



September 2020

GLENCORE

GLENDELL CONTINUED OPERATIONS PROJECT

Response to Submissions - Part B

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Glencore

Project Director: Bret Jenkins
Project Manager: Bridie McWhirter
Report No. 4166F/V1
Date: September 2020



Newcastle

75 York Street Teralba NSW 2284

T| 1300 793 267 E| info@umwelt.com.au

www.umwelt.com.au





Disclaimer

This document has been prepared for the sole use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that for which it was supplied by Umwelt (Australia) Pty Ltd (Umwelt). No other party should rely on this document without the prior written consent of Umwelt.

Umwelt undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. Umwelt assumes no liability to a third party for any inaccuracies in or omissions to that information. Where this document indicates that information has been provided by third parties, Umwelt has made no independent verification of this information except as expressly stated.

©Umwelt (Australia) Pty Ltd

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
V1	Bret Jenkins	5/8/2020		
	Barbara Crossley	5/8/2020		
V2	Bret Jenkins	19/8/2020		
V3	Bret Jenkins	21/8/2020		
V4	Bret Jenkins	02/09/2020		



Table of Contents

1.0	Intro	auction	1
2.0	Distu	rbance Area Amendment	4
3.0	Herit	age Submission Analysis	6
	3.1	Overview	6
	3.2	Heritage Submissions	7
	3.3	Aboriginal Cultural Heritage	7
4.0	Resp	onse to Agency Submissions	9
	4.1	Biodiversity and Conservation Division – Department of Planning, Industry and Environment	9
	4.2	Heritage Council	10
5.0	Resp	onse to Community and Interest Group Submissions	65
	5.1	Aboriginal Cultural Heritage	65
6.0	RAP	Feedback on Revised ACHAR	69
	6.1	RAP Feedback on Homestead Relocation	74
7.0	Prop	osed Additional Management Measures	75
8.0	Refe	rences	78
9.0	Abbr	eviations	79
Fig	ures		
Figure	1.1	Project Locality	2
Figure		Glendell Continued Operations Project	3
Figure Figure		Additional Disturbance Area amendment Extent of Survey Effort	5 14
Figure		Map of Events across the Hunter Valley 1824-1827	15
Figure		Hunter Valley Conflict Events	16
Figure		Aerial view of the Place identifying the location of the principal components of the	
		Place, the Ravensworth Estate core remains and other sites within the boundaries of the Place	24
Figure	4.5	Aerial view of the Core Estate Lands identifying the location of the Ravensworth Homestead Complex and other sites associated with the early development of the	
		estate lands	25
Figure	4.6	Site plan of the Ravensworth Homestead Complex	27
Figure	4.7	Viewshed from the Ravensworth Homestead Complex	29
Figure	4.8	Diagram of the Core Estate Lands showing indicative grades of significance for the	2.4
Eiguro	4.0	principal components	34 57
Figure Figure		Building Footings Proposed cutline location for the Main House	57 59
Figure		Location of Ravensworth Farm Recipient Site in relation to existing underground	33
-		workings	62



Plates

Plate 4.1 Plate 4.2 Plate 4.3 Plate 4.4 Plate 4.5 Plate 4.7 Plate 4.6	Aerial view of Ravensworth Homestead Complex Aerial view of the Dunmore House homestead complex Aerial view of Bolwarra. Aerial view of Negoa Aerial view of Kinross Aerial view of Abbey Green Aerial view of Tocal	37 37 37 38 38 38
Graphs		
Graph 3.1	Total Number of Supporting, Comment and Objecting Submissions from Community and Interest Groups for Each Area	ϵ
Tables		
Table 3.1 Table 4.1 Table 4.2 Table 4.3 Table 4.4 Table 4.5 Table 5.1 Table 6.1 Table 6.2	Community Member and Interest Group Heritage Submissions by Location Changes to Statement of Significance criteria Assessment of Significance against the extension of open cut mining operations LSJ Ranking of Significance Before and After Relocation/Rebuilding Preliminary Building Cutline Summary of Similar Intact Move Projects Summary of PCWP consultation throughout ACHA Process Summary of RAP feedback on revised ACHAR Comment on matters raised in PCWP response to Revised ACHAR	58 60 68 69

Appendix 1	Register of Submitters
Appendix 2	Expanded Analysis and Statement of Significance of the Ravensworth Homestead
	Complex
Appendix 3	Revised ACHAR
Appendix 4	Addendum to Move Methodology Report (Commercial in Confidence)
Appendix 5	Summary of investigation and due diligence work completed
Appendix 6	Previous Projects by Mammoth Movers and CVs
Appendix 7	Intact Move Risk Assessment
Appendix 8	Dismantle and Rebuild Risk Assessment
Appendix 9	RAP Response to Homestead Relocation



1.0 Introduction

The existing Glendell Mine forms part of the Mount Owen Complex located within the Hunter coalfields in the upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres (km) north-west of Singleton and 24 km south-east of Muswellbrook (refer to **Figure 1.1**). Mount Owen Complex was identified in the Environmental Impact Statement (EIS) for the Glendell Continued Operations Project (SSD 9349 and SSD 5850 Modification) (the Project) as the Mount Owen Complex. Mount Owen Complex is owned by subsidiaries of Glencore Coal Pty Limited (Glencore). The proponent is proposing to extend the life of operations at the Glendell Mine and optimise the use of infrastructure at Mount Owen Complex by extending mining in the existing Glendell Pit to the north (the Project) (refer to **Figure 1.2**).

The EIS for the Project was placed on public exhibition from 11 December 2019 to 14 February 2020. A total of 359 submissions were made in response to the public exhibition of the Project EIS. This included 16 agency submissions and 343 community and interest group submissions. The 343 submissions received included 205 submissions in support of the Project.

Part A of the Response to Submissions (RTS Part A) (Umwelt, 2020) was prepared to address all public and agency submissions relating to non-heritage matters and was submitted to the Department of Planning, Industry and Environment (DPIE) on 15 May 2020. RTS Part A provides a project summary and detailed analysis of all submissions, by issue theme and by geographic distribution.

This further Response to Submissions (RTS Part B) has been prepared by Umwelt (Australia) Pty Limited (Umwelt) on behalf of Glencore considering the DPIE draft guideline on Preparing a Submissions Report (draft guideline) (DPIE 2019). RTS Part B seeks to address specific heritage issues raised in agency, community, and interest group submissions. This RTS Part B considers both Aboriginal and non-Aboriginal heritage matters.

During the preparation of RTS Part B, ongoing consultation and assessment work was undertaken to respond to the issues raised in submissions in relation to heritage. This additional work was undertaken to inform Glencore's response to the Heritage Council submission and the Biodiversity Conservation Division of DPIE (BCD; now Heritage NSW) submission as well as the Plains Clans of the Wonnarua People (PCWP) Values Report (submitter ID SE-120516) and a separate community submission (submitter ID S-121212).

Since the submission of the EIS, PCWP have provided their Cultural Values Report for inclusion in the Aboriginal Cultural Heritage Assessment for the Project. The Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Project has been updated to include PCWP cultural values. This revised ACHAR was then provided to RAPs for review and a summary of the feedback received on the revised ACHAR is addressed in **Section 6.0**.

RTS Part B also provides details of minor amendments to the proposed disturbance area following further development of infrastructure design details. These amendments to the disturbance area are minor in nature and will not result in any increase in the environmental impacts of the Project.

Appendix 1 provides a register of objecting, supporting, and commenting submitters for the Project. It also provides cross-references to relevant sections of RTS Part A document and this RTS Part B document which address the key issues or comments.

It is noted that a separate response has been provided to the issues raised by the submission from the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development, established under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (IESC). The IESC submission was provided after the other submissions due to the timing of the IESC meeting schedule. The response to IESC was submitted to the DPIE on 7 August 2020.



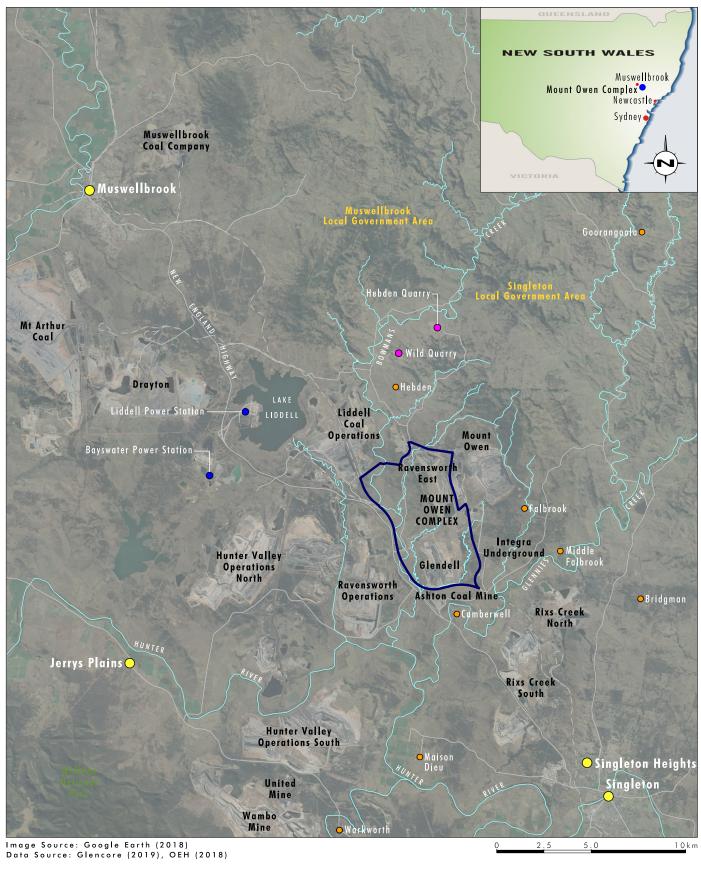




FIGURE 1.1

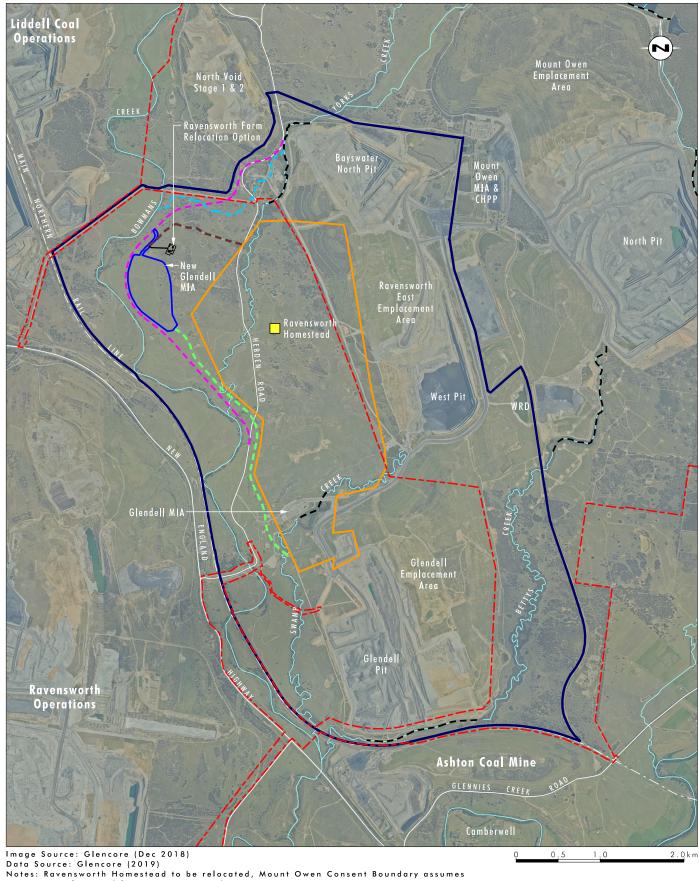
Project Locality

Drainage Line

Village/Localities

Towns





Narama Pipeline Modification is approved

Legend

Project Area Glendell Pit Extension **□□** Mount Owen Consent Boundary Ravensworth Homestead --- Existing Creek Diversion --- Construction Access Road

Project Features: New Glendell MIA --- Heavy Vehicle Access Road --- Yorks Creek Realignment --- Hebden Road Realignment

FIGURE 1.2

Glendell Continued Operations Project



2.0 Disturbance Area Amendment

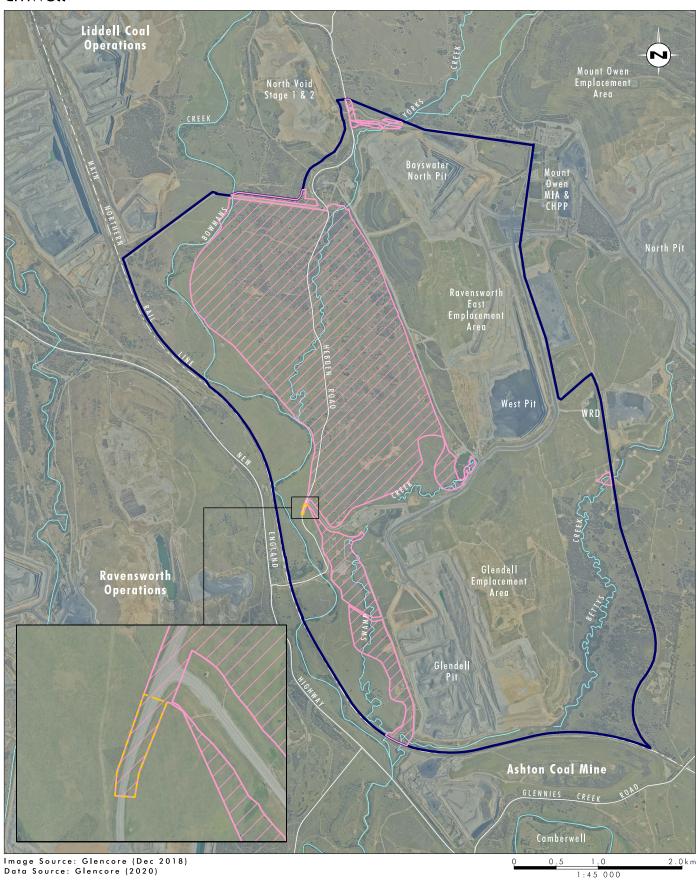
Following further development of the intersection upgrade design at the existing Glendell MIA, there is a minor amendment required to the proposed Additional Disturbance Area for the Project. This amendment is required to enable the refined intersection design to be constructed.

The current proposed Additional Disturbance Area covers approximately 750 ha, and the revisions include an additional 0.3 ha. The additional area (0.3 ha) is within the current proposed Project Area. **Figure 2.1** identifies the minor amendment to the Additional Disturbance Area. Assessment of this area has confirmed that the area is Category 1 – Exempt Land, which was determined through analysis of past aerial photos. Category 1 Land is identified as 'land cleared of native vegetation as at 1 January 1990' within the Local Land Services Act 2013. The classification of this land as Category 1 land means that it does not require assessment under the *Biodiversity Conservation Act 2017*.

This amendment to the Additional Disturbance Area is minor in nature and will not result in any increase in the environmental impacts of the Project.

On completion of the road design, should the road design encroach upon the adjoining Glencore owned land, a property boundary adjustment will be undertaken so that the final road formation is contained within the road reserve.





Legend

Project Area
Additional Disturbance Area
Additional Disturbance Area Amendment

FIGURE 2.1

Additional Disturbance Area Amendment



3.0 Heritage Submission Analysis

This section provides a summary of submissions made on the Project that raised heritage issues. Further details of the analysis of all submissions by issue theme and by geographic distribution is provided in Section 2.0 of RTS Part A.

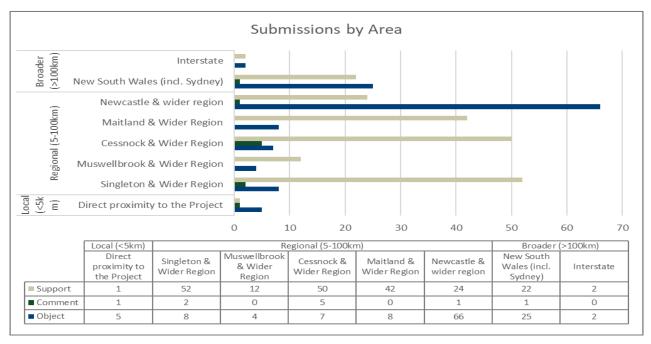
3.1 Overview

During the Project EIS public exhibition period from 11 December 2019 to 14 February 2020, 359 submissions were made on the project, comprising 16 government agency submissions, 16 interest group submissions and 327 community submissions.

The 343 community and interest group submissions received on the Project were classified into spatial areas to allow analysis of the submissions on a local, regional and broader scale. For the purposes of this analysis, 'Local' areas were classified as being in direct proximity to the Project (<5 km), 'Regional' areas were classified as locations being between 5 to 100 km of the Project and 'Broader' areas were submissions which were received from locations of greater than 100 km distance from the Project. Agency submissions were not classified into areas as the location of agency submissions is dependent on the location of the agency office.

The areas were defined by grouping submitter locations based on the proximity to the Project and the closest nearby regional centre such as Singleton or Cessnock.

Of the 343 submissions, seven submissions were from areas in direct proximity to the Project categorised as Local, 281 submissions were from areas categorised as Regional, and 52 submissions were received from broader areas (wider NSW and Interstate). It should also be noted that three submissions were received which did not specify their location. **Graph 3.1** indicates the number of community and interest group submissions received for each area.



Graph 3.1 Total Number of Supporting, Comment and Objecting Submissions from Community and Interest Groups for Each Area

© Umwelt, 2020



3.2 Heritage Submissions

Agency submissions regarding heritage matters were received from the Heritage Council and the BCD (now Heritage NSW). These are addressed in **Section 4.0**. Specific issues raised by the Heritage Council are responded to in **Section 4.2**, and a revised Statement of Significance (LSJ, 2020) is provided as **Appendix 2**, incorporating the outcomes of additional research undertaken for this RTS Part B.

A summary of heritage related submissions from community members and interest groups is provided in **Table 3.1** showing the location of submitters. With regard to heritage matters, a total of 19 submissions were received in objection to the Project, 10 comments were received, and 29 submissions were received in support of the Project.

Table 3.1 Community Member and Interest Group Heritage Submissions by Location

Location	Objection	Comment	Supportive
Local Area	4	0	0
Regional Area	13	8	27
Broader Area	2	2	1
Not specified	0	0	1
Total	19	10	29

Of the 29 supportive submissions specifically relating to heritage aspects, eight of these submissions provided general support for the relocation of the Ravensworth Homestead, and the remaining 21 submissions provided specific support for the relocation of the Ravensworth Homestead complex to the Broke township (Option 2).

Responses to community and interest group submissions relating to heritage issues are provided in **Section 5.0**.

3.3 Aboriginal Cultural Heritage

During the preparation of the Project EIS, an Aboriginal Cultural Heritage Assessment Report (ACHAR) was undertaken in accordance with the relevant guidelines (DECCW 2010). The preparation of the ACHAR by Australian Cultural Heritage Management (ACHM) (Appendix 22 of the Project EIS) was informed by:

- the collection of scientific data through the completion of a detailed archaeological survey and assessment by OzArk Environment and Heritage (OzArk) (Appendix 22 of the EIS),
- comprehensive historical research involving detailed review and analysis of primary and secondary sources in relation to interactions between Aboriginal people and early settlers within and around Ravensworth Estate and more broadly the upper Hunter Valley between the 1820s and the mid 1830s by Dr Mark Dunn (Appendix 22 of the EIS),
- extensive consultation with Registered Aboriginal Parties (RAPs), in accordance with the Aboriginal
 Cultural Heritage Consultation Requirements for Proponents 2010 (ACHCRs; DECCW 2010), to inform
 the preparation of the ACHAR. The extensive consultation undertaken with RAPs during the
 preparation of the ACHAR involved site visits, presentations, workshops and interviews, attendance at
 the archaeological surveys and circulation of the draft ACHAR for review and comment.



One RAP group, the Plains Clans of the Wonnarua People (PCWP), attended the archaeological surveys but declined to participate in the cultural heritage interviews and workshop processes. The PCWP provided their own Cultural Values Report after the completion of the consultation period required by the ACHCRs, after the EIS exhibition period, and after the preparation of RTS Part A.

Subsequently, this RTS Part B includes a revised ACHAR (provided as **Appendix 3**), updated following the receipt of the PCWP Values Report, which includes a review of the PCWP Values Report, incorporated as an appendix to the revised ACHAR. The revised ACHAR was also re-circulated to RAPs for further comment from 21 July 2020 to 19 August 2020. These comments have also been considered in the revised ACHAR.

Specific response to the PCWP submission is provided in **Section 5.1** and response to the PCWP Values Report is included in the revised ACHAR in **Appendix 3**.



4.0 Response to Agency Submissions

4.1 Biodiversity and Conservation Division – Department of Planning, Industry and Environment

The following section provides an overview discussion of responses to the items raised by the BCD (now Heritage NSW). Heritage NSW submissions are provided in text boxes below, and the response follows.

Aboriginal Cultural Heritage

10. BCD is satisfied that consultation with the Aboriginal community has been undertaken in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010. BCD notes that consultation with one registered Aboriginal party is ongoing and should conclude prior to the preparation of the response to submissions report.

Following extensive consultation undertaken in accordance with the ACHCRs throughout the project assessment phase, as outlined by BCD (Heritage NSW), one remaining RAP - the PCWP - were yet to provide their cultural values relating to the Project Area. This was received on 25 June 2020, after the conclusion of the EIS exhibition period. The heritage advisor appointed to compile the ACHAR for the Project, Dr Shaun Canning (ACHM), has reviewed the PCWP Cultural Values Report and has provided a summary overview of the contents which is included as revised Section 6 of the ACHAR for the Project. Further discussion of the PCWP Cultural Values Report is provided in **Section 5.1**.

The revised ACHAR, including the PCWP Values report, has been provided to the Project RAPs for information and comment, in accordance with the ACHCRs. Those feedback comments received in the required 28 day consultation period have been noted and considered in the ACHAR. The revised ACHAR is provided as **Appendix 3** to this RTS.

It should be noted that the outcomes of the assessment of cultural values and significance by ACHM has not changed following consideration of the PCWP Values Report as part of the Aboriginal Cultural Heritage Assessment (ACHA). Further detail is provided in **Appendix 3**.

11. BCD is satisfied that the significance assessment of the Aboriginal cultural heritage values of the project area have been adequately accessed (sic), as well as any potential impacts on those values.

Noted. The Aboriginal cultural heritage values recorded in the ACHAR have been revised where appropriate to incorporate consideration of the PCWP Values Report. As noted in Comment 10 above, the additional Cultural Values Report was provided by PCWP on 25 June 2020, however, the inclusion of these values has not changed the overall outcomes of the assessment. An overview of those findings has been incorporated in Section 6 of the revised ACHAR, provided as **Appendix 3** to this RTS.

The PCWP Values Report included some proposed mitigation/management measures which have been considered by the Project and the recommended management and mitigation measures shown in the ACHAR have been revised, refer to **Section 7.0**.



12. BCD recommends that the Mt Owen Open Cut, Aboriginal Cultural Heritage Management Plan, V4 (XMO SD PLN 0060), 29 May 2018, is revised to include all additional Aboriginal sites and cultural values.

The Aboriginal Cultural Heritage Management Plan (ACHMP) for the Mount Owen Complex will be revised in consultation with the Mount Owen Complex Aboriginal Cultural Heritage Working Group (ACHWG) and Project RAPs.

The additional Aboriginal sites recorded in the Aboriginal Archaeological Impact Assessment prepared by OzArk (Appendix 22 of the EIS) will also be included in the updated ACHMP.

Glencore commits to consider the cultural values identified in the ACHAR in the revision of the ACHMP for the Mount Owen Complex including revised management actions (refer to **Section 7.0**). Management measures for on-site heritage management recommended in the ACHAR will be included in the Mount Owen Complex ACHMP.

4.2 Heritage Council

The following provides an overview discussion of responses to the items raised by the NSW Heritage Council in their submission dated 11 February 2020.

To provide clarification of where the issues raised by the Heritage Council were addressed in the EIS, Lucas Stapleton Johnson (LSJ) prepared a letter or of advice to Glencore seeking to clarify issues raised by the Heritage Council which was issued to DPIE on 4 March 2020. Further, DPIE facilitated a teleconference between Heritage Council members, Glencore, LSJ and Umwelt on 16 April 2020 which provided further understanding of the issues raised and the additional detail required by the Heritage Council as part of this Response to Submissions (RTS).

Following this correspondence, additional research, analysis and assessment has been undertaken to address the Heritage Council's submission. LSJ have prepared an *Expanded Analysis of the Ravensworth Homestead Complex*, provided as **Appendix 2** in which certain aspects of the analysis and assessment of significance for the Ravensworth Homestead Complex were re-examined, leading to a revised Statement of Significance for the whole of the Place.

It should be noted that the additional research and analysis provided in **Appendix 2**, resulted in clarification only of aspects of the significance of the place and did not result in any substantial change to the understanding of or level of significance previously identified in the Statement of Significance included in Appendix 23a of the EIS.

A summary of the identified levels of significance (State or Local) under each of the criteria of heritage significance (as per the NSW Heritage Council's publication *Assessing Heritage Significance*, 2001) for both the original Statement of Significance (SoS) and the revised version is provided in **Table 4.1** below.

Table 4.1 Changes to Statement of Significance criteria

Changes to Statement of Significance Criteria	Previous Statement of Significance (LSJ, 2019)	Revised Statement of Significance
(a) Historical significance	State and Local	No change
(b) Historical associational significance	State and Local	No change
(c) Aesthetic and/or Technical significance	State and Local	No change
(d) Social, Cultural or Spiritual significance	State and Local	No change
(e) Research potential	State and Local	No change



Changes to Statement of Significance Criteria	Previous Statement of Significance (LSJ, 2019)	Revised Statement of Significance
(f) Rarity	State and Local	No change
(g) Representativeness	State and Local	No change
(h) Historical associational significance	State and Local	No change

Glencore believes that the SEARs were met in the EIS, however, additional information as requested by the Heritage Council is provided in the following sections to address the issues raised.

The Heritage Council submissions are provided in text boxes below, and responses follow. Responses include references to revisions to key supporting documents, which are provided as appendices to this RTS Part B, and form part of the response.

The EIS has not adequately addressed the following SEARs for the Project. It is requested that the EIS is updated with further information based on the following dot points:

2 d) an assessment of the potential impacts of the development on Aboriginal heritage (cultural and archaeological), including consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage;

Following extensive consultation undertaken in accordance with the ACHCRs (DECCW 2010) throughout the Project assessment phase, as outlined in the Heritage NSW submission above, one remaining registered Aboriginal party - the PCWP - had not provide their advice on cultural values relating to the Project Area.

Following the preparation of RTS Part A, a PCWP Cultural Values Report containing their cultural values relating to the Project area was received on 25 June 2020. This report is provided as an appendix of the revised ACHAR (**Appendix 3**).

In summary, the PCWP Values Report describes the strong connection of the members of the PCWP to the lands of the upper Hunter Valley, the area of their former Native Title claim. (The PCWP Native Title Claim "Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People" (NC2013/006) is shown as having "Discontinued" status in searches of the NT Register conducted at the time of compiling this RTS Part B document (04/08/2020,

http://www.nntt.gov.au/searchRegApps/NativeTitleClaims/Pages/details.aspx?NTDA_Fileno=NC2013/006). No replacement or alternate claim has been lodged at the time of preparing this report. As such, the PCWP are no longer a Native Title Claimant under the *Native Title Act 1993* (Cth).

The PCWP Values Report describes specific first-hand connections to locations in the Glennies Creek area and surrounding vicinity, including family farming land and a stone arrangement Aboriginal site through stories told by PCWP family members and recollections of stories told by their ancestors. The report also notes significant Aboriginal cultural sites more broadly across the Hunter Valley. This includes Baiame Cave at Milbrodale, approximately 33 km south near the edge of the Hunter Valley, and a bora ground near the present day township of Bulga, approximately 23 km to the south of Ravensworth near the Wollombi Brook. The cultural information provided in the PCWP Values Report is consistent with other cultural connection reports previously provided by PCWP to Glencore including for the adjacent Mount Owen Continued Operations Project (PCWP, 2013) and the United/Wambo Joint Venture Project (PCWP, 2015). The 2020 PCWP Values Report provides limited new cultural values information specific to the Project Area.



In addition, the PCWP Values Report contains an anthropological report prepared by Dr Neale Draper which is mostly consistent with early contact historical research completed by Dr Mark Dunn from his thesis, "A Valley in a Valley: Colonial struggles over land and resources in the Hunter Valley, NSW" (2015), and the historical paper prepared for the Project EIS and included in Appendix 22, "Ravensworth Contact History" (2019). Draper's interpretation of historical research by Dr Dunn and others appears to focus on conflict associated with Ravensworth Estate and incorrectly suggests that Ravensworth Estate was the focal point of that conflict. Research by Dr Dunn identified numerous other armed clashes between settlers supported by government forces and Aboriginal people more broadly across the Hunter Valley during the same period (1822 to 1827). These events stretch from colonial properties of Merton and Pickering approximately 32 km on western side of the Hunter Valley (near present day township of Denman), an area 8 km to the east in the current Glennies Creek area, other clashes at Segenhoe approximately 33 km to the north, and at Gostwyk near Paterson around 56km to the southeast. As such, whilst these events were devastating for the victims, they are not unique to the Ravensworth Estate and nor was the nature of these events specific to the area around the Ravensworth Estate.

Refer to Section 6.11.4 of the updated ACHAR (**Appendix 3**) for further details on Dr Dunn's response to Draper's historical interpretation.

The heritage advisor appointed to compile the ACHAR for the Project, Dr Shaun Canning (ACHM), has reviewed the PCWP Values Report and has included a summary overview of the contents which is included as Section 6 of the revised ACHAR for the Project (provided as **Appendix 3**). The PCWP values are considered in the ACHAR along with the cultural and historical values provided during the project consultation phase which engaged the other 31 RAPs. The revised ACHAR including the PCWP Values Report was provided to the Project RAPs for information and comment, and those comments have also been considered in the revised ACHAR (**Appendix 3**).

It should be noted that the outcomes of the assessment of cultural values and significance has not changed following inclusion of the PCWP Cultural Values Report as part of the ACHA. Further detail is provided in **Appendix 3**.

i. The EIS has identified that the site has a very significant pre and post contact Aboriginal history. This history will be included in the SHR nomination assessment.

Contrary to the comment by the Heritage Council, included in their submission, while the historical record does record Ravensworth Estate in the contact phase of British settlement in the Hunter Valley, the role of the Estate is not highly significant or different to what was happening elsewhere in the district. In terms of tangible archaeological items, neither the ACHA or the archaeological study for the Project EIS has identified that the Project Area has any highly significant Aboriginal objects or deposits. For example, it is noted that no burials have been recorded at the Mount Owen Complex despite over 40 years of often intensive investigation. The EIS identified that the Aboriginal archaeology in the Project Area is generally of low scientific significance due to historic disturbances in the area, widespread soil loss, being in a fragmented archaeological landscape, and the varying degrees of archaeological salvage that have been carried out in the past. The ACHA found that the RAPs did not identify specific cultural significance associated with the Project Area. Rather these RAPs hold cultural values which relate to the wider Hunter Valley region generally, and some specific key cultural sites such as Baiame Cave and Lizard Rock located around 33km to the west. Very little additional cultural information was presented in relation to the Project Area throughout the RAP consultation process undertaken for the Project (refer to Section 7.7.7 of the EIS and the revised ACHAR).



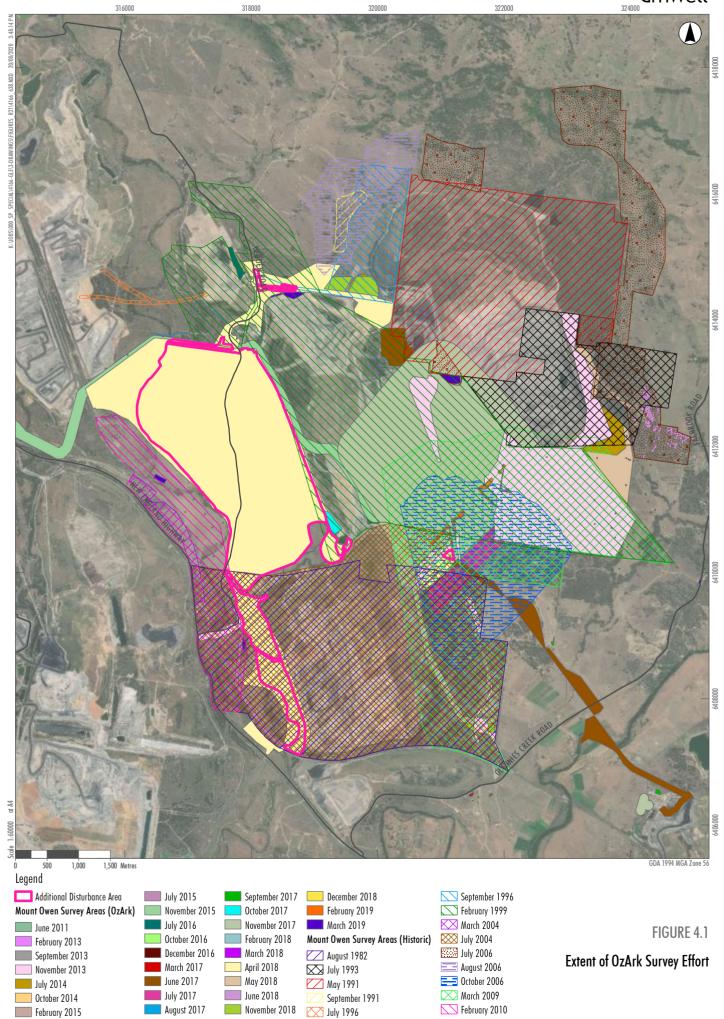
Further, the Project vicinity has been extensively studied from an archaeological and cultural heritage perspective, by many archaeological firms. OzArk has identified numerous archaeological and cultural heritage assessments having been completed for previous nearby projects such as the Mount Owen Continued Operations Project (MOCO Project) in 2013. The extensive history of detailed archaeological surveys and the extent of those surveys is provided by OzArk in **Figure 4.1**. While some of these assessments have recorded evidence of the contact period, most notably in the form of knapped glass objects, no evidence has been forthcoming that suggests that the Project Area was of special importance during the pre-contact period for the Aboriginal occupants. Further, despite intensive investigations, no tangible evidence of conflict has been recorded and no burials have been noted; either from the contact period or earlier. Section 6 of the ACHAR (**Appendix 3**) provides further detail.

