



INSITE HERITAGE  
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***Aboriginal Heritage Assessment  
Longwalls 201-204 Extraction Plan  
Ashton Coal Project, Camberwell NSW***

Report to

**Ashton Coal Operations Ltd**

**September 2016**

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#### Sensitive Cultural Information

Sections of this report (Figures 1 & 2) contain information pertaining to the location of Aboriginal objects and are included to satisfy reporting conditions. These sections should be excluded from public display if the report is to be released for public review and comment.

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## **1.0 Introduction**

### **1.1 Project Information**

Ashton Coal Operations Ltd (ACOL) engaged Insite Heritage Pty Ltd to prepare an Aboriginal Heritage Assessment for inclusion into an Extraction Plan for mining of Longwalls 201 to 204 (LW 201-204), Upper Lower Liddell Seam, of the Ashton Coal Project (ACP).

The following background information has been provided by ACOL:

The ACP is located approximately 14 km northwest of Singleton in the Hunter Valley region of New South Wales. The project includes an open cut mine, an underground mine, a Coal Handling and Preparation Plant and associated rail siding and infrastructure.

The ACP was granted consent on 11 October 2002 by the Minister of Planning pursuant to the provisions of the Environmental Planning and Assessment Act 1979 (DA 309-11-2001-i). The mine is approved to produce up to 5.45 million tonnes per annum (Mtpa) of run of mine (ROM) coal and operate until 2023. The consolidated consent has been modified on ten occasions, with the most recent on 12 December 2012.

The underground mine is approved for multi-seam longwall extraction, targeting four coal seams in descending order Pikes Gully (PG), Upper Liddell (ULD), Upper Lower Liddell (ULLD) and Lower Barrett (LB). Development of the underground mine commenced in December 2005 and is accessed through the southern wall of the Arties Pit under the New England Highway. Mining of LW 201-204 is to be completed in the ULLD Seam and is planned to commence in 2017. This will be the third coal seam extracted by ACOL.

A plan of the LW201-204 project area is provided in Figure 1 below.

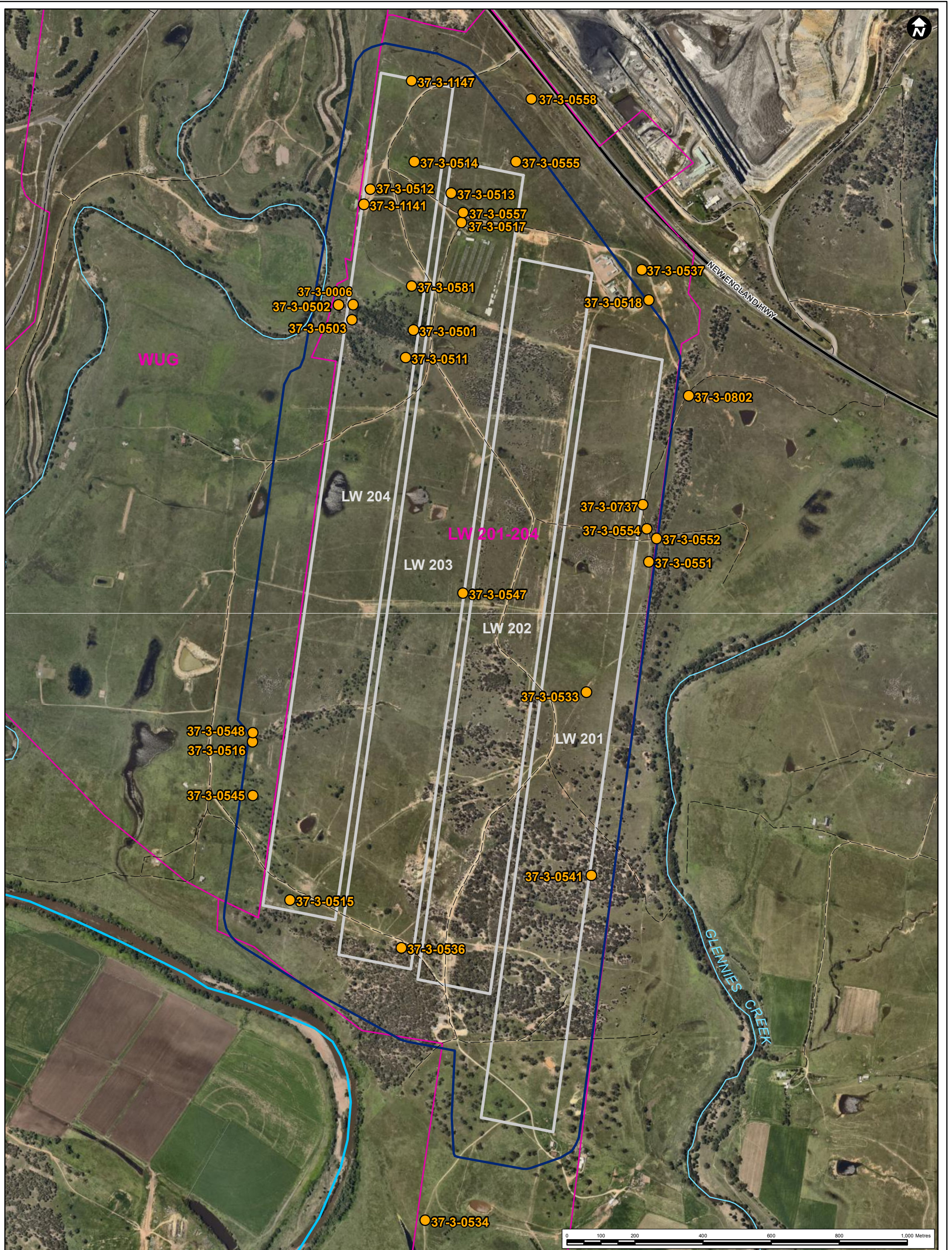
### **1.2 Management of Archaeological Sites**

