directly if there are any changes to the field program due to weather.</p> <p>If you have any questions, please feel free to call or email.</p> <p>Kind regards,</p> <p>Renée</p>
Tuesday, 19 April 2022	12:25pm	Stage 2	Renee Regal	Regal Heritage	Phonecall	John	Tocomwal	John called for directions for field work

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
Tuesday, 19 April 2022	1:28pm	Stage 2	John	Tocomwall	Phonecall	Renee Regal	Regal Heritage	Called to let him know the catchment is closed and fieldwork will be postponed
Tuesday, 19 April 2022	1:32pm	Stage 2	Scott Franks	Tocomwall	Email	Renee Regal	Regal Heritage	Hi there Scott,  Just a short one to let you know I have just let John know that the field work for this week has been post phoned as the catchment is still closed until the 26 <sup>th</sup> April- a road has also washed away. I am hoping to get out there either the first or second week of May, but I will let you know when I have a firmer date.  Kind regards,  Renée
Tuesday, 19 April 2022	1:37pm	Stage 2	Glenda Chalker	Cubbitch Barta Native Title Claimants	Phonecall	Renee Regal	Regal Heritage	Called to let Glenda know the catchment is closed and fieldwork is postponed
Tuesday, 19 April 2022	1:40pm	Stage 2	Kayla Williamson	Woronora Gundungarra Elders Corporation	Phonecall	Renee Regal	Regal Heritage	Called to let Kayla know that the catchment is closed and fieldwork is postponed
Wednesday, 8 June 2022	12:30pm	Stage 2	Kayla Williamson	Gundungarra Elders Corporation	Phonecall	Renee Regal	Regal Heritage	Left a message about field work starting next Tuesday
Wednesday, 8 June 2022	12:35pm	Stage 2	Glenda Chalker	Cubbitch Barta Native Title Claimants	Phonecall	Renee Regal	Regal Heritage	Someone available on the 20 and 21 <sup>st</sup> June 2022

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
Wednesday, 8 June 2022	12:45pm	Stage 2	Scott Franks	Tocomwall	Phonecall	Renee Regal	Regal Heritage	Left a message about field work starting next Tuesday
Wednesday, 8 June 2022	12:46pm	Stage 2	Kim Moran	Bellambi Tent Embassy	Phonecall	Renee Regal	Regal Heritage	Left a message about field work starting next Tuesday
Wednesday, 8 June 2022	12:47pm	Stage 2	Donna Hiscock	ILALC	Phonecall	Renee Regal	Regal Heritage	Left a message about field work starting next Tuesday
Wednesday, 8 June 2022	12:54pm	Stage 2	Renee Regal	Regal Heritage	Phonecall	John	Tocomwall	John is available 14 and 20 and 21 June for field work
Wednesday, 8 June 2022	12:56pm	Stage 2	John	Tocomwall	Text message	Renee Regal	Regal Heritage	Sent a text with RR email address for him to respond with so I email the field work details through
Wednesday, 8 June 2022	1:28pm	Stage 2	Felicity Fitzpatrick	ILALC	Phonecall	Renee Regal	Regal Heritage	Donna is on leave until next Tuesday but they will see if they have someone available 20, 21 and 23 <sup>rd</sup> June
Wednesday, 6 July 2022	1:43pm	Stage 2	Carly Todhunter	Woronora Gundungarra Elders Corporation	Email	Kayla Williamson	Woronora Gundungarra Elders Corporation	Invoice sent for survey work
Monday, 11 July 2022	12:20pm	Stage 2	Scott Franks	Tocomwall	Phonecall	Carly Todhunter	Niche Environment and Heritage	Request to be sent invoice for work completed.