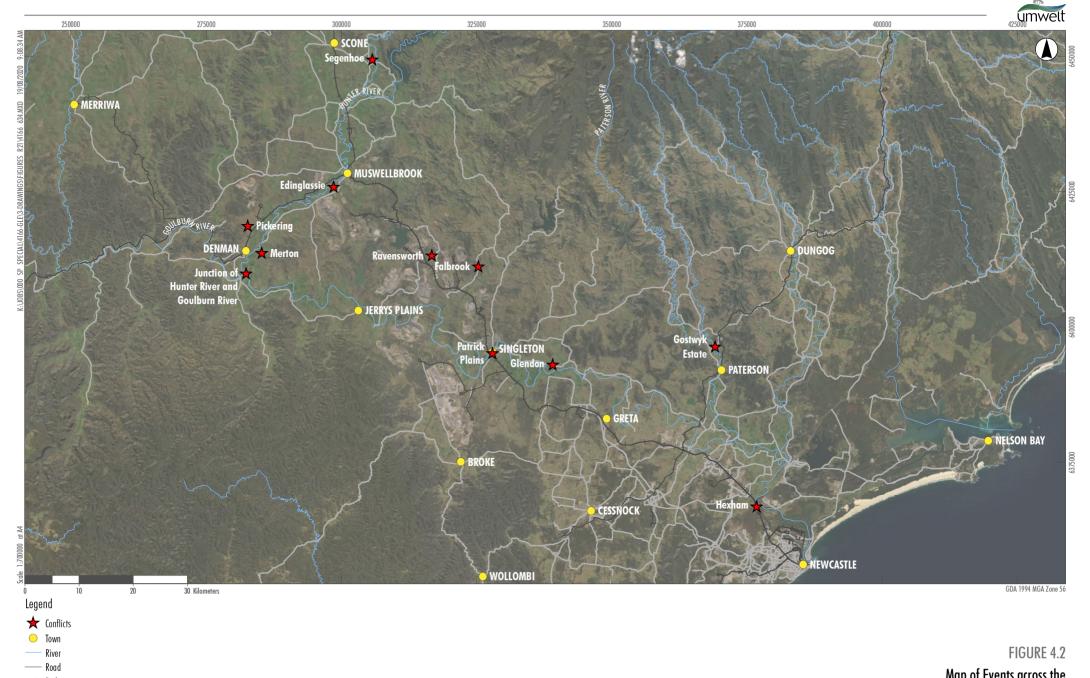
The PCWP Cultural Values Report has identified some nearby areas of cultural significance to the PCWP, such as a stone arrangement; however, these specific locations are outside the Project Area, and are not affected by the Project.

In relation to post-contact Aboriginal history, Ravensworth Estate was the site of encounters between the British settlers, convicts and local Aboriginal people in the second half of the 1820s. Those events that occurred at and around the Ravensworth Estate are described in detail in Dr Dunn's historical research contained in the ACHAR (Appendix 3). However, it is important to note that the Ravensworth Estate was only one of the estates and farm sites at which encounters occurred, there being no central place of conflict but rather a series of clashes across the region that coincided with European settlement. In the period between 1824 and 1827, multiple attacks and raids were recorded across the entire length of the Hunter Valley from Maitland and Gostwyck in the lower valley, around Singleton and all the way to Denman and near Scone. Figure 4.2 shows the extent of events which occurred across the Hunter Valley region, as described by Dr Dunn's historical analysis (Appendix F of Appendix 3). Further, Figure 4.3 shows a timeline of these conflict events across the Hunter Valley between 1824 and 1827.

It must be emphasised the encounters that occurred across the Ravensworth Estate were not unique.







NOTE: Location of conflict as marked is approximate only
Image Source: ESRI Basemap Data source: DFSI (2020)

Map of Events across the Hunter Valley 1824 - 1827

Robert and Helenus Scott's John Platt reported his crop of maize was Two stockman as well as a convict working **HUNTER VALLEY** crop was raided at Glendon on destroyed by a fire, as well as a barn with his for Captain John Pike on his estate the Hunter River near harvest, his farm implements and some of Pickering are attacked in separate Conflict Event Timeline Singleton. Robert Scott caught his livestock killed at his farm at Ironbark incidents. Pike's estate, Pickering, was on the Hunter River close to its junction with and held one of the raiders for Hill, near present day Hexham and implied it Two shepherds killed on a day, hoping this would was the work of Aboriginal raiders as had the Goulburn River approximately 34km to Ravensworth Estate. Figure 4.3 the west of Ravensworth and close to Greig. discourage further attempts. occurred at his farm twice prior to this event. Location unknown. Settler Robert Greig is speared A shepherd working for George and killed at the hut of his Forbes at his estate Edinglassie is speared and wounded. Edinglassie cousin James Greig on the Initial Land Grant to Dr James Hunter River near its junction is up the Hunter River from James Chilcott attacked in his Bowman of 10,000 acres Pickering (approximately 13km with the Goulburn River. An hut on Fal Brook (Glennies north) between the modern towns known as Ravensworth unnamed convict servant is Creek) located approximately Two fence workers attacked also killed in the incident. of Denman and Muswellbrook. 10km to the east of Ravensworth. Estate Lands. on Ravensworth estate. JUN DEC 28 OCT JUNE JUNE 18 JUNE 20 JUNE 1824 1824 1824 1825 1826 1826 1826 1826 JUL/AUG 1826 Aboriginal men allegedly involved in Governor Darling calls for an 200 warriors go to Merton attacks on Bowman's and Chillcott's inquiry into the activities of the are captured by mounted police. These homestead in last week of August mounted police at Hunter River in response to mounted police men were subsequently shot while and the troops are recalled to arrests. No report of violence after attempting to escape according to Mrs Ogilvie and son talk to the men Newcastle. police testimony. Location unknown. Scott's party raids Aboriginal 1 AUG camp 32 miles (20 kilometres) 1826 from Alcorn's hut resulting in Jackey-Jackey executed at deaths of up to 18 Aboriginal 28 AUG 12 AUG 30 AUG 28 AUG Late AUG c12 AUG Wallis Plains police station. people. This incident has been 1826 1826 1826 1826 1826 1826 referred to as a massacre. 2 SEP 1826 Magistrate Robert Scott organises Hut of Richard Alcorn on Fal One Aboriginal man allegedly a party of mounted police, Brook attacked. Two Europeans shot in a tree one mile from Mr Aboriginal trackers and settlers to killed and two wounded. Bowman's hut (first pursue the Aboriginal warriors Ravensworth homestead site). 11 Settlers on Hunters River write a petition 4 SEP who attacked Alcorn's Hut. He to Governor Darling calling for the military 1826 rides from the hut of James not to be withdrawn and for more Glennie on Fal Brook on 30 August protection from Aboriginal raids. Signatures were from Dr J. Bowman, Peter McIntyre, A.B. Sparke, Leslie Duguid, J. Gaggin, John 5 SEP Cobb, T.W. Winder, David Maziere, William LATE LATE FEB 25 MAR **28 MAR** Mid-1827 1826 3 OCT NOV Ogilvie, H. Malcolm, John Brown. 1826 1827 1826 1827 nward 1826 1827 Governor Darling sends a response to the settlers petition rebuffing the settlers for Five fence workers at Child of John and Catherine Hut of George Claris of Reports of violence in the not being on their estate. Ravensworth ambushed by Hunt at Patricks Plains Redbournberry near Hunter Valley declined. Aboriginal attackers. None (Singleton) is kidnapped by Singleton is surrounded by were injured. Aboriginal man known to the warriors including Bit-Ofamily who was called Bit-O-Bread but not attacked. Bread. John Elliott a blacksmith at 12 Aboriginal people were killed Samuel Owen, an overseer at Segenhoe Estate avoids an during an altercation at the Ravensworth is confronted by ambush by warriors on the road Gostwyck estate of Edward Cory on Aboriginal warriors, including after being warned by an the Paterson River, approximately Girrogan who challenged

55km south east of Ravensworth,

close to present day Paterson.

Owen. Incident is broken up

by arrival of Cobborn Mary, wife of Bit-O-Bread

Aboriginal man he knew



- ii. The Heritage Council notes that the EIS outlines that Aboriginal significance of the site is assessed as low-moderate based on an assessment of the scientific significance of the Aboriginal archaeology present within the Homestead area and wider estate lands. However, an interrogation of the relationship between the Homestead and Aboriginal people has not been fully investigated. The EIS focuses on specific events and their locations rather than undertaking an assessment of the wider Aboriginal cultural heritage significance related to the sites social and intangible values as the place of contact between and the reason for conflict among Aboriginal groups and European early setters.
- iii. The impacts on these potentially significant values from the proposal have not been assessed.

The EIS does identify that the scientific significance of archaeological evidence obtained for the Project, and for previous surveys on the Project area, have not identified any archaeological evidence of scientific significance above low to moderate. The classification of scientific significance for artefacts or places is only one aspect of determining cultural heritage significance. The guideline "Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW" (OEH 2011) identifies that scientific significance is one of four key aspects to consider when determining cultural significance (section 2.4.1). These are social or cultural value, historical value, scientific (archaeological) value and aesthetic value.

Subsequently, the ACHA was informed with advice from the RAPs to consider all aspects of cultural significance, consistent with the assessment and consultation processes outlined in the relevant guidelines (DECCW 2010 and OEH 2011), and the assessment has been endorsed by BCD (Heritage NSW).

The relationship between Aboriginal people and the Ravensworth Homestead was questioned and raised with the RAPs during consultation undertaken for the preparation of the ACHAR and was not shown to be of significance. Some people identified that the Homestead Complex was a symbol of the period of British colonial settlement and the loss of their traditional lands. However, none of the RAPs had any direct knowledge of their ancestors having a direct association with the Ravensworth Estate (refer to **Appendix 3**).

As shown in the revised ACHAR, the PCWP have identified that they have a cultural connection to the local landscape, in particular the Glennies Creek catchment, which is outside the Project Area, and to a lesser extent the Bowmans Creek catchment. Draper identifies the Ravensworth Homestead as a symbolic reminder of the conflicts that occurred between settlers and Aboriginal ancestors in the vicinity (refer to Appendix F of Appendix 3).

It is noted that in the research undertaken by Dr Dunn (Appendix F of **Appendix 3**), and described in the report provided by Draper for PCWP, most of the conflict occurred between 1822 and 1827, and research has confirmed that the current Ravensworth Homestead was not built until 1832, and was therefore not constructed whilst most of the conflict occurred. The research also identifies that whilst some tragic clashes between settlers with support from government forces and Aboriginal people occurred on and around Ravensworth, many more similarly tragic events occurred at wide intervals across the Hunter Valley including 32 km to the west at the properties of Pickering and Merton, on Glennies Creek 8km to the east, at Segenhoe 33 km to the north, and at Gostwyk 56 km to the east near Paterson.

Additional research has been undertaken by Dr Dunn to address the Heritage Council's request that further investigations be undertaken to examine the role the Ravensworth Homestead and its wider cultural landscape played in frontier conflicts. This research is presented in **Appendix 3** and concludes that during the years 1825-1827, a series of attacks and retributions took place between Aboriginal people and the British in the middle Hunter Valley. A combination of increasing pressures on traditional food sources by the influx of settler's livestock, the locking off of land through fencing and farming, provocation by convicts against Aboriginal people all combined to create an atmosphere of tension and the potential for violence.



As noted by Dunn, a close reading of the available evidence, through newspapers, depositions and enquiries appears to show not a series of random attacks, or rampaging bands of warriors, but rather targeted attacks against individuals and isolated workers. Bowman's Ravensworth Estate was the site of three attacks resulting in two Europeans killed and two wounded, with one Aboriginal man wounded and another captured, shot and hanged. Bowman's worker Samuel Owen was also confronted close to the estate.

Dunn confirms that the Ravensworth Estate was not the only estate to be targeted. Violent clashes were spread across the Valley floor from Merton (near the present day township of Denman) approximately 32km to the west, to Segenhoe approximately 33km to the north, and Gostwyck (near present day township of Paterson) around 56km to the east, with a series of raids and attacks against mostly small, and isolated huts and outposts. **Figure 4.2** shows the widespread locations of reported incidents in the middle Hunter Valley between 1824 and 1827. The compounds that had been developed on the large estates, with the exception of Ogilvie's Merton, were rarely seriously threatened. Aboriginal people were probably aware of the danger in attacking these establishments, which were easily defended and often had sizable populations of convicts and workers around.

Some properties however were used as temporary staging posts for the mounted police and district constables, such as James Glennie's property on Fal Brook (now Glennies Creek). It was from the property of James Glennie, not Ravensworth Estate, which Robert Scott set out with his party to pursue the attackers on Alcorn's hut (also located on Fal Brook) in late 1826. The attack by this party that was reported by The Australian occurred 20 miles (approximately 32 km) from Alcorn's Hut and resulted in the death of 18 Aboriginal people. Even though the exact location of this event is unknown, the plotting of a 20 mile (32 km) radius from Alcorn's Hut situates this event well beyond Ravensworth Estate, which lies approximately 5 miles (8 km) to the north-west.

Following the completion of this additional historical research the outcomes of the assessment of Aboriginal cultural values and significance has not changed. The PCWP Cultural Values Report does not provide new cultural values associated with the Project Area and tends to focus the cultural values of the PCWP on the Glennies Creek catchment, extending through to the Jerrys Plains and Bulga areas. Further detail is provided in **Appendix 3**.

Whilst it is acknowledged that the conflicts that occurred at Ravensworth Estate, and elsewhere in that vicinity, were both tragic, and of high significance to local Aboriginal population, the research clearly shows that the conflicts around Ravensworth were no more significant than those that occurred elsewhere across the Hunter valley, or across the state. Other conflicts recorded on the Hawkesbury, at Bathurst and further west were similarly of high significance to the local Aboriginal communities that were directly affected. However, from the perspective of identifying the level of significance of Ravensworth Homestead, these events are not unique or confined to the Ravensworth Estate and therefore do not greatly elevate the historical significance of the Ravensworth Homestead in terms of rarity.

It is acknowledged British settlement of Australia resulted in tragic outcomes for Aboriginal people. Conflicts were widespread and research shows there are many varied and contradictory accounts of most episodes from different historical sources.

iv. The Heritage Council requests that the EIS should be amended to include this information. The Heritage Council considers that when the intangible values related to the role Ravensworth Homestead and its wider cultural landscape played in frontier conflicts are re-examined, the level of significance for the Aboriginal values of the site would be likely to increase. The impact the proposal would have on those values may then be weighted more heavily.



The ACHAR for the Project has been amended to include consideration of the PCWP Cultural Values Report and has been circulated for comment amongst the Project RAPs. The revised ACHAR is provided as **Appendix 3**. The additional research and analysis completed in regard to early contact history and inclusion of the PCWP Cultural Values Report has not changed the Project ACHAR's assessment of significance in relation to Aboriginal values.

As outlined in **Section 7.0**, Glencore is proposing that a specific piece of interpretive work be developed as a mitigation measure to capture the Aboriginal cultural and historical values relating to the vicinity of the Project area. This would utilise digital media and include the historical information identified in the preparation of the Project EIS and additional information prepared for this RTS, including cultural values provided by PCWP and historical connections such as St Clair Mission provided by WNAC and other RAPs. The information presented in the interpretive work will be by agreement with the Project RAPs and will be designed to be suitable for use at schools and for distribution to Aboriginal groups and historical groups. This will ensure that the story of frontier conflicts associated with the Hunter Valley is available for the education of future generations and provides an example of the consequences of the British settlement of NSW on the Aboriginal inhabitants.

The ACHMP for the Mount Owen Complex will be revised to include all sites identified during the Project assessment. Measures will be included to manage "Unexpected Finds" as required by Heritage NSW guidelines, and will include specific measures to be undertaken in the event of an unknown burial being identified, in accordance with existing site procedures at the Mount Owen Complex.

Additional research has been undertaken, as identified above, to inform this specific response including:

- Revised ACHAR (Appendix 3)
- Dr Mark Dunn's research on frontier conflicts across the Hunter (Appendix F of Appendix 3)
- The Statement of Significance and comparative analysis has been amended to include summaries of and reference to the above appendices. It is provided as **Appendix 2** to this RTS Part B.

e) in relation to Ravensworth Homestead, the EIS must include:

a detailed heritage significance assessment of the homestead, including consideration of its surrounding garden and landscape.

LSJ has prepared an expanded analysis of the Ravensworth Homestead Complex to address the issues identified under item 2(e) of the Heritage Council's submission and includes a revised Statement of Significance. The expanded analysis and revised Statement of Significance is provided in **Appendix 2** of this Part B RTS. A summary response to the matters raised by the Heritage Council under item 2(e) are provided below.

The assessment of the heritage significance of the homestead including its surrounding garden and landscape and subsequent Statement of Significance in the EIS is considered inadequate for the following reasons:

 The description of Ravensworth's connection to 'range of significant places and people' is considered inadequate. These places and people should be identified.



A detailed description of significant places and people connected to the Ravensworth Homestead was provided in Appendix 23a of the EIS, however LSJ have provided this consolidated information in Section 2.1 of **Appendix 2**. A list of the significant places and people associated with the Ravensworth Homestead is provided below, however refer to **Appendix 2** for detailed information on each of these associations.

Persons of note associated with the Place as described by LSJ in Appendix 2 include:

- Dr James Bowman (1784-1842)
- Edward Macarthur Bowman (1826-1872)
- John Larnach (1805-1869)
- James White (1798-1842)
- Captain William Russell (1807-1866)
- Duncan Forbes Mackay (1834-1887)
- Alexander Couchrian Reid (c1863-1925)
- A.C. Marshall (1891-1983).

LSJ note that given the long history of the Ravensworth Estate and the known associations with persons of note throughout this history (some of which are listed above), there are numerous other properties and sites historically associated with the place. Of particular note is the range of other homesteads/estates located throughout the Hunter Valley region that have some historic link to Ravensworth via past owners and overseers. These include:

- St Clement's Church, Camberwell
- Ashton Farm
- Other James Bowman properties such as Lyndhurst in Glebe, the General Hospital in Sydney and Australian Agricultural Co. lands
- John Larnach associations with Castle Forbes and Rosemount (Baroona)
- James White associations with Stroud Estate at Port Stephens, Broomfield, Edinglassie and Timor Station at Gundy
- Captain William Russell associations with Chesthunt Park at Whittingham and Glenridding at Patrick's Plains
- Duncan Forbes Mackay associations with Melbee at Dungog, etc.

Refer to Appendix 2 for detailed descriptions on these associations with the Place.



Further, the Statement of Significance provided in Appendix 23a of the EIS remains unchanged and states:

Established in 1824, the Ravensworth Estate is associated with a range of significant colonial places and people including Dr. James Bowman, principal surgeon of the colony of NSW, who established the estate and is one of only a few places where, under Edward Bowman, horticultural experimentation first started in Australia. The place retains tangible evidence of the colonial period including substantial archaeological remains, landscape features and cultural plantings and made more meaningful by the surviving c1832 homestead complex including its siting and configuration.

The acknowledged connection of John Verge, one of Australia's pre-eminent colonial architects, with the design of the Ravensworth Homestead and Stables, referred to in both this report (HHAA, p59) and in previous studies by the authors, has not been sufficiently considered. The analysis should include a precautionary approach including a comparison of Ravensworth with other examples of work by Verge. Furthermore, the link to Verge and the MacArthur's should be referenced in the Statement of Significance.

Appendix 23a of the EIS *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (HA&SoS), prepared by Lucas, Stapleton, Johnson & Partners, dated November 2019 provides a discussion of the possible associations with architects and gentlemen architects of the early 19th century with the design and construction of the Ravensworth Homestead Complex.

Section 4.6.2 Architectural Significance of Homestead Group within the HA&SoS includes a discussion regarding the suggestion that John Verge may have been the designer of the Stables building at the Ravensworth Homestead Complex. Specifically, the east elevation treatment of the building has led to the suggestion that John Verge may have been the designer, as it is similar to an unbuilt design by Verge for Camden Park and to the existing stables complex at Wivenhoe, Cobbitty.

In order to address the Heritage Council submission point 2 e) shown above, LSJ provided further comment on the potential associations between Ravensworth Homestead Complex and Verge, summarised below, and included in the expanded analysis of the Ravensworth Homestead Complex provided in **Appendix 2** (refer Section 2.2.1 for details).

The publication *The Australian Colonial House: Architecture and Society in New South Wales 1788-1842* (J. Broadbent, 1997) includes an extensive discussion of John Verge's architectural works of the 1830s. In this it is noted that, although practicing as an architect for only a period of 7 years (1830-1837), Verge's clients were primarily the rich and socially prominent colonists.

For these people, including John Macarthur (Camden Park) and James Bowman (Lyndhurst), Verge "produced elegant houses, well scaled, competently built and decorated with beautifully designed and resolved Greek Revival detailing; moulded shouldered architraves within and without, incised pilasters, Doric columns and egg-and-dart cornices. It is this detailing, rather than in the planning of his houses, that the strength of Verge's work lies." Broadbent notes that "from house to house, from house to chapel, from chapel to shop", Verge utilises the same finely detailed forms, more or less elaborately, depending on the client. None of these distinctive architectural details are found in the buildings at Ravensworth Complex.

Broadbent notes further that Verge's work is in keeping with late-English Neo-classical architecture, including details such as tripartite windows, French doors with external architraves, and entablatures, pilasters and parapets that distinguish Verge's work in NSW. Again, none of these attributes are exhibited at Ravensworth.



LSJ notes that the arched entry of the Ravensworth stables appears more as a design idea not fully realised rather than a developed architectural feature, and as Broadbent notes in his essay "The Heritage Significance of Ravensworth", dated May 2020 (see Appendix A of **Appendix 2**), "the untutored handling of the arcade in the flanking range and the clumsy break in levels and roof lines clearly show that in that time and place- the Hunter Valley in the late convict era- the limits of architectural expertise available did not match the aspirations of its proprietor".

When examining Verge's work for rural or country residences, the same Georgian Revival details as discussed above are used. Examples include Camden Park, Denham Court, Aberglasslyn, Tempe House, Vineyard or Subiaco (demolished) and Wivenhoe. The broken back bungalow style of the Main House at Ravensworth is far different from the sophisticated Regency villa designs known to be by John Verge and his assistant John Bibb.

LSJ also adds that two country residences that are not considered to be typical of Verge's work are Wyoming Cottage, Gosford and Bedervale, Braidwood. Both of these houses are described by James Broadbent as being examples of a "verandahed cottage rather than a bungalow". Salisbury Court in Rose Bay (now the council chambers of Woollahra Municipal Council) is another example of a Verge "verandahed cottage". Although atypical of Verge's work, the verandahed cottage was not new in the 1830s and is identified by having its verandah separate to and contrasting with the main roof of the house, rather than the integrated verandah form of the bungalow as is found at Ravensworth. Broadbent suggests that such verandahs may possibly have been regarded as less 'colonial' than bungalow verandahs.

As part of the research undertaken for the HA&SoS (Appendix 23a), available primary documentary sources were examined to try and locate any evidence that Verge was involved with the design of the Ravensworth Homestead Complex. Verge's ledgers and surviving papers contain no evidence of the Ravensworth connection.

In addition, surviving financial records for Bowman in the form of cheque butts, receipts and banking ledgers both held as colonial bank records and personal accounts and transactions¹ were also searched.

Two payments to John Verge were located, one for a small amount (approximately £30) in 1831 and a second payment in July 1840 in the amount of £226/6/3. Given that the main house at Ravensworth has been dated to c.1832, while Lyndhurst was not completed until c.1837, it seems more likely that this large payment to Verge relates to his work at Lyndhurst, where it is known that he was involved.

LSJ conclude that regardless of the above, Verge or others may have influenced the design of the Main House of the Ravensworth Homestead Complex and this is possible given his connections with both Bowman and Macarthur, although no definitive documentary evidence has, at this stage, been found to substantiate the suggestion.

The revised concluding statement by LSJ shown below, is included in the revised SoS provided in **Appendix 2**.

The group of buildings comprising the complex and including the adjacent privy are of aesthetic significance on a State level for their fine dressed stonework and finely made roof carpentry, simple architectural detailing and high-quality detailed design and execution; the group was likely designed, possibly informally, by an architect or gentlemen architect of the 1820s and 1830s and, although unproven, it is possible that Henry Kitchen, John Verge or Robert Scott influenced the design of the homestead complex.

¹ Papers of James Bowman, 1796-1860, James Bowman Account books/Bank books, 1817-1842, A4264, Macarthur Family Papers, ML and ANZ bank records. Research undertaken by Victoria Grey of University of Newcastle



 The EIS has a lack of definition of the curtilage or setting of Ravensworth Homestead and lacks an assessment of the cumulative impact of the works on the significance of the Core Estate Lands.

To respond to this issue raised by the Heritage Council, LSJ have completed an expanded analysis of the Ravensworth Homestead in relation to the curtilage and setting of the place which is provided in detail in Section 2.3.1 of **Appendix 2**, with a summary of this analysis provided below.

Curtilage

The Heritage Office publication *Heritage Curtilages*² provides guidance for identifying, conserving and managing the curtilage and setting of heritage items. "Curtilage" is described as the extent of land around a place which "should be defined as encompassing its heritage significance". This area of land is known as a heritage curtilage.

Given the former size of the Ravensworth Estate and in order to clearly identify and analyse the principal components of the estate lands, the area of land that forms the basis of the HA&SoS (Appendix 23a of the EIS) was broken into three components:

- the Place,
- the Core Estate Lands, and
- the Ravensworth Homestead Complex.

Each of these areas of land are defined below.

The Place

In order to firstly undertake a thorough assessment of the significance of the Ravensworth Homestead Complex and the associated former Ravensworth Estate lands; and secondly, to undertake an assessment of the potential impacts as a result of the proposal on features, items and areas of significance located within and in the vicinity of the proposed Project works, an area of land that encompassed the principal historic components of the Ravensworth Estate and its subsequent development (including the Ravensworth Homestead Complex), and that also encompassed all of the area of land affected by the proposal was selected. This is defined as 'the Place'.

'The Place' as described in the HA&SoS (Appendix 23a of the EIS) has been defined as being all the land located within the historic boundaries of the three land grants forming the main centre of the Ravensworth Estate; that is Portions 149 and 150 of the Parish of Liddell and Portion 1 of the Parish of Vane. Together this land comprises Dr. James Bowman's original "10,000" (10,439) acre land grants applied for under Governor Brisbane in 1824. Figure 7.8.8 of the EIS showed the extent of the Place and has been reproduced as **Figure 4.4**.

² Heritage Office, Department of Urban Affairs and Planning, 1996; Heritage Curtilages



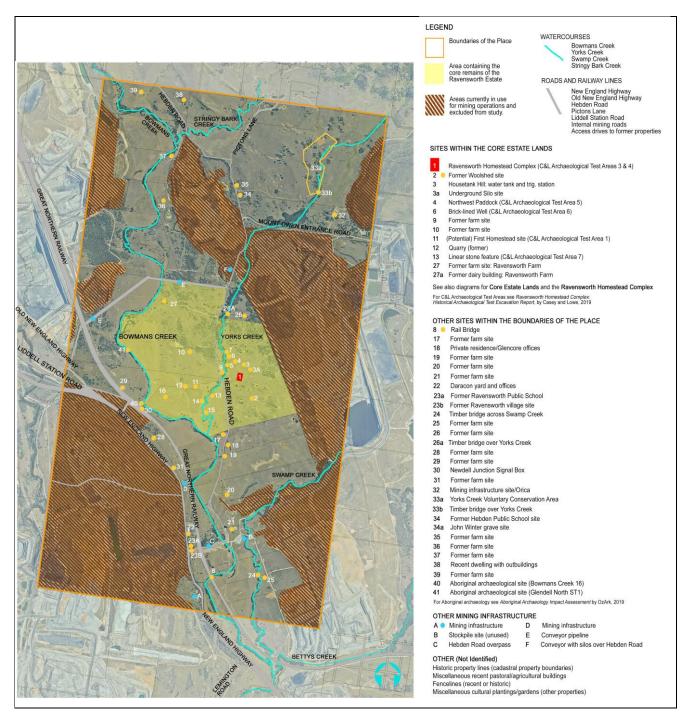


Figure 4.4 Aerial view of the Place identifying the location of the principal components of the Place, the Ravensworth Estate core remains and other sites within the boundaries of the Place © Umwelt,

As part of the HA&SoS undertaken for the EIS (Appendix 23a of the EIS), research and investigations were completed to establish the location of surviving physical evidence associated with the colonial period of the Ravensworth Estate which included research of land titles documentation, historic maps, plans and images and contemporary written descriptions of the estate lands; site investigations; and an extensive historical archaeological test program undertaken by Casey & Lowe in 2019 (refer to Appendix 23c of the EIS).



The area of land that was established as retaining physical evidence of the earliest period of European colonisation of the estate lands, for the purposes of the HA&SoS, has been identified as the Core Estate Lands, being the focus of remaining historical evidence within the Place, and is defined by the allotment containing the Ravensworth Homestead Complex (Lot 228 DP 752470) together with land to the west between Yorks Creek and Bowmans Creek. Figure 1.5 in Appendix 23a of the EIS showed the extent of the Core Estate Lands and has been reproduced as **Figure 4.5**.

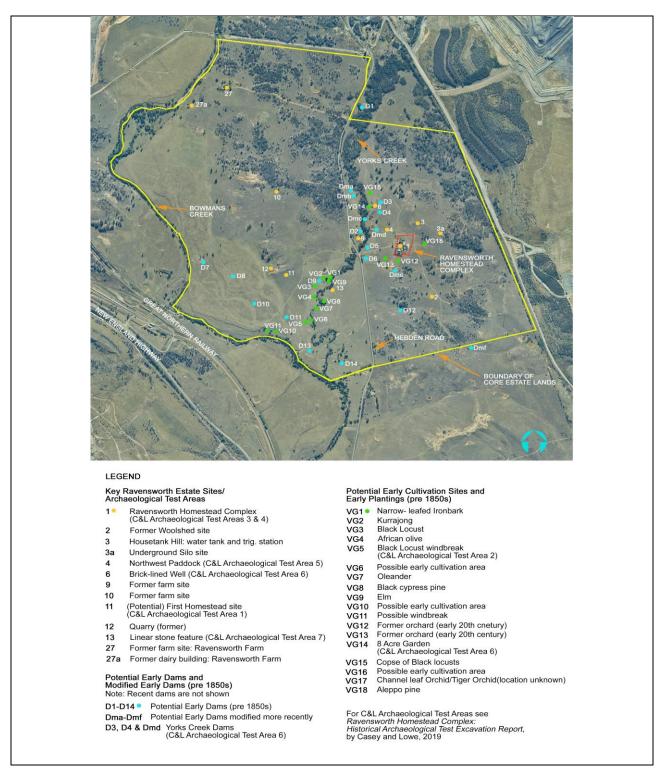


Figure 4.5 Aerial view of the Core Estate Lands identifying the location of the Ravensworth Homestead Complex and other sites associated with the early development of the estate lands

© Umwelt,



The Ravensworth Homestead Complex

Although no longer functioning as the main homestead for a large pastoral property, the Ravensworth Homestead Complex nevertheless remains the historic focus of the locality and is the main surviving evidence of the establishment and subsequent development of the Ravensworth Estate.

Constructed in c1832, the complex consists of a symmetrical group of agricultural buildings with homestead and attached kitchen, located in a garden setting. The complex also contains a barn, stables, privy, men's quarters building, yard areas, paddocks and associated site and landscape features dating from the early 19th century through to recent years. The complex is clearly delineated from its immediate setting and the broader Core Estate Lands by being contained within agricultural fencing (of varying forms and dates) and is a distinctive and rare group of farm buildings. Refer to **Figure 4.6**.

Defining the Curtilage of the Ravensworth Homestead Complex

As the Core Estate Lands contain most of the physical remains and historical archaeology relating to the colonial development of the Ravensworth Estate and given that the early history of the estate is no longer readily apparent in the remainder of the lands within the boundaries of the Place (having been heavily impacted and modified by 20th century road, rail, subdivision and mining development) the Core Estate Lands is considered an appropriate heritage curtilage for the Ravensworth Homestead.



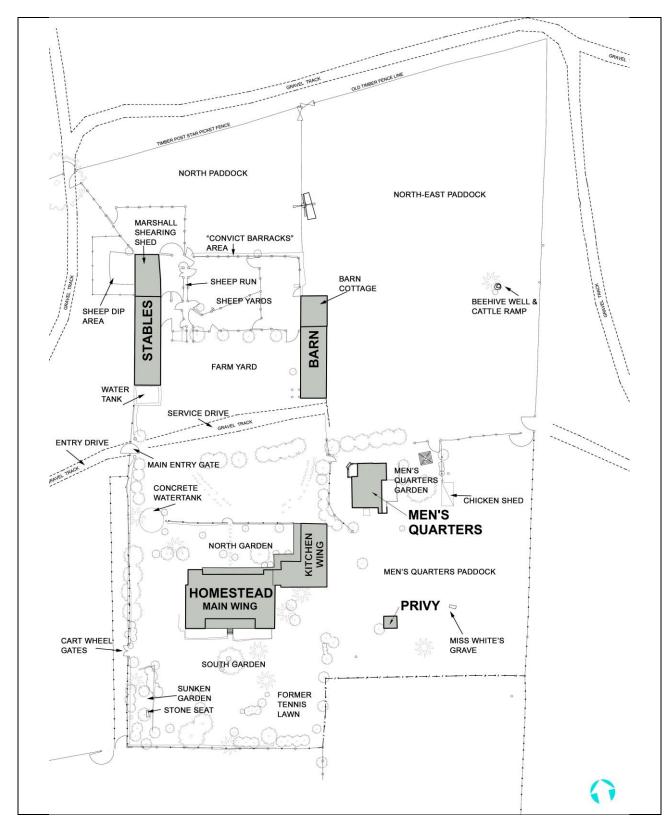


Figure 4.6 Site plan of the Ravensworth Homestead Complex

© Umwelt, 2020



Setting

The Australia ICOMOS Burra Charter (2013) defines "setting" as per the following:

"Article 1.12 Setting means the immediate and extended environment of a place that is part of or contributes to its cultural significance and distinctive character."

In regard to the landscape setting, the current landscape around the Ravensworth Homestead presents as tracts of largely open farmland with lines of riparian vegetation (mainly along Yorks Creek), a backdrop of denser woodland and clusters of more recent woodland regeneration.

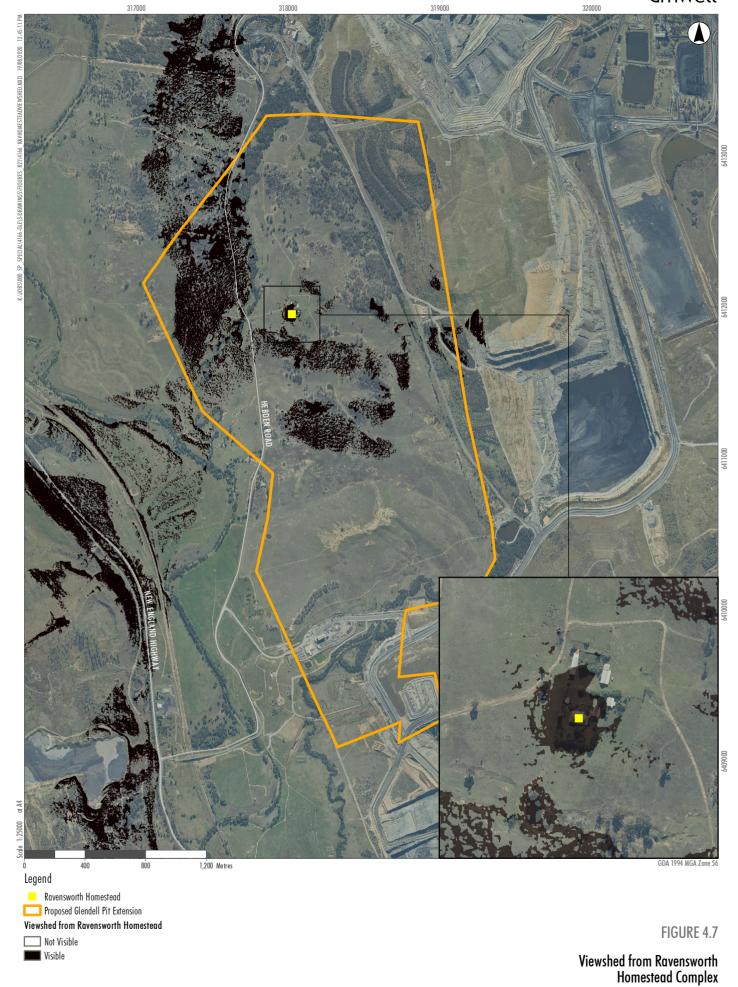
The Homestead Complex is positioned conveniently close to local drainage lines for easy access to water while being carefully sited on a rise overlooking the creeks and away from potential flooding. The siting of the Ravensworth Homestead Complex enhances the landscaped setting of the group of buildings.