Aboriginal archaeological sites across the ACP are currently managed under two Aboriginal Heritage Impact Permits (AHIPs) and an Archaeology & Cultural Heritage Management Plan (ACHMP). The two current AHIPs held over the ACP area are:

- AHIP #1131017 issued on 23 December 2011, for longwall panels: LW1, LW2, LW3, LW4 and;
- AHIP #1130976 granted by the NSW Land and Environment Court in August 2011, encompassing longwall panels LW5, LW6A, LW6B, LW7A, LW7B and LW8, and the Bowmans Creek diversion.

The Archaeology and Cultural Heritage Management Plan (ACHMP) received approval from the Department of Planning and Environment (DP&E), formerly Department of Planning and Infrastructure (DP&I) in July 2012 and was prepared in accordance with Condition 3.36 of the development consent for Modification 6 to DA 309-11-201 (granted December 2010) and forms part of the Extraction Plan in accordance with Condition 3.12(h). The ACHMP has been subject to a number of reviews and minor administrative changes by ACOL, the current approved version is dated 13.06.2015. The plan considers the potential impacts of the second workings associated with LW 101-108 in the ULD Seam on cultural heritage and outlines ACOL's statutory requirements relating to monitoring and management of subsidence impacts on cultural heritage sites within the underground operations, as well as consultation, monitoring and reporting requirements. The ACHMP is required to be reviewed prior to undertaking longwall mining in the ULLD seam.





**Figure 1: ULLD EP Project Area & AHIMS Sites**

- AHIMS Site
- Access Tracks
- AHIP Boundaries ULLD
- River
- EP Project Area ULLD
- Creeks (original course)
- Longwalls 201-204



**Map Projection:**  
GDA 1994 MGA Zone 56

**Data Sources:**  
LPI - 2012  
AECOM - 2016  
ACOL - 2012  
nearmap - 2016

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Disclaimer: This is not an official or a legal map but is for informational use only. All data was compiled from the best sources available. All boundaries, scale and geographic points are approximate.



## 2.0 Archaeological Resource

### 2.1 European Heritage Sites

Three European heritage sites as listed by local and state government agencies have been identified in proximity to the ACP:

- St Clements Anglican Church, Lot 103 DP 738182, located to the west of Camberwell Village is an item of local significance as listed on the Singleton Council Local Environmental Plan (LEP) 2013 (Item No. I12).
- Camberwell Community Hall, Lot 2 Section 13 DP 758214, located south of the New England Highway is an item of local heritage significance as listed in the Singleton Council LEP 2013 (Item No. I13)
- Camberwell Glennies Creek Underbridge located at 252.613km Main Northern Railway Line is listed under Section 170 of the Heritage Act 1977. The item curtilage includes the bridge structure and a surrounding area of 20m in all directions.