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
Monday, 11 July 2022	12:25pm	Stage 2	Scott Franks	Tocomwall	Email	Carly Todhunter	Niche Environment and Heritage	Request to be sent invoice for work completed.
Monday, 11 July 2022	12:28pm	Stage 2	Rebecca Chalker	Cubbitch Barta Native Title Claimants	Phonecall	Carly Todhunter	Niche Environment and Heritage	Request to be sent invoice for work completed. Left voicemail
Monday, 11 July 2022	12:30pm	Stage 2	Rebecca Chalker	Cubbitch Barta Native Title Claimants	Email	Carly Todhunter	Niche Environment and Heritage	Request to be sent invoice for work completed.
Monday, 11 July 2022	12:40pm	Stage 2		ILALC	Phonecall	Carly Todhunter	Niche Environment and Heritage	Request to be sent invoice for work completed.
Monday, 11 July 2022	12:43pm	Stage 2		ILALC	Email	Carly Todhunter	Niche Environment and Heritage	Request to be sent invoice for work completed.
Monday, 25 July 2022	4:50pm	Stage 4	Glenda Chalker	Cubbitch Barta Native Title Claimants	Mail	Chelsea Freeman	Niche Environment and Heritage	ACHA Sent for Review
Monday, 25 July 2022	4:50pm	Stage 4	Gary Caines		Mail	Chelsea Freeman	Niche Environment and Heritage	ACHA Sent for Review
Monday, 25 July 2022	4:50pm	Stage 4	Rueben Brown	Korewal Elouera Jerrungarugh Tribal Elders Council	Mail	Chelsea Freeman	Niche Environment and Heritage	ACHA Sent for Review



Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
Monday, 25 July 2022	4:50pm	Stage 4	Norma Simms and Yvonne Simms	La Perouse Botany Bay Corporation	Mail	Chelsea Freeman	Niche Environment and Heritage	ACHA Sent for Review
Monday, 25 July 2022	4:50pm	Stage 4	Keith Ball and Heather Ball	Wadi Wadi Coomaditchie	Mail	Chelsea Freeman	Niche Environment and Heritage	ACHA Sent for Review
Monday, 25 July 2022	4:56pm	Stage 4	Kim Moran	Bellambi Aboriginal Tent Embassy	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Dear Ms Moran,</p> <p>Re: Re: Longwall 19A Subsidence Management Plan: Aboriginal Cultural Heritage Assessment</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>In accordance with the Heritage NSW (formerly the Office of Environment and Heritage) Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010) please find attached the Draft Longwall 19A Aboriginal Cultural Heritage Assessment report for your review and comment. If you have any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.</p> <p>Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								Ms Renée Regal Principal Heritage Consultant Niche Environment and Heritage Kind Regards, Chelsea Freeman
Monday, 25 July 2022	4:58pm	Stage 4	Glenda Chalker	Cubbitch Barta Native Title Claimants	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Dear Mrs Chalker,</p> <p>Re: Re: Longwall 19A Subsidence Management Plan: Aboriginal Cultural Heritage Assessment</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>In accordance with the Heritage NSW (formerly the Office of Environment and Heritage) Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010) please find attached the Draft Longwall 19A Aboriginal Cultural Heritage Assessment report for your review and comment. If you have any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.</p> <p>Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								Principal Heritage Consultant Niche Environment and Heritage Kind Regards, Chelsea Freeman
Monday, 25 July 2022	4:58pm	Stage 4	Scott Franks	Tocomwall	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Dear Mr Franks,</p> <p>Re: Re: Longwall 19A Subsidence Management Plan: Aboriginal Cultural Heritage Assessment</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>In accordance with the Heritage NSW (formerly the Office of Environment and Heritage) Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010) please find attached the Draft Longwall 19A Aboriginal Cultural Heritage Assessment report for your review and comment. If you have any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.</p> <p>Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal Principal Heritage Consultant</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								Niche Environment and Heritage Kind Regards, Chelsea Freeman
Monday, 25 July 2022	4:59pm	Stage 4	Maria Maher	Kullilia Welfare	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Dear Ms Maher,</p> <p>Re: Re: Longwall 19A Subsidence Management Plan: Aboriginal Cultural Heritage Assessment</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>In accordance with the Heritage NSW (formerly the Office of Environment and Heritage) Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010) please find attached the Draft Longwall 19A Aboriginal Cultural Heritage Assessment report for your review and comment. If you have any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.</p> <p>Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal Principal Heritage Consultant</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								Niche Environment and Heritage Kind Regards, Chelsea Freeman
Monday, 25 July 2022	5:00pm	Stage 4	Kayla Williamson	Woronora Gundungarra Elders Corporation	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Dear Ms Williamson,</p> <p>Re: Re: Longwall 19A Subsidence Management Plan: Aboriginal Cultural Heritage Assessment</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>In accordance with the Heritage NSW (formerly the Office of Environment and Heritage) Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010) please find attached the Draft Longwall 19A Aboriginal Cultural Heritage Assessment report for your review and comment. If you have any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.</p> <p>Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal Principal Heritage Consultant</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								Niche Environment and Heritage Kind Regards, Chelsea Freeman
Monday, 25 July 2022	5:01pm	Stage 4	Paul Knight	ILALC	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Dear Mr Knight,</p> <p>Re: Re: Longwall 19A Subsidence Management Plan: Aboriginal Cultural Heritage Assessment</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>In accordance with the Heritage NSW (formerly the Office of Environment and Heritage) Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010) please find attached the Draft Longwall 19A Aboriginal Cultural Heritage Assessment report for your review and comment. If you have any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.</p> <p>Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal Principal Heritage Consultant</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
								Niche Environment and Heritage Kind Regards, Chelsea Freeman
Thursday, 28/7/22	1:37pm	Stage 4	Chelsea Freeman	Niche Environment and Heritage	Email	Donna Hiscox	ILALC	<p>Good afternoon Chelsea,</p> <p>Thank you for your email and reports in relation to Longwall19A Subsidence Management Plan Project.</p> <p>I have passed the reports and correspondence onto ILALC's Culture and Heritage Manager Aara Welz for review.</p> <p>Kind regards,</p> <p>Donna Hiscox Illawarra Local Aboriginal Land Council</p>
Tuesday, 8 August 2022	2:42pm	Stage 4	Kim Moran	Bellambi Aboriginal Tent Embassy	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Good Afternoon,</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>This email is a reminder any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report. Could you please direct all correspondence to Renée Regal,</p>