LSJ note in their analysis that from the various ridges between Bowmans Creek and the eastern edges of the Ravensworth property, it is possible to appreciate views back to the homestead group. The same views also allow an appreciation of the various contextual landscape features associated with the homestead group and their longstanding proximity to one another. Such features include the line of Hebden Road and the vegetated course of Yorks Creek through the local area as well as distinctive topographic landmarks beyond the immediate estate area. However, it should be also noted that in virtually every view there is visible mine rehabilitation and exposed overburden emplacements, usually in the middle to far distance.

Current perceptions of the overall landscape are also being shaped by the changing peripheral landforms as a result of existing mine overburden emplacement formations on the neighbouring Ravensworth East mine to the east and Ravensworth Operations to the south and southwest. In contrast to more modern rehabilitation land shaping and landforms, the existing overburden emplacement landforms are generally long, broad ridges contrasting with the generally more finely articulated, undulating natural site topography. **Figure 4.7** indicates the geographical areas visible from within the south garden of the Ravensworth Homestead Complex. **Figure 4.7** demonstrates that available views from the Ravensworth Homestead Complex are to the southwest, west and northwest. Views to the east, northeast and southeast are limited due to natural and modified landforms. Much of the surrounding area has been disturbed by existing mining operations.

³ The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 2013, p. 3





Note: Viewshed calculated on bare earth only (no vegetation or other obstructions considered in this analysis)



Defining the Setting of the Ravensworth Homestead Complex

LSJ note that in an analysis of any significant place, it is normal to nominate the setting of that place. The setting is essentially what exists outside of the place and includes those aspects that contribute to overall significance. In these terms, the setting of the Place could be said to be extensive, taking into account the whole of the Place and extending from the Hebden locality to the Hunter River and from the village of Camberwell to Liddell.

However as much of this land has undergone substantial change and contains little that has direct, tangible links with the Ravensworth Homestead Complex, this expansive setting is not considered to be a useful concept. In LSJ's view it is more useful to consider the setting of the Ravensworth Homestead Complex, rather than the whole of the Place.

When considering the setting of the Ravensworth Homestead Complex, the visual curtilage of the Core Estate Lands, could be considered to be an appropriate heritage curtilage for the Place.

The Statement of Significance provided in Appendix 23a of the EIS addresses the significance of the Place as a whole incorporating the above analysis of the extent of the place and of the landscape and visual setting of the Ravensworth Homestead Complex and the Core Estate Lands. The Statement of Significance provided in Appendix 23a in relation to setting is still considered valid and is reproduced below.

"The Place, containing the remnants of the Ravensworth Estate, is of some aesthetic significance on a Local level as a representational example of a Hunter Valley landscape. The rural landscape of the place including scattered remains of early 20th century farms is punctuated by the two main creek lines, Bowmans Creek and Yorks Creek, pockets of lightly forested lands and gentle rises in the landform that provide expansive views of the floodplains and grazing lands leading southwards down to the Hunter River. The various isolated historic buildings, cultural plantings, landscape and agricultural features located across the landscape, are of some aesthetic significance, being indicative of the 20th century agricultural and community-driven development of the broader locality."

"The Place retains its historic visual catchment, most clearly viewed from highpoints between Bowmans and Yorks Creek and these district views to the south-east, south-west, north-west and south towards the Hunter River, in the past would have attached considerable scenic value to the setting of the Ravensworth Homestead Complex. Today however, these views and the aesthetic values of the rural landscape are somewhat reduced by the encroachment of large-scale industrial structures and modified landforms associated with open cut mining along the skyline to the south, east and west."

Cumulative Impact of the Works on the Significance of the Core Estate Lands

As noted in the HA&SoS (Appendix 23a of the EIS), the Core Estate Lands are primarily of moderate significance, although within the boundaries of the Core Estate Lands are individual items, features and groups of items that are of little, moderate, high and exceptional significance. Figure 5.2 of the EIS showed these indicative grades of significance for the principal components, and this figure has been reproduced as **Figure 4.8**.

Appendix 23d of the EIS, the Statement of Heritage Impact (SoHI) prepared by LSJ (2019), provides a comprehensive assessment of the potential impact of the Project on the cultural significance of the Place, the Core Estate Lands, the Homestead Complex, as well as the setting and individual features and items located within the boundaries of the Place.

Further, the SoHI (Appendix 23d of the EIS) assessed the individual components of the proposed Project potentially impacting on the heritage values of the Ravensworth Estate. Of relevance is the assessment of significance undertaken against the extension of open cut mining operations north from the existing Glendell Mine (Section 3.1 of the SoHI). These have been extracted and summarised below.



Table 4.2 Assessment of Significance against the extension of open cut mining operations

Comment/Recommendation	Heritage Impact	Mitigation
The existing Glendell Mine is partly located within the boundaries of the original Ravensworth Estate lands (the "10,000 acres) and the Project is to extend this mine further within the historic Ravensworth Estate ("the Place"). Whilst the change is high, generally the land is of moderate significance and therefore the impact is notable.	Notable heritage impact	The proposed rehabilitation of the land would form a low-level mitigation of this impact.
Some of the mining would occur within the Core Area of the estate which is generally of moderate significance and so the impact here would be of note.	Notable heritage impact	The proposal includes full salvage archaeology of these areas and this would be a substantial mitigation.
The proposal includes mining within the visual catchment of the Ravensworth Homestead Complex (RHC) which is of moderate significance and so the heritage impact would be of note.	Notable heritage impact	The proposal includes full salvage archaeology of these areas and this would be a substantial mitigation.
The proposal includes mining the immediate setting and beneath and around the RHC which is of high, and in some aspects of exceptional significance. It would completely change the physical aesthetic values of the setting and destroy the existing archaeological potential of the land. As a high degree of change is proposed and the item is of high/exceptional significance, the heritage impact would be high.	High heritage impact	The proposal includes full salvage archaeology which would be a substantial mitigation. The proposal also includes the relocation of the RHC to a new setting which has verisimilitude to the existing and this would be a substantial mitigation.
The proposed mining activities would impact on the scientific significance of the Aboriginal archaeology located throughout the Ravensworth Estate. Surviving Aboriginal archaeology has been graded as being of little/moderate scientific significance. As per above, the proposal would destroy the existing Aboriginal archaeological potential of the land as well as the known Aboriginal archaeological sites at the place. As a high degree of change is proposed and the Aboriginal archaeology is of little/moderate significance, the heritage impact would be notable. Refer to Appendix 22 of the EIS: Aboriginal Cultural Values Assessment Report (ACHAR).	Notable heritage impact	The proposal includes conserving Aboriginal archaeological sites outside of the identified Additional Disturbance Area, salvaging (collecting and recording) all surface artefacts at all sites within the Additional Disturbance Area and undertaking additional archaeological excavation to confirm the nature of archaeological deposits. This work would be a substantial mitigation.



Comment/Recommendation	Heritage Impact	Mitigation
The proposal would also impact the social significance of the Ravensworth Estate as a marker of the historic locality of Ravensworth, which is of high significance. The proposal includes mining the setting of the Ravensworth Homestead Complex taking in historic markers across the landscape (including the RHC, Yorks Creek and Hebden Road) and the heritage impact would be high.	High heritage impact	The relocation of the RHC to the Ravensworth Farm Recipient Site, the diversion of Yorks Creek, the realignment of Hebden Road and the retention of the names: Ravensworth, Yorks Creek and Hebden at the place would be substantial mitigations.

As provided in Section 2.3.2 of **Appendix 2**, LSJ conclude that based on the analysis, it can be said that the proposal will have a high or substantial cumulative impact on the significance of the Core Estate Lands as a whole.

The east side and central area of the Core Estate Lands will be recorded and then removed or relocated. The west side of the Core Estate Lands will remain intact with a substantial overlay of alterations. Where archaeological features are removed (historical and Aboriginal), salvage archaeology will provide a substantial mitigation.

LSJ have provided an opinion, that mitigation of loss of heritage significance will vary dependent on the option selected. According to LSJ where the homestead is relocated, Option 1 (relocation to Ravensworth Farm) provides the most mitigation, as Option 1 puts the buildings in an appropriate setting, involves the least damage to the significant fabric and provides the most likelihood of ongoing sympathetic use, treatment and maintenance. This is preferred by LSJ as compared to Option 2 (relocation to Broke Village) which, in their opinion, provides less avenue for mitigation.

Table 4.3 provides LSJ's opinion of the significance of the Ravensworth Homestead Complex group of buildings before and after relocation, considering both Option 1 and Option 2. This analysis is discussed further in Section 2.6.1 of **Appendix 2**.

Table 4.3 LSJ Ranking of Significance Before and After Relocation/Rebuilding

Heritage Value	Existing	Option 1: The Complex at Ravensworth Farm	Option 2: The Complex at Broke Village					
Historical:								
Early colonial homestead	State	Of some interest only because of similar setting, use and reused plantings	Of little interest only as a remnant					
Associations:	Associations:							
BowmanMacarthur		Local (actual buildings but not actual location)	Local (rebuilt buildings – Macarthur association lost)					
Aesthetic:								
 Architecture Designed by gentleman architect Quality of stonework and carpentry 		State (definite configuration proposed – less than existing but still meets threshold)	Local depending on changes (only approximate design and rebuild)					



Heritage Value	Existing	Option 1: The Complex at Ravensworth Farm	Option 2: The Complex at Broke Village				
Landscape setting	Local	Of interest because of similar setting, use and reused plantings	Nil interest				
Technical:							
Stone and carpentry	State	State	Local (rebuilt)				
Scientific:							
Historical archaeology	State	Local (some archaeology survives within built structure)	Nil (all values transferred to written record)				
Social:							
Public esteem	Local (not widely known)	Local (still in Ravensworth vicinity)	Of interest only (not at Ravensworth location)				
Rarity:							
 "H" plan of main house and farmyard arrangement 	State	State (actual buildings in exact configuration – less than existing but still meets threshold)	Of interest only (as remnant rebuilt and not fully in designed configuration)				



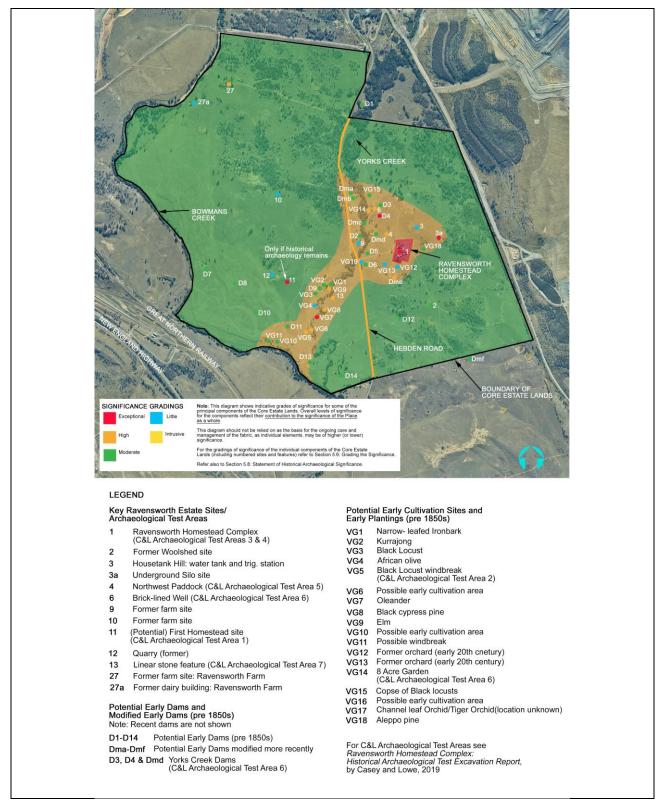


Figure 4.8 Diagram of the Core Estate Lands showing indicative grades of significance for the principal components

© Umwelt, [YYYY]



The comparative analysis with pre 1850s Hunter homesteads is inadequate to enable an assessment of the significance of Ravensworth as the following have not been considered:

 The main house on the Ravensworth property (called Ravensworth) has been identified as one of very few homesteads from the initial establishment period to survive relatively unchanged in terms of its vernacular form (CHS, p57).

Research and investigations (including site inspections) undertaken by LSJ in the preparation of the HA&SoS provided as Appendix 23a of the EIS, determined that the Main House at the Ravensworth Homestead Complex is of heritage interest as an example of an Australian colonial bungalow building that is relatively intact. The Main House has undergone some change, particularly to the north elevation, but is still substantially intact in terms of materials, form and configuration and could be restored/reconstructed to its original or early configuration.

As stated in the HA&SoS provided (Appendix 23a of the EIS), the Main House at Ravensworth is a good example of a colonial bungalow as:

"the fabric is relatively intact and it exhibits many of the typical features of an Australian colonial bungalow including single storey rectilinear plan form with brokenback roof profile, recessed verandahs, symmetrical planning, multi-pane timber sash windows, 6-panelled doors and stone flagged verandahs. All these features are relatively intact and constructed in high quality workmanship.

Constructed generally prior to 1840, this building type is relatively rare in Australia and indicative of Australian colonial building practise. Nevertheless, there are numerous surviving examples of buildings of this type, particularly around the oldest colonised areas of the country. This example [Ravensworth] is made more significant by the quality of the stonework and carpentry construction."

LSJ's Pre 1850s Hunter Estates study (LSJ, 2013) noted that throughout the Hunter Region, as elsewhere in NSW, the distinctly Australian colonial bungalow was the dominant style of early 19th century homestead constructed by large scale landowners with social and economic standing in colonial NSW at the time.

The comparative analysis included in the HA&SoS examined further other colonial bungalows of single storey rectilinear plan form with brokenback roof profile throughout the Hunter Region and LSJ notes that the colonial bungalow is the predominant form for surviving early homesteads (dating from the 1820s and 1830s) throughout the region and a number display the brokenback roof type including: Lewinsbrook, Terrigong, Booral House, Alderley House and Laguna House. Further, LSJ note in their Pre 1850s Hunter Estates study (LSJ, 2013), very few homesteads survive from the initial establishment period unchanged from this basic form. Refer to Section 2.4.1 of **Appendix 2** for further detail.

LSJ also identified in the HA&SoS (Appendix 23a of the EIS), what distinguishes Ravensworth from all of its contemporaries in the Hunter Region is the 'H' plan form of the bungalow with porch *in antis* to both the front and rear elevations, making Ravensworth a very rare example of the colonial bungalow house type, with only two other extant examples of this house form known to survive in NSW (Horsley Park and Glenlee).



As a result of further analysis completed by LSJ as presented in Section 2.4.1 of **Appendix 2**, LSJ have revised the Statement of Significance (LSJ, 2020) to state:

The intactness of the Main House of Ravensworth makes the place relatively rare within the context of the Hunter Region and of high significance, however the original "H plan" form of the Main House of Ravensworth makes the place extremely rare and of exceptional significance on a State level.

Both relocation options propose to re-instate the original "H plan" form of the Main House.

There are 4 properties identified in the 2013 comparative study which also include a House and Primary Farmyard with five or more buildings with a single nucleus, including Bolwarra (modified by later additions), Negoa, Kinross and Abbey Green. Existing SHR items with similar features include Tocal Homestead (SHR00147) and Dunmore House (SHR01887). Direct comparisons between Ravensworth and these properties have not been made.

As part of the Pre 1850's Hunter Estate Study (LSJ, 2013) a baseline historical archaeological assessment was undertaken which entailed a desktop analysis utilising online documentation and aerial photography to record the number of homesteads, attached buildings and outbuildings and the layout of the main homestead and its primary farmyard. However, as noted in the assessment, the use of aerial photography does not compare with information that could be completed as a site inspection, such as the ability to date buildings from their roof style or ascribe a use of the farm buildings being limited. Therefore, the assessment was intended to provide sufficient information to determine which sites warranted further assessment through site survey.

The assessment found that there were a number of other settlement nodes or nuclei on the property, comprising houses, cottages or outbuildings. Some properties had up to 5 settlement nuclei, in addition to the main homestead and primary farmyard. All of the buildings were added into the quantified database for each property, although a number of outbuildings were excluded from the quantified database, such as stock shelters and large sheds for modern pig or poultry production. The nature of landscaping and plantings on each property was also recorded, including the presence of mature gardens, mature exotic or native trees, avenues, hedges and windbreaks.

As part of this assessment, a database of homestead complexes was formed and analysed in accordance with three principal classifications:

- Typology of sites, namely the numbers of buildings, outbuildings and settlement nuclei
- Farm layout
- Planting and landscaping

These classifications are described further in Section 2.4.1 of Appendix 2.

In regard to the Ravensworth Homestead Complex, the baseline archaeological assessment identified the following attributes:

- Typology of the site: classified as 4.4 House and Primary Farmyard, with 5 or more buildings; single nucleus
- House and Primary Farmyard Layout: classified as 1.1 House and Farmyard, rectangular blocks, designed (LSJ, 2013).



The database identified a total of 28 other Hunter Estates with the same "Typology of the Site" as the Ravensworth Estate (refer to Section 2.4.1 of **Appendix 2**), however, only one other Hunter Estate was identified with the same "House and Primary Farmyard Layout" classification, being Dunmore House in Bolwarra Heights. A comparison of Dunmore House with Ravensworth Estate has been undertaken by LSJ and is provided in Section 2.4.1 of **Appendix 2**, with a summary provided below.

Further comparison of Ravensworth Estate with Bolwarra, Negoa, Kinross, Abbey Green and Tocal properties as identified by the Heritage Council are also provided in Section 2.4.1 of **Appendix 2** and summarised below.



Plate 4.1 Aerial view of Ravensworth Homestead Complex

© Umwelt, [YYYY]



Plate 4.2 Aerial view of the Dunmore House homestead complex showing the configuration of the main house (to the northeast) with the two rear wings forming a central courtyard and enclosed to the southwest by a smaller, later addition barn.

Source: SHR database no. 5056380



Plate 4.3 Aerial view of Bolwarra showing location of the main house (indicated with a blue arrow) and the barn (indicated with a red arrow), now on a separate allotment.

Source: GoogleMaps



Plate 4.4 Aerial view of Negoa

Source: SixMaps





Plate 4.5 Aerial view of Kinross

Source: GoogleMaps



Plate 4.7 Aerial view of Abbey Green

Source: GoogleMaps



Plate 4.6 Aerial view of Tocal

Source: GoogleMaps



Dunmore House, Bolwarra Heights

Dunmore House, Bolwarra Heights is located on 1000 acres of land granted to George Dunmore Lang in c1822. The property is located on the Paterson River between the villages of Largs and Paterson. George died in 1825 and the estate was taken over by his brother Andrew Lang who constructed the main homestead in c1833. Dunmore house is a very fine and early example of a convict-built Colonial Georgian homestead complex⁴.

As can be seen in **Plate 4.1** and **Plate 4.2**, Dunmore House and Ravensworth Estate display a similar configuration in relation to the placement of the house and associated outbuildings, including their symmetrical placement around a courtyard or farmyard.

However, the Ravensworth Homestead Complex is distinct for being a group of individual farm buildings with main house and kitchen wing enclosing a farmyard; whereas Dunmore House is configured as a house with two rear wings forming a courtyard, although it is acknowledged that one of the rear wings did function as a farm building.

The Ravensworth Homestead Complex is also distinct from Dunmore House as a designed group of stone buildings, architecturally complementary to each other and constructed at the same time.

As noted in the State Heritage Register listing for Dunmore House,15 the stone pavilions were constructed prior to the main house and altered in their appearance by the application of dressed facing stones as a veneer, to reference the detail of the stone work of the north façade of the main house, "as a final aesthetic touch to relate the earlier buildings to the newer homestead in their detail and outward presentation."

The Statement of Significance prepared for Ravensworth (Appendix 23a of the EIS), included in the HA&SoS, under Criteria (c) Aesthetic/Technical Significance notes:

"The homestead complex of the Ravensworth Estate constructed in c1832, is of aesthetic significance on a State level as a fine example of a very rare, relatively intact 'architecturally planned' group of colonial farm buildings located in its late 19th century landscaped setting...

The conscious design of the symmetrical compound is reinforced by the inclusion of stone decorative quoins at the outer extremities of the group and inclusion of blank window recesses on the western elevations of the main homestead and the barn, suggesting that the building group was designed to be approached and viewed from the west. The formality of composition of the complex of buildings is further reinforced by surviving evidence of the early planning of the broader homestead precinct with an early dam (albeit modified) to the south of the homestead complex, placed on axis with the main house and the 1830s stone grave located to the east placed along the longitudinal axis of the main house.

The group of buildings comprising the complex and including the adjacent privy are of aesthetic significance on a State level for their fine dressed stonework and finely made roof carpentry, simple architectural detailing and high-quality detailed design and execution."

No change is proposed to the above section of the Statement of Significance, with respect to the comparison with Dunmore House.

Glendell Continued Operations Project 4166F RTS Part B Final V4

^{4 &}quot;Dunmore House" SHR No. 01887, database no. 5056380



Bolwarra, Bolwarra

The remains of the Bolwarra Estate are located on portions of the 2030 acres of land originally granted to John Brown, in 1822. The property was sold on to Thomas Potter MacQueen (owner of Segenhoe) in 1826 via his agent Peter McIntyre and it was McIntyre who initially developed the estate including establishing hops and tobacco and constructing the original homestead (c1833) and a large convict built, stone barn (c1833). When sold to Richard Jones in 1833, the property was described as having a new dwelling, detached kitchen, store house, blacksmith's shop, barn, dairy, two stables, men's huts, rickyard and garden.⁵

As can be seen on **Plate 4.1** and **Plate 4.3**, the separation of the Barn from the Main House and the lack of a formal layout of the main farmyard means that Bolwarra is not comparable with the Ravensworth Homestead Complex.

Negoa, Kayuga

Negoa is located on land formed by a 4000 acre grant to William Cox Snr and a 4000 acre grant to William Cox Jnr, both in the year 1825. William Cox Jnr purchased his fathers' land grant, forming the 8000 acre Negoa estate.

In their comparative analysis, LSJ note that, in 1845, tenders were called for the construction of a shingled cottage on the estate, with the plans and specifications to be seen at Mr James Atkinson's, Windsor. In 1864, the estate was advertised for lease and described as containing a house (brick and stone,2-stories, 10 rooms), kitchen, laundry, stores, stables, woolshed etc. all in excellent repair. In 1952, the estate was once again advertised for sale and described as containing a 2-storey homestead of stone and brick, plaster walls containing 8 rooms, kitchen, bathroom and pantry, large verandah, underground cellar, detached man's room and lumber room of brick.⁶

As can be seen on **Plate 4.1** and **Plate 4.4**, Negoa is not configured around an enclosed farmyard and does not have a courtyard area, and as such the place is not comparable with the Ravensworth Homestead Complex. Further comparative analysis of Negoa is provided in Section 2.4.1 of **Appendix 2.**

Kinross, Raymond Terrace

Kinross is located on the remnants of a 640-acre grant made to George Thomas Graham in 1827. In their comparative analysis, LSJ note that in c1830, Sir (William) Edward Parry (Commissioner of the AA Co.) visited Kinross on his way to Newcastle and described the homestead at that time as "a miserable slab hut of their own building open to admit the wind and rain in most parts badly thatched with reeds....no floor.. the fireplace a recess made of slabs...". In 1834, the estate was advertised for sale and the main house was at that time under construction being described as "the frame of a substantial and commodious verandah cottage residence of 4 rooms with a kitchen detached has been erected and part of the materials for completing it were on the ground. A large substantial slab barn, with stock yard, huts are built." This appears to describe a timber house.

As can be seen on **Plate 4.1** and **Plate 4.5**, Kinross is configured as a house with a rear wing and a separate barn building forming two sides of a courtyard, and as such it is not comparable with the Ravensworth Homestead Complex which is a designed group of stone buildings, architecturally complementary to each other and constructed at the same time. Further comparative analysis of Kinross is provided in Section 2.4.1 of **Appendix 2**.

Advertising, "Pre-emptory sale of Hunter River property: the Bolwarra Estate", The Australian, Friday16th August 1833, p. 4

⁶ "Negoa" Inventory sheet prepared for the 2013 Hunter Estates study



Abbey Green, Mount Thorley

Abbey Green is located on the remains of a 4000 acre grant of land originally issued to Archibald Mosman in 1838. The estate was expanded by subsequent owners until it was approximately 10,000 acres under its third owner, George Andrew Loder.

LSJ note in their comparative analysis that in 1861 George Andrew Loder had the Victorian mansion built according to the design of Thomas Rowe, one of Australia's leading architects of the Victorian era. The complex comprises a homestead which is a distinctively Victorian building of sandstock brick with slate roof and with the drawing room thrust forward, woolshed, stables, slab octagonal building, courtyards and remains of Victorian gardens. Assorted other outbuildings, yards and fenced enclosures are scattered throughout the property. The construction date of the agricultural outbuildings are not known at this time.

As can be seen on **Plate 4.1** and **Plate 4.6**, Abbey Green is not comparable with Ravensworth Homestead Complex given that it is a Victorian era homestead complex and is configured as a Main House with single rear wing forming two sides of courtyard.

Tocal, Paterson

The Tocal estate is located on a 4,000 acre land grant to James P. Webber in 1822, who established it as a productive farm. In 1834 Webber sold Tocal to Caleb and Felix Wilson. The Wilson family built the homestead in the 1840s to designs by architect William Moir (who was apprenticed to Mortimer Lewis) for use as a country residence and the Wilson family held the property till 1907.

The Homestead consists of a late Georgian/Regency Revival rendered sandstock brick two storey homestead, with verandahs (flagged sandstone) on three sides, set on a knoll overlooking the Paterson River and surrounding areas. The site also consists of a wide range of vernacular timber buildings, stockyards, post and rail fences, underground silos and other elements representing technology of a 19th century farm. These consist of convict-built sandstock brick residential buildings, as well as a large stone barn built in 1830 by convicts with a 1920s addition, 1860s timber barn designed by architect Edmund Blacket and yards, fences etc.

As can be seen on **Plate 4.1** and **Plate 4.7**, Tocal is not comparable with the Ravensworth Homestead Complex as the configuration of the place is sprawling rather than symmetrical and there is no courtyard or farmyard defined by the principal agricultural outbuildings as is found at Ravensworth.

Conclusion

Ravensworth is distinct from the above selection of Hunter Estates for retaining five relatively intact colonial farm buildings, all constructed in c1832 with complementary architectural detailing and in the same material, configured as a symmetrical, designed group of buildings, forming an enclosed farmyard.

LSJ note that Abbey Green, Bolwarra and Kinross exhibit some similarity with Ravensworth in that they both have an attached wing located at right angles to the main house, forming two sides of a courtyard area. In 1982, David Sheedy prepared a report for the then NSW Department of Environment and Planning entitled Hunter Region Heritage Study: Nineteenth Century Buildings. In this report, Sheedy noted that the most common form of homestead found in the Hunter Region was comprised of a main house with attached wing or wings added at various stages of a property's growth⁷. As such, this configuration is not considered to be unusual and can be found at numerous other homesteads and farms throughout the Hunter Region and NSW more broadly. In addition, Abbey Green is a Victorian homestead complex (c1861) and the configuration of the main house with kitchen wing is not considered rare or unusual for either the colonial or Victorian periods.

Sheedy, D., 1982, Hunter Region Heritage Study: Nineteenth Century Buildings, prepared for the NSW Department of Environment and Planning; pgs. 28-30



As stated in **Appendix 2**, Negoa, Bolwarra and Kinross are also similar to Ravensworth being small complexes, comprised of only 4 or 5 buildings in the group, and all also retain at least one building within the group dating from the 1830s. The retention of at least one building dating from the 1830s as part of a homestead complex is not considered to be rare in the context of the Hunter Region. As Sheedy points out, at the time his report was prepared, the Hunter Region possessed probably the richest and most diverse collection of 19th century buildings to be found in any comparable area of Australia and that with relatively few exceptions, the vast number of buildings erected after 1830 have survived. However, many of these outbuildings being working agricultural buildings have been substantially altered overtime, as their continual renewal or reconfiguration is part of the adaptive nature of an outbuilding.

Ravensworth is distinct in this respect, as unlike the majority of Hunter Estates, which were added to, altered and reconfigured over time, particularly during the Victorian era, Ravensworth has retained the majority of its original principal buildings relatively intact and continues to present as a c.1832 homestead complex.

Based on the above analysis, the Statement of Significance (SoS) included within the HA&SoS (Appendix 23a of the EIS) has been amended to include the following:

The configuration, construction date, intactness and design attributes of the Ravensworth homestead complex makes the place very rare in the context of the Hunter Region and is of State level significance.

It should be noted that the proposed homestead complex relocation Option 1 will relocate all of the buildings in the original configuration and the intact move methodology will retain the original building fabric, while Option 2 will relocate all of the buildings, there will be minor modifications to the Complex to facilitate community use.

The revised SoS is provided as **Appendix 2**.

 The use of architects in the design and construction of the early homesteads is rare. It appears that Ravensworth is a rare example of this.

This comment is noted and agreed. In the HA&SoS provided as Appendix 23a of the EIS, LSJ concluded the following:

The Ravensworth homestead complex includes a rare, formally designed farmyard complex of colonial buildings including a good example of a colonial bungalow, with stonework and roof carpentry of note. As originally built, the "H" plan bungalow is a rare feature, indicating a design (potentially) by a gentleman architect.

Through detailed examination as part of the HA&SoS (Appendix 23a of the EIS), key indicators that an architect or gentleman architect was possibly involved in the design of the homestead complex include:

- The symmetrical layout of the farmyard comprised of a group of designed buildings that complement each other architecturally
- The "H plan" of the Main House with porch in antis to the front and rear elevations all under one bellcast hipped roof (albeit altered)
- The use of architectural details such as stone quoins at each corner of the farmyard and the blank window recesses on the elevations viewed on approach on the homestead complex from the west.

Sheedy, D., 1982, p. 16



Together these aspects of the architectural design of the place indicate a high degree of design consideration was involved in the original construction and laying out of the place. LSJ noted the rarity of the "H plan" of the Main House alone is a strong indicator that an architect or gentleman architect was involved with the design of Ravensworth.

Further, the 2013 Hunter Estates Study, prepared by LSJ, and discussed in Section 2.4 of **Appendix 2** notes that the use of architects in the design and construction of the early homesteads was very rare due to the isolation of the region and the necessity (due to grant requirements) to place capital into the development of the farm, rather than into any display of wealth. In the main, early homesteads were probably constructed using convict labour and architectural refinements were only possible if a landowner, overseer or a convict had a particular interest or previous experience.

As described in Section 2.4 of **Appendix 2**, over 200 Hunter Estates were surveyed as part of the 2013 study and only a small number of properties were identified where an architect is known to have been involved or an architect has been attributed to designing the pre-1850 homestead, however there may be some other examples which are unaccounted for due to lack of documented evidence. The Hunter Estates with known associations with architects are:

- Aberglasslyn (1842) which is alternately attributed to John Verge and Henry Robertson
- Tomago, Port Stephens (1840-45) and later the verandah addition at Kinross, Raymond Terrace (1840s), have been credited to Mortimer Lewis, who was the architect for the Windeyer family
- Tocal, Paterson (1845) is known to have been designed by William Moir, and
- Lyndhurst Vale, Dungog (c1830), it is assumed that John Verge designed his own house at his Williams River property.

In addition to practicing, professional architects, LSJ note that local landholders possessing a particular interest or skill in building design also operated as amateur architects, or gentlemen architects (refer to Section 2.4.1 of **Appendix 2**). Of particular note are the associations with Henry Kitchen architect, and Robert and Helenus Scott gentlemen architects, identified by Dr James Broadbent in his book *The Australian Colonial House* (Broadbent, 1997), where their works (Glenlee at Menangle and Glendon at Singleton respectively) possess similar features to Ravensworth.

As a result of further analysis completed by LSJ as presented in Section 2.4.1 of **Appendix 2**, LSJ have revised the Statement of Significance to state:

The Ravensworth Homestead Complex is relatively rare in the context of the Hunter Region for most probably being an example of an early homestead designed by an architect or gentlemen architect.

The revised Statement of Significance is provided as **Appendix 2**. Further detail on the rarity of the Ravensworth Homestead in the context of the Hunter Region for most probably being an example of an early homestead designed by an architect or gentlemen architect is provided in Section 2.4.1 of **Appendix 2**.



- The known archaeology and written records existing for Ravensworth relating to its Aboriginal history is an uncommon and highly significant aspect of the place, particularly regarding its history as a place associated with frontier conflict between European and Aboriginal people.
- Although incidents of violent conflict between European and Aboriginal peoples are likely to have been more common, only approximately 16 of these incidents in the 1820s are well documented. Six of these incidents are associated with the Ravensworth property, including one incident popularly referred to as the Ravensworth Massacre. Other incidents are noted to have occurred in the vicinities of Gostwyck, Invermein and Segenhoe, and existing SHR item, Merton (SHR00159). The site with the most available documentation, and therefore the closest comparative example in this sense, is Gostwick. Direct comparisons with these properties have not been made.

As stated in the ACHAR (**Appendix 3**), the Project Area has undergone considerable modification since British settlement. Traditional Aboriginal lifeways and customs began to disappear in the early days of contact with the British and had been severely disrupted before the turn of the 19th Century. Much of the natural landscape no longer exists in any cohesive manner, as the long history of agriculture in the area has irreversibly altered the landscape. Combining the historical disconnection of people from place with the extensive landscape modification since settlement means that the Project Area has a relatively low cultural significance when compared to other places within the wider region. This is also consistent with the archaeological assessment, which has determined that most of the pre-contact archaeological sites are of low to moderate scientific significance due to the levels of post-depositional disturbance that has occurred in the region.

Section 6.11.3 of the ACHAR entails OzArk's response to the Neil Draper report (provided in Section 6.11.3 of **Appendix 3**). OzArk discounts the notion on scientific grounds that there is a high potential to discover significant cultural materials, and in particular human burials, relating to the frontier conflict period at Ravensworth (and indeed any other period). Further, OzArk notes that the results of almost 40 years of archaeological research and survey at Mount Owen have revealed a pattern of Aboriginal archaeological site distribution entirely consistent with the archaeological signature of the remainder of the Hunter Valley. While there was some interesting contact period archaeology discovered and recorded by OzArk in the region (2019), the likelihood of significant Aboriginal archaeological sites remaining undiscovered in the area of Ravensworth is low.