These items are located outside of the LW 201-204 project area and will not be impacted by underground mining at the ACP.

Two additional sites of historic occupation have been identified within the ACP overlying Longwall 8. These sites are located outside of the project area and will not be impacted by mining of LW 201-204. Management of these sites is included in the ACHMP.

### 2.2 Aboriginal Heritage Sites – LW 201-204 Project Area

Known Aboriginal archaeological sites within, and in close proximity to, the LW 201-204 project area are outlined in Figure 1 above. These sites were identified by archaeological assessments undertaken for the ACP Environmental Impact Assessment (Witter 2002, Hardy 2002) and subsequent inspections.

The majority of Aboriginal archaeological sites located within the LW201-204 project area have been subject to management measures resulting from longwall mining of the previous two seams (PG and ULD) and associated activities in accordance with AHIPs #1131017, #1130976 (current) and AHIP#2783 (expired). The current status of Aboriginal archaeological sites within the LW 201-204 project area is provided in Table 1 below.

There are three identified sites of particularly high scientific and cultural significance within or in proximity to the LW 201-204 project area:

1. Waterhole Site (37-3-0500)
2. Oxbow Site (37-3-501,37-3-502, 37-3-503, 37-3-0511 & 37-3-0006); and
3. Glennies Creek Site (37-3-0541 & 37-3-0549)

The Waterhole site is to be retained with no disturbance from underground mining activities. The Oxbow site has been partially impacted by mining activities in the ULD seam with management measures implemented in accordance with AHIP#1131017 and the ACHMP. The Glennies Creek Site is managed within a conservation area. AHIP#1131017 allows for partial impacts to the site where impacts from underground mining occur. The majority of the site lies outside of the AHIP area and will not be impacted by mining activities.

**Table 1 Aboriginal archaeological sites within / in proximity to LW 201-204 project area**

<b>AHIMS No.</b>	<b>Site Name</b>	<b>Site Type</b>	<b>Archaeological Significance</b>	<b>Current Status</b>
37-3-0545	EWA 51	Artefact scatter	Low	Partially salvaged. Loci of site RS9 extant
37-3-0548	EWA 57	Artefact scatter	Low	Partially Salvaged. Loci within ULD subsidence crack zone salvaged
37-3-500	Waterhole Site	Artefact scatter and grinding grooves	High	Extant Artefact scatter and Grinding Grooves located on edge of waterhole on Bowmans Creek.
37-3-0502 37-3-0501 37-3-0503 37-3-0511 37-3-0006	Oxbow Site	Artefact scatter	High	Partially salvaged. Loci within ULD subsidence crack zone salvaged.
37-3-0581	Homestead Site	Artefact Scatter	Moderate	Partially salvaged Loci within ULD subsidence crack zone salvaged.
37-3-0541/37-3-0549	Glennies Creek Site	Artefact scatter and grinding grooves	High	Partially salvaged Site located within the Southern Woodland Conservation Area Loci of sites within ULD subsidence crack zone salvaged.
37-3-0537	High Ridge Workshop Site	Artefact scatter	High	Partially salvaged
37-3-0533	Ridge Peak Site	Artefact scatter	High	Partially Salvaged
37-3-0536	High Spur Site	Artefact scatter	High	Partially Salvaged
37-3-0547	EWA 56	Isolated find	Low	Salvaged
37-3-0737	EWA 77	Artefact Scatter	Low	Partially salvaged
37-3-0554	EWA 78	Artefact Scatter	Low	Salvaged