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								<p>contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal Principal Heritage Consultant Niche Environment and Heritage PO Box 2443 North Parramatta NSW 1750 Telephone: 0400 594 580 Fax: 02 4017 0071 Email: renee@regalheritage.com.au</p> <p>Kind regards, Chelsea Freeman</p>
Tuesday, 8 August 2022	2:42pm	Stage 4	Glenda Chalker	Cubbitch Barta Native Title Claimants	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Good Afternoon,</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>This email is a reminder any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.</p> <p>Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal Principal Heritage Consultant</p>



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								<p>Niche Environment and Heritage            PO Box 2443            North Parramatta NSW 1750            Telephone: 0400 594 580            Fax: 02 4017 0071            Email: renee@regalheritage.com.au</p> <p>Kind regards,            Chelsea Freeman</p>
Tuesday, 8 August 2022	2:42pm	Stage 4	Scott Franks	Tocomwall	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Good Afternoon,</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>This email is a reminder any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.            Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal            Principal Heritage Consultant            Niche Environment and Heritage            PO Box 2443            North Parramatta NSW 1750            Telephone: 0400 594 580</p>

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								<p>Fax: 02 4017 0071 Email: renee@regalheritage.com.au</p> <p>Kind regards, Chelsea Freeman</p>
Tuesday, 8 August 2022	2:42pm	Stage 4	Kayla Williamson	Woronora Gundungarra Elders Corporation	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Good Afternoon,</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>This email is a reminder any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.</p> <p>Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal Principal Heritage Consultant Niche Environment and Heritage PO Box 2443 North Parramatta NSW 1750 Telephone: 0400 594 580 Fax: 02 4017 0071 Email: renee@regalheritage.com.au</p> <p>Kind regards,</p>

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								Chelsea Freeman
Tuesday, 8 August 2022	2:42pm	Stage 4	Paul Knight	ILALC	Email	Chelsea Freeman	Niche Environment and Heritage	<p>Good Afternoon,</p> <p>Many thanks for your assistance on behalf of Illawarra Coal Holdings Pty Ltd (Illawarra Metallurgical Coal [IMC]) with the Aboriginal community consultation for the Longwall19A Subsidence Management Plan Project to date.</p> <p>This email is a reminder any comments, suggestions or queries regarding the report, please contact Niche Environment and Heritage by COB 22 August 2022, noting that any feedback received at any time will be accepted and considered, up to the finalisation of the report.</p> <p>Could you please direct all correspondence to Renée Regal, contact details provided below at your soonest convenience.</p> <p>Ms Renée Regal Principal Heritage Consultant Niche Environment and Heritage PO Box 2443 North Parramatta NSW 1750 Telephone: 0400 594 580 Fax: 02 4017 0071 Email: renee@regalheritage.com.au</p> <p>Kind regards, Chelsea Freeman</p>

Date	Time	Stage	Individual Contacted	Organisation Contacted	Form of contact	Contacted by	Organisation represented	Nature of Consultation
Thursday, 11 August 2022	11:53pm	Stage 4	Chelsea Freeman	Niche Environment and Heritage	Email	Donna Hiscox	ILALC	<p>Thank you for your reminder Chelsea.</p> <p>Kind regards,</p> <p>Donna Hiscox Illawarra Local Aboriginal Land Council</p>