Associated with retaliatory conflict by settlers and colonial government forces, Ravensworth was only one of a collection of farms and estates that were caught up in the violence on the wider Hunter Valley frontier during the period 1825-1828. The large estates of Merton, Edinglassie and Invermein were also targeted, as were travellers on the roads between these estates. Bowman's neighbours, Robert Lethbridge, Richard Alcorn and James Chilcott (located approximately 8km to the east on Glennies Creek) were all targeted during this period. Attacks and raids also occurred around the modern town of Singleton in the year after the events at Ravensworth. These are outlined in detail in the Dunn (2020) Ravensworth Contact History Report prepared for Umwelt (and appended to the ACHAR prepared by ACHM, refer to **Appendix 3**). Taken in the wider context of the ongoing conflict, while Ravensworth was targeted, it was only one of a number of sites rather than the central focus of conflict with the events having taken place within and around Ravensworth Estate not being unique or uncommon. A timeline of early conflict events that occurred throughout the middle Hunter Valley between 1824 and 1827 and the spatial plotting of these events is provided as **Figure 4.3**.

Dr Mark Dunn prepared a report for the EIS (Appendix 22 of the EIS), *Ravensworth Contact History*, which has since been updated following further research and investigation and is appended to the updated ACHAR provided in **Appendix 3**. A summary of key aspects is provided below.



The violence that erupted in the later years of the 1820s across the Hunter Valley was not unusual in the colonial period of New South Wales. Sydney had experienced a long running war from the late 1790s through to 1816, with fighting breaking out at various points along the Nepean and Hawkesbury River. To the west, over the mountains around Bathurst, a violent series of clashes had led to martial law being imposed and the mounted police deployed during the main fighting between 1822 and 1824. The violence that then came to the Hunter Valley was one more example of this evolving and fluid frontier.

The notion of a frontier in the Hunter Valley was an ever changing one. There was no frontline of fighting behind which either side was safe. Ravensworth was surrounded by large estates on all sides, such as the Chief Justice Francis Forbes 10,000 acre Skellator estate near present day Muswellbrook, or Thomas Macqueen's 24,000 acre Segenhoe estate near present day Scone further inland. Attacks by Aboriginal raiding parties and on Aboriginal groups occurred at all these places throughout the period in question sometimes within weeks or months of each other. Events were also recorded at Merton near Denman and later back down the valley near Singleton.

The years 1825-1827 cycled through a series of tit-for-tat attacks and retributions between Aboriginal people and Europeans in the middle Hunter Valley. A combination of increasing pressures on traditional food sources by the influx of settler's livestock, the locking- off of land through fencing and farming, provocation by convicts against Aboriginal people all combined to create an atmosphere of tension and the potential for violence. A close reading of the available evidence, through newspapers, depositions and enquiries appears to show not a series of random attacks, or rampaging bands of warriors, but rather targeted attacks against individuals and isolated workers. Bowman's large estate was the site of three attacks resulting in two Europeans killed, and two wounded and, with one Aboriginal man wounded. Another Aboriginal man, captured by mounted police was reported to have been hung from a tree approximately one mile from the old homestead. Bowman's worker, Samuel Owen was also confronted close to the estate but was not hurt.

Ravensworth was not the only estate to be targeted. Violence spread across the Valley floor from Merton (Denman) in the west to Patricks Plains (Singleton) and Gostwyck (Paterson) in the east, with a series of raids and attacks against mostly small, and isolated huts and outposts. The compounds that had been developed on the large estates, with the exception of Ogilvie's Merton, were rarely seriously threatened. Aboriginal people were probably aware of the danger in attacking these establishments, which were easily defended and often had sizable populations of convicts and workers around.

Some however were used as temporary staging posts for the mounted police and district constables, such as James Glennie's property. It was from the property of James Glennie on Fal Brook (Glennies Creek), not Ravensworth, which Robert Scott set out with his party to pursue the attackers on Alcorn's hut in late 1826. The attack by this party that was reported by The Australian occurred 20 miles (32 kilometres) from Alcorn's Hut and resulted in the death of 18 Aborigines. Even though the exact location of this event is unknown, the plotting of a 20 mile (32 kilometre) radius from Alcorn's Hut situates this event well beyond Ravensworth Estate, which lies approximately 5 miles (8 kilometres) to the north-west.

The post contact history of interaction with Aboriginal people is also seen in documentation of places of Aboriginal employment such as Merton (SHR00159) and Caergwrle, camp sites such as Invermein, Bolwarra and Glendon, corroborree and/or ceremonial sites such as Segenhoe and Bolwarra, and sites selected with the help of Aboriginal guides such as Bolwarra, Glendon and Segenhoe. Direct comparisons between Ravensworth and these properties have not been made.

It is noted that some early pastoral estates had working relationships with Aboriginal people, as did some surveyors, Mounted Police, church missionaries and explorers. Conversely some established farming estates did not have working relationships with Aboriginal people. It is not clear that further research into these relationships will benefit the assessment of the impact of relocating the Ravensworth Homestead Complex.



Further, consultation with RAPs as part of the ACHA indicated that the majority of RAPs did not hold any attachment to the Ravensworth Estate or the homestead. As noted by ACHM in the ACHAR (**Appendix 3**), it is of their view that much of the discussion surrounding the Project Area from the RAP's is descriptive and relates to generalised Aboriginal lifeways at the time of first settlement, and the historical impact of white settlement on Aboriginal people and is common to many Aboriginal groups throughout Australia, and does not relate to any direct knowledge of, or connection with, the Project Area.

Further, the Ravensworth Estate and Project Area are not associated with any known or verified Aboriginal ceremony or tradition. ACHM state that there is 'scant evidence of any continuing traditional practices or observances of ritual or ceremony within the Project Area (refer to Section 6.11 of **Appendix 3**).

- The Casey & Lowe report completed quite extensive assessment against the NSW Heritage Criteria, which is missing from the Statement of significance and should be included as the site is likely to provide unique insights into:
- o A newly-established frontier and contact/interaction with Aboriginal people.
- Rural lifeways, including tastes and customs through the 19th to early 20th centuries.
- o Material culture and lives of significant colonial people.
- o Convict lives and the assignment system and how it was implemented within this landscape.
- Use of technology and management of water, changing transportation and economics and how they shaped life on the estate.

Casey and Lowe (C&L), specialist heritage archaeologists, completed an analysis of the historic archaeological resources, which included a test excavation program, and provided an assessment of the significance of those resources. The HA&SoS (Appendix 23 of the EIS) identified the Ravensworth Homestead Complex as having state significant heritage values and the potential archaeological resource associated with the Ravensworth Homestead Complex as also being of state significance.

The archaeological testing confirmed the survival of early and later nineteenth and early twentieth-century archaeological remains across the site with minimal impacts from later nineteenth-century demolition and twentieth-century farming and land-use. The date and context of these remains means they are considered by C&L to be of state heritage significance. The later periods are of local significance.

In summary, C&L identified the archaeology of the Core Estate Lands as having been associated with a number of prominent individuals: James Bowman, Mary Bowman (née Macarthur), and overseers James White and John Larnach along with convict assignment, as well as later owners Captain William Russell and the Marshall family. From its establishment, the property is a good example of an intact colonial rural estate built on convict labour, enhancing its role as a site of archaeological and scientific importance. C&L identified the heritage values of the archaeological resource in the Core Estate Lands as being of state significance. The wider site is associated with an evolving pastoral activity, notably early wool production, and is of local significance.

The Statement of Significance provided in the HA&SoS in Appendix 23c of the EIS included consideration of the work completed by C&L, however, the SoS has been revised to include further detail on the archaeological significance and is provided in **Appendix 2**. The revised sections have been provided in blue text in **Appendix 2** for ease of reference. It should be noted that the inclusion of this further detail has not changed the overall statement of significance, refer to **Table 4.1**.



f) an analysis of all reasonable and feasible options to preserve the Homestead (including leaving in situ);

- The EIS has not adequately met the requirements of this SEAR as it has not provided an analysis of all reasonable and feasible options to preserve the Homestead (including leaving in situ) or an adequate justification of why Options 6, 7 and 8 are not possible to ensure that Ravensworth Homestead is not impacted by the proposed works.

Glencore disagree with the statement that the requirements of this SEAR have not been met. Appendix 1 of the EIS describes the mine plan alternatives considered for the Project which includes analysis of all potential reasonable and feasible options, including three options which leave the Ravensworth Homestead in-situ. The detailed investigation and assessment of these mine plan options are considered in detail in Appendix 1 of the EIS with a brief outline of the analysis for each mine plan option which leaves the Ravensworth Homestead in-situ provided below.

It is noted that a formal obligation is imposed on all Mining Lease holders under the NSW Mining Act 1992 to ensure the efficient extraction and maximisation of the State-owned coal resource within each mining tenement. Further, the Division of Resources and Geoscience (DRG) noted in their submission on the EIS that 'should the project be approved, efficient and optimised resource outcomes can be achieved, and any identified risks or opportunities can be effectively regulated through the conditions of mining authorities issued under the Mining Act 1992'.

In addition, Clause 15 of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2017 (Mining SEPP) requires the consent authority of new mining developments to have regard to whether the proposal will be carried out in a manner that optimises the efficiency of resource recovery.

Mining around the Ravensworth Homestead to within 100m of the buildings (Option 6) was assessed for feasibility which results in the sterilisation of approximately 46Mt of ROM coal equating to the loss in revenue to the state of NSW in the form of royalties in the order of \$250M (undiscounted), relative to the proposed mine plan (the Project). In addition to the economic (sterilisation of coal reserves) and financial impacts, this option also poses potential blast vibration impacts, long term stability risks, change in visual catchment and setting, and isolation and inaccessibility of the Ravensworth Homestead.

Mining up to 500m distance of the Ravensworth Homestead (Option 7) was investigated which would reduce the extent of blasting vibration on the buildings and remove the potential for fly rock damage from blasting. This option sterilises approximately 80Mt of ROM coal which equates to a loss in royalties to the state of NSW of around \$420M (undiscounted) and is not economically viable for Glencore due to the reduced resource recovery and mine life.

An additional mine plan option was also investigated which involves mining up to a distance of 900 m to the south of the Ravensworth Homestead, the approximate southern boundary of the Core Estate Lands. However, this option results in the further sterilisation of reserves and loss in revenue to the state of NSW and was not considered reasonable or feasible.

Underground mining methods (Option 8) were also considered as this would reduce surface impacts associated with the Project, however geology and geometry of the Project area are not favourable for underground mining and there is a high capital cost associated with the establishment, and the tonnage of coal available for recovery are insufficient to ensure the economic viability of the operation and provide a suitable return on investment.



The proposed mine plan and proposed relocation options for the Homestead as presented and assessed in the Project EIS are considered to achieve an appropriate balance between mine planning, economic, environmental and social outcomes. Further, the Project requires the development of the full mining area as proposed, in order to achieve a return on investment. If approval was given for an alternative mining footprint that leaves the Ravensworth Homestead in situ, then it is highly unlikely that Glencore would proceed with the Project which would have significant local, regional and State economic impacts. Glencore believes that the proposed mining footprint and associated relocation of Ravensworth Homestead provides an appropriate balance between the competing interests of mining and economic benefits to NSW, and the conservation of heritage values.

g) if relocation is selected as the preferred option, please include an analysis of all feasible relocation options...

As described in Section 7.8.6 of the EIS, Glencore have undertaken extensive research and investigation throughout the preparation of the EIS to select reasonable and feasible options for the relocation of the Ravensworth Homestead including:

- Formation of the Ravensworth Homestead Advisory Committee of key stakeholders with interests in heritage matters, in order to facilitate the process of gaining key stakeholder views on the proposed relocation, and to review and provide guidance on the future of Ravensworth Homestead Complex (refer to Section 7.8.6.1 of the EIS)
- Identification of key factors and issues for consideration when assessing and selecting relocation options
- Investigation into recipient site options, which involved identification and investigation of 11 relocation options (refer to Section 7.8.6.3 of the EIS)
- Investigation into two alternate methods for relocation of the buildings; wholly intact (or in large intact sections) or dismantling and rebuilding at a new recipient site and assessment of the suitability of these methods for the recipient sites, including route assessments.

The outcomes of these investigations resulted in Glencore proposing two reasonable and feasible relocation options as part of the EIS. These options are:

- Ravensworth Farm (Option 1) involves the intact relocation of all buildings including moving selected trees and plants to the 'Ravensworth Farm' site located within the Project Area and on the original Bowman "10,000 acre" land grant (Ravensworth Estate Lands). The building will be used by Glencore as an administration and training facility during the life of the Project and, after mining, the Ravensworth Homestead could return to use as a farmstead with an attached landholding. This option will place the buildings on land with a similar landscape and outlook to the current Homestead site and will maximise the retention of building fabric and heritage values including the building complex layout.
- Broke Village (Option 2) this is a proposal put forward to Glencore by members of the Broke-Fordwich community and involves the dismantling all of the Homestead buildings and relocation to Broke where the buildings would be rebuilt and have multi-purpose usage forming the village square. This outcome will provide lower preservation of heritage values, however, provide greater community benefits with a higher level of public accessibility. This option will require further secondary approvals for the Broke site, and the securing of land tenure should this option be approved as part of the Project approval.

Further detail on the process of selecting reasonable and feasible relocation options undertaken was provided in Section 7.8 of the EIS, however responses to the specific issues raised by the Heritage Council in relation to the relocation options are provided in the following sections.



 This SEAR has not been met. The proposed options for relocation are not considered to have been appropriately met as neither option provides for the full relocation of the entirety of Ravensworth Homestead without demolition or removal of significant fabric such as the 1920s addition and the original homestead footings. Much more detailed information needs to be provided before either option can be considered.

Glencore disagrees with the statement that this SEAR has not been met.

The proposed options for relocation of the Ravensworth Homestead includes relocation of those elements of the existing homestead complex that are considered significant and important as identified by heritage consultants with experience in colonial architecture. Each option proposes to relocate all buildings that make up the Ravensworth Complex excluding the later 20th century addition to the Main House, and other minor modification works such as sheds and covered areas added to the Barn and Stables which are seen to "hinder understanding and confuse appreciation" of the original floorplan (refer Broadbent (2020) in LSJs Expanded Analysis, **Appendix 2**). Each relocation option will result in the partial loss of the original building footings below ground surface, though the original footings, where currently visible will be relocated with the building, leading to no visible loss of footings at the recipient site compared to the current site. Further detailed discussion on this matter is provided below.

Whilst it is acknowledged that the loss of some non-visual elements of the footings is regrettable, the relocation of the buildings in one piece not only preserves the majority of building fabric but will also ensure that it does not further dilapidate where the original footing design was insufficient. This can be seen in selected areas where the original footing construction was not sufficient to withstand the building loads over its life and is particularly evident on the stables and the northern end of the barn building. The relocation of the building is likely to preserve those areas of the building which are currently compromised due to unsatisfactory original footing design. Furthermore, the relocation of the buildings provides an opportunity to improve the support and therefore the stability of the buildings at the new site as the buildings will be relocated onto footings designed to modern building codes and utilising modern methods.

It is also noted that as part of our investigations to determine the depth and design of the a section of footing on the western side of the stables was uncovered which has already had additional underpinning work undertaken in the form of a more substantial concrete footer. This suggests that section of the original footer may already have been modified in the past in an attempt to stop the degradation of the buildings due to insufficient footings being constructed.

A substantial amount of investigation, consultation and design has been completed in development of each option to satisfy the SEARS with significant detail provided in the EIS (refer Appendix 23 of the EIS). Further detail on this information is provided below. The scope for relocation of the Ravensworth Homestead and associated outbuildings has been comprehensively developed, over a two year period, with input and advice from subject matter experts on colonial homesteads and colonial history, and a range of technical advisors including heritage architects, heritage engineers, specialist moving engineers and heritage building contractors. The Ravensworth Homestead Advisory Committee (RHAC) was also involved in every aspect of the analysis and decision-making process.

The selection of buildings and other elements to be relocated is a direct result of this advice and input, and included the removal of the later 20th century additions as these additions are seen to greatly diminish the understanding and appreciation of the history and development of the homestead's 19th century fabric, which is considered more significant. Additional discussion on the significance and treatment of the later additions is provided in a report prepared by Dr James Broadbent, an expert in early colonial architecture (refer to Appendix A in **Appendix 2**).



The EIS included detailed investigation and assessment of Ravensworth Homestead in all of its elements including history, architecture, archaeology, landscape and setting, and gardens. Further, comprehensive assessment of relocation options with supporting information, technical analysis, methodology descriptions and recipient site assessments has been completed. This included significant detail on the proposed relocation options for which approval is being sought.

The EIS included a comprehensive and detailed heritage analysis and statement of significance (Heritage Analysis and Statement of Significance - Ravensworth Estate and associated building group (Lucas Stapleton Johnson), Appendix 23a of the EIS) and a comprehensive and detailed historic archaeological assessment of the homestead and core estate (Historic Archaeological Impact Statement of Core Estate Lands (Casey & Lowe), Appendix 23c of the EIS). The level of investigation, analysis and detail provided in the EIS far exceeds any previous knowledge and understanding of the Homestead or any other Homesteads in this part of the valley.

The EIS also included a comprehensive mining options report (Glencore, refer Appendix 1 of EIS) that assessed mine plan alternatives and included leaving the homestead in-situ, as well as a summary statement justifying the relocation of the homestead (Glencore, refer to Appendix 23e of the EIS). This information provides context on the requirement to relocate the homestead for the Project and provides further detail on why a mine plan option that leaves the homestead in-situ is not considered reasonable and feasible.

Further, the EIS also contained a comprehensive and detailed relocation option identification and assessment report (Glencore, refer Appendix 23f of the EIS), which detailed the role of the RHAC, the progression of options and efforts involved in option identification and selection of the preferred relocation options. It includes minutes of each Ravensworth Homestead Advisory Committee (RHAC) meeting, a detailed route assessment by the specialist moving engineer, recipient site assessments, planning constraints report and landscaping schedules. This is further supplemented by additional design and technical documentation for the two selected relocation options (refer Appendix 23g and 23h of the EIS) that includes architectural drawings, preliminary engineering design, move methodology reports and other supporting information. This amount of documentation produced over the last 2 years of investigation is indicative of the amount of effort put in by numerous parties, including a diverse range of subject matter experts and technical advisors with significant experience in this work.

 There are several significant issues raised regarding the 'intact' relocation Option 1, including the unique project risks outlined by the movers, as well as the outstanding methodology and cost calculations that provide little certainty to this option.

Glencore disagree with the statement that the methodology and cost calculations provide little certainty to the option of intact relocation. As stated previously, the scope for relocation of the Ravensworth Homestead and associated outbuildings has been comprehensively developed, over a two year period, with input and advice from subject matter experts on colonial homesteads and colonial history, and a range of technical advisors including heritage architects, heritage engineers, specialist moving engineers and heritage building contractors.

The EIS documentation included a report from the specialist moving engineer describing the intact move methodology proposed for Option 1 (refer Appendix 23g of EIS) plus a comprehensive route assessment completed by the specialist moving engineer (refer Appendix 23f of EIS) that included additional route related considerations for moving the buildings intact.



To further supplement the information included in the Project EIS, the following additional information has been prepared by the specialist moving engineer and are provided as appendices of this Part B RTS report:

- List of key potential risks and proposed mitigation measures for managing the risks associated with the intact relocation of the buildings to the Ravensworth Farm site (Option 1) (Appendix 7).
- Addendum to Relocation Methodology Document Risk Mitigation Strategies and Supporting
 Information (Appendix 4). This document is supplementary to the move methodology provided in
 Appendix 23g of the EIS and is provided as commercial in confidence as it contains sensitive intellectual
 property that the specialist moving engineer would like to protect. The document provides further
 discussion on:
 - o pre-move stabilisation works
 - the process for removing flagstones
 - the presence of bedrock and its influence on the building cutline, which is the location at which the building is separated from its foundation
 - proposed methodologies for managing the double leaf stone walls with rubble infill
 - o the methodology for raising, lowering and supporting the buildings, and
 - o transport requirements.

Key Potential Risks

In development of the move methodology by the specialist moving engineer, they have considered risks and controls based on their extensive experience in conducting this work. In order to better communicate the risks that have been considered, a list of key potential risks and their controls has been prepared by the specialist moving engineer and heritage architect for the intact relocation of the buildings to the Ravensworth Farm site (Option 1) and includes measures for managing the potential risks (refer to **Appendix 7**).

The risk list will be regularly reviewed and revised and form part of the formal Risk Assessment process as the Project progresses into the Execution Phase. It should be noted that none of the potential risks identified are considered significant and can be effectively managed through the implementation of the proposed management measures. The specialist moving engineer has undertaken extensive on-site review of the building construction and condition and in doing so has identified the risks associated with the proposed relocation in one piece. These investigations have not identified any risks or construction issues which have not been seen and mitigated before in previous moves as is demonstrated at a high level in the additional example moves document (refer to **Appendix 6**). Nevertheless, the relocation of masonry buildings remains a specialist field and successful operation in the industry requires aptitude in problem solving as every move is individual and presents its own unique challenges. The specialist moving team contains highly experienced individuals who have successfully undertaken numerous similar challenging moves in North America and Australia.

Relocation Methodology

As mentioned above, Appendix 23g of the Project EIS includes a methodology report prepared by the specialist moving engineer for the intact relocation of the buildings to the Ravensworth Farm site (Option 1). In addition to this methodology, the specialist moving engineer has prepared an addendum to the relocation methodology report that provides further information on key elements associated with the homestead buildings including the proposed process for removing flagstones and methodologies for managing the double leaf stone walls with rubble infill.



The intact relocation of the buildings is considered the most sympathetic to the significance of the buildings and would maximise the retention of the existing heritage fabric. The buildings would be transported along a purpose built road of sufficient width to accommodate the relocation of the Main House and Kitchen Wing as whole buildings.

The methodology for the intact relocation of the Ravensworth Homestead Complex would comprise 3 phases as outlined below and is reproduced from Section 7.8.7.1 of the EIS.

Phase 1 involves a range of preparatory work including:

- Detailed archaeological (both Aboriginal and historical) investigation, recording and salvage within the immediate area of the proposed relocation works. Further details on the post-approval archaeological investigation is provided in the SoHI (Appendix 23d of the EIS).
- Salvage of select plants, trees and other garden features as identified in Appendix 23f of the EIS with
 advice from specialist landscapers and arborists. Trees and plants salvaged from the existing garden
 and immediate surrounds would be initially housed in a temporary nursery located onsite before being
 incorporated into the final landscape scheme.
- Hazardous material assessment and removal as required (e.g. asbestos, lead paint), demolition and removal of identified structures considered of minimal heritage significance such as the Dairy Stalls alteration in the Barn building and the Shearing Shed alterations in the Stable building.
- Sensitive removal of the early 20th century addition to the Main House in order to reinstate the original 'H' plan form.
- Documentation, disassembly and palletisation of identified structures not suitable for intact relocation including the southern room of the Stables.
- Building repair and stabilisation works such as roof timber replacement and reinstatement with
 matched timber (where missing), tie-down connection of roof members to walls, crack stitching,
 installation of wall through ties and permanent roof bracing. The final schedule of repair and
 stabilisation works would be determined following further investigation and consultation with the
 building mover and heritage structure engineer.
- Construction of transport route from existing site to recipient site.
- Civil works at recipient site including site regrading, drainage, construction of new House Dam, construction of new driveway, footing construction and conduit installation for services.

The Phase 2 (building move) works would be completed by a specialist moving engineer. A detailed move methodology for the intact relocation of the buildings to the Ravensworth Farm site has been prepared by Mammoth Movers and is provided in Appendix 23g of the EIS. In summary, the key steps in moving the buildings includes:

- Installation of temporary structural support or bracing to maintain the buildings in their existing condition during the move
- Excavation around and beneath the buildings and installation of the jacking support frame consisting of steel beams used to spread the load onto a network of hydraulically linked dollies
- The uniform raising of the buildings and transfer onto dollies



- Transporting the buildings to the recipient site via a purpose built road that avoids interaction with public road users
- Placing the buildings onto their new footings and the building up of supports to the underside of the buildings relocated footings
- Reconnection of services
- Removal of the jacking support frame from under the buildings, temporary bracing and supports and demobilisation of relocation equipment
- Infill of building support walls at footing interface where temporary support beams have been removed
- Backfilling around the buildings to the final design level
- Separate relocation of disassembled building components that were not suitable for intact relocation to the recipient site and reassembly in their new location using a suitably qualified heritage builder.

The Phase 3 works would occur after the buildings have been moved and would include:

- Internal fit out to suit the proposed end use including service reticulation and wet areas;
- Construction of other adaptation works to suit the proposed end use, and
- Planting of salvaged trees and plants and establishment of gardens in accordance with proposed landscape scheme.

The move methodology addendum prepared by the specialist moving engineer provides additional background information with respect to the management of potential risks associated with the intact relocation of the buildings. This document is provided as commercial in confidence as it contains sensitive intellectual property that the specialist moving engineer would like to protect. The document provides further discussion on:

- Pre-move stabilisation works: including crack-stitching of walls, stone replacement where structurally compromised, filling and pointing of open joints, localised re-construction of structurally sensitive elements (e.g. sections of northern room of Barn only) and pinning of walls through the installation of through-ties.
- Removal of flagstones: flagstones will be removed by removing underlying material enabling them to
 'drop out' from the floor vertically rather than attempting to lever the stones out from above. Prior to
 removal each stone will be numbered to allow reinstatement in the original arrangement at the
 recipient site.
- Presence of bedrock and its influence on the cutline (point at which the building is separated from its
 foundation) of the buildings: geotechnical investigations have indicated the possible presence of rock
 (up to approximately 0.5m below the surface) beneath the Kitchen Wing, eastern portion of Main
 House and Privy. It is highly likely that some rock will need to be excavated in order to install the steel
 beam supporting platform that the buildings will sit on when being moved. This will be completed using
 small machine mounted hammers and other low impact methods in order to minimise vibration where
 in close proximity of the buildings.



A preliminary cutline has been selected for each building having regard to the depth of rock and the building fabric retained above the separation point. Further details on the preliminary cutline for each building are provided in Appendix 23g of the Project EIS. The final cutline of each building will be determined in consultation with the specialist moving engineer and heritage architect with consideration of the outcomes of a further detailed geotechnical investigation.

- Treatment of the double leaf stone walls with rubble infill: the construction of the existing walls for all buildings are double leaf with rubble infill and vary in thickness between 470mm and 640mm. The existing walls also include occasional tie-stones that span the two wall leaves and tie the wall together. This type of wall construction requires consideration during the moving of the buildings in order to prevent the delamination (separation) of the wall leaves (particularly where few tie-stones exist) as well as the movement and potential loss of the rubble fill during excavation for the supporting steel beams or building relocation. These scenarios can be managed through:
 - Installing pins through the walls the potential for delamination will be managed by installing pins into the wall to tie the two wall leaves together. This requires the drilling holes into both leaves from the inside and installing steel pins that are epoxied into position.
 - o Foam injection expanding foam can be injected at or above the building cutline to fill the wall void and stabilise the rubble between the wall leaves and prevent the loss of rubble fill.
 - o localised grouting it may be necessary to inject grout between the wall and the top of the support steel to fill any voids and retain the rubble cavity.
 - Installation of banding banding would be installed at the building cutline and involves the
 installation of steel straps that cradle and support the bottom of the wall. Plywood can also be
 installed to the underside of the wall to provide further assurance that all wall rubble is
 contained.
- Methodology for raising, lowering and supporting the buildings: a steel supporting platform will be
 installed beneath each building before being uniformly raised for placement on dollies using
 hydraulically connected jacks. The jacks will be connected to a unified jacking system that ensures all
 jacks extend at the same rate and all sections of the building are lifted in unison. The unified jacking
 system also provides the instantaneous pressure of each jacking circuit to allow any problems to be
 recognised immediately.

Cribbing (supporting structure) will be used to support the buildings as it is raised with it being continually built in successive levels to minimise at all times the gap between the top of cribbing and underside of the steel supporting platform. This mitigates the risk of jack failure as the building would settle back onto the cribbing.

In addition to the pressure gauges on the unified jacking system, additional gauges would be installed around the perimeter of each building to monitor the raising of the building relative to a stationary benchmark. Further plumb bobs would be installed to confirm the building is being raised without any transverse movement.

• Transport requirements: once raised, dollies are placed under the supporting steel platform with each dolly containing a central vertical hydraulic ram that is hydraulically connected to the rams of other dollies and that keep the building level while traversing the transport route. The buildings will be transported slowly on a purpose built road constructed to the specialist moving engineer's requirements with the buildings being pulled to the new location using a pull truck and self-propelled power dollies. The use of hydraulic dollies enables variation in the road surface to be accommodated with no transfer of load in the support platform and into the building, thereby preserving the building as it moves along the road despite localised changes in topography and road surface.



Cost Estimate

A cost estimate has been developed by Glendell in consultation with the specialist moving engineer, heritage structural engineer and heritage architect for the intact relocation of the homestead buildings to the Ravensworth Farm site (Option 1) and includes the following items (not exhaustive):

- Removal and disposal of hazardous materials such as asbestos, lead paint and organo-pesticides associated with the former cattle dip
- Salvage of trees and plantings as identified including housing in a temporary on-site nursery and reinstatement at recipient site
- Construction of purpose built road for the transportation of the buildings to the specialist moving engineer's specifications with consideration of the vertical and horizontal geometry
- Pre-move stabilisation and repair works including installation of temporary bracing, crack-stitching and through ties, and reconstruction of north room of barn
- Removal of 1920s addition to Main House and other later additions not being relocated
- Recipient site preparatory works including earthworks, drainage, footing construction and service installation
- Specialist mover costs including import of specialist equipment and expertise from the USA
- Repurposing of buildings to suit proposed end use including new wet areas
- Landscape works consistent with the proposed landscape scheme (refer Appendix 23g of EIS)

The methodology described in the specialist mover's report (Methodology for the Relocation of Ravensworth Homestead Complex Ravensworth, Hunter Valley, Appendix 23g of EIS) and supplementary information contained in **Appendix 4** describes in detail how the buildings will be relocated and how the potential risks associated with moving the buildings intact will be managed. The cost estimate developed for the intact relocation of the buildings to Ravensworth Farm (Option 1) is based on this detailed methodology.

Glendell considers that the cost build up is sufficiently detailed having been informed through a significant amount of investigation and analysis, and accounts for all elements associated with the relocation of the buildings and their repurposing to suit the proposed end use. The extent of investigation and analysis completed by Mammoth Movers to inform the scope of the move and cost estimate is described in **Appendix 5**.

Other, non-mover costs have been determined based on developed scopes of work for architectural treatment, structural engineering, earthworks and landscaping using contractor and market rates.

In addition to the above, Glendell has also included provision for a contingency amount that reflects the maturity of the design works completed and level of risk and uncertainty associated with the scope of works. This is consistent with the risk management approach taken on major projects and accepted best practice.

 Furthermore, the preferred intact relocation option will require a large amount of demolition of significant fabric which will not be relocated to the new location and the introduction of new fabric such as new footings.



As discussed previously, the later 20th century building addition to the Main House is not considered to have high heritage value by experienced heritage architects, Lucas Stapleton Johnson, and may detract from its original 19th century layout and construction. The removal of the later addition to the Main House is also supported by Dr James Broadbent, an expert in early colonial architecture (refer Appendix A of **Appendix 2**). As such, it is not proposed to relocate the later addition as part of the intact relocation to Ravensworth Farm (Option 1). Suitable materials from the dismantle of this later addition may be salvaged and used to replace damaged stone in the existing buildings.

Other disruption of heritage fabric, separate to the 20th century addition, that is required to complete the intact relocation of the buildings to Ravensworth Farm (Option 1) is restricted to the following areas:

- Dismantle and rebuild of the southern room of the Stables where walls currently require propping to prevent any further separation
- Removal of hazardous materials including asbestos and lead paint and disposal at a licenced waste receival facility
- Replacement of pest and weather affected timber
- Disconnection of the building mid-footing with the remaining in-situ footing to be archaeologically recorded

Contrary to the concerns of the Heritage Council, all other significant building fabric including timber floors, flagstone flooring, skirting boards and doors will be carefully dismantled and reinstated following relocation of the building. Windows will remain in the building where practicable and will be protected during the move using plywood sheeting.

Further discussion on these elements and how they will be managed is provided below.

Dismantle and Rebuild of Stables Section

The western and eastern walls of the southern room of the Stables building have started to separate and will require rebuilding as part of the relocation proposal. As a result, the southern room will be sensitively dismantled and rebuilt at the recipient site. The existing roof covering the southern room will be removed and reinstated in one piece. The dismantling and rebuilding of the walls will follow the same move methodology as that proposed for the Broke Village option (Option 2). Further details on the dismantle and rebuild methodology are provided in Section 7.8.7.2 of the Project EIS and Appendix 23h.

Removal of Hazardous Materials

The homestead buildings currently contain hazardous materials including sections of asbestos fibre panels and lead paint. As part of the relocation works, a full hazardous materials assessment will be completed and hazardous materials will be removed prior to relocation.

A suitably qualified hazardous materials contractor will be engaged to complete the sensitive removal of the hazardous materials, in consultation with the heritage architect and a heritage building contractor. Removed hazardous materials will be disposed of at a suitably licensed waste receival facility.

Replacement of Pest and Weather Affected Timber

There is no current pest activity at the homestead, however the roof structure of the Main House shows evidence of past pest attack from termites and previous weathering effects. As part of the pre-move works, a campaign to identify and replace pest affected timber will be completed. The replacement timber will be approved by the heritage architect and will be of similar material and dimensions to the existing timber (pre-degradation).



Removal and reinstatement of timber floors, flagstone flooring, skirting boards and doors

The removal and reinstatement of building components such as timber floors, skirting boards and doors will follow the dismantle and rebuild methodology and involve the numbering of all components before being removed so that they can be reinstated at the recipient site where applicable. Further details on the dismantle and rebuild methodology is provided in Section X and Appendix 23h of the Project EIS.

Flagstones for the intact move will be removed as described above and involve removal of the underlying material so they can 'drop out' from the floor vertically rather than attempting to lever the stones out from above. Prior to removal each stone will be numbered to allow reinstatement in the original arrangement at the recipient site.

Separation of the buildings from their footings

As discussed in the moving engineer's methodology report, installation of support steel and jacking of the building requires selection of an appropriate plane of separation of the building from its foundation, referred to as the 'cutline'.

During archaeological investigation of the homestead complex and to better understand the current building footing arrangement and condition, archaeological test pits were completed to the depth of footing in several areas adjacent to each building with the following findings described below and in **Figure 4.9**:

- Main House and Kitchen Wing had significant sturdy footings of 2-4 courses, varying in depth and varying in material between dressed stone and large rubble
- Stables footings were found to be of similar construction, deeper on the western side than the eastern side by approximately 2 courses
- Barn footings varied and in many places were more rubble-like than the shaped stones of the Stables or the Main House with the barn footings at the northern end being particularly shallow.

In general, footing materials and depth are variable across each of the buildings as well as within the same building due to variations in rock depth across the site and the availability of stone material at the time of building construction, making relocation of the full depth of footings in their current arrangement impractical and problematic.











Figure 4.9 Building Footings



During the development of the intact move methodology, a cutline for each building was chosen in consultation with the heritage architect having regard for:

- depth to rock for the purpose of installing the steel beam lifting platform. The lower the cutline the deeper the excavation required for the installation of steel beams.
- The weight of the building. The lower the cutline the more weight that is added to the building, which can be overcome through appropriate sizing of steel beams.
- Retention of building fabric. A lower cutline retains more of the building fabric including footings.
- Condition of existing footings. Footings comprising small irregular stones or weak stones may not
 provide an appropriate interface or support structure between the underside of the building and
 top of the steel beam lifting platform and could result in wall instability if stones were to move, crush
 or dislodge.