AHIMS No.	Site Name	Site Type	Archaeological Significance	Current Status
37-3-0557	EWA 91	Isolated find	Low	Salvaged
37-3-1141	AFA 21, AFA22, AFA 23, AFA 24.	Open site	Low	Salvaged
37-3-0516	Ash 20	Open site	Moderate	Salvaged
37-3-0551	Ashton EWA69	Artefact scatter	Low	Partially salvaged
37-3-0552	Ashton EWA70	Isolated artefact	Low	Partially salvaged
37-3-0555	Ashton EWA78	Artefact scatter	Low	Partially salvaged
37-3-0558	Ashton EWA96	Isolated artefact	Low	Extant
37-3-0534	Ashton Hunter River slope site	Artefact scatter, Hearth	High (part of site)	Partially salvaged This artefact scatter was the only example where there were scattered heat retainers and a well formed hearth with charcoal. Potential for sub surface
37-3-0802	SA13/3	Artefact scatter	Low	Extant
37-3-1147	AFA52 AFA53 AFA54	Artefact scatter	Low	Partially salvaged Artefact scatter located on exposed track.
37-3-0512	ASH16	Artefact scatter	Low	Salvaged
37-3-0513	ASH17	Artefact scatter	Medium	Extant Located in an eroded exposure on a ridge overlooking Bowmans Ck The site also contained some burnt clay deposit.



<b>AHIMS No.</b>	<b>Site Name</b>	<b>Site Type</b>	<b>Archaeological Significance</b>	<b>Current Status</b>
37-3-0514	ASH18	Artefact scatter	Low	Partially Salvaged Terrace overlooking Bowmans Ck. Some potential for subsurface artefacts.
37-3-0515	ASH19	Isolated artefact	Low	Partially salvaged Eroded exposure on ridgeline overlooking Hunter River.
37-3-0517	ASH21	Isolated artefact	Low	Salvaged
37-3-0518	ASH22	Artefact scatter	Low	Salvaged
37-3-0540	EWA67	Artefact Scatter	Low	Extant
37-3-0550	EWA68	Artefact Scatter	Low	Extant
37-3-1148	AFA55	Artefact scatter	Low	Partially salvaged

## 3.0 Subsidence & Impacts to Heritage Items

### 3.1 Predicted Subsidence Impacts

The ULLD seam is the third seam to be extracted in the approved multi seam ACP. An assessment of subsidence impacts has been prepared for mining in the ULLD seam LW 201-204 (SCT 2016).

Incremental subsidence of up to 2.7m is expected following completion of mining the ULLD seam in LW 201-204. Cumulative subsidence of up to 5.8m is expected where there is overlap of the center of longwall panels for the PG, ULD and ULLD seams (SCT 2016:4.1).

The total cumulative subsidence estimate at completion of mining the ULLD seam is consistent with the maximum subsidence predicted in the Environmental Assessment undertaken for the Bowmans Creek Diversion for mining of the PG, ULD and ULLD seams (SCT 2016:4.3). Predicted subsidence impacts are still consistent with maximum predicted parameters for the ACP.

The subsidence assessment outlines that general background levels of tilts and strains predicted for LW201-204 ULLD seam are less than those estimated for the Bowmans Creek Diversion (SCT 2016:4.3). However, monitoring of the ULD seam has identified that tilts and strains are significantly higher than the general background in areas of stacked goaf edges. For LW 201-204 project area this is expected at the start of LW 202-204 and the finish lines of LW 201-204, the eastern edge of LW 201 and the north western edge of LW 204 (SCT 2016:4.3).

Surface impacts from mining of the ULLD seam in LW201-204 are not expected to be significantly different to those experienced in the previous two seams (SCT 2016:7.0).

### 3.2 Mechanisms for Impact to Heritage Items

The potential impacts to Aboriginal archaeological sites within the LW 201-204 project area will generally arise via the following mechanisms (ACOL 2015:4.1):

**Cracking and or crack remediation:** The ground may crack as a result of the underground goaf collapse. Cracking associated with mining the ULLD seam is predicted to require remediation. Generally where cracking requires repair this is achieved with ripping of the crack with a bulldozer or grader. Figure 2 below, details the locations of known Aboriginal archaeological sites in relation to the predicted subsidence crack zone for mining LW 201-204 in the ULLD seam.

The subsidence assessment outlines that high tilts and strains are expected at locations of stacked goaf edges resulting in perceptible changes in elevation, large cracks and local steep grades (SCT 2016:4.2). Remediation measures will need to be undertaken in these locations.

**Knick points and rilling:** Changes in slope can cause changes in erosion patterns and may hasten the movement of knick points upslope.