The cutlines proposed and the general treatment of the footings for the intact relocation of the homestead to Ravensworth Farm (Option 1) is presented in **Table 4.4** and further discussed below.

Table 4.4 Preliminary Building Cutline

Building	Preliminary Cutline
Main House	450mm below the building basecourse
Kitchen Wing	At the base of the building basecourse as a minimum – To be lowered if feasible – dependent on presence and strength of bedrock
Barn	70mm above grade at the south-western corner of the Barn extending to the northern end of the Barn section. Cutline of the Barn northern room to be determined but as a minimum to be below the basecourse at the lowest corner relative to grade,
Stables	At the bottom of the building basecourse on the western wall, (resulting in all footings being relocated)
Privy	At the bottom of the building basecourse as a minimum – dependent on presence and strength of bedrock

As part of the building move, a single plane cutline has been selected, above which the building will be moved intact. The location of the cutline for the buildings will generally be at or just below the surrounding existing ground level. Excavation to install supporting steelwork would then occur 1.2m below the selected cutline.

Location of the cutline for the Main House (450mm below building basecourse) means that a portion of the existing footing stone will be taken with the building. The final cutline for each building will be selected as part of further detailed assessment and investigation of ground conditions and existing footings involving the heritage architect and specialist moving engineer. The cutlines will be reassessed and where feasible lowered once the Project has commenced and the footings around the building perimeters are uncovered so full assessment can be made.

The remaining in situ footings will be recorded as part of the salvage archaeology program with potential for salvage of the stone for use in any necessary replacement or repair works or used to reconstruct a footing interpretive display at the recipient site.

New engineered footings at the recipient site will be located below the finished ground surface and the interface with the existing building footings and basecourse would not be a visible part of the building following relocation.



Figure 4.10 shows the proposed cutline location for the Main House relative to the existing footings and the future ground level.

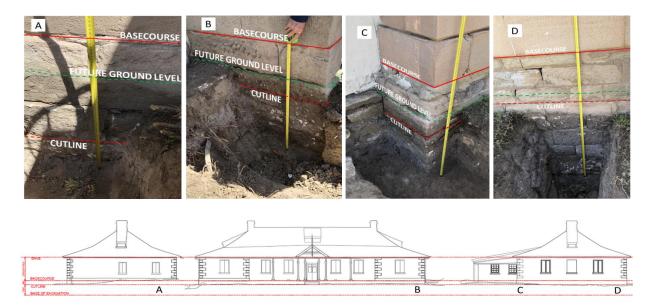


Figure 4.10 Proposed cutline location for the Main House

The current condition of Ravensworth House and its original construction techniques also mean the buildings are not favorable to relocation.

The specialist moving engineer has completed extensive investigations and assessments to assess the viability of moving the buildings intact having regard to their age and construction techniques. The outcome of these investigations and assessments is that the buildings are not unique and can be moved intact, however the use of this move methodology is limited to recipient sites within 3 to 5km of the current homestead location due to transport route constraints.

Appendix 5 of this RTS provides details of the investigations and assessments completed by the specialist moving engineer. In addition, the buildings have been inspected and assessed by Lucas Stapleton Johnson and structural consultant engineers (Mott MacDonald) who agree that an intact move is possible without damage to the buildings (refer Section 7.8.9.8 and Appendix 23G of the Project EIS).

The method for moving buildings intact is well-established and has been used extensively to move stone and masonry buildings throughout North America and Europe. In Australia, the first heritage listed masonry building to be moved using the proposed intact move methodology was the Hornsby Signal Box, which was moved by Mammoth Movers in 2007. A summary of comparable building relocations is shown in **Table 4.5** with further detail for each of the listed projects available in **Appendix 6**. Also provided in **Appendix 6** are Curriculum Vitae of Mammoth Mover key personnel.

Aspects of the intact move methodology have been tailored specifically to the Project by the specialist moving engineer in consultation with the heritage architect and structural engineer having regard to the condition of the buildings, their structural composition and method of construction. This includes the development of solutions for managing the double-leaf stone wall arrangement that contains loose rubble fill. Whilst these are tailored approaches, they are also tested on previous Projects which had similar constraints and therefore are also proven. Refer to **Appendix 7** for further details on proposed measures for managing key potential risks.

^{*}Note that the future ground level at location 'D' is shown above the current ground level due to correction of localised settlement of ground at the corner of the building associated with nearby drainage.



Table 4.5 Summary of Similar Intact Move Projects

Project No.	Building Name	Location	Heritage listed	Year Built	Year Relocated	Building construction (e.g. stone or brick)	No. of storeys	Approx weight of building (tonnes)	Building dimensions (Length x width) (m)	Approx distance moved (m)	Total time for the relocation component
GCOP	Ravensworth Homestead	Ravensworth, NSW, Australia	Yes, Singleton LEP	c1832	N/A	Double leaf sandstone construction with rubble fill (stone mason chips) between leaves (similar to Oneida Stake Academy and Armstrong House). Exterior leaf high quality dressed sandstone ashers with interior leaf of hand pecked roughed out sandstone	1	Homestead 615t Stable 226t* Barn 306t Kitchen Wing 375 t Privy 32t * assumes sections dismantled and rebuilt as per report	Homestead 11 x 22 m Stable 7 x 15 m* Barn 7 x 23 m Kitchen Wing 12 x 16 m Privy 3 x 3 m * assumes sections dismantled and rebuilt as per report	2616 m	2-3 days
1	King of Prussia Inn	Pennsylvania, USA	Yes	1719	2000	Constructed of locally available stone and a weak mortar of lime, sand and clay	3	670 tonne	15 m x 10 m	730 m	2 days
2	Jeremiah Clemens House	Alabama, USA	Yes	1835	2004	Locally made brick and fine brown clay for mortar (i.e. not cohesive binding mortar between bricks)	2	515 tonne	18 m x 14 m	800 m	3 days
3	Horticultural Building	Ontario, Canada	Yes	1914	2012	Brick	1	1540 tonne	55 m x 37 m	152 m	3 days
4	Oneida Stake Academy	Idaho, USA	No	1895	2003	Double leaf stone and rubble fill with sand and lime mortar	2.5	1500 tonne	24 m x 18.5 m	5 blocks	4 days
5	Century and Gem theatre	Michigan, USA	Yes	1903 and 1927	1999	Brick and stone	2 and 4	2450 tonne	32m x 30 m	563 m	4 days
6	Hornsby Signal Box	NSW, Australia	Yes	1928	2007	Full brick, lime mortar	2	320 tonne	22 m x 8 m	130 m	1 day
7	Armstrong House	Minneapolis, USA	Yes	1886	2001	Brick and double leaf cut stone with rubble fill	4 plus basement	770 tonne	16.5 m x 20 m	800 m (4 blocks)	9 days



 Insufficient information has been provided for Option 1 regarding the presence of underground mining under the recipient site and the likely blasting vibrations impacts on the relocated structures from existing adjacent mines.

The proposed Ravensworth Farm (Option 1) recipient site intentionally locates the building in a position where they do not directly overlie any existing underground workings (refer to **Figure 4.11**). Previous underground mining in the vicinity of the proposed Ravensworth Farm site occurred over 25 years ago at a depth in excess of 160m below the natural surface.

An assessment of subsidence impacts has shown that there is minimal potential for any current or future subsidence effects at the proposed homestead site given the age of the workings and that the homestead does not directly overlie any existing underground workings. In an extreme case involving failure of adjacent pillars, the angle of draw and tilt would be less than the Australian Standards limit for masonry buildings.

A copy of this assessment and design information for the homestead has been provided to Subsidence Advisory NSW post exhibition of the EIS. Following review of this information Subsidence Advisory NSW has subsequently provided approval conditional on adoption of recommended subsidence mitigation strategies as a precautionary approach, which includes:

- Development of a subsidence management plan
- Development and implementation of a monitoring plan across the existing site pre-relocation to identify long term trends
- Monitoring of the structure post-relocation
- Slab and foundation design to consider potential settlement mechanisms

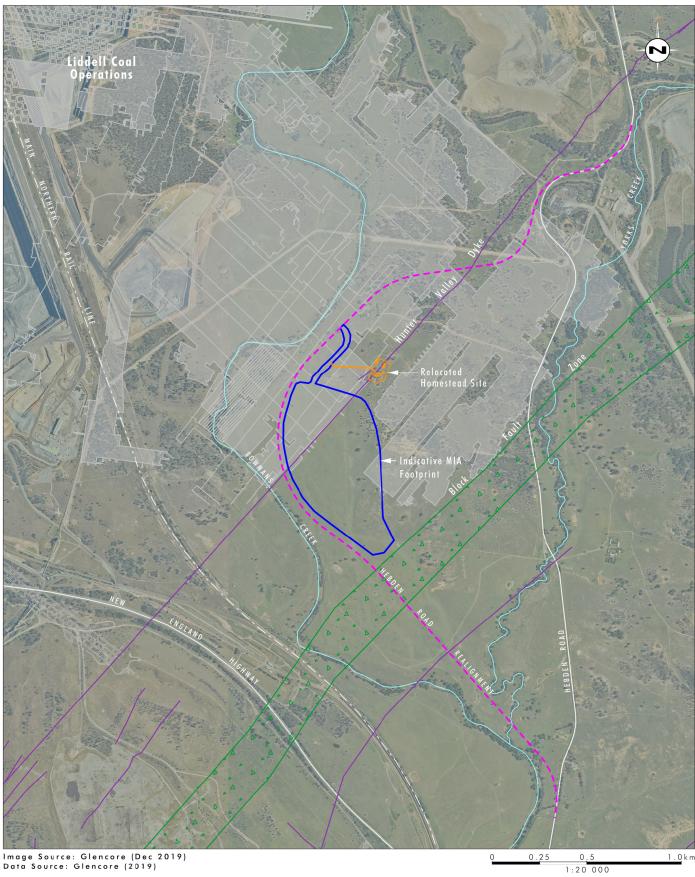
Future underground mining is not considered feasible beneath the proposed Ravensworth Farm recipient site due to geological features such as the Hunter Valley Dyke and Block Fault Zone, and that all mineable coal has been previously extracted.

A comprehensive Blast Impact Assessment (BIA) was completed for the EIS and considered the impact of blast vibration on the homestead buildings at the proposed Ravensworth Farm recipient site (Section 7.4 of the EIS). The BIA uses a model to predict vibration due to blasting associated with the Project at designated points based on blast information and site geology.

The BIA shows that following relocation of the homestead buildings, blast vibration can be effectively managed to maintain ground vibration levels below the existing vibration limit of 5mm/s (under the Mount Owen Consent) by managing charge masses through the blasting of smaller benches or application of deck charges, together with the use of precise initiation timing. Blasting would also occur more than 500m away from the homestead and therefore, out of the potential zone for flyrock.

Once the relocation works are completed and the Homestead is located at the Ravensworth Farm recipient site, a staged testing program will be carried out to confirm the new vibration limit. The vibration limits for the Ravensworth Homestead are expected to increase once the building is relocated due to the significant improvements to the building foundations completed as part of the relocation. However, until new limits have been confirmed, the current Mount Owen Consent criteria will continue to apply to the Homestead in its relocated position.





Legend

--- Hebden Road Realignment Indicative MIA Footprint Liddell Underground Workings — Dyke

Block Fault Zone

FIGURE 4.11

Location of Ravensworth Farm Recipient Site in relation to Existing Underground Workings



 Similar issues exist for Option 2. The proposed removal of internal walls will remove original fabric, graded high significance and alter the internal layout, graded exceptional significance. The current Option 2 proposed approach to the conservation of Ravensworth Homestead including the similar approach to the outbuildings will have a severely detrimental impact to their heritage significance

As presented in the EIS, the relocation to Broke Village (Option 2) is a proposal put forward to Glencore by members of the Broke-Fordwich community that sites the buildings in a publicly accessible location to provide an ongoing community benefit through dismantling and rebuilding the homestead buildings to form the Broke Village square. The buildings would have multi-purpose usage and would require adaptation to suit the intended end use. Once relocated the new facility would represent a significant interpretation of the original homestead.

In recognition of the heritage significance of the building group it is proposed to relocate all buildings to the new site in a configuration that is similar to their current arrangement, though it is noted that the distance between the Barn, Stables and Kitchen Wing has been reduced to improve the facility layout. Additionally, the alignment of the building group along the north-south axis has been modified in order to better fit with the site arrangement and frontage to Wollombi Street (Broke Road) and Milbrodale Road.

The preliminary architectural concept involves internal modification of the buildings to provide a more usable floorplan to suit the intended end use (refer Section 7.8 of the Project EIS), however this will be further developed as part of the secondary approval process. Option 2 also proposes the removal of the 20th century timber frame and asbestos additions to the Main House as they are not considered to have high heritage value and detract from its early 19th century layout and construction. Similar to Option 1, it is not proposed to relocate the original footings as part of rebuilding the buildings in Broke. The buildings will be rebuilt on new engineered footings with consideration given to relocating some of the footing stones if deemed structurally sound. The remaining footings will be recorded as part of the post-approval archaeological programme with potential to relocate and include a portion of the footing wall in the new landscape scheme as an interpretive display.

The proposed recipient site in Broke is not currently subject to blast vibration and flyrock impacts or potential impacts associated with underground mining.

The proposed move methodology and budget costs for Option 2 have been developed by a specialist heritage contractor with experience in the dismantle and rebuild of heritage buildings. A methodology report by the heritage contractor is provided in Appendix 23h of the Project EIS for the proposed dismantle and rebuilding of the homestead in Broke.

Similar to the Ravensworth Farm (Option 1), a cost estimate for relocation to Broke Village (Option 2) has been developed in consultation with a heritage contractor and architect, and includes (not exhaustive):

- Removal and disposal of hazardous materials such as asbestos, lead paint and organo-pesticides associated with the former cattle dip.
- Salvage of trees and plantings as identified including housing in a temporary on-site nursery and reinstatement at recipient site.
- Removal of 1920's addition to Main House and other later additions not being relocated.
- Recipient site preparatory works including earthworks, drainage, footing construction and service installation.
- Dismantle and rebuild costs including cost for transporting materials to the recipient site.



- Fitout of buildings to suit proposed end use including new wet areas.
- Landscape works consistent with the proposed landscape scheme (refer Appendix 23h of EIS).

Additional supporting information regarding the identification and treatment of risks associated with the dismantling and rebuilding of the buildings for Option 2 is provided in **Appendix 8**. Key risks associated with Option 2 relate to incorrect reconstruction of the buildings and damage to the building materials during dismantling, transportation and reconstruction. The majority of these risks can be overcome through the use of trained and competent personnel with heritage specific trades and supervision.



5.0 Response to Community and Interest Group Submissions

Submissions received from community members and Interest Groups relating to heritage matters are provided in text boxes below, and responses follow.

5.1 Aboriginal Cultural Heritage

Community Submission

"1. The main conclusion drawn in relation to traditional Aboriginal cultural heritage values within the study area is inappropriate and contrary to the lawful National Native Title Tribunal process in which one Registered Aboriginal Party (RAP) for the Project, namely the Plains Clans of the Wonnarua Peoples (PCWP) is actively engaged.

The PCWP has a Registered Whole of Country Native Title Claim over a portion of the Hunter Valley that includes the Project area. There has of yet been no determination made by the Native Title Tribunal with regard to the nature, extent or indeed extinguishment of Native Title Rights of the PCWP in the Project area and surrounds. S-121212

Native Title has been extinguished over all the land that exists within the Project disturbance area.

Dring the preparation of the Project EIS and ACHA, the PCWP discontinued their Native Title Claim (NC2013/006) and are no longer registered Native Title Claimants. A search of claims on the National Native Title tribunal on 9 June 2020 for preparation of this report (reference: http://www.nntt.gov.au/searchRegApps/NativeTitleClaims/Pages/details.aspx?NTDA_Fileno=NC2013/006) identified the claim as discontinued. A search of claim applications indicates that no new claim has been lodged and as such there are no current active Native Title Claims over the Project Area.

In addition, all RAPs are required to be, and were, consulted as part of the ACHA.

2. To the extent that the 22-ACHAR makes the claim that there are no traditional Aboriginal heritage values within the Project area - and indeed that it refers to the PCWP as 'knowledge holders' rather than as Registered Native Title Claimants — suggests that the document seeks to undermine the rights to Native Title of the PCWP and/or pre-empt any decision of the Native Title Tribunal. By implication, it cannot be concluded that the ACHAR presents a fully impartial and/or comprehensive assessment of the Aboriginal cultural heritage values within the Project Area. S-121212

Umwelt advises that the use of the terminology "knowledge holder" is a broad term that respects Aboriginal people with both statutory and traditional cultural recognition. This is consistent with the DECCW (now Heritage NSW) ACHCRs which refers to cultural knowledge (Section 3.3) and identifies who can provide that knowledge (Section 3.3.1) as "the traditional owners or custodians of the land that is the subject of the proposed project". The guideline notes that these are Aboriginal people who continue to maintain a deep respect for their ancestral belief system, traditional lore and custom, as the holders of that traditional cultural knowledge relevant to the area. The guideline goes further to say that in some cases this information is held by Aboriginal people with statutory recognition such as under the Aboriginal Lands Rights Act and/or native title holders or claimants.

It is therefore appropriate to describe the PCWP as knowledge holders.



As identified above, the PCWP Native Title Claim "Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People (NC2013/006) has been discontinued. As no replacement or alternate claim has been lodged at the time of preparing this report, the PCWP is not a Registered Native Title Claimant under the Native Title Act 1993 (Cth).

It should also be noted that the outcomes of the assessment of cultural values and significance has not changed following inclusion of the PCWP Cultural Values Report as part of the Aboriginal Cultural Heritage Assessment (ACHA). Further detail is provided in **Appendix 3**.

Further, BCD (Heritage NSW) has advised in its submission that the consultation process undertaken for the Project was best practice (refer to **Section 4.1**).

3. Further to this, in 2013 when employed by Tocomwall Pty Ltd I was involved in all aspects of the preparation of the document titled: 'Beginning and Belonging: The traditional, historical and contemporary Aboriginal cultural landscape of the Mount Owen Continued Operations area: A plains clans of the Wonnarua Perspective'. With my unique knowledge of this document (and its development as part of the broader Mount Owen Continued Operations Project Area (MOCO) ACHAR [to which the quote from page viii above refers]) I note that:

i. Despite my documentation of some of the traditional values held by the PCWP within the broader study area as part of the MOCO EIS process [and the inclusion of this document within the MOCO ACHAR) this prior EIS is being used to 'reaffirm' a lack of traditional Aboriginal values within this Project area." S-121212

The ACHA undertaken by ACHM included consultation with 32 Aboriginal community stakeholders and the Aboriginal cultural values identified by RAPs during the consultation process were provided in the ACHAR (Appendix 22 of the EIS). BCD (Heritage NSW) has advised in its submission that the consultation process undertaken for the Project was best practice.

At the time of finalisation of the EIS in December 2019, the PCWP had elected not to participate in the ACHA process for the Project. Since the lodgement of the EIS, the PCWP have provided a Values Report and the ACHAR has subsequently been updated to include consideration of these values, included as Section 6.7 of the revised ACHAR for the Project (refer to **Appendix 3**).

The PCWP Values Report expresses a broad connection to the Hunter Valley, including reference to dreaming tracks, Bora, rock art and other important cultural places. However, the PCWP Values Report places these values and places (apart from the historic associations with early colonial settlement of the Ravensworth Estate) well outside the Project Area.

The information provided by PCWP is consistent with its earlier report provided for the Mount Owen Continued Operations (MOCO) project (PCWP, 2013), United Wambo Joint Venture Project (PCWP, 2016) and Mangoola Coal Continued Operations project (PCWP, 2018).

Due to the revisions made to the ACHAR and in accordance with the ACHCRs, the revised ACHAR was provided to the Project's RAPs for a 28 day review period from 21 July to 19 August 2020 to provide any feedback.

Mitigation measures have been proposed to address the cultural heritage impacts identified by all RAPs in the ACHAR and are provided in **Section 7.0**.

It should be noted that the outcomes of the assessment of cultural values and significance has not changed following inclusion of the PCWP Cultural Values Report as part of the ACHA. Further detail is provided in **Appendix 3**.



Interest Group Submission – Plains Clan Wonnarua People

"The PCWP would like it to be known that Appendix 22 has been submitted without the Aboriginal cultural heritage consultation requirements for proponents 2010 having been completed. The consultation with the PCWP is still in progress. The PCWP therefore do not consider the Aboriginal Cultural Heritage Assessment report in support of the application as complete. Specifically section 4.3 Stage 3 – Gathering information about cultural significance including:

- 4.3.3 As part of this consultation, the proponent must also seek cultural information from registered Aboriginal parties to identify:
- (a) whether there are any Aboriginal objects of cultural value to Aboriginal people in the area of the proposed project
- (b) 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 s.84 of the NPW Act or not). This will 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.
- 4.3.4 Some information obtained from registered Aboriginal parties may be sensitive or have restricted public access. The proponent must, in consultation with registered Aboriginal parties, develop and implement appropriate protocols for sourcing and holding cultural information. In some cases the sensitive information may be provided to the proponent by an individual and the proponent should not share that information with all registered Aboriginal parties or others without the express permission of the individual.
- 4.3.5 Information obtained in 4.3.4 is used to understand the context and values of Aboriginal object(s) and/or place(s) located on the proposed project site. This information must be integrated with the scientific (archaeological) assessment of significance. Together the context, values, and scientific assessment provide the basis for assessing Aboriginal heritage values and recommending management options.

The applicant has been in discussion with the PCWP for the provision of the inputs to the Aboriginal Cultural Heritage study and agreed to the PCWP provision of the inputs. The PCWP have requested to visit the land to undertake anthropological research activity in order to be able to provide the inputs required by the consultation process however these arrangements for the site visit have been deferred by the applicant on a number of occasions. Whilst there is still agreement to provide this information, the Aboriginal Cultural Heritage Assessment report has been submitted without the outcomes of the consultation with the PCWP. The consultation outcomes are intended to inform the assessment of significance, Aboriginal heritage values, and the recommendations of the management options as required by the National Parks and Wildlife Act 1974, and the Aboriginal cultural heritage consultation requirements for proponents 2010. Therefore the Aboriginal Cultural Heritage Assessment report submitted as part of this application is incomplete and is not compliant with the consultation requirements.

The PCWP has specific concerns relating to the significance of conflict sites from the early colonial period not being adequately represented in the study. Additionally aspects of the cultural landscape that are significant to the PCWP have not been considered and represented in the study together with the archaeology of the Glendell Continued Operations Area. The PCWP cannot support the Aboriginal Cultural Heritage Assessment report in its present form until the consultation inputs and cultural values of the PCWP are included and used to inform the Aboriginal Cultural Heritage Assessment as required by the legislation."

As mentioned above, at the time of finalisation of the Project EIS, the PCWP had not provided their Values Report for inclusion into the ACHAR, however consultation with the PCWP during the EIS preparation raised concerns regarding colonial violence and claims of a massacre of Aboriginal people. Since the preparation of the Project EIS, the PCWP have completed their own Cultural Values Report for the Project Area, as discussed above. A high-level summary of the report is provided in the revised ACHAR (refer to **Appendix 3**).

Consultation with the PCWP has occurred throughout the assessment phase of the Project and Glencore believes they have fully met all requirements of the ACHCRs. Further, BCD (Heritage NSW) are satisfied that the consultation met these requirements (refer to **Section 4.1**). **Table 5.1** provides a summary of the consultation with the PCWP in accordance with each section of the ACHCRs.



Table 5.1 Summary of PCWP consultation throughout ACHA Process

Relevant Section of the ACHCRs	Consultation with the PCWP
Stage 1 – Notification of project proposal and registration of interest (Section 4.1 of the ACHCRs)	In accordance with tasks outlined in Stage 1 of the ACHCRs, letters were issued to all Aboriginal people and Aboriginal organisations identified by the relevant agencies, including the PCWP inviting them to be involved in the Project as a RAP. Scott Franks on behalf of the PCWP registered their interest for the Project on 22 December 2017.
Stage 2 – Presentation of information about the	As a RAP, the PCWP was issued the Draft Archaeological Survey Methodology by email on 19 February 2018 for review and comment.
proposed project (Section 4.2 of the ACHCRs)	As part of the Aboriginal Archaeological Values Assessment, Tocomwall (on behalf of the PCWP) were invited to provide fieldworkers for the archaeological survey component of the assessment. The PCWP fieldworkers attended the survey each day for the three-week duration.
	An additional Archaeological test pitting program was conducted with RAP involvement and included Tocomwall (on behalf of the PCWP) participants each day for the duration of the program.
	The historic archaeological test excavation program was also conducted with RAP involvement and included Tocomwall (on behalf of the PCWP) participants each day for the duration of the program.
Stage 3 – gathering information about cultural significance (Section 4.3 of the ACHCRs)	In recognition of PCWP's position as the Registered Native Title Claimant (at the time) for the Proposed Project Area, the PCWP were given the opportunity to prepare their own Aboriginal Cultural Values Report consistent with Stage 3 of the ACHCRs.
	An opportunity for the PCWP to attend a Cultural Heritage values workshop was also provided.
Stage 4 – Review of draft cultural heritage assessment report Section 4.4 of the ACHCRs)	The aim of Stage 4 of the ACHCRs was to prepare and finalise the ACHAR with input from RAPs. The ACHAR and Aboriginal Archaeological Impact Assessment (AAIA) was provided to the RAPs for the 28-day period for review and comment between 18 September – 18 October 2019, with one comment received following the review period on 30 October 2019 which was incorporated into the ACHAR.
	Following the receipt of the PCWP Values Report in June 2020, the ACHAR has now been updated and was reissued for the 28-day RAP review and comment in accordance with the ACHCRs. The ACHAR has been updated to include RAP comments and is now attached as a final report as Appendix 3 .

As outlined in **Section 7.0**, Glencore is proposing that a specific piece of interpretive work be developed as a mitigation measure to capture the Aboriginal cultural and historical values relating to the vicinity of the Project area. This would utilise digital media and include the historical information identified in the preparation of the Project EIS and additional information prepared for this RTS and include, where they wish to participate the cultural values of the RAPs. This can also include historical connection to other areas and sites such as St Clair Mission raised by the RAPs. The information presented in the interpretive work can be be designed to be suitable for use at schools and for distribution to Aboriginal groups and historical groups. This can allow the story of frontier conflicts associated with the Hunter Valley to be available for the education of future generations and provide the RAP's views on how this period of Australia's history still affects them today. The ACHMP for the Mount Owen Complex will be revised to include all artefact sites identified during the Project assessment. Measures will be included to manage "Unexpected Finds" as required by Heritage NSW guidelines, and will include specific measures to be undertaken in the event of an unknown burial being identified, in accordance with existing site procedures at the Mount Owen Complex.



6.0 RAP Feedback on Revised ACHAR

As stated previously, following receipt of the PCWP Cultural Values Report, the ACHAR (ACHM, 2019) submitted as part of the EIS was revised to include PCWP values. Due to the revisions made to the ACHAR and in accordance with the Guide (DECCW, 2010), the revised ACHAR (ACHM, 2020) was provided to the Project's RAPs for a 28 day review period from 21 July to 19 August 2020 to provide any feedback, however feedback received after this period has also been included. Feedback was received from eight RAPS and has been incorporated into the revised ACHAR (refer to **Appendix 3**) with a summary provided in **Table 6.1** below.

Table 6.1 Summary of RAP feedback on revised ACHAR

Date received	RAP	Summary of RAP feedback
8 August 2020	Corroboree Aboriginal Corporation	Written feedback received stating no issues with ACHAR and that Corroboree Aboriginal Corporation agree with project plans.
5 August 2020	Des Hickey	Verbal feedback received stating he is satisfied with the updated ACHAR and has no additional comments
12 August 2020	Rhoda Perry	Verbal feedback received stating she is satisfied with the updated ACHAR and has no additional comments
18 August 2020	Hunter Valley Aboriginal Corporation (HVAC)	Written feedback received stating the HVAC wishes for the history of the Ravensworth Homestead to acknowledge the possibility of Aboriginal peoples as labourers or residential staff from Macarthur's estate at Camden Park. Furthermore, the HVAC supports the relocation of the Homestead to Broke. The reasoning for this position is to ensure that the heritage and history of the homestead is maintained and is accessible to the wider
19 August 2020	Neil Draper on behalf of PCWP	community. Report received from Neil Draper on behalf of PCWP. Refer to Table 6.2 for Glencore's comments on the matters raised in the Neil Draper Report. Further detail is also provided in Appendix 3 .
20 August 2020	Laurie Perry (Wonnarua Nation Aboriginal Corporation)	Letter received from Laurie Perry (CEO) on behalf of Wonnarua Nation Aboriginal Corporation (WNAC). The WNAC acknowledge that there were a number of skirmishes between Aboriginal people and early settlers throughout the Hunter Valley, however they do not believe that there was anything more significant about the events that took place at Ravensworth Estate when compared to other areas. In their opinion, if a massacre had occurred at Ravensworth, then their ancestors would have known this. The WNAC identify St Clair Mission, Biaimie Cave, Lizard Rock and Redbournberry Hill as significant Aboriginal places. The WNAC suggest a range of mitigation measures for the Project that include support for cultural healing and mental health workshops, and funding for the development of a native food plants supply business.
21 August 2020	Noel Downs (Wanaruah Local Aboriginal Land Council)	Letter received from Noel Downs on behalf of the Wanaruah Local Aboriginal Land Council (WLALC). The WLALC response is mostly a broad commentary on the Aboriginal occupation and history of the Hunter Valley. The WLALC recommends funding be set aside for disadvantages members of the community and land management aligned with (undefined) 'traditional' practices.
31 August 2020	Arthur Fletcher	Verbal feedback received from Arthur Fletcher stating he and his immediate family support the updated ACHAR.



The following **Table 6.2** provides a summary of matters raised by Draper in his review of the revised ACHAR - grouped by themes, and also provides corresponding responses:

Table 6.2 Comment on matters raised in PCWP response to Revised ACHAR

Matters Raised by theme	Responses
The updated ACHAR does not achieve its purpose with respect to the required level of consideration of Aboriginal cultural values and remains critically deficient in its consideration of	The Code of Practice for Archaeological Investigation of Aboriginal objects in NSW (the Code; DECCW 2010) and the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (the Guide; OEH 2011) was followed in detail in the preparation of the ACHAR, to ensure that the ACHA process and report meet the appropriate guidelines identified in the Project SEARs.
the fundamentally important aspect of intangible cultural heritage awareness and assessment	• Extensive consultation was undertaken following the Aboriginal cultural heritage consultation requirements for proponents (DECCW 2010). This consultation included all RAPs and recorded all tangible and intangible cultural heritage values that were provided by the RAPs. The PCWP were offered the same opportunities as the other RAPs to provide their tangible and intangible values through a facilitated workshop though chose not to, instead choosing to prepare their own cultural values report. The ACHAR includes a full copy of the PCWP cultural heritage values report. All views of all RAPS were considered, and all RAPs were given opportunity to contribute in a forum or way they felt comfortable. No RAP was provided a privileged role above another RAP.
	• The ACHA consultation process has spanned a period of approximately two years and provided opportunities for all RAPs to contribute. The BCD (now Heritage NSW) submission noted that 'consultation with the Aboriginal community has been undertaken in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010'. BCD further noted that 'the significance assessment of the Aboriginal cultural heritage values of the project area have been adequately accessed (sic), as well as any potential impacts on those values' (refer to Section 4.1).
The ACHAR dismisses PCWP cultural values despite the detailed report by Draper	No oral history or cultural values have been dismissed and a clear record of all cultural values has been provided in the ACHAR and its appendices. The PCWP report has been reproduced and provided in full (refer to Appendix 3).
	• The ACHA consultation process was commended by BCD (Heritage NSW) in their submission as being best practice (refer to Section 4.1).
	No RAP has been afforded a privileged status and all views are compiled and presented, having been treated equally and respectfully.



Matters Raised by theme	Responses
The ACHAR ignores the Casey and Lowe report	Note that the Casey & Lowe (C&L) Historical Archaeological Assessment and Archaeological Research Design report (Casey & Lowe, 2018) was the initial assessment report prepared by C&L prior to the historical and Aboriginal archaeology fieldwork being completed and the ACHA being undertaken.
	 Since this time, a substantial body of work and consultation has been undertaken, informing the ACHA, including the detailed historical archaeological assessment, the Aboriginal archaeological survey and assessment and the colonial historical research as well as the extensive consultation undertaken with all RAPs, and former owners of Ravensworth Estate. This work has been used to inform the ACHAR, in accordance with the Guide (DECCW, 2010).
	• C&L's report <i>Historical Archaeological Test Excavation Report and Impact Statement for the Core Estate Lands</i> (Casey & Lowe, 2019) presents a revised statement of archaeological significance in Section 5.2.1. This statement of significance states that "The Place has the potential to provide information, by way of further study and archaeological investigation, into contact-period with Aboriginal people" and "key research themes relate to the nature of lives on a newly-established frontier and contact with Aboriginal people". The statement of significance concludes by saying, "The archaeological landscape, sites and material culture of parts of the Core Estate Lands and Ravensworth Homestead Complex are of State and local significance". While this statement of significance does rightly mention the possibility of contact period archaeology, the major values contributing to the heritage significance of the Ravensworth Homestead Complex, in the view of C&L, are the buildings themselves, the historic archaeological remains and the association of the place with colonial historical events and people. This is further supported by C&L in their statement in their report (page 80, C&L 2019) that "No evidence of early conflict between Aboriginal people and European settlers was uncovered during the testing program".
Ravensworth was the centre of a military- supported campaign of violence and massacre, and that Bowman's Ravensworth Estate Ravensworth was a focus of the military campaign of violence toward Aboriginal people	• All historical events that were identified through the research of Dr M. Dunn were presented in the EIS and provided in detail in Appendix 3 . Further research undertaken for this RTS Part B has confirmed the original understanding of the chronology and location of colonial period conflicts between Aboriginal people, settlers and government forces. The research identified which events occurred on Ravensworth Estate and which events occurred elsewhere in the Hunter Valley. This does not support the PCWP and Draper position that the Ravensworth Estate was the centre of a military campaign. Refer to Figure 4.2 and Figure 4.3 for all events that have been identified from colonial historical records and where they occurred across the Hunter Valley.