**Ponding:** Ponds may develop where subsidence forms depressions. The subsidence assessment prepared for the LW 201-204 Extraction Plan has identified a number of potential ponding areas. Potential ponding areas comprise enlargement of existing farm dams, enlargement of existing depressions formed during mining of the PG and or ULD seams, or new ponding locations resulting from ULLD mining (SCT 2016:5.1.5). ACOL will manage the effects of ponding as mining progresses via an adaptive management strategy, potential remediation measures may include formation of drainage lines to allow overflow into existing watercourses or landform reshaping work (SCT 2016:5.1.5).

**Development & Maintenance of Surface Infrastructure:** To facilitate the underground mining operations the installation of various types of surface infrastructure will be required. These may include gas drainage bores and associated infrastructure, access tracks, dewatering facilities, ventilation shafts etc. (ACOL 2015:4.1).

As mining progresses in the LW 201-204 project area, monitoring and management measures will be undertaken to manage the effects of subsidence on existing infrastructure including maintenance of access tracks, buried pipelines, electricity transmission lines, and telecommunications cables, particularly in areas of stacked goaf edges (SCT 2016:5.0). Any required remediation works on existing infrastructure is considered to have minimal impact on heritage items given the existing level of disturbance in these locations.

### **3.2.1 Predicted Subsidence Impact & Aboriginal Archaeological Sites**

As outlined in Section 3.2 above, impacts to Aboriginal archaeological sites from mining LW 201-204 in the ULLD seam will generally occur from remediation measures required to manage subsidence cracks and ponding. The Development Consent for the ACP requires that underground mining will have no greater subsidence impact or environmental consequences than approved under a permit issued under section 90 of the *National Parks and Wildlife Act 1974*. The Development Consent also details that there is to be negligible impact on the Waterhole Site at the completion of mining and no construction within 70m of the grinding grooves located at this site (DA 309-11-2001 MOD 6 Condition 3.9, Statement of Commitments 11.3).

The current AHIPs issued under section 90 of the National Park and Wildlife Act 1974 held for the ACP allow for impacts to those parts of Aboriginal archaeological sites to be affected by subsidence, subsidence remediation measures, longwall mining and associated infrastructure, rehabilitation activities, and upgrade and maintenance of access tracks within the approved AHIP area. The whole of Waterhole Site must not be harmed and harm may only occur to that part of the Glennies Creek Site to be impacted by subsidence and subsidence remediation measures located within the boundary of AHIP#1131017 (Schedules A2 & B2 AHIP#1131017).

For mining of LW 201-204 in the ULLD seam, impacts to Aboriginal archaeological sites are consistent with the approved impacts outlined in the Development Consent and AHIPs. There will be no impacts to the Waterhole Site which lies outside of the ULLD LW 201-204 project area. Part of the Glennies Creek Site is located within the stacked goaf edge of LW201 and subsidence remediation works will be required. This area is included within the AHIP boundary and predicted impacts are consistent with those approved in AHIP#1131017. For the remainder of Aboriginal archaeological sites within the LW 201-204 project area, impacts will mainly result from the implementation of subsidence remediation measures.

The ACHMP details four categories of potential subsidence impacts:

**High** – Definite potential for cracking, ponding or surface erosion to occur that will require remediation.

**Medium** – Subsidence will be experienced but only a moderate chance that impacts requiring remediation will occur.

**Low** – Subsidence may be experienced at the site however there is a low chance that repair work will be required.

**No Impact** – No impacts on sites will occur as they are located outside the subsidence zone /



areas of impact.

Table 2 below identifies the predicted level of impact to each known Aboriginal site within the ULLD project area. Figure 2 details the area of predicted surface cracking and ponding which may require remediation works and locations of Aboriginal archaeological sites.

The subsidence assessment prepared for the ULLD seam will be incorporated into the review of the ACHMP and Aboriginal archaeological sites will continue to be managed in accordance with the relevant AHIP and the ACHMP.

#### **4.0 Management Recommendations**

For management purposes the ACHMP and AHIPs anticipate that archaeological sites overlying the ACP extraction area will be impacted, to varying degrees, by the remediation of subsidence. All remediation such as ripping of cracks, filling of ponding or earthworks to control erosion, will be reassessed for its potential to impact sites prior to implementation of management measures in accordance with the ACHMP and relevant AHIP. The ACHMP will be reviewed and updated prior to commencement of mining works in the ULLD seam. Further details regarding subsidence remediation is outlined in the Extraction Plan main document.