Matters Raised by theme	Responses
The heritage assessment criteria requires consideration of intangible cultural heritage	Dr M. Dunn was not engaged to identify intangible cultural heritage aspects or to review oral history. Dr M. Dunn specialises in colonial historical events and records, which are provided and referenced in his report.
which were absent from the revised ACHAR	B. Churcher (OzArk) undertook the Aboriginal archaeological assessment of the Project area and this provides the scientific values associated with the record of cultural heritage items and artefacts located across the Project Area. No artefact sites located were recorded with a high scientific significance and there were no findings that indicated historic contact or conflict in the Project Area.
	• Dr S. Canning provided a record in the ACHAR of the intangible cultural heritage values associated with the Project Area and the broader Hunter Valley context, as provided by all RAPs. The revised ACHAR (Appendix 3) also includes a full copy of the Draper report commissioned by PCWP, containing the tangible and intangible cultural heritage values of the PCWP associated with the Project Area and the broader Hunter Valley context.
Draper's Scope of work	Glencore was aware that Draper was going to be engaged by PCWP but had no control over terms of engagement by PCWP or how the work was to be undertaken by Draper
	The complete scope of this independent report or methods used by Draper is not known to Glencore
	There were a significant number of RAPs engaged in the ACHA process – not just PCWP.
Draper identifies that he had access to other information	Draper identifies that he has been provided with additional information regarding conflict between Aboriginal people, settlers and government forces by PCWP. However, the exact nature of this information has not been identified and has not been disclosed and the information has not been made available to Glencore or its consultants.
	Opportunities have been made available for over two years for PCWP to provide any additional information for consideration in the ACHA, including on a confidential basis if required however no such additional information has been provided.
	PCWP is not a Native Title Claimant for the Project Area. Extensive consultation has been undertaken with the PCWP (and other RAPs) in accordance with ACHCRs (DECCW 2010) throughout the Project assessment phase.



Matters Raised by theme	Responses
Recommendations for mitigation measures	Based on all feedback received, Glencore has developed a package of management and mitigation measures which acknowledge the cultural connection and potential loss of cultural values should the Project be approved, and the recommendations made by the RAPs.
	 The mitigation measures also include opportunity for the community to continue to propose mitigation and projects, post approval (should the Project be approved), based on the themes of values, impacts and recommendations presented.
	These mitigation measures have been circulated to all Project RAPs for comment and feedback.
	 Glencore remains open to receiving feedback on these mitigation measures and recommendations as part of the assessment process.
	 Glencore is open to discuss any mitigation measures with any of the RAPs, and as noted provides for these to continue to be proposed and developed.
	• The PCWP Cultural Values Report provides very little regarding suggested mitigation measures, and none which relate to their intangible cultural values. Draper has proposed a suggestion to engage the PCWP (in his words: "i.e. not just any locally resident Aboriginal people") to monitor all earthmoving operations capable of containing archaeological material.
	• A substantial amount of fieldwork has been completed including extensive coverage of the proposed disturbance area. No evidence of potential burials has been found to date despite surface surveys, subsurface archaeological excavations, and a ground penetrating radar investigation around the Ravensworth Homestead. The possibility of burials or remains in the Project Area is considered low. Appropriate processes will be followed in the event of the discovery of human remains. Procedures for the discovery of human remains are also set out in Section 7.5.4 of Historical Archaeological Test Excavation Report and Impact Statement for the Core Estate Lands (Casey & Lowe, 2019). A process has been proposed in the ACHA and Glencore has committed to putting in place a procedure to manage the unlikely discovery of burials or human remains in the revised ACHMP, in accordance with relevant legislation.



6.1 RAP Feedback on Homestead Relocation

Feedback was received from the Wonnarua Nation Aboriginal Corporation (WNAC) provided to the Broke community-based group who have proposed the Ravensworth Homestead relocation Option 2.

The letter dated 19 August 2020, states that the WNAC support the relocation of the homestead to Broke and wish to provide further details regarding an indigenous arts and crafts shop within the proposed complex on a commercial basis, noting the potential for the proposed complex to generate employment opportunities. The letter is provided as **Appendix 9**.

In addition, the Hunter Valley Aboriginal Corporation (HVAC) noted in their response to the revised ACHAR provided in August 2020, that they supported the relocation of the Ravensworth Homestead to Broke. Their submission is contained in the revised ACHAR (**Appendix 3**).



7.0 Proposed Additional Management Measures

In addition to the environmental, cultural heritage and social impact management measures outlined in the Project EIS, the following management measures have been proposed to address issues raised in the Project submissions as addressed in the RTS Part A Report, Response to IESC Report, and this RTS Part B report.

Aboriginal Cultural Heritage

- Glencore will develop a cultural heritage awareness package for staff, operators and contractors working on clearing works associated with the Project and the Ravensworth Homestead relocation. This would include technical archaeological input, as well as a video discussing the Cultural Heritage Values of the area as told by local Aboriginal people. As part of this project, RAPs would be given the opportunity to submit videos for the awareness package. Glendell would fund a third party videographer and editor to assist the community in the development of their contribution to the package. RAPs and Knowledge Holders that would prefer their values to not to be disclosed to other parties (other than those involved in the works above) would have this option available, should they wish.
- Glendell will provide opportunities for local Aboriginal businesses to tender for revegetation and land management works at the Mt Owen Complex.
- Glendell will provide support to local Aboriginal groups seeking to undertake conservation projects at culturally significant places and sites in the region, in consultation with the applicable Government bodies and landholders.
- The ACHMP for Mount Owen Glendell Operations will be revised to include all sites identified during
 the Project assessment and will be include measures to manage "Unexpected Finds" as required by
 Heritage NSW guidelines, and specific measures to be undertaken in the event of an unknown burial
 being identified.
- Glencore is proposing that a specific piece of interpretive work be developed as a mitigation measure to capture the Aboriginal cultural and historical values relating to the vicinity of the Project Area. This would utilise digital media and include the historical information identified in the preparation of the Project EIS and additional information prepared for this RTS, including cultural values provided by PCWP and historical connections such as St Clair Mission provided by WNAC and other RAPs. The information presented in the interpretive work will be by agreement with the Project RAPs and will be designed to be suitable for use at schools and for distribution to Aboriginal groups and historical groups. This will ensure that the story of frontier conflicts associated with the Hunter Valley is available for the education of future generations and provides an example of the consequences of the British settlement of NSW on the Aboriginal inhabitants.
- The ACHMP for the Mount Owen Complex will be revised to include all artefact sites identified during
 the Project assessment. Measures will be included to manage "Unexpected Finds" as required by
 Heritage NSW guidelines, and will include specific measures to be undertaken in the event of an
 unknown burial being identified, in accordance with existing site procedures at the Mount Owen
 Complex.



Air Quality

- Glencore will use a number of processes to minimise diesel fuel use which, in turn, will minimise diesel exhaust emissions. Such processes may include:
 - Optimising the design of haul roads to minimise the distance travelled between the pit, ROMs and overburden dumping locations, where practicable.
 - Minimising the re-handling of material.
 - Managing truck payloads to utilise the tray space without overloading.
 - Optimising the length of haulage routes to improve operating efficiency.
 - Optimising ramp gradients according to pit geometry parameters and mobile equipment performance characteristics.
 - o Reducing idle times.
 - Developing long, medium and short term operational plans to optimise the recovery of approved resources.
 - Managing truck utilisation rates to minimise truck waiting times.
 - o Maintaining the mine fleet in good operating order.

Biodiversity

- Glencore will undertake surveys of Delmar Impar in September 2020 in accordance with the survey techniques established in the Survey Guidelines for Australia's Threatened Reptiles (Department of Sustainability, Environment, Water, Populations and Communities, 2011).
- Glencore will add Stygofaunal monitoring of the isolated 5.5-km fragment of alluvial aquifer of Bowmans Creek to the proposed monitoring program during and after mining to confirm that reconnection occurs and the stygofaunal community recovers as predicted.

Bushfire

 Glencore will develop and implement a site-specific Fire Management Plan for the Project in consultation with the RFS to manage bushfire threat and to document emergency response procedures.

Groundwater

Should the Ashton South East Open Cut commence operations, the Regional Groundwater Model used
for the Project will be updated to include consideration of this Project to assist in the differentiation of
cumulative impacts, particularly to the south and west of the existing Glendell Pit.

Rehabilitation and Closure

- As part of the detailed mine closure planning process, the need for water access licences in the post closure landform will be identified having regard to the following:
 - o The regulatory regime applicable at the time of closure
 - Updated groundwater modelling, including modelling of post recovery conditions
 - o Detailed final landform design (including any dams and pit lakes retained in the final landform)
 - Approved post closure land use requirements.



- The mine closure planning process will include a strategy for obtaining all necessary water access licences prior to the predicted take occurring
- Any dams retained within the final landform that are in excess of harvestable rights or do not qualify
 for harvestable rights exemptions will also be modified to comply or will be licenced as required by the
 regulatory regime in force at the time.
- Should the Project be approved, weed and feral animal control measures will be reviewed and updated where necessary as part of the management plan review process.
- The species list for all communities targeted in the Rehabilitation and Closure Strategy will be updated to include Port Jackson Fig (Ficus rubiginosa).
- Singleton Council will also be consulted as part of the Mine Closure Planning process and the updated
 results of modelling associated with the final landform will also be provided to Singleton Council in an
 appropriate file format.

Surface Water

- The detailed design of the Yorks Creek Realignment will include consideration of instream aquatic habitat values and the shallow grade sections are expected to re-establish alluvial type conditions over time which can be recolonised through both upstream and downstream movement of fauna
- The update of the Mount Owen Complex SWMMP will include details of reference sites to be used for the Project and updated site specific guideline values for these sites which have regard to all relevant guideline materials.
- The monitoring program will be developed as part of the detailed design of the proposed diversion and the update of the Mount Owen Complex SWMMP. The Proponent will include flow monitoring within the Yorks Creek Realignment as part of the updated monitoring program.

Traffic and Transport

• The Hebden Road realignment will be designed to meet relevant standards for use by 25/26 m B-Double vehicles and will improve upon the existing road geometry.

Waste Management

- Construction works will be subject to a Construction Environmental Management Plan which will document the waste management measures required during the construction phase of the Project.
- A full hazardous materials assessment will be completed as part of the works to determine any special treatment required for hazardous waste.
- As part of the Ravensworth Homestead relocation works, a full hazardous materials assessment will be completed and hazardous materials at the homestead site will be removed prior to relocation under either option (Ravensworth Farm or Broke Village).
- A suitably qualified hazardous materials contractor will be engaged to complete the sensitive removal
 of the hazardous materials, in consultation with the heritage architect and a heritage building
 contractor.



8.0 References

Casey & Lowe, 2018. *Historical Archaeological Assessment and Archaeological Research Design.* Glendell Continued Operations Project

Casey & Lowe, 2019 Historical Archaeological Test Excavation Report and Impact Statement for the Core Estate Lands. Glendell Continued Operations Project

Clive Lucas Stapleton & Partners, 2013. *Hunter Estates: A Comparative Heritage Study of pre 1850s Homestead Complexes in the Hunter Region*

Department of Environment, Climate Change and Water (DECCW), 2010. Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.

James Broadbent, 1997. The Australian Colonial House: Architecture and Society in New South Wales, 1788-1842

NSW Heritage Office, 2001. Assessing Significance: a NSW Heritage Manual Update.

Office of Environment and Heritage (OEH), 2011. Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW.

Plains Clans of the Wonnarua People (PCWP), 2013. Beginning and Belonging: the traditional, historical & contemporary cultural landscape of the Mount Owen Continued Operations Project Area: A Plains Clans of the Wonnarua Peoples Perspective.

Plains Clans of the Wonnarua People (PCWP), 2015. *Glencore United Collieries Aboriginal Cultural Heritage Assessment*.

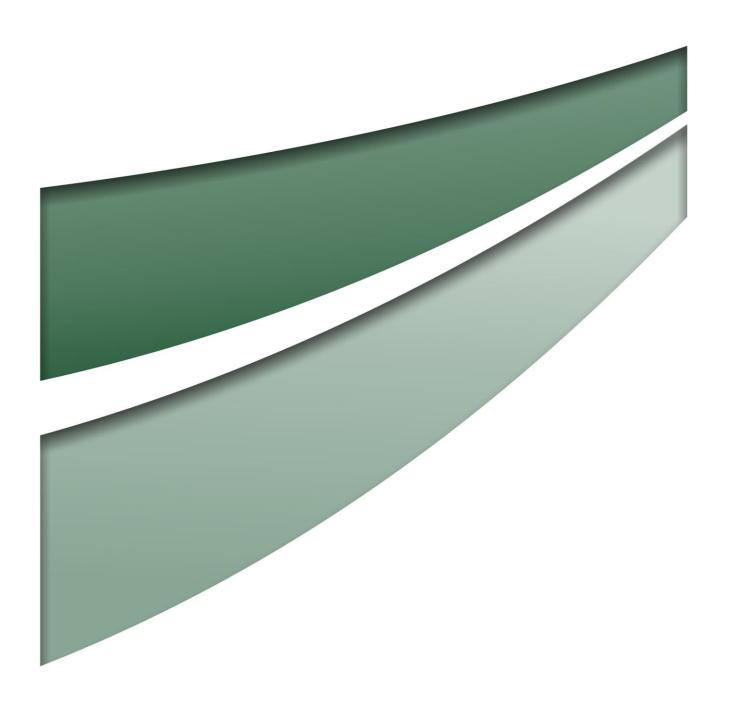
Plains Clans of the Wonnarua People (PCWP), 2018. *Mangoola Aboriginal Cultural Values Assessment Report*.

Umwelt (Australia) Pty Limited, 2019. *Glendell Continued Operations Project Environmental Impact Statement*.



9.0 Abbreviations

Term	Definition
AAIA	Aboriginal Archaeological Impact Assessment
ACHA	Aboriginal Cultural Heritage Assessment
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHM	Australian Cultural Heritage Management
ACHMP	Aboriginal Cultural Heritage Management Plan
ACHCRs	Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
BCD	Biodiversity Conservation Division within DPIE (the heritage compliance functions of BCD are now with Heritage NSW)
BIA	Blast Impact Assessment
C&L	Casey and Lowe
DPIE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
Glencore	Glencore Coal Pty Limited
HA&SoS	Heritage Analysis and Statement of Significance
IESC	Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development
km	kilometre
LSJ	Lucas Stapleton Johnson
MIA	Mine Infrastructure Area
Mining SEPP	State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2017
МОСО	Mount Owen Continued Operations
Mount Owen	Mt Owen Pty Limited
Mount Owen Complex	The combined operations of the Mount Owen Mine, Ravensworth East Mine and the Glendell Mine
Mount Owen Consent	Mount Owen Continued Operations Project development consent SSD-5850
Mt	Million tonnes
NSW	New South Wales
OzArk	OzArk Environment and Heritage
OEH	Office of Environment and Heritage (now Heritage NSW)
PCWP	Plains Clans of the Wonnarua People
RAPs	Registered Aboriginal Parties
RFS	Rural Fire Service
RHAC	Ravensworth Homestead Advisory Committee
RtS	Response to Submissions
ROM	Run of mine
SEARs	Secretary's Environmental Assessment Requirements
SoHI	Statement of Heritage Impact



APPENDIX 1

Register of Submitters



Appendix 1 – Register of Submitters

Agency Submission	Where issues are addressed in RTS
Division of Resources and Geoscience	Section 4.1 of RTS Part A Report
Resource Regulator	Section 4.2 of RTS Part A Report
Department of Planning, Industry and Environment - Water	Section 4.3 of RTS Part A Report
Environment Protection Authority	Section 4.4 of RTS Part A Report
Diadicardia, and Canage estion Division	Section 4.5 of RTS Part A Report
Biodiversity and Conservation Division – Environment, Energy and Science	Response to issues relating to cultural heritage are provided in Section 4.1
Department of Primary Industries	Section 4.6 of RTS Part A Report
Singleton Council	Section 4.7 of RTS Part A Report
Crown Lands	Section 4.8 of RTS Part A Report
Hunter New England Local Health District	Section 4.9 of RTS Part A Report
NSW Rural Fire Service	Section 4.10 of RTS Part A Report
Subsidence Advisory NSW	Section 4.11 of RTS Part A Report
Transport for NSW	Section 4.12 of RTS Part A Report
Dams Safety NSW	Section 4.13 of RTS Part A Report
Department of Environment and Energy	Section 4.14 of RTS Part A Report
Heritage Council	Section 4.2
Independent Expert Scientific Committee	Response provided separately to the RTS



	Issue C	ategory											Environm	ental, Socia	l and Econo	omic Issues											The Project	Me	erits		Procedural Matters	
				Theme	Agriculture	Climate Change		lmpa	cts on Community			Reh	abilitation		F	Project Emissi	ons	Water	Resources	Bio	odiversity		Heritage		Bushfire	Socio-econom	Droinet	M	erits	Compliance With SEARs	Economic Assessment	Engagement and Decision Making
																								itage te			e					<u>ت</u>
			:	Sub-Theme		eg	/ and Culture	B y Rights	quity	infrastructur	dings	ndform										stead	Heritage	lated to Heri Isworth Esta		ion and lent Benefits	ension of Tin	n-Specific)	ustainable	ARS	ŧ	cision Makin
Submitter	Ref. Number (Submitter ID)	Location	Group	View	Land Use	GHG/Climate Chan	Sense of Community	Health and Wellbein	Intergenerational ec	Social Amenity Existing Operation/i	Impacts on Surroun	Final Void/ Final Lan	Rehabilitation	Air Quality	Blasting	Noise	Cumulative Impacts	Groundwater	Surface Water	Stygofauna	Biodiversity impact	Ravensworth Home	Aboriginal Cultural H	Aboriginal events re and Historical Raver	Bushfire	Economic Contribut Community Investm Lack of Community	Mine Extension/Ext	Support/Object (No	Environmental Harm/Ecologically S Development	Compliance with SE	Economic Assessme	Engagement and De
Aaron Hamer	S-120599	Branxton 2335	Individual	Support			2.3.3		2.3	3.3																2.3.3						
Adrian Jaji Allan Davies	S-120778 S-120713	Corlette 2315 Coolum Beach 4573	Individual Individual	Support Support			2.3.3			2.3.3																2.3.3						
Allan Pryor	S-120713	Figtree 2525	Individual	Support						2.5.5															-	2.3.3	1					
Amy Breakwell	S-119079	Aberglasslyn 2320	Individual	Support			2.3.3																			2.3.3						
Andrew Drain	S-120571 S-121080	Largs 2320	Individual	Support																						2.3.3						
Andrew Lovell Anonymous	S-121080 S-119300	Branxton 2335 Floraville 2280	Individual Individual	Support Support																					 	2.3.3						
Anonymous	S-119676	North Rothbury 2335	Individual	Support						2.3.3																2.3.3						
Anonymous	S-119885	Milbrodale 2330	Individual	Support																					 	2.3.3		<u> </u>				
Anonymous	S-120135 S-120254	Muswellbrook 2333 Merewether 2291	Individual Individual	Support			1		2.3.3	2.3.3		-														2.3.3		1			 	
Anonymous Anonymous	S-120254 S-120258	Merewether 2291 Thornton 2322	Individual	Support Support					2.3.3																 	2.3.3		-				
Anonymous	S-120283	Branxton 2335	Individual	Support																					 	2.3.3	1					
Anonymous	S-120319	Macksville 2447	Individual	Support			2.3.3		2.3.3																							
Anonymous	S-120320	Griffith 2680	Individual	Support					2.3.3																 	2.3.3						
Anonymous Anonymous	S-120321 S-120493	Gumma 2447 Rutherford 2320	Individual Individual	Support Support					2.3.3								+									2.3.3	+					
Anonymous	S-120497	Charlestown 2290	Individual	Support																								2.3.3				
Anonymous	S-120503	Maitland 2320	Individual	Support																						2.3.3						
Anonymous	S-120505	Rutherford 2320	Individual	Support																					 	2.3.3						
Anonymous	S-120515 S-120517	Newcastle East 2300	Individual Individual	Support																					 	2.3.3						
Anonymous Anonymous	S-120517 S-120527	Singleton 2330 Windella 2320	Individual	Support Support			2.3.3		2.3.3																 	2.3.3						
Anonymous	S-120542	Singleton Heights 2330	Individual	Support																						2.3.3						
Anonymous	S-120544	Branxton 2335	Individual	Support																						2.3.3						
Anonymous	S-120556 S-120575	Telarah 2320 Lorn 2320	Individual	Support			2.3.3		2.3.3	222																2.3.3		2.3.3				
Anonymous Anonymous	S-120575	Scone 2337	Individual Individual	Support Support			2.3.3		2.3.3 2.3	2.3.3															 	2.3.3						2.3.3
Anonymous	S-120587	Dartbrook 2336	Individual	Support					2.3																	2.3.3						
Anonymous	S-120601	Singleton 2330	Individual	Support					2.3.3 2.3	3.3																2.3.3						
Anonymous	S-120608	Gumma 2447	Individual	Support																						222	+	2.3.3				-
Anonymous Anonymous	S-120634 S-120656	Branxton 2335 Gowrie 2330	Individual Individual	Support Support																					 	2.3.3					-	
Anonymous	S-120665	Singleton Heights 2330	Individual	Support																					 	2.3.3	1					
Anonymous	S-120666	Singleton Heights 2330	Individual	Support																						2.3.3						
Anonymous	S-120667	Heddon Greta 2321	Individual	Support																								2.3.3				
Anonymous Anonymous	S-120676 S-120687	Heddon Greta 2321 Lower Belford 2335	Individual Individual	Support Support					2.3.3																	2.3.3	+					
Anonymous	S-120687 S-120703	North Rothbury 2335	Individual	Support																							1	2.3.3				
Anonymous	S-120709	Macksville 2447	Individual	Support																						2.3.3						
Anonymous	S-120711	Bonny Hills 2445	Individual	Support																						2.3.3						
Anonymous	S-120722	Lower Belford 2335	Individual	Support			222		2.3.3			-														2.3.3	1					
Anonymous Anonymous	S-120727 S-120728	Broke 2330 Singleton 2330	Individual Individual	Support Support			2.3.3																					2.3.3				
Anonymous	S-120743	Broke 2330	Individual	Support			2.3.3																				1					
Anonymous	S-120793	Heddon Greta 2321	Individual	Support																						2.3.3						
Anonymous	S-120834	East Gresford 2311	Individual	Support					2.3.3																	2.3.3						
Anonymous Anonymous	S-120849 S-120850	Hunterview 2330 Gumma 2447	Individual Individual	Support Support					2.3.3																	2.3.3	+	2.3.3				
Anonymous	S-120851	Hunterview 2330	Individual	Support																						2.3.3						
Anonymous		Aberglasslyn 2320	Individual	Support						2.3.3																2.3.3						
Anonymous		Figtree 2525	Individual	Support					2.3.3																	2.3.3						
Anonymous	S-120608	Gumma 2447	Individual	Support																								2.3.3				
Anonymous Anonymous	S-120321 S-120881	Gumma 2447 Singleton 2330	Individual Individual	Support Support													+									2.3.3	+				+	
Anonymous	S-120881	Mascot 2020	Individual	Support																					.	2.3.3						
Anonymous	S-120890	Shortland 2307	Individual	Support																					 	2.3.3	<u> </u>					
		I.	1				•	<u>.</u>	1	•	*			ı	ı	ı	1	1	ı				I				-	•				



			Issu	ue Category									Environme	ental, Social	and Econo	omic Issues											The Project	М	erits		Procedural Matters	
				Theme	Agriculture	Climate Change		Impacts	s on Community	y		Reha	bilitation		Project E	Emissions		Water Re	esources	Biodiv	versity		Heritage		Bushfire	Socio-econ	omic Project Design	М	lerits	Compliance With SEARs	Economic Assessment	Engagement and Decision Making
						change	a																	orth			Je u			02.110		<u>م</u>
				Sub-Theme	Land Use	ilmate Change	of Community and Culture	and Wellbeing al and Property Rights	nerational equity	Amenity g Operation/infrastructur	s on Surroundings	oid/ Final Landform	litation	ality	89		ative Impacts	dwater	. Water	auna	ersity impact	worth Homestead	inal Cultural Heritage	inal events related to ge and Historical Ravensw	o	nic Contribution mmunity nent	Community Benefits	1/Object (Non-Specific)	nmental Ecologically Sustainable pment	ance with SEARs	nic Assessment	ment and Decision Makir
Submitter	Ref. Number (Submitter ID)	Location	Group	View		дне/с	Sense	Health	Interge	Social A	Impact	Final V	Rehabi	Air Qua	Blastin	Noise	Cumula	Ground	Surface	Stygofa	Biodive	Ravens	Aborigi	Aborigi Heritag Estate	Bushfir	Econom and Co Investn	Lack of	Suppor	Enviror Harm/I Develo	Compli	Econon	Engage
Anonymous Anonymous	S-120899 S-120908	Singleton Heights 2330 Broke 2330	Individual Individual	Support Support			2.3.3																			2.3.3						-
Anonymous	S-120922	Bolwarra Heights 2320	Individual	Support					2.3.3																	2.3.3					<u> </u>	
Anonymous	S-120952	Muswellbrook 2333	Individual	Support																						2.3.3						
Anonymous	S-120995	Thornton 2322	Individual	Support																						2.3.3						
Anonymous	S-120997	North Rothbury 2335	Individual	Support																						2.3.3						_
Anonymous	S-120998 S-120999	Scone 2337 Greta 2334	Individual Individual	Support																						2.3.3		+				
Anonymous Anonymous	S-120999 S-121004	Ravensworth 2330	Individual	Support					2.3.3	2.3.3																2.3.3		+				2.3.3
Anonymous	S-121005	Merewether 2291	Individual	Support																						2.3.3						
Anonymous	S-121008	Heddon Greta 2321	Individual	Support					2.3.3				<u> </u>									<u>L</u>	<u>L</u>			2.3.3			<u> </u>			
Anonymous	S-121044	Manly 2095	Individual	Support																	_					2.3.3						
Anonymous	S-121063	Singleton Heights 2330	Individual	Support					2.3.3													<u> </u>				2.3.3						
Anonymous	S-121072 S-121077	Gillieston Heights 2321 Singleton 2330	Individual Individual	Support																						2.3.3						-
Anonymous Anonymous	S-121077	Singleton 2330	Individual	Support					2	2.3.3 2.3.3																2.3.3						
Anonymous	S-120544	Branxton 2335	Individual	Support																						2.3.3						
Anonymous	S-121134	Singleton Heights 2330	Individual	Support			2.3.3		2.3.3																	2.3.3						
Anonymous	S-121144	Singleton Heights 2330	Individual	Support																						2.3.3						
Anonymous	S-121150	Singleton Heights 2330	Individual	Support																						2.3.3						
Anonymous	S-121173	Bolwarra 2320	Individual	Support					222																	2.3.3		-				
Anonymous Anthony Fay	S-121180 S-120578	Bolwarra Heights 2320 Singleton 2330	Individual Individual	Support Support					2.3.3																	2.3.3					 	2.3.3
Ashley McLeod	S-118350	Hunterview 2330	Individual	Support																						2.3.3						
Belinda Passlow	S-120734	Bulga 2330	Individual	Support																						2.3.3						
Benjamin Deaves	S-120723	Hunterview 2330	Individual	Support																						2.3.3						
Benjeman Cummins	S-120731	Millfield 2325	Individual	Support																												_
Bianca Rolph	S-120607	Greta 2334	Individual	Support																								2.3.3			 	<u> </u>
Brad Whitmarsh Brendan O'Brien	S-120765 S-119340	Fordwich 2330 Stanhope 2335	Individual Individual	Support			2.3.3																			2.3.3					 	-
Brendan Mudd	S-120668	Bishops Bridge 2326	Individual	Support					2.3.3 2	2.3.3																2.3.3						
Brendan Haworth	S-120877	Muswellbrook 2333	Individual	Support																								2.3.3				
Brendon Heien	S-120923	East Branxton 2335	Individual	Support					2.3.3																	2.3.3						
Brett Harris	S-120031	Wattle Ponds 2330	Individual	Support																						2.3.3						<u> </u>
Brian Mcguigan	S-120831	Pokolbin 2320	Individual	Support			2.3.3															<u> </u>										
Callan Sheldon Cameron Wallace	S-120888 S-120848	Salamander Bay 2317 Singleton 2330	Individual Individual	Support					2.3.3	2.3.3																2.3.3		+				
Campbell Anlezark	S-120848 S-120492	Mulbring 2323	Individual	Support					2.3.3																	2.3.3		+				
Cindy Wilkinson	S-120602	Roughit 2330	Individual	Support																						2.3.3						
Craig Duffie	S-120330	North Rothbury 2335	Individual	Support																						2.3.3						
Daniel Pietrangel	S-120504	Singleton 2330	Individual	Support																						2.3.3						
Daryl Gray	S-121082	Jerrys Plains 2330	Individual	Support					2.3.3					<u> </u>												2.3.3						<u> </u>
Dean Bryen Donovan Meehan	S-120896 S-120840	East Branxton 2335	Individual Individual	Support			2.3.3		2.3.3																	2.3.3		1				
Donovan Meehan Doug Smith	S-120840 S-120551	Cliftleigh 2321 Cessnock 2325	Individual	Support					2.3.3																	2.3.3						
Emily Hunter	S-120934	Nulkaba 2325	Individual	Support																		<u> </u>				2.3.3		1				
Emma Oswell	S-120625	Aberglasslyn 2320	Individual	Support																						2.3.3						
Expressway Spares	-	Wauchope 2446	Interest Group	Support																						2.3.3						
Felicia Deaves	S-120724	Hunterview 2330	Individual	Support										<u> </u>												2.3.3		-				<u> </u>
Francesca Scholl Garath Boss Walker	S-120725	+	Individual	Support			2.3.3			222				<u> </u>								-				222		1			-	
Gareth Boss-Walker Geoff Trescott	S-121181 S-120694	Wattle Ponds 2330 Tenambit 2323	Individual Individual	Support					2	2.3.3												-				2.3.3	+	1				
Geoff Stevenson		Singleton Heights 2330	Individual	Support						2.3.3																2.3.3		+				
Graham Weary	S-119209	Hamlyn Terrace 2259	Individual	Support													-					<u> </u>				2.3.3	 	1				
Graham Farish		Lambton 2299	Individual	Support			2.3.3						<u>_</u>										<u> </u>						<u> </u>			
Harrison Vassallo	+	Singleton 2330	Individual	Support					2.3.3																	2.3.3						
Helen Sharrock		Fordwich 2330	Individual	Support																						2.3.3		1				<u> </u>
Hiroshi Morita	S-121019	Sydney 2000	Individual	Support					2.3.3					<u> </u>								<u> </u>				2.3.3					<u> </u>	



			Iss	ue Category									ı	Environme	ntal, Social	and Econo	mic Issues										The Project	Me	erits		Procedural Matters	
		_		Theme	Agriculture	Climate		Impacts on Comr	unity				Rehabil	itation		Project E	Emissions		Water Re	esources	Biodiversi	ty		Heritage	Bushfire	Socio-econo	omic Project Design	M	erits	Compliance With	Economic Assessment	Engagement and
					•	Change				Т						•											a a			SEARs		Decision Making
				Sub-Theme	Land Use	limate Change	of Community and Culture	and Wellbeing	nerational equity	ımenity	; Operation/infrastructure	s on Surroundings	oid/ Final Landform	itation	lity			tive Impacts	water	Water	nna	rsity impact	worth Homestead	nal Cultural Heritage nal events related to e and Historical worth Estate	a	ic Contribution nmunity nent	Community Benefits tension/Extension of Tim	t/Object (Non-Specific)	nmental cologically able Development	ance with SEARs	nic Assessment	ment and Decision Makin
Submitter	Ref. Number (Submitter ID)	Location	Group	View		дне/с	Sense o	Health a	Interger	Social A	Existing	Impacts	Final Vo	Rehabili	Air Qua	Blasting	Noise	Cumula	Ground	Surface	Stygofa	Biodive	Ravensı	Aborigii Aborigii Heritag	Bushfire	Econom and Cor Investm	Lack of	Support	Environ Harm/E Sustaina	Complie	Econom	Engager
lan Buffier Jack Stoker	S-121052 S-120494	Bolwarra Heights 2320 Weston 2326	Individual Individual	Support Support					2.3.3		2.3.3															2.3.3						
James Johnston	S-119662	East Maitland 2323	Individual	Support			2.3.3																			2.3.3						
James Cox	S-120854	Muswellbrook 2333	Individual	Support					2.3.3	2.3.3																2.3.3						
Jason Passlow		Bulga 2330	Individual	Support			2.3.3																			2.3.3						
Jason Cooper Jeff Torkington	S-120738 S-120689	Broke 2330 Stanmore 2048	Individual Individual	Support Support			2.3.3		2.3.3		2.3.3															2.3.3						
Jeremy Hill	S-120314	East Maitland 2323	Individual	Support																						2.3.3						
Jeroen Hendriks	S-121007	Merewether 2291	Individual	Support																						2.3.3						
Jody Derrick Joel Cribb	S-120701 S-120670	Broke 2330 East Maitland 2323	Individual Individual	Support Support			2.3.3																			2.3.3		 				
Jon Gontier	S-120670 S-121017	Ellalong 2325	Individual	Support		<u> </u>			2.3.3																	2.3.3	 					
Jordan Smith	S-120603	Singleton 2330	Individual	Support					2.3.3																	2.3.3						
Joseph Andrews	S-119678	North Rothbury 2335	Individual	Support																						2.3.3						
Joseph Florence Justin Martin	S-120642 S-120616	Heddon Greta 2321 Speers Point 2284	Individual Individual	Support Support					2.3.3																	2.3.3						
Kate Mcshea	S-120010	Hunterview 2330	Individual	Support					2.3.3																	2.3.3						
Kathleen Harris	S-120553	Largs 2320	Individual	Support																						2.3.3						
Kelsea Lewis	S-120858	Wattle Ponds 2330	Individual	Support			-																			2.3.3						
Kerry Popowski Kevin Morris	S-120678 S-120312	Mount Thorley 2330 Rutherford 2320	Individual Individual	Support Support					2.3.3																	2.3.3						
Kevin Hardy	S-120675	Bateau Bay 2261	Individual	Support																						2.3.3		2.3.3				
Kim Charters	S-120636	Castle Rock 2333	Individual	Support			2.3.3		2.3.3																	2.3.3						
Kim Barry	S-120658	Singleton Heights 2330	Individual	Support																						2.3.3						
Leanne Morris Lee Morgan	S-120644 S-120514	Rutherford 2320 Singleton Heights 2330	Individual Individual	Support Support																						2.3.3						
Leighton O?brien	S-120543	Rutherford 2320	Individual	Support																						2.3.3						
Leon Cutts	S-119681	North Rothbury 2335	Individual	Support																						2.3.3						
Liam Murphy	S-119282	Fern Bay 2295	Individual	Support			_																			2.3.3						
Lindsay Macleay Ling Tayla	S-120513 S-120508	Wybong 2333 Singleton Heights 2330	Individual Individual	Support																						2.3.3						
Madi Magill	S-120508	Singleton 2330	Individual	Support																						2.3.3						
Maico Pereira	S-120516	Hunterview 2330	Individual	Support							2.3.3															2.3.3						
Mark Robinson	S-120318	Lambton 2299	Individual	Support							2.3.3															2.3.3						
Mark Russell	S-120683 S-120664	Unknown 2330	Individual	Support			2.3.3		222																	2.3.3						
Matt King Matt Owens	S-120664 S-120892	Soldiers Point 2317 Thornton 2322	Individual Individual	Support Support			2.3.3		2.3.3																	2.3.3						
Michael Deaves	S-120525	Hunterview 2330	Individual	Support			2.3.3																			2.3.3						
Michael Walls	S-120559	Aberglasslyn 2320	Individual	Support							2.3.3															2.3.3						
Michele Omeley Mitch Graham	S-121175 S-120688	Aberglasslyn 2320 Lambton 2299	Individual Individual	Support Support																						2.3.3		1				
Mitchell Nolan	S-120688 S-120673	Maitland Vale 2320	Individual	Support				2.3.	3																	2.3.3	+	1				
Mitchell Bayley	S-120882	Singleton 2330	Individual	Support																						2.3.3						
Murray Gregson	S-121054	Lorn 2320	Individual	Support																						2.3.3						
Namka Gorman Olivia Morrissey Burley	S-120886 S-120509	Mulbring 2323 Singleton 2330	Individual Individual	Support																						2.3.3		 				
One Key Resources	2-120209		Individual Interest Group	Support Support						+ +																2.3.3	+	1				
P M	S-120295	Branxton 2335	Individual	Support					2.3.3																	2.3.3						
Patrick Kennedy	S-120936	Scone 2337	Individual	Support																						2.3.3						
Paul Adams Phillip Enderby	S-120260 S-120331	Gillieston Heights 2321 Speers Point 2284	Individual Individual	Support Support																						2.3.3		-				-
Rebecca Rollason	S-120331 S-119281	Bolwarra Heights 2320	Individual	Support																						2.3.3						
Rebel Darr	S-120567	Singleton Heights 2330	Individual	Support					2.3.3																	2.3.3						
Renata Roberts	S-120693	Merewether 2291	Individual	Support							2.3.3															2.3.3						$\downarrow \qquad \downarrow$
Richard Wilkes Robert Hanington	S-120852 S-120560	East Branxton 2335 Macquarie Hills 2285	Individual Individual	Support Support					2.3.3	2.3.3																2.3.3		<u> </u>				
Robert Stanley	S-120360 S-120704	Chain Valley Bay 2259	Individual	Support					2.3.3	2.3.3																2.3.3	 					
Robyn Lynch	+	Singleton 2330	Individual	Support				2.3.																		2.3.3						
	Į.						_		•												<u>I</u>			,		<u>I</u>	•	•	J			



		Issue Category														ntal. Social	and Econo	omic Issues										The Project	Merits		Procedural Matters	
			.5.	suc cutegory												, 300.01	una 200110											The Froject	Ments		I I I I I I I I I I I I I I I I I I I	
				Theme	Agriculture	Climate Change		Impacts	on Communit	,				Rehabi	litation		Project E	Emissions		Water Resources	Biodive	ersity	Herit	age		Bushfire	Socio-economic	Project Design	Merits	Compliance With SEARs	Economic Assessment	Engagement and Decision Making
				Sub-Theme	Land Use	mate Change	Community and Culture	nd Wellbeing	and Property Rights	erational equity	nenity	Operation/infrastructure	on Surroundings	d/ Final Landform	tation	ity			ive Impacts	vater Mater	na	sity impact	rorth Homestead	al Cultural Heritage	al events related to and Historical orth Estate		c Contribution munity ent community Benefits	ension/Extension of Time	Object (Non-Specific) nental cologically	ble Development nce with SEARs	c Assessment	ıent and Decision Making
Submitter	Ref. Number (Submitter ID)	Location	Group	View		GHG/Cli	Sense of	Health a	Personal	Intergen	Social An	Existing (Impacts	Final Voi	Rehabilit	Air Quali	Blasting	Noise	Cumulati	Groundw Surface \	Stygofau	Biodivers	Ravensw	Aborigin	Aborigin Heritage Ravensw	Bushfire	Economic and Com Investme Lack of C	Mine Ext	Support/ Environr Harm/Ec	Sustaina	Economi	Engagem
Roman Rzechowicz	S-120259	Cooks Hill 2300	Individual	Support						2.3.3																						2.3.3
Ross Heath	S-120315	Cooks Hill 2300	Individual	Support																							2.3.3					
Sally Morris	S-120692	Rutherford 2320	Individual	Support																							2.3.3					
Sarah Williams	S-120733	Jerrys Plains 2330	Individual	Support															-								2.3.3					
Scott Perry Scott Omeley	S-118542 S-120522	Sedgefield 2330 Aberglasslyn 2320	Individual	Support Support						2.3.3																	2.3.3					
Scott Perrett	S-120853	Rutherford 2320	Individual	Support						2.3.3																	2.3.3					
Shane Colbert	S-120686	Kotara South 2289	Individual	Support						2.3.3																	2.3.3					
Simon Breakwell	S-119078	Aberglasslyn 2320	Individual	Support			2.3.3																				2.3.3					
Simon Charters	S-120641	Denman 2823	Individual	Support			2.3.3			2.3.3		2.2.5															2.3.3					
Sini Ariell Sonja Read	S-120856 S-120736	Mirannie 2330 Broke 2330	Individual	Support			2.3.3					2.3.3									+						2.3.3					
Sonja Read Sophie Morris	S-120736 S-120313	Rutherford 2320	Individual	Support Support		1	2.3.3						-+						+								2.3.3					
Steven Humbles	S-120861	Telarah 2320	Individual	Support						2.3.3									+								2.3.3					
Strike Force Services Pty Ltd	-	Maitland 2320	Interest Group	Support																							2.3.3			1		
Suzanne Turner	S-120653	Singleton 2330	Individual	Support																							2.3.3					
Tamara Donnelly	S-120677	Aberdeen 2336	Individual	Support						2.3.3																	2.3.3					
Tennille Perry	S-121191	Singleton 2330	Individual	Support			+			222																	2.3.3					
Thiess Thomas Carroll	S-119688	South Brisbane 4101 Glendon 2330	Interest Group	Support Support			1			2.3.3																	2.3.3			+		
Tim Strong	S-120554	Kotara 2289	Individual	Support						2.3.3	2.3.3																2.3.3					
Tim Harris	S-120557	Birmingham Gardens	Individual	Support																							2.3.3					
Timothy Lovekin	S-119344	2287 Gateshead 2290	Individual	Support			1																				2.3.3					
Todd Geddes	S-120742	Singleton 2330	Individual	Support																							2.3.3					
Tom Lee	S-120735	Point Frederick 2250	Individual	Support																							2.3.3					
Tracy Dargan	S-120912	Broke 2330	Individual	Support			2.3.3																									
Trent Brown	S-120526	Aberglasslyn 2320	Individual	Support						2.3.3																	2.3.3			-		
Vanessa Egan-Smith Wayne Florence	S-120719 S-120672	Broke 2330 West Wallsend 2286	Individual	Support Support			2.3.3				2.3.3								+											+		
WesTrac NSW	-	Tomago 2322	Interest Group							2.3.3	2.3.3																2.3.3					
Zoe Cunningham	S-120498	Maison Dieu 2330	Individual	Support					2.3.3																		2.3.3					
Adrian Garner	S-120652	Tighes Hill 2297	Individual	Object		5.1.3																										
Adrianne Haddow	S-120754	Broadmeadow 2292	Individual	Object		5.1.3		5.1.2.2								5.1.1.1				5.1.6.1												
Allie McGarity	S-120612	Broadmeadow 2292	Individual	Object		5.1.3		5.1.2.2								5.1.1.1																
Alexa Stuart Alycia Senthinathan	S-120712 S-121081	Lambton 2299	Individual	Object		5.1.3		5.1.2.2								5.1.1.1				5.1.6.1												
Alycia Senthinathan Anonymous	S-121081 S-120539	Elermore Vale 2287 Tighes Hill 2297	Individual	Object Object		5.1.3		3.1.2.2					-+						+													
Anonymous	S-120540	Wickham 2293	Individual	Object		5.1.3													+													
Anonymous	S-120541	Highfields 2289	Individual	Object		5.1.3																	<u></u>									
Anonymous	S-120546	Dudley 2290	Individual	Object		5.1.3																										
Anonymous	S-120547	Birmingham Gardens 2287	Individual	Object		5.1.3																	<u> </u>	<u> </u>	<u> </u>	<u> </u>						
Anonymous	S-120548	Mayfield 2304	Individual	Object																							5.1.5.1		5.4.1			
Anonymous	S-120549	Charlestown 2290	Individual	Object		5.1.3																										
Anonymous	S-120552	The Hill 2300	Individual	Object									-+								-								5.4.1			
Anonymous Anonymous	S-120555 S-120558	Hamilton 2303 Merewether 2291	Individual	Object Object		5.1.3 5.1.3							-+						+												1	\vdash
Anonymous	S-120558	Merewether 2291	Individual	Object		5.1.3																										
Anonymous	S-120569	Merewether Heights 229		Object		5.1.3																										
Anonymous	S-120585	Tighes Hill 2297	Individual	Object																									5.4.1			
Anonymous	S-120600	Cardiff 2285	Individual	Object		5.1.3																										
Anonymous	S-120617	Mayfield 2304	Individual	Object		5.1.3	+																								-	
Anonymous	S-120629	Valentine 2280	Individual	Object		5.1.3	+	F 4 3 3								E 1 1 1				E 1 6 1											-	
Anonymous Anonymous	S-120630 S-120640	Lightning Ridge 2834 Merewether 2291	Individual	Object Object		5.1.3 5.1.3		5.1.2.2					-+			5.1.1.1 5.1.1.1				5.1.6.1 5.1.6.1												
Anonymous	S-120643	Belmont 2280	Individual	Object		5.1.3	+	5.1.2.2												5.1.6.1											1	
Anonymous	S-120645	The Hill 2300	Individual	Object		5.1.3																										
Anonymous	S-120649	Tighes Hill 2297	Individual	Object		5.1.3										5.1.1.1			5.1.1.4	5.1.6.1												
Anonymous	S-120652	Rutherford 2320	Individual	Object		5.1.3																										

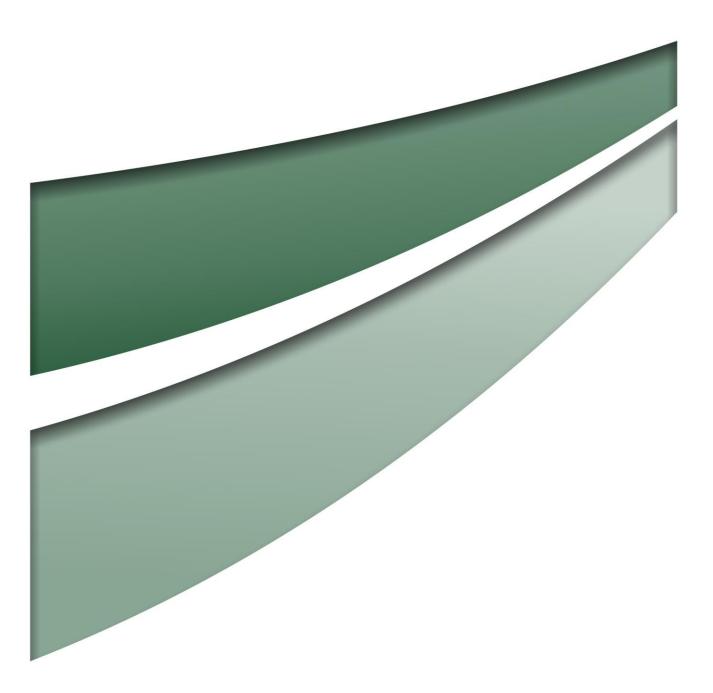


											F	nvironmer	ntal. Social	and Fcono	omic Issues										т	The Project	Merits			Procedural Matters				
Issue Category												Environmental, Social and Economic Issues													ne Project	Wients			Tocedural Matters					
Theme				Agriculture	Climate Change		Impacts	s on Community					Rehabilit	tation		Project Er	missions		Water Resourc	ces	Biodiversity	Herit	tage		Bushfire	Socio-econo	mic Pr	Project Design	Merits	Cor	mpliance With SEARs	Economic Assessment	Engagement and Decision Making	
				Sub-Theme	Land Use	Jimate Change	of Community and Culture	and Wellbeing	al and Property Rights	nerational equity	Amenity	g Operation/infrastructure	s on Surroundings	oid/ Final Landform	litation	ality	50		ative Impacts	Jwater	• Water	auna ersity impact	worth Homestead	inal Cultural Heritage	inal events related to ge and Historical worth Estate	ə	nic Contribution mmunity nent	Community Benefits	xtension/Extension of Time	t/Object (Non-Specific) nmental	Ecologically Iable Development	ance with SEARs	nic Assessment	ment and Decision Making
Submitter	Ref. Number (Submitter ID)	Location	Group	View		дне/с	Sense	Health	Person	Interge	Social	Existin	Impact	Final V	Rehabi	Air Qu	Blastin	Noise	Cumul	Ground	Surface	Stygof	Ravens	Aborig	Aborig Heritag Ravens	Bushfii	Econon and Co Investr	Lack of	Mine E	Suppo	Harm/ Sustair	Compli	Econor	Engage
Anonymous	S-120663	Lambton 2299	Individual	Object		5.1.3		5.1.2.2	5.1.2.3			5	5.1.2.4		5.1.7						-					5.1.9		5.1.5.2		5	5.4.1			
Anonymous Anonymous	S-120718 S-120726	Charlestown 2290 Elizabeth Bay 2011	Individual Individual	Object Object		5.1.3 5.1.3		5.1.2.2								5.1.1.1				5.1.6.1			5.1.4.1											
Anonymous	S-120750	Camberwell 2330	Individual	Object					5.1.2.3			5	5.1.2.4	5.1.7		5.1.1.1	5.1.1.2				1.6.2	5.1.8.1	5.1.4.1		5.1.4.2									5.3.3
Anonymous	S-120753	Camberwell 2330	Individual	Object				5.1.2.2								5.1.1.1			5.1.1.4				5.1.4.1											
Anonymous	S-120769	Tighes Hill 2297	Individual	Object		5.1.3																												
Anonymous	S-120777	Adamstown Height 2289		Object		5.1.3										5.1.1.1				5.1														
Anonymous	S-120795 S-120837	Singleton 2330 Camberwell 2330	Individual Individual	Object Object		5.1.3	1	5.1.2.2	5.1.2.3						5.1.7	5.1.1.1	E 1 1 2	5.1.1.3	5.1.1.4	5.1	1.6.2		5.1.4.1 5.1.4.1						+					
Anonymous Anonymous	S-120837 S-120838	Pokolbin 2320	Individual	Object				5.1.2.2	5.1.2.3							5.1.1.1	5.1.1.2	3.1.1.3	5.1.1.4	5.1	1.0.2		5.1.4.1						+	5.4				
Anonymous	S-120839	Hamilton 2303	Individual	Object		5.1.3																								-				
Anonymous	S-120889	Cooks Hill 2300	Individual	Object		5.1.3										5.1.1.1				5.1.6.1														
Anonymous	S-120932	Maryville 2293	Individual	Object		5.1.3										5.1.1.1				5.1.6.1														
Anonymous	S-120937	Gateshead 2290	Individual	Object		5.1.3	<u> </u>									5.1.1.1																		
Anonymous	S-121060	Adamstown 2289	Individual	Object				5.1.2.2													_													
Anonymous Anonymous	S-121061 S-121073	Elermore Vale 2287 Not supplied	Individual Individual	Object Object	5.1.10	5.1.3 5.1.3	1									5.1.1.1				5.1	1.6.2		5.1.4.1											
Anonymous	S-121073	Hamilton North 2292	Individual	Object	5.1.10	3.1.3	1									5.1.1.1				5.1	1.0.2		3.1.4.1											
Anonymous	S-121090	Eastwood 2122	Individual	Object		1	1	5.1.2.2																										
Anonymous	S-121170	Fairfield 2165	Individual	Object		5.1.3																												
Anthony Lonergan	S-121192	Kayuga 2333	Individual	Object		5.1.3														5.1.6.1		5.1.8.2												
Ben Ewald	S-121016	The Hill 2300	Individual	Object		5.1.3	1									5.1.1.1																		
Beverley Atkinson	S-120635 S-121095	Scone 2337 Gowrie 2330	Individual Individual	Object		5.1.3	1	E 1 2 2							5.1.7	5.1.1.1				5.1.6.1	-		5.1.4.1						5.2.1				5.3.2	5.3.3
Bob Vickers Bronwen Hughes	S-121093	Port Macquarie 2444	Individual	Object Object		5.1.3 5.1.3		5.1.2.2								5.1.1.1				5.1.6.1													3.3.2	
Brooke Macnab	S-121188	Maitland 2320	Individual	Object		5.1.3		5.1.2.2																				5.1.5.2						
Christine Turner	S-121078	Camberwell 2330	Individual	Object																			5.1.4.1											
Claire Cupitt	S-120717	Paddys River 2577	Individual	Object		5.1.3		5.1.2.2								5.1.1.1				5.1.6.1														
Climate Action Newcastle	-	Dangar 2309	Interest Group	Object		5.1.3	1								5.1.7													5.1.5.2		5	5.4.1			
Climate Change Australia (CCA)		Port Macquarie 2444	Interest Group	Object		5.1.3	1													5464														
Clint Seares Crystal Egan	S-120885 S-120768	Coomera 4209 The Hill 2300	Individual Individual	Object Object		5.1.3 5.1.3										5.1.1.1				5.1.6.1	+								+					
Dana Upenieks	S-120961	Cardiff 2285	Individual	Object		5.1.3										5.1.1.1				5.1.6.1														
Daniel Ewald	S-121099	Lennox Head 2478	Individual	Object		5.1.3										5.1.1.1	5.1.1.2																	
Denis Rothwell	S-120867	North Rothbury 2335	Individual	Object		5.1.3										5.1.1.1				5.1.6.1														
Denman Aberdeen Muswellbrook Scone Healthy Environment Group	-	Kayuga 2333	Interest Group	Object		5.1.3																												
Diane Call Doctors for the Environment	S-120639	Tenambit 2323	Individual	Object		5.1.3	1		1							5.1.1.1				5.1.6.1	\perp													
Australia (DEA)	-	College Park 5069	Interest Group	Object		5.1.3	1	5.1.2.2								5.1.1.1				5.1.6.1			1											
EcoNetwork Port Stephens Elisha Jahnsen	- S-120646	Salamander Bay 2317 Forster 2428	Interest Group Individual	Object		5.1.3 5.1.3	1									5.1.1.1				5.1	1.6.2		5.1.4.1		5.1.4.2							5.3.1		5.3.3
Eliza Milliken	S-120646 S-120826	Mayfield 2304	Individual	Object Object		5.1.3	1	5.1.2.2							5.1.7					5.1.6.1	+													
Emily O'Sullivan	S-120631	Stockton 2295	Individual	Object		5.1.3		2.2.2.2				5	5.1.2.4										5.1.4.1						5.2.1	5	5.4.1			5.3.3
Emily Grace	S-120891	East Lismore 2480	Individual	Object		5.1.3																												
Georgina Huxtable	S-120576	Hamilton East 2303	Individual	Object		5.1.3																												
Graeme Cheetham	S-120792	Middle Falbrook 2330	Individual	Object		<u> </u>	5.1.2.1		1							5.1.1.1		5.1.1.3							<u> </u>			5.1.5.2						5.3.3
Greer Allen	S-120902	Edgecombe 3444	Individual	Object		5.1.3	-		+ +							5.1.1.1				5.1.6.1	-		-											
Guy Jeffery Heather Mclean	S-121091 S-121189	Armidale 2350 Mount Royal 2330	Individual Individual	Object Object		5.1.3 5.1.3	1									5.1.1.1					+		+					-						
Holly Wilcox	S-121189 S-120550	Kurri Kurri 2327	Individual	Object		5.1.3	1																						+					
Hunter Environment Lobby	-	North Rothbury 2335	Interest Group			5.1.3	1	5.1.2.2								5.1.1.1																		
Hunter Environment Lobby Inc.	-	East Maitland 2323	Interest Group	Object		5.1.3		5.1.2.2						5.1.7		5.1.1.1				5.1.6.1			5.1.4.1									5.3.1		5.3.3
Ieva Dzintars	S-120901	Pennant Hills 2120	Individual	Object		5.1.3		5.1.2.2			T					5.1.1.1				5.1.6.1														
lleigh Hellier	S-120650	Merewether 2291	Individual	Object		1	1	5.1.2.2	1												\perp									5	5.4.1			
Isabelle Jones	S-120615	Hamilton 2303	Individual	Object		5.1.3	1	F 4 2 2	1							F 4 4 *					-+													<u> </u>
Jane Morgan Janet Fenwick	S-121013 S-120671	Hamilton 2303 Bulga 2330	Individual Individual	Object Object		5.1.3 5.1.3	+	5.1.2.2	+ +							5.1.1.1 5.1.1.1			5.1.1.4	5.1.6.1	+		5.1.4.1						+					
Janet Murray	S-120714	Buttai 2323	Individual	Object		5.1.3	<u> </u>		1							5.1.1.1				5.1	1.6.2		5.1.4.1						+			5.3.1		5.3.3
Jetse Kalma	S-120847	Dudley 2290	Individual	Object		5.1.3	1		†														1											
	•					-	•	•		1	ı	1	4	I		ı.	ı	I		ı	4	l	-	•						ı				



Part	Matters
The column The	
Taylor Part	Assessment Engagement an Decision Makir
Marie Mari	nent and Decision Making
Marie Mari	Engagen
Marche M	
Marchane	
Marical Mari	
Maria Mari	
Section Sect	
Part Conference Part	
Mathematical Mat	
Section Sect	
Part	
Marie Mari	
Page	
Second S	5.3.3
Maricanism Mar	
Page	3.2
Section Sect	,. <u>.</u>
Section 1988	
Michael Bereich S-2-17-18 Michael Bereich S-2-18-18 Michae	
Marie Name Sility	
Part Need September Sept	
New Water S.19545 New New 2313 Indicated S.1944 New New 2313 Indicated S.1944 S.1945 New New 2313 Indicated S.1945 New New 2313 New 2313 New 2313 New 2313 New 2313 New New 2313 N	
Figure 1985 Substitution Subst	
For Scienting Green Gree	
Note	<u> </u>
Support Michaelphin Support Suppor	
Sally Corbett S-12085 Dungog 2420 Individual Object S-13 S-12 S S S S S S S S S S S S S S S S S S S	5.3.3
Smirt Husein 5:12107 Highfields 2289 Individual Object 5:1.3 5:1.2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	5.3.3
Singleton Shire Healthy Environment Singleton Shire Healthy Enviro	
Singleton Shire Healthy Environment Group Singleton Shire Heal	
Stephanic Miller S-12046 Stephanic Miller S-12046 Stephanic Miller S-121068 Stephanic Miller S-121078 Stephanic Miller Stephanic Miller S-121078 Ste	
Stewart Mitchell 5-121068 Bulga 2330 Individual Object Individual Object Individual Object Individual Object Individual Object Individual Object 5.1.2.3 Individual Individual Object 5.1.3.3 Individual Individual Object 5.1.2.3 Individual Individual Object 5.1.3.3 Individual Individual Object 5.1.3.3 Individual In	
Thanjon Michniewicz S-121094 East Gosford 2250 Individual Object 5.1.2.2 5.1.2.2 Individual Object 5.4.1 Tony Fane S-120781 Grays Point 2232 Individual Object Individual Individual Object Individual Individual <t< td=""><td></td></t<>	
Tony Fane S-120781 Grays Point 2232 Individual Object S-121097 The Hill 2300 Individual Object S-1.3 S S S S S S S S S S S S S S S S S S S	
Virginia Reid S-121097 The Hill 2300 Individual Object 5.1.3	
Wendy White S-120844 East Maitland 2323 Individual Object 5.1.3	
Andrew Birtchnell S-120875 Pokolbin 2320 Individual Comment 5.1.2.1 5.1.2.2 5.1.2.1 5.1.2.2 5.1.2.1 5.1.2.2 5.1.2.1 5.1.2.2 5.1.2.1 5.1.2.2 5.1.2.1 5.1.2.2 5.1.2.1 5.1.2.2 5.1.2.1 5.1.2.2 5.1.2.1 5.1.2.2 5.1.2.2 5.1.2.1 5.1.2.2 5.1.2 5.1.	
Anonymous S-120860 East Branxton 2335 Individual Comment 2.3.2 2.3.2 2.3.2 2.3.2	
Anonymous S-121069 Middle Falbrook 2330 Individual Comment 5.1.1.4 5.1.6.1	
Antony Bainton S-120767 Fordwich 2330 Individual Comment 2.3.2 Individual Comment	
Carol Russell S-120684 Canberra 2912 Individual Comment 2.3.2 Individua	
Natalie Hewitt S-120827 Wattle Ponds 2330 Individual Comment 2.3.2	
Richard Owens S-120710 Newcastle 2300 Individual Comment 2.3.2 2.3	
Stewart Ewen S-120707 Fordwich 2330 Individual Comment Comment	
Stuart Bonds S-120855 Mirannie 2330 Individual Comment 2.3.2 2.3.2	
Plains Clans of the Wonnarua People - Wentworth Falls 2781 Interest Group Comment	

Note - Submissions in blue text are addressed in this RTS Part B report, submissions in black text are addressed in RTS Part A report



APPENDIX 2

Expanded Analysis and Statement of Significance of the Ravensworth Homestead Complex

Ravensworth Estate, Ravensworth, NSW

Expanded Analysis of the Ravensworth Homestead Complex



Photograph courtesy of Glencore

Prepared for: Mt Owen Pty Ltd, Glencore

Locked Bay 6015 Hunter Regional MC NSW 2310

Prepared by:

Lucas Stapleton Johnson & Partners Pty. Ltd.

The Trust Building Suite 303, 155 King Street Sydney NSW 2000 Telephone: (02) 9357 4811 Email: mailbox@lsjarchitects.com

ISSUED: 14th August 2020

Executive Summary

This expanded analysis of the Ravensworth Homestead Complex has been prepared to address issues raised in the written advice that Heritage NSW forwarded to the Department of Planning, Industry & Environment, dated 11th February 2020, in relation to the Glendell Continued Operations Project SSD9349.

The Heritage NSW correspondence raised a number of issues in relation to the analysis of cultural significance of the place provided for in the EIS; Appendix 23a: *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (HA&SoS), prepared by Lucas, Stapleton, Johnson & Partners (2019) and Appendix 23d: *Statement of Heritage Impact* (SoHI), prepared by Lucas, Stapleton, Johnson & Partners (2019).

The analysis and discussion provided for in this document aim to address the issues raised by the Heritage Office and culminates in a revised Statement of Significance for the Ravensworth Estate as follows:

Revised Statement of Significance

The following revised Statement of Significance takes into account the issues raised by the Heritage Office and additional research and analysis undertaken with respect to the issues raised. Revised or new text is included in blue.

Criterion (a) Historical Significance

An item is important in the course, or pattern, of NSW's (or the local area's) cultural or natural history.

The land on which the Ravensworth Estate is located is of historical significance on a <u>Local level</u> as forming part of the land of the Wonnarua that stretched over much of the Hunter Valley. Regardless of the history of European colonisation, agricultural development and mining uses, the Ravensworth Estate retains physical evidence of the past lives of the Wonnarua people.

The history of Aboriginal dispossession in the locality sits alongside the colonial history of the place, with reports of interactions between Aboriginal people and convicts and colonists dating from the early 1800s. The estate lands are of historical significance on a <u>Local level</u> for being located in a district that witnessed a series of attacks and retributions between Aboriginal people and the newly arrived Europeans in the central Hunter Valley between 1825 and 1827. The Ravensworth Estate was one of a number of reported locations of violence during this period.

The land that forms the Ravensworth Estate today is also of historical significance on a <u>Local level</u> for being the substantial remnants of an early (1824) pastoral estate in the Upper Hunter region of NSW.

The place is of historical significance on a <u>Local level</u> for being one of a surviving group of pastoral estates established shortly after the opening up of the Hunter Region to European colonisation in the early 1820s by Governor Brisbane and Commissioner Bigge, and evidence of this important historical period remains in the property boundaries, the road alignments, remnant landscape features (including

Executive Summary Lucas stapleton johnson & partners pty ltd

the alignment of fence lines, vegetation modification, early dams and evidence of early cultivation), historical archaeological sites (including the potential for a convict barracks, the underground silo together with evidence of an extensive range of former outbuildings) and the surviving c1832 homestead complex including its configuration and landscape setting.

The Ravensworth homestead garden is also of historical significance on a <u>State level</u> as being, along with Camden Park, Camden, NSW, among the few places where the first experiments with plant breeding were carried out in Australia. Edward Macarthur Bowman and William Macarthur undertook this early work at the place in coordination with John Carne Bidwill.

The Ravensworth Estate is historically significant on a <u>Local level</u> for being located along an important regional transport corridor (that remains in place today), connecting the city of Sydney with the agricultural regions of the Hunter Valley and the Liverpool Plains (and beyond) as evidenced by the remnants of the early (1820s and 1830s) roads located across the estate lands. The strategic location of the estate lead to the place being known as a destination point and a place of note to the broader community from the 1820s onwards, as evidenced by early written accounts of the estate lands and the numerous well-known persons who visited the estate in the 1820s and 30s, including surveyor Henry Dangar, A.A. Co. commissioner Sir Edward Parry, pastoralists Robert and Helenus Scott and missionaries James Backhouse and George Washington Walker. The importance of the location led to Ravensworth becoming a known locality in the district and across NSW, with the Ravensworth Estate and homestead complex at its centre.

The later history of the Ravensworth Estate is of some historical significance on a <u>Local level</u> for demonstrating a pattern of development that is found throughout the central Hunter Region and NSW. From being a large pastoral estate for sheep fattening for most of the 19th century, from the late 19th century onwards the estate underwent speculative subdivision, eventually being used for smaller allotment mixed farming including dairying throughout the 20th century, until the 1960s when large portions of the former lands of the Ravensworth Estate were developed for open-cut coal mining. The allotment that contains the Ravensworth Homestead Complex is also of historical significance for being the remnants of a soldier's settlement purchase taken up by A.C. Marshall in 1920.

The estate lands are of some historical significance on a <u>Local level</u> for being identified as early as the 1840s as one of the locations in the Hunter Valley with a likely presence of coal, and for being the location of early drilling expeditions and subsequent underground coal mining from the 1890s.

Criterion (b) Historical Associational Significance

An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's (or the local area's) cultural or natural history.

The Ravensworth Estate is of significance on both a <u>State and local level</u> for its associations with a number of people of historical note and places of historical note located throughout NSW. The richness of these historic associations provides further evidence of the significance of the history of the Ravensworth Estate.

Historical associations with notable persons include:

• Dr James Bowman (1784-1846), principal surgeon of the colony and inspector of colonial hospitals and local committee member of the Australian Agricultural Co. (A.A. Co.), who was granted the land, established and expanded the property as a sheep run and named the property Ravensworth. He is said to be buried on the property (location unknown).

- Mary Bowman (1795-1852), daughter of John Macarthur, whose dowry of 2000 sheep and 200 cattle allowed James Bowman to apply for the initial land grant that became the Ravensworth Estate
- John Macarthur (1767?-1834), entrepreneur, pastoralist and founder of the A.A Co. the oldest continuously operating company in Australia, and his sons James Macarthur (1798-1867) politician, and William Macarthur (1800-1882) an influential horticulturalist, who financially assisted the Bowman's with the management of the estate lands throughout its early history.
- Edward Macarthur Bowman (1826-1872), eldest son of Dr James and Mary Bowman was a botanical collector and botanist who lived at and managed Ravensworth from 1843 to 1848. In cooperation with his friend botanist John Carne Bidwill, Edward participated in some of the first efforts at plant breeding in Australia including the hybridisation of gladioli being among the experiments carried out at Ravensworth. Edward Bowman became a botanical collector in northeast Australia and he is best-known for his discovery of *Ptychosperma alexandrae* (Alexandra palm) named for Alexandra, Princess of Wales.
- James White (1801-1842), former employee of the A.A. Co. and founder of the White pastoral dynasty (other White family estates in the Hunter region include Edinglassie, Belltrees, Merton, Martindale and Waverley), who was an early overseer at Ravensworth and for whom the homestead was constructed.
- John Larnach (1805-1869), partner of James Mudie at Castle Forbes and joint author *Vindication* of James Mudie and John Larnach, From Certain Reflections on Their Conduct Contained in Letters Addressed to Them ... Relative to the Treatment by Them of Their Convict Servants in 1834, and who was an early overseer at Ravensworth.
- Jackey-Jackey (d.1827), a local Aboriginal man, who following his capture for an attack on James Bowman's men on the Ravensworth Estate lands was executed without trial at Wallis Plains by Lieutenant Nathaniel Lowe of the Mounted Police, this led to a military officer being brought before the courts for actions against Aboriginal people for the first time in 1827.
- Later owners including Captain William Russell (1807-1866), pastoralist who also owned Cheshunt Park and substantial squatting properties; Duncan Forbes Mackay Jnr. (1834-1887), successful horse breeder and owner of the Anambah and Minimbah properties and Tilpil Station (amongst others); both of whom continued running the Ravensworth Estate as a pastoral property.
- F.J.L Measures (1863-1936) and A.C. Reid (c1863-1925), developers, who subdivided the estate lands into smaller agricultural parcels in the early 20th century.
- Later owner Augustine Campbell Marshall (1891-1983), a Light Horse veteran who obtained a portion of the original estate lands (Portion 228) containing the homestead complex under the *Closer Settlement Scheme* in 1920; and his descendant, son Geoffrey and his wife Jenny Marshall who took over the property and held the land until 1997. The Marshall family are notable for being the owners of the homestead for the longest continuous period.
- Noted NSW architect J.W. Pender who designed the 1880s woolshed (no longer surviving) and local architect James Warren Scobie, who undertook renovations at the homestead in the early 1900s.

Historic places of significance associated with the history of the Ravensworth Estate include:

- Lyndhurst, Glebe, Bowman's Sydney residence, designed by John Verge in c1835.
- The General Hospital (Rum Hospital), Sydney where Bowman was Principal Surgeon of the colony from 1819-1823.
- Numerous other parcels of land throughout the Hunter Valley owned by Bowman and forming
 part of the extended Ravensworth Estate lands, including Ashton Farm and at one time Segenhoe
 and the Waverley Estate.

- The Australian Agricultural Company lands throughout NSW, where Bowman formed part of the Colonial Committee for the company.
- The former Ravensworth village and the Ravensworth Public School (now a ruin), and the former Hebden village including the Hebden Public School (now a ruin), Hebden Community Hall (relocated) and Hebden Church (relocated).
- The former Bayswater Estate, owned by Edgar Raby Moore (grandfather of former owner of the Ravensworth homestead, Geoffrey Marshall), which formed part of Bowman's original "10,000" acres until the 1880s.
- St. Clement's Anglican Church, Camberwell (deconsecrated), constructed on land donated by Bowman, out of the extended Rayensworth Estate lands.
- Numerous other smaller farming allotments located across the estate lands resulting from the subdivision of the estate lands in the early 20th century under F.J.L. Measures and A.C. Reid.
- Numerous other Hunter Valley pastoral stations owned by early overseers (John Larnach and James White) and later owners.
- Other works by noted NSW architect J.W. Pender, including Belltrees, Scone, Anambah homestead, Gosforth and Saumarez homestead, Armidale.
- Other works by Maitland architect J.W. Scobie, including Maitland Town Hall, Maitland and Langford homestead, Walcha.

Criteria (c) Aesthetic and/or Technical Significance

An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or in local area).

The Place, containing the remnants of the Ravensworth Estate, is of some aesthetic significance on a Local level as a representational example of a Hunter Valley landscape. The rural landscape of the place including scattered remains of early 20th century farms is punctuated by the two main creek lines, Bowmans Creek and Yorks Creek, pockets of lightly forested lands and gentle rises in the landform that provide expansive views of the floodplains and grazing lands leading southwards down to the Hunter River. The various isolated historic buildings, cultural plantings, landscape and agricultural features located across the landscape, are of some aesthetic significance, being indicative of the 20th century agricultural and community-driven development of the broader locality.