Table 2 below details the known Aboriginal archaeological sites which are likely to require salvage works prior to implementation of subsidence remediation measures for mining LW 201-204.

In addition to the requirements of the ACHMP and AHIPs, prior to any remediation works or surface disturbance works undertaken onsite, ACOL operate a permit to disturb system across the ACP area. This includes the investigation of any archaeological issues such as 'no go'/exclusion areas or requirements for any archaeological investigations prior to the commencement of any surface disturbance works.

The potential for previously unidentified Aboriginal objects to occur in the LW 201-204 project area is likely; however, the sites that have been recorded have been sufficient to identify the probable character of any additional sites. The salvage methodologies have therefore been designed to be applicable to both known and unknown sites, unless a previously unknown site is identified as significant at which time special conditions within the relevant AHIP will be implemented.

Based on the results of archaeological salvage works undertaken in Property 130 for mining in the ULD seam, there is potential for unknown Aboriginal objects to occur within the predicted subsidence crack zone for the ULLD seam. Salvage methodologies in areas which may require remediation works within Property 130 will be undertaken in accordance with AHIP#1131017.

**Table 2 Predicted subsidence impacts and management measures**

AHIMS No.	Site Name	Site Type	Archaeological Significance	Description (incl. status)	Predicted Impact	Management Measures
37-3-0545	EWA 51	Artefact scatter	Low	Partially salvaged. Loci of site RS9 extant	High Site located within subsidence crack zone for ULLD	Manage according to AHIP #1131017, #1130976 & ACHMP
37-3-0548	EWA 57	Artefact scatter	Low	Partially Salvaged. Loci within ULD subsidence crack zone salvaged	High Site located within subsidence crack zone for ULLD. Parts of site may also be affected by predicted ponding	Manage according to AHIP #1131017, & ACHMP
37-3-500	Waterhole Site	Artefact scatter and grinding grooves	High	Extant Artefact scatter and Grinding Grooves located on edge of waterhole on Bowmans Creek.	No Impact	Continue monitoring for impacts.
37-3-0502 37-3-0501 37-3-0503 37-3-0511 37-3-0006	Oxbow Site	Artefact scatter	High	Partially salvaged. Loci within ULD subsidence crack zone salvaged.	High Site located within subsidence crack zone for ULLD. Parts of site may also be affected by predicted ponding.	Manage according to AHIP #1131017, & ACHMP
37-3-0581	Homestead Site	Artefact scatter	Low	Partially salvaged Loci within ULD subsidence crack zone salvaged.	Low Site located outside ULLD subsidence crack zone	Monitor & manage according to AHIP #1131017, & ACHMP

<b>AHIMS No.</b>	<b>Site Name</b>	<b>Site Type</b>	<b>Archaeological Significance</b>	<b>Description (incl. status)</b>	<b>Predicted Impact</b>	<b>Management Measures</b>
37-3-0541/37-3-0549	Glennies Creek Site	Artefact scatter and grinding grooves	High	Partially salvaged Site located within the Southern Woodland Conservation Area Loci of sites within ULD subsidence crack zone salvaged	High Parts of the site located within subsidence crack zone for ULLD may be affected by remediation. Effects of predicted ponding to also be monitored and managed where required.	Manage according to AHIP #1131017, & ACHMP
37-3-0537	High Ridge Workshop Site	Artefact scatter	High	Partially salvaged	Moderate Portion of site - loci EWA079 & EWA076 located on edge of ULLD subsidence crack zone	Manage according to AHIP #1131017, & ACHMP. No impacts to portion of site outside of AHIP boundary (loci AFA117)
37-3-0533	Ridge Peak Site	Artefact scatter	High	Partially Salvaged	Moderate – Low loci of site located on edge of ULLD subsidence crack zone may be impacted by cracking	Monitor & Manage according to AHIP #1131017, & ACHMP
37-3-0536	High Spur Site	Artefact scatter	High	Partially Salvaged	High Parts of the site located within subsidence crack zone for ULLD	Manage according to AHIP #1131017, & ACHMP
37-3-0547	EWA 56	Isolated find	Low	Salvaged	Nil	Site has been salvaged
37-3-0737	EWA 77	Artefact Scatter	Low	Partially Salvaged	Nil	Portion of site remaining outside of subsidence crack zone for ULLD

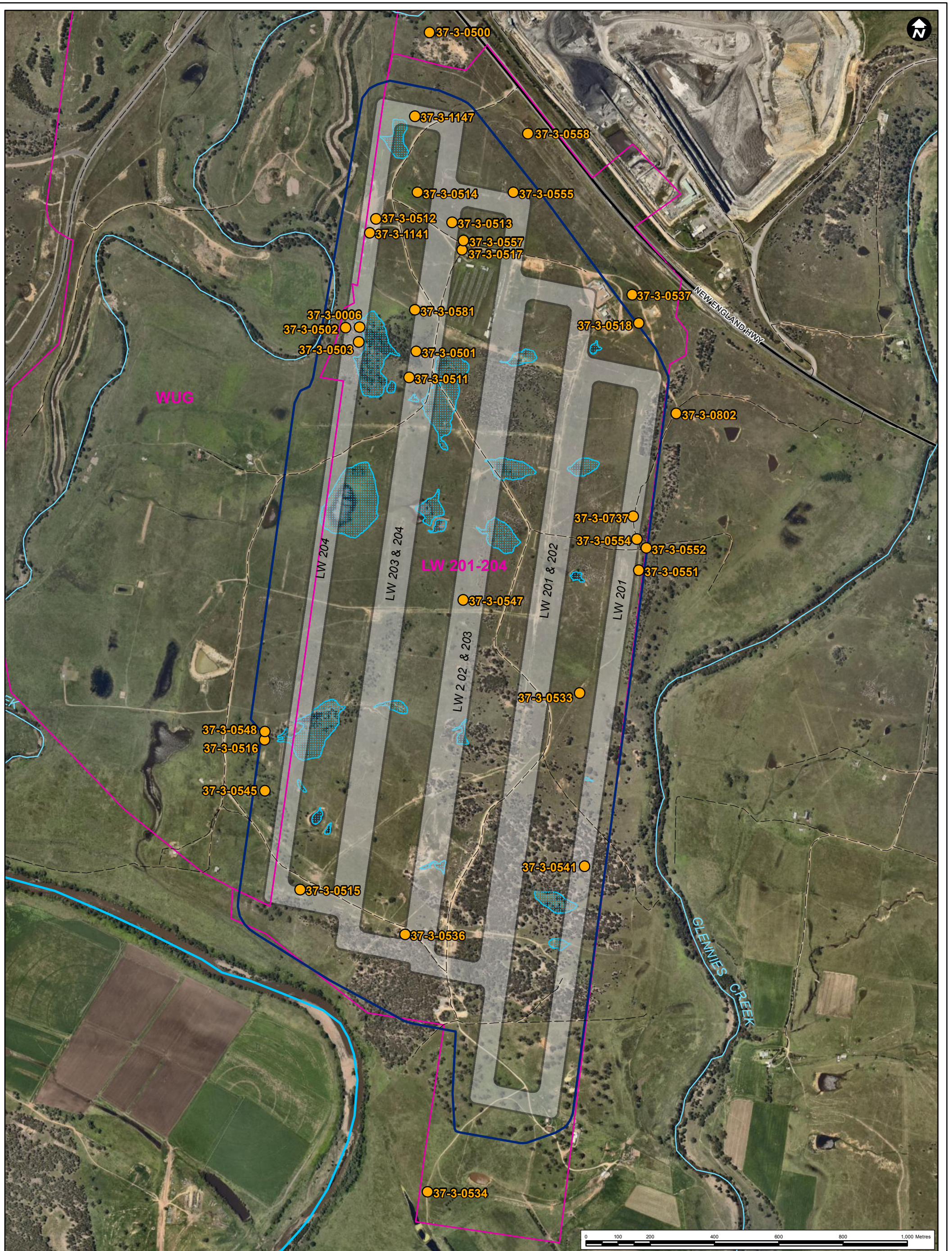


AHIMS No.	Site Name	Site Type	Archaeological Significance	Description (incl. status)	Predicted Impact	Management Measures
37-3-0554	EWA 78	Artefact Scatter	Low	Salvaged	Nil	Site has been salvaged
37-3-0557	EWA 91	Isolated find	Low	Salvaged	Nil	Site has been salvaged
37-3-1141	AFA 21, AFA22, AFA 23, AFA 24.	Open site	Low	Salvaged	Nil	Site has been salvaged
37-3-0516	Ash 20	Open site	Moderate	Salvaged	Nil	Site has been salvaged
37-3-0551	Ashton EWA69	Artefact scatter	Low	Partially salvaged	Moderate Loci of site situated outside of ULLD subsidence crack zone but may be affected by ponding and any required remediation measures.	Monitor and manage according to ACHMP and AHIP
37-3-0552	Ashton EWA70	Isolated artefact	Low	Partially salvaged	Low Loci of site situated outside of ULLD subsidence crack zone	Monitor and manage according to ACHMP and AHIP. Portion of site outside of AHIP not to be impacted.
37-3-0555	Ashton EWA78	Artefact scatter	Low	Partially salvaged	High Site located within subsidence crack zone for ULLD	Manage according to AHIP #1131017, & ACHMP

<b>AHIMS No.</b>	<b>Site Name</b>	<b>Site Type</b>	<b>Archaeological Significance</b>	<b>Description (incl. status)</b>	<b>Predicted Impact</b>	<b>Management Measures</b>
37-3-0558	Ashton EWA96	Isolated artefact	Low	Extant	Nil	Monitor and manage according to ACHMP and AHIP.
37-3-0534	Ashton Hunter River slope site	Artefact scatter, Hearth	High (part of site)	Partially salvaged	Nil	Monitor and manage according to ACHMP and AHIP.
37-3-0802	SA13/3	Artefact scatter	Low	Extant	Nil	Site located outside of AHIP no impacts
37-3-1147	AFA52 AFA53 AFA54	Artefact scatter	Low	Partially salvaged  Artefact scatter located on exposed track.	High  Site located within subsidence crack zone for ULLD	Manage according to AHIP #1131017 & ACHMP
37-3-0512	ASH16	Artefact scatter	Low	Salvaged	Nil	Site has been salvaged
37-3-0513	ASH17	Artefact scatter	Medium	Extant	High  Site located within subsidence crack zone for ULLD	Manage according to AHIP #1131017 & ACHMP
37-3-0514	ASH18	Artefact scatter	Low	Partially Salvaged	Low  Loci of site situated outside of ULLD subsidence crack zone	Monitor and manage according to ACHMP and AHIP.

<b>AHIMS No.</b>	<b>Site Name</b>	<b>Site Type</b>	<b>Archaeological Significance</b>	<b>Description (incl. status)</b>	<b>Predicted Impact</b>	<b>Management Measures</b>
37-3-0515	ASH19	Isolated artefact	Low	Partially salvaged	Moderate-High Site located within subsidence crack zone for ULLD	Manage according to AHIP #1131017 & ACHMP
37-3-0517	ASH21	Isolated artefact	Low	Salvaged	Nil	Site has been salvaged
37-3-0518	ASH22	Artefact scatter	Low	Salvaged	Nil	Site has been salvaged
37-3-0540	EWA67	Artefact Scatter	Low	Extant	Nil Site located outside of ULLD subsidence crack zone	Site located outside of AHIP no impacts
37-3-0550	EWA68	Artefact Scatter	Low	Extant	Nil Site located outside of ULLD subsidence crack zone	Site located outside of AHIP no impacts
37-3-1148	AFA55	Artefact scatter	Low	Partially impacted	Moderate- High Site located within subsidence crack zone for ULLD	Manage according to AHIP 1130976 & ACHMP





**Figure 2: AHIMS Sites, ULLD Predicted Subsidence Crack Zone & Ponding**

- AHIMS Site
- AHIP Boundaries
- ULLD EP Project Area
- ULLD LW201-204 Predicted Subsidence Crack Zones
- Predicted Ponding Locations
- Access Tracks
- River
- Creeks (original course)



**Map Projection:**  
GDA 1994 MGA Zone 56

**Data Sources:**

LPI - 2012  
AECOM - 2016  
ACOL - 2012  
nearmap - 2016

**Project Ref:** 20170051

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