The Place retains its historic visual catchment, most clearly viewed from highpoints between Bowmans and Yorks Creek and these district views to the south-east, south-west, north-west and south towards the Hunter River, in the past would have attached considerable scenic value to the setting of the Ravensworth Homestead Complex. Today however, these views and the aesthetic values of the rural landscape are somewhat reduced by the encroachment of large-scale industrial structures and modified landforms associated with open cut mining along the skyline to the south, east and west.

The homestead complex of the Ravensworth Estate constructed in c1832, is of aesthetic significance on a <u>State level</u> as a fine example of a very rare, relatively intact "architecturally planned" group of colonial farm buildings located in its late 19th century landscaped setting. The group of early buildings is complemented by a late Victorian Men's Quarters.

The main homestead with kitchen wing and the surviving two balanced farm buildings (barn and stables) form a very rare, symmetrical compound composition of aesthetic appeal and consistent detailing, comparable with Glenrock, Marulan; the ruins of the Lake Innes House, Port Macquarie; Malahide, Tasmania and Rosedale, Tasmania and very few others. The symmetrical composition of the group of colonial stone buildings is of aesthetic and technical significance on a <u>State level</u>.

The conscious design of the symmetrical compound is reinforced by the inclusion of stone decorative quoins at the outer extremities of the group and inclusion of blank window recesses on the western elevations of the main homestead and the barn, suggesting that the building group was designed to be approached and viewed from the west. The formality of composition of the complex of buildings is further reinforced by surviving evidence of the early planning of the broader homestead precinct with an early dam (albeit modified) to the south of the homestead complex, placed on axis with the main house and the 1830s stone grave located to the east placed along the longitudinal axis of the main house

The group of buildings comprising the complex and including the adjacent privy are of aesthetic significance on a State level for their fine dressed stonework and finely made roof carpentry, simple architectural detailing and high-quality detailed design and execution; the group was likely designed, possibly informally, by an architect or gentlemen architect of the 1820s and 1830s and, although unproven, it is possible that Henry Kitchen, John Verge or Robert Scott influenced the design of the homestead complex.

The main house is a fine and relatively rare example of a colonial Georgian bungalow with relatively intact internal configuration and finishes (albeit partially reconstructed after termite attack). As originally designed, the single pile "H" plan with central flagged hall, and porch *in antis* on the front and rear elevations all under one bellcast hipped roof (albeit altered) is extremely rare and comparable with very few other colonial period houses, aside from Horsley, Horsley Park; Glenlee, Menangle and Glendon (1837 extension), Singleton. This form is of note for being of Palladian stylistic derivation.

The main homestead contains a number of other colonial architectural features of note including the stone quoins, stone flagging, stone mantelpieces, blank window recesses and six panelled colonial doors and twelve-pane colonial windows.

The complement of outbuildings, the stables, barn and privy are all of high-quality stonework and the stables in particular is of architectural interest with its symmetrical layout and arcaded recessed porch to the tack room, all similar in style to the stables at Wivenhoe, Narellan and the stables at Camden Park (not built), both designed by John Verge. The barn, although simple in style and character is of architectural interest and relatively rare being stone built (usually timber built in NSW).

The garden of the main homestead provides the immediate landscape setting for the house and is of some aesthetic significance on a <u>Local level</u> being a remnant of a late 19th/early 20th century garden planted within an 1830s-40s layout. A profusion of discarded stones from demolished structures creates an evocative historical rural atmosphere.

The technical or research value of Ravensworth Homestead Complex lies in its potential to contribute to our understanding of a range of research questions, including but not limited to:

- The group of surviving 1830s homestead buildings and other surviving colonial-built agricultural features (including the brick beehive cistern and underground silo) have a high potential to provide further information regarding colonial architecture and building practices.
- Information relating to the use of assigned convicts, a newly established system by Commissioner Bigge, in the development of the pastoral estates in early to mid-19th century NSW. The archaeology of this place may also provide information on the lives of individual convicts within the much harsher assignment system and longer penalties of imprisonment imposed by the British courts.

- Early transport systems, roads and railway lines that provide information regarding the gradual spread of colonial settlement through the northwest of NSW during the early to mid-19th century.
- Early frontier life and the nature of contact and conflict between British settlers and Aboriginal people and their traditional practices as set out in the written sources.

Bowman Period (1824-1846)

- The lives of Aboriginal people and the nature of interaction with the British arrivals in the contact period as documented in the written sources.
- The level of fortification of the place (the original "House" site and the homestead), if any, for a newly established estate on a frontier.
- Evidence for how convicts were managed or treated in this isolated place, including attitudes to punishment in a non-institutional or non-military setting, and segregation of male and female convicts.
- The differences between free and convict residents and how they operated on the estate.
- Evidence for habitation and living in this remote environment, such as the nature of diet (faunal
 material and fossil pollen evidence for possible vegetables grown in the gardens), and the
 possible modification of scarce material culture resources, such as tools (how they were reused,
 adapted, modified, stolen, hidden and general resistance to control and enforced labouring on
 the property).
- Material culture of the main household which may be associated with the Bowman family and how it expresses their status in the colony.
- Changes made to the estate once the Bowman family relocated to this site following their financial collapse and sale of Lyndhurst.
- Nature of early pastoral and agricultural practices and how this is represented and amended in the landscape.

Generally

- The construction, modification and subsequent use of the homestead complex and associated lands through the later 19th and 20th centuries.
- Material culture of lives of families who lived on the estate during later years.
- Evolving nature of the archaeological landscape as people and practices changed and different requirements were placed on the landscape to support economic requirements.

There is extensive documentation about the Ravensworth Estate, and the settlement and development of the Hunter Valley more generally, which serves to complement and interact with the physical evidence creating a wealth of documentary and physical evidence of past practices and traditions. This provides a significant opportunity to consider the nature of the oral and written sources to further the understanding of how the archaeological record supports, amends or challenges the written history of this period. This evidence when considered together will offer considerable new insights into the history and archaeology of the Ravensworth Estate.

There is moderate to high potential for the archaeological resource within the Ravensworth Estate to provide information that is unavailable from other sources. The ability of a site to reflect knowledge that no other resource can is dependent upon the research questions which are posed and the methodology employed to investigate the archaeological resource.

The potential research significance of the archaeological remains at Ravensworth Homestead Complex are likely to be significant at both a <u>State and Local level</u>.

Criterion (d) Social, Cultural or Spiritual Significance

An item has strong or special association with a particular community or cultural group in NSW (or local area) for social, cultural or spiritual reasons.

The region of the Upper Hunter, in which the Ravensworth Estate is located, holds high cultural significance (including cultural, historic and aesthetic values) for many Wonnarua people, and the wider landscape of the Hunter Valley is deeply imbued with meaning for Wonnarua people.

Forming part of the broader locality of Ravensworth, the Ravensworth Estate is of social significance on a <u>State level</u> for providing the historical name of the place and for being the tangible focus of the Ravensworth locality. Ravensworth homestead also provides a strong sense of place for past local residents, many of whom continue to live in the Upper Hunter region. The homestead complex, together with other markers across the broader landscape, including the ruins of the Ravensworth Public School and the Hebden School, as well as the scattered remains of agricultural buildings and other features, provide physical markers of the history of the locality of Ravensworth and are reminders of the late 19th and early 20th century history of a distinct community living in the area.

More generally, as one of a group of surviving colonial pastoral estates of the Hunter Region, Ravensworth Homestead Complex is held in high esteem by portions of the local community as well as the broader NSW community as indicated by the statutory and non-statutory heritage listings existing for the area and its components. There is also a wealth of research, books, images, heritage studies, published and unpublished histories, memoirs, family archives and other documentation relating specifically to the agricultural development of the region and its people from the early 19th century to date.

Criterion (e) Research Potential

An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).

The Ravensworth Homestead Complex and its immediate surrounds has potential for retaining physical evidence of the history of use of the land by the Wonnarua people, although evidence examined thus far indicates that many sites have low scientific significance as they generally have a low artefact density and are located in landforms that have been modified by agriculture. No archaeological evidence from the early contact period, including Aboriginal burials, has so far been recorded in the area despite extensive investigations.

The place has moderate to high potential for retaining physical evidence of the history of agricultural uses dating from the mid-1820s to date, particularly in those areas relatively undisturbed by mining activity such as adjacent to the creek lines and within the flood plains between. With an accumulation of fence lines, tracks, timber bridges, cattle ramps, timber yards and other agricultural structures and features, as well as the remains of the Ravensworth and Hebden villages, together with the historical archaeology, all have the potential to provide further information regarding colonial farming practices, 19th century sheep runs, early 20th century soldier settlements and smaller scale farming and dairying and late 19th and early 20th century small rural villages.

The homestead complex and its immediate surrounds have moderate to high potential to provide further information of significance in relation to colonial building practices and architecture, agriculture and horticultural practices as well as the use of convicts in a non-institutional setting and modes of living dating from the early 19th century through to the early to mid 20th century.

Executive Summary Lucas stapleton johnson & partners pty ltd

The group of surviving c1832 homestead buildings have a high potential to provide further information regarding colonial building practices and architecture in the early to mid 19th century in NSW (although recent recording work has lessened this potential in some areas). Of particular note is the configuration of the complex and the timber roof framing of the homestead complex buildings. Underfloor areas and building cavities of the group of buildings have moderate to high potential to reveal items of material culture relating to the long history of domestic and agricultural use. An archaeological feature of note is the evidence of a large stone building that once enclosed the northern side of the farmyard, anecdotally referred to by former owners as the "convict barracks".

The landform of the garden and farmyard of the homestead complex is evidence of the Bowman period and the vegetation is remnant of the Hill family period (late 19th to early 20th century). Features of note include the stone seat and historic plant species including *Ficus macrophylla* (Moreton Bay fig), aloes, *Dovyalis caffra* (Kei apple), cactus or epiphyllum, *Phoenix canariensis* (Canary Island palms), *Nerium oleander* Splendens, *Pinus halepensis* (Aleppo pine) and *Rosa* cv. Although recently partly recorded, the documentary and archaeological evidence relating to the front (south) garden and the immediate landscape setting of the homestead complex, has the potential to (via further study including archaeological investigation) provide further information into colonial lifestyles and horticultural practices as well as the aesthetic concerns of James and Mary Bowman and their early managers/overseers.

The other surviving colonial-built agricultural features in the surrounds of the homestead complex also have a moderate to high potential to yield important information regarding colonial building practices and 19th and early 20th century agricultural practices (via further study including archaeological investigation). Features and archaeological sites of note include the brick beehive cistern, the brick lined well, the underground silo, the stone lined dams, footings of former buildings and other structures immediately to the north of the homestead complex, cultural plantings forming wind breaks, the former woolshed and sheep dip, the configuration of paddocks and their fencing and evidence of early cultivation.

The 1830s stone grave (Miss White's) has the potential to provide some further information of importance into colonial burial practices at (what was) an isolated, rural establishment.

Because the subsequent development of the homestead complex and its surrounds was modest, there exists a relatively large and undisturbed (though weathered) archaeological record relating to the colonial period of the homestead complex and together with documentary evidence, there is potential for the homestead locality to provide good, and potentially rare, evidence of the use and treatment of convicts in a non-institutional setting from the early 1820s to the late 1830s.

The research potential of the place for European settlement phases is rare and of high historic significance on a State and local level.

Criterion (f) Rarity

An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).

The Ravensworth Homestead Complex and adjacent landscape and features are relatively rare on a Local level, as the substantial remnants of an early colonial pastoral estate.

The intactness of the Main House of Ravensworth makes the place relatively rare within the context of the Hunter region and of high significance, however the original "H plan" form of the Main House of Ravensworth makes the place extremely rare and of exceptional significance at a State level.

The configuration, construction date, intactness and design attributes of the Ravensworth Homestead Complex makes the place very rare in the context of the Hunter region and is of State level significance.

The Ravensworth Homestead Complex is relatively rare in the context of the Hunter region for most probably being an example of an early homestead designed by an architect or gentlemen architect.

The Ravensworth Estate also contains the following relatively rare components:

- The finely built (stone and timber), architecturally planned group of colonial farm buildings configured symmetrically around a farmyard compound.
- The original colonial Georgian bungalow style house of single pile "H" plan with porch *in antis* on the front and rear elevations, all under one bellcast hipped roof.
- The form of the stables with an arcaded recessed porch to the tack room.
- The stone-built barn.
- The breadth of the historical archaeological evidence at the place, which survives intact (although weathered), is an important, relatively undisturbed record of the workings of an early 19th century pastoral property that relied on convict labour for its establishment and initial growth.
- Individual historical archaeological sites and landscape features of note dating from the 1820s and 1830s including:
 - The remains of a substantial, stone building enclosing the northern side of the farmyard;
 - o The underground silo (Site 3a) [refer to Figures 1.4 and 1.5 in Appendix 23a];
 - o Remains of an extensive early outbuilding group north-west of the house complex;
 - O The site of an extensive kitchen/produce garden with evidence of early associated structures (including evidence of herringbone brick paving) in proximity to the homestead complex (the "8 acre garden" and the Northwest Paddock);
 - o The dam adjacent to Yorks Creek with log and stone wall (Dam D4);
 - An extensive network of remnant early dams as evidence of concerted efforts to drought proof the property;
 - O Surviving evidence of the layout and planning of the estate core (e.g. the deliberate address of the homestead southwards to the house dam and westwards to the approach road and the location of the stone grave); and
 - o Rare surviving evidence of early alluvial terrace cultivation (defined by the senescent Black Locust trees).
- The place is also rare for being one of only a few places, along with Camden Park, Camden, NSW where the first experiments in plant breeding were carried out in Australia.

The Ravensworth Homestead Complex and its immediate surrounds are rare on a State and local level.

Criterion (g) Representativeness

An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or environments (or a class of the local area's cultural or natural places or environments).

The place is a representative example of a large pastoral property subdivided in the early 20th century under the *Closer Settlement (Amendment) Act* 1904, instigated by the government to encourage agricultural development of smaller rural allotments by ex-service personnel and migrants. Evidence of this period of development survives in the current cadastral property boundaries located across the estate lands and in the form of boundary fencing, former farms and dairies and other associated buildings and agricultural features.

The Place also contains Aboriginal archaeological sites that are representative of artefact sites located throughout the upper Hunter Valley, both in terms of the types of artefacts recorded and the raw materials from which the artefacts were manufactured.

Ravensworth Estate, established in 1824, is representative of the implementation of a new and highly significant government policy introduced in 1822 by Governor Brisbane and Commissioner Bigge in the Hunter Region aimed at the economic and agricultural development of the colony through the management of land and convicts by private landowners. This policy resulted in the rapid colonisation of the region in the period 1820s to 1840s and the Ravensworth Estate is one of a number of surviving former pastoral estates which together form the foundational layer of the European settlement of the Hunter region.

The later history of the Ravensworth Estate is also representative of the history of changing land uses in the Hunter Valley, when from the mid to late 20th century former pastoral estate lands and smaller farming allotments began to be mined for coal. From this period onwards, the Ravensworth Estate entered a new phase of consolidation and development, a pattern of land use that is found in relatively large pockets of land throughout the Upper and Central Hunter Valley today.

The principal characteristics of Ravensworth Estate including its associations with important persons in the development of the colony (Dr. James Bowman and the Macarthur family), the establishment of the property as a sheep run, the c1832 homestead buildings, garden and associated agricultural features located adjacent to a water course (Yorks Creek and Bowman Creek), and the use of overseers/managers with assigned servants in the establishment of the estate, are all representative of a significant pattern of colonisation and history of development that occurred throughout the Hunter Valley and other parts of NSW in the 1820s and 1830s.

Contents

Execu	tive Summary	i
1.	Introduction	1
2.	Response	
2.1.	Point 2e) Item 1	3 3 3
	2.1.1. Response:	3
	2.1.2. Conclusion to NSW Heritage Item 1: Historical Associations	20
2.2.	Point 2e) Item 2	22
	2.2.1. Response:	22
	2.2.2. Conclusion to Point 2 e) Item 2	27
2.3.	Point 2e) Item 3	28
	2.3.1. Response:	28
	2.3.2. Conclusion to Point 2e) Item 3	38
2.4.	Point 2e) Item 4	41
	2.4.1. Response:	42
2.5.	Point 2e) Item 5	59
2.6.	Point 2g) Item 6	59
	2.6.1. Opinion of Significance Before & After Relocation/Rebuilding	60
2.7.	Revised Statement of Significance	62
	2.7.1. Revised Summary Statement of Significance	71
Appe	endices	
	Appendix A: The Heritage Significance of Ravensworth, prepared by Dr. J. Broadbent	73

Contents

LUCAS STAPLETON JOHNSON & PARTNERS PTY LTD

PAGE INTENTIONALLY LEFT BLANK

LUCAS STAPLETON JOHNSON & PARTNERS PTY LTD 1. Introduction

1. Introduction

This expanded analysis of the Ravensworth Homestead Complex has been prepared to address issues raised in the written advice that Heritage NSW forwarded to the Department of Planning, Industry & Environment, dated 11th February 2020, in relation to the Glendell Continued Operations Project SSD9349.

The Heritage NSW correspondence raised a number of issues in relation to the analysis of cultural significance of the place provided for in the EIS; Appendix 23a: *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (HA&SoS), prepared by Lucas, Stapleton, Johnson & Partners (2019) and Appendix 23d: *Statement of Heritage Impact* (SoHI), prepared by Lucas, Stapleton, Johnson & Partners (2019).

Specifically, Heritage NSW noted that the EIS, in their opinion, had not adequately addressed the following SEARs for the Project:

- "2. The EIS has not adequately addressed the following SEARs for the Project. It is requested that the EIS is updated with further information based on the following dot points.....
- e) in relation to Ravensworth Homestead, the EIS must include: a detailed heritage significance assessment of the homestead, including consideration of its surrounding garden and landscape.

The assessment of the heritage significance of the homestead including its surrounding garden and landscape and subsequent Statement of Significance in the EIS is considered inadequate for the following reasons:

- Item 1: The description of Ravensworth's connection to 'range of significant places and people' is considered inadequate. These places and people should be identified.
- Item 2: The acknowledged connection of John Verge, one of Australia's pre-eminent colonial architects, with the design of the Ravensworth Homestead and Stables, referred to in both this report (HHAA, p59) and in previous studies by the authors, has not been sufficiently considered. The analysis should include a precautionary approach including a comparison of Ravensworth with other examples of work by Verge. Furthermore, the link to Verge and the MacArthur's should be referenced in the Statement of Significance.
- Item 3: The EIS has a lack of definition of the curtilage or setting of Ravensworth Homestead and lacks an assessment of the cumulative impact of the works on the significance of the Core Estate Lands.
- Item 4: The comparative analysis with pre 1850s Hunter homesteads is inadequate to enable an assessment of the significance of Ravensworth as the following have not been considered:
 - The main house on the Ravensworth property (called Ravensworth) has been identified as one of very few homesteads from the initial establishment period to survive relatively unchanged in terms of its vernacular form (CHS, p57).
 - There are 4 properties identified in the 2013 comparative study which also include a House and Primary Farmyard with five or more buildings with a single nucleus, including Bolwarra (modified by later additions), Negoa, Kinross and

1. Introduction Lucas stapleton johnson & partners pty ltd

Abbey Green. Existing SHR items with similar features include Tocal Homestead (SHR00147) and Dunmore House (SHR01887). Direct comparisons between Ravensworth and these properties have not been made.

- The use of architects in the design and construction of the early homesteads is rare. It appears that Ravensworth is a rare example of this......
- Item 5: The Casey & Lowe report completed quite extensive assessment against the NSW Heritage Criteria, which is missing from the Statement of significance and should be included as the site is likely to provide unique insights into:
 - o A newly-established frontier and contact/interaction with Aboriginal people.
 - o Rural lifeways, including tastes and customs through the 19th to early 20th centuries.
 - o Material culture and lives of significant colonial people.
 - Convict lives and the assignment system and how it was implemented within this landscape.
 - Use of technology and management of water, changing transportation and economics and how they shaped life on the estate.
- g) if relocation is selected as the preferred option, please include an analysis of all feasible relocation options...
- Item 6: This SEAR has not been met. The proposed options for relocation are not considered to have been appropriately met as neither option provides for the full relocation of the entirety of Ravensworth Homestead without demolition or removal of significant fabric such as the 1920s addition and the original homestead footings. Much more detailed information needs to be provided before either option can be considered."

The following discussions aim to address the above issues raised by the Heritage Office and culminates in a revised Statement of Significance for the Ravensworth Estate (see Section 2.7 of this document).

2. Response

2.1. Point 2e) Item 1

Point 2 e) Item 1 of the Heritage NSW correspondence included the following comments:

Point 2 e) in relation to Ravensworth Homestead, the EIS must include: a detailed heritage significance assessment of the homestead, including consideration of its surrounding garden and landscape.

The assessment of the heritage significance of the homestead including its surrounding garden and landscape and subsequent Statement of Significance in the EIS is considered inadequate for the following reasons:

Item 1: The description of Ravensworth's connection to 'range of significant places and people' is considered inadequate. These places and people should be identified.

2.1.1. Response:

Appendix 23a of the EIS accompanying the Glendell Mine Extension SSD Application 9349 contains the report *Ravensworth Estate*, *Singleton*, *NSW: Heritage Analysis and Statement of Significance* (HA&SoS), prepared by Lucas, Stapleton, Johnson & Partners, dated November 2019. *Section 4: Analysis of Evidence* of this report provides detailed information in relation to the range of significant places and people connected to the Ravensworth Estate.¹

For ease of reference, this information is repeated below.

To assist in locating the principal owners and occupiers of the Ravensworth Estate within its history, a table providing the chronology of ownership for the Ravensworth Home and the Homestead allotment has also been provided. This information has been drawn from *Section 2: History of the Ravensworth Estate* included in the HA&SoS.

Owner	Dates	Occupier/Overseer	Dates
Dr. James Bowman	1824 – 1842	John Larnach, Overseer	1824 – c1827
		John Alexander, Superintendent	1828
		John Tucky (convict), Overseer	
		James White, Overseer	1829 – c1839
		Mr. Shepperd (variously Shepherd) Superintendent	1840
James & William Macarthur	1842 – 1846	Dr. James Bowman and family	1843 – 1846 (death)

¹ Lucas Stapleton Johnson & Partners, 2019; *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (Appendix 23a), pp. 302-318

Owner	Dates	Occupier/Overseer	Dates	
Bank of Australasia	1846 – 1853	E. M. Bowman	c1847	
		Bernard Fox, Sheep Overseer	1847	
		John Carlyle, Storekeeper		
		James Burnett, Superintendent	1848 – 1849	
Capt. William Russell	1853 – 1866	Capt. William Russell	1850 – 1854	
		James E. Davys, Superintendent	1854 – 1864	
		William Barton, Superintendent	1860	
		George Wyndham Jnr.	1865 – 1866	
Mrs. Eliza Russell	1866 – 1882	James E. Davys, Superintendent	1866 – 1882	
		J. Hindmarsh, Overseer	c1872	
		John Moss, Overseer	1878	
Duncan Forbes Mackay	1882 – 1911	Duncan Forbes Mackay	1882 – 1887	
		Robert A. Hill, Manager	1890 – c1911	
Frank J. L. Measures	1911 – 1920	Mr Newman Manager	1914	
		Mr H. A. Swinney [Sweeney] Manager	1917	
A.C. Reid	1916-1920	?		
Owners and Occupiers of the Ravensworth Homestead allotment only (post 1912 subdivision)				
Alfred Walter Albert Farey	1912-1916			
Vacant for 8 years				
Alexander Couchrian Reid	1920			
Augustine Campbell Marshall	1920			
Geoffrey Campbell Marshall	1980s			
Liddell Southern Tenements Pty Ltd	1997			

Historical Associations with the Place

Persons of Note Associated with the Place

The following provides a brief outline biography of notable persons with strong associations with the establishment and subsequent development of the Ravensworth Estate (the Place).

Dr. James Bowman (1784-1842)²

James Bowman, the son of Edward and Ann Bowman of Carlisle, Cumberland, England, entered the navy as an assistant surgeon in 1806 and promoted to surgeon in 1807. In 1814 however, due to the impacts of the Napoleonic Wars, he was reduced to half-pay. The following year on the

Ravensworth Estate, Ravensworth, NSW Expanded Analysis of the Ravensworth Homestead Complex

² Nancy Gray, 'Bowman, James (1784–1846)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, http://adb.anu.edu.au/biography/bowman-james-1812/text2067, published first in hardcopy 1966

recommendation of William Redfern that naval surgeons be appointed to convict transports, Bowman sailed to New South Wales as surgeon and agent of the transport Mary Anne, arriving on 19 January 1816. However, disappointed in his expectations of a colonial appointment he returned to England, strongly recommended by Governor Lachlan Macquarie for his "assiduous and humane attention" to the convicts and for his "mild, gentleman-like manners and accomplishments".

In 1817, when surgeon of the transport *Lord Eldon*, Bowman first met John Macarthur, then returning to New South Wales after a long exile.

In 1819, having been appointed to succeed D'Arcy Wentworth as principal surgeon, Bowman returned to Sydney in the company of Commissioner John Thomas Bigge, and took up his duties in September. Bowman made many immediate improvements at Sydney Hospital (the Rum Hospital or General Hospital). Wards, nursing staff, the general dietary scheme and the system of rationing convict patients were all reorganized. A mortuary and dissecting-room were added, and arrangements made for adequate supplies of instruments.

In 1823 Bowman married Mary Isabella Macarthur, the second daughter of John and Elizabeth Macarthur. Together they went on to have five children: Edward Macarthur (1826-72), James (1829-71), William Macarthur (1831-78), Isabella Macarthur (1834-83) and Frederick Macarthur (1836-1915).

In 1824, Bowman was appointed a member of the local committee of the Australian Agricultural Co. and in this same year, Bowman applied to Governor Brisbane for land in the Upper Hunter Valley (Ravensworth Estate). When the mismanagement of the company's concerns became a public scandal, Bowman was deputed, as "the docile instrument of his father-in-law's [John Macarthur] policy", to dismiss the agent Robert Dawson, and to appoint Macarthur to manage its affairs. Sir Edward Parry sent out by the London directors in 1829 to assume complete control, understandably "found the Company's affairs embarrassed with no common difficulties".

Bowman was also an Appointed Member of the first Legislative Council from 1824 to 1843. The appointment was terminated by Royal Warrant dated 17 July 1825 and proclaimed on 20 December 1825. However, Bowman only sat in Council until 22 November 1825.

In 1828 Bowman became inspector of colonial hospitals, but after Sir George Arthur and Sir Richard Bourke had both complained of laxity in supervision, in 1836 hospital administration was placed under military control and Bowman's services were no longer required.

For the next ten years Bowman remained in Sydney, taking little part in public affairs, save briefly as a local director of the Bank of Australasia. He applied for, but was refused, a town allotment, so John Verge built Lyndhurst for him on purchased land adjoining Wentworth Park in Glebe. When his official salary ceased in 1838, two years after his services were dispensed with, he retired with his family to Ravensworth, but received once more his naval half-pay. Drought and depression, combined with ill-advised expenditure and inexperience, led inevitably to heavy financial losses. After Bowman's sudden death from apoplexy on 23 August 1846 at Ravensworth his invalid widow and five children welcomed the generous and necessary assistance of Mary's brother William Macarthur and relocated to Camden Park.

2. Response Lucas stapleton johnson & partners pty ltd

Edward Macarthur Bowman (1826-1872)³

Edward Macarthur Bowman was the eldest son of Dr James Bowman and Mary Macarthur. He lived with his family, first at the General Hospital in Sydney where his grandmother Elizabeth Macarthur lived with them for substantial periods, and at Lyndhurst in Glebe from 1836. He seems to have been particularly close to his grandmother who later wrote to him frequently. He also spent time at Camden Park with his uncles James and William Macarthur. Surviving manuscript records commenced in 1843 when it seems he was living at Ravensworth, the same year the Bowmans left Lyndhurst. Edward appears to have started to support his father in his management of Ravensworth by 1845 and from surviving letters he often acted as his agent in Sydney and Maitland.

As a youth Edward Bowman developed a strong interest in botany and befriended the botanist John Carne Bidwill. Bowman developed his skills in identification and hybridisation throughout his life, although during his time at Ravensworth, the management of the estate took precedence (refer to Section 4.4 regarding the historical development of the garden for further details).

In 1850 Edward was appointed to the district of Camden, Narellan, Picton and Campbelltown, to regulate the sale of Waste Lands of the Crown.⁵ In 1851 he was appointed Assistant Commissioner of Crown Lands for the Gold District.⁶ However by 1852 the 'young commissioner' was having difficulty asserting authority and while at Mudgee began to suffer from "fits" which it became apparent were drinking binges.⁷ In 1853 he wrote that he would have a better chance of recovering "his character" if he could "obtain any employment in some other place..."

Edward steadily deteriorated; his uncles at Camden Park paid for his debts on more than one occasion and eventually wiped their hands of him. At his lowest ebb in 1854 he was turned off the diggings under the *Vagrancy Act* 1851 and a family friend brought Edward back to Parramatta in a "sad state of destitution" where his aunt Emmeline and her husband Henry Parker nursed him back to health before finding him work as a stockman near Yass in a situation that was far from temptation.

By 1860 Edward Bowman had returned to botany, was collecting plant specimens in the Lower Macquarie River area and from then onwards Bowman collected specimens in North East Australia for several botanists including Baron Ferdinand von Mueller, Government Botanist and Director of the Melbourne Botanic Gardens. Bowman is noted for collecting in central-eastern Queensland, particularly along the Fitzroy and Burdekin Rivers. He is best-known for his discovery of *Ptychosperma alexandrae* (Alexandra palm) named for Alexandra, Princess of Wales and described by von Mueller c1865. Although he collected a number of ferns, which von Mueller sent to Sir William Hooker, none were named after Bowman despite von Mueller's request.

³ Research provided by Colleen Morris

⁴ Michelle Scott Tucker *Elizabeth Macarthur, A life at the edge of the world*, Text publishing, Melbourne, 2018.

⁵ Bowman Papers ML SLNSW

⁶ 'Government Gazette Friday September 19, 1851', The Maitland Mercury and Hunter River General Advertiser Wed September 24 1851, p.3

⁷ SMH, 'Assize Intelligence" Mon March 1 1852, p.2; ML SLNSW Macarthur Papers.

⁸ Macarthur Papers ML SLNSW, A4296 op. cit.

⁹ Biographical entry *Encyclopaedia of Australian Science* http://www.eoas.info/biogs/P005202b.htm ¹⁰ http://vmcp.conaltuohy.com Ferdinand von Mueller correspondence 65.00.00i From Edward Bowman

MEL516576, National Herbarium of Victoria, RBG Melbourne

¹¹ Ibid, 63.05.14 To William Hooker 14/5/63



The Victorian Government had an official botanical collector in Queensland and when the incumbent John Dallachy died in 1871 von Mueller was "most anxious to replace him" and proposed Bowman to the Victorian Under-Secretary for the position. He described Bowman as "a good Bushman and Horseman, who has likewise been trained to collecting and who is extensively acquainted with Australian plants". ¹²

Figure 1: (Figure 4. 21 in Appendix 23a) Watercolour of *Ricinocarpos bowmanii*, NSW, 1921 by Adam Forster. Source: NLA PIC Drawer 3425 #R1438

Bowman died at Clermont Downs, Queensland in 1872. *Eucalyptus bowmanii* F.Muell was named in his honour. He is also commemorated in other species such as *Agaricus, Boronia, Cyperus, Dendrobium, Eremophila, Pimelea* and *Ricinocarpos*. ¹³

John Larnach (1805-1869)¹⁴

John Larnach was born at Auchingill, County Caithness, Scotland, the son of William Larnach, naval purser, and his wife Margaret, née Smith. In July 1823 he arrived at Sydney a free settler. He became overseer first to James Bowman at Ravensworth and then to James Mudie of Castle Forbes, Patrick's Plains, Hunter River. Later he became a partner of James Mudie and in 1827 at Newcastle married Emily, Mudie's eldest daughter. Larnach took up a near-by property, Rosemount (later purchased by the Dangars and renamed Baroona) and lived there with his wife.

Larnach spent more time than Mudie at Castle Forbes, where some twenty assigned servants worked on heavy clearing and cultivation and were kept under rigid discipline. In November 1833 some of the convicts revolted, took to the bush and returned to plunder the property for food, clothes, guns, ammunition and horses. Larnach, who at the time was washing sheep in a near-by stream, was shot at but not injured, and he took refuge at the neighbouring home of Henry Dangar (Neotsfield). A party of police and civilians including Larnach captured the absconders, six of whom were remanded to Sydney. After a dramatic trial in December 1833 three of the prisoners were executed in Sydney and two at Castle Forbes; the youngest was sent to Norfolk Island for life.

Accusations by the convicts at their trial caused such a public outcry that Governor (Sir) Richard Bourke ordered an inquiry by the solicitor-general, John Plunkett, and the police superintendent, Frederick Hely. They found that Mudie and Larnach had not been harsh or oppressive but considered Larnach "imprudent" in striking one convict and "reprehensible" in bringing another before the local bench twice on the same day for the same offence so as to obtain two sentences of

1

¹² http://vmcp.conaltuohy.com Ferdinand von Mueller correspondence, 71.06.12 To James McCulloch, Melbourne Botanic Garden, Z71/7551, unit 576, VPRS 3991/P

¹³ https://trove.nla.gov.au/people/1499582?c=people

¹⁴ Bernard T. Dowd and Averil F. Fink, 'Larnach, John (1805–1869)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, http://adb.anu.edu.au/biography/larnach-john-2330/text3031, published first in hardcopy 1967

2. Response Lucas stapleton johnson & partners pty ltd

fifty lashes each. This report angered Mudie and Larnach who prepared a joint protest and asked Bourke to send it to London. Bourke refused because of its improper form, so in September 1834 they printed *Vindication of James Mudie and John Larnach, From Certain Reflections on Their Conduct Contained in Letters Addressed to Them ... Relative to the Treatment by Them of Their Convict Servants*. They sent this pamphlet direct to the Colonial Office, where the governor's action was fully upheld.

Thereafter Larnach withdrew from public notice and after Castle Forbes was sold in 1836, he carried on his own agricultural and pastoral pursuits. He died at Rosemount on 10 February 1869, aged 64.

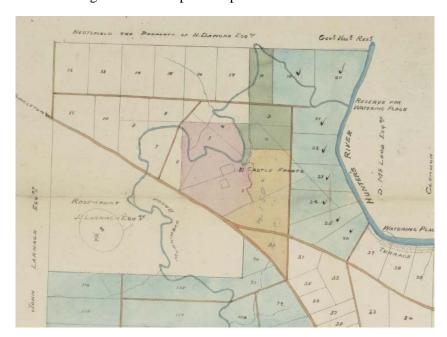


Figure 2: (Figure 4. 22 in Appendix 23a) Detail from 1840 auction plan by the Australian Auction Company, showing the location of Castle Forbes, Rosemount and Neotsfield on the Hunter River. Source: NLA, MAP F 800

James White (1798?-1842)¹⁵

James White from Heathfield in Somerset, England, arrived in Sydney in 1826 in the *Fairfield*, accompanying 79 French merino sheep for the Australian Agricultural Company and served as an overseer until 1829 at the Gloucester Estate. While working for the A.A. Co., White was comparatively wealthy in his own right having arrived with £500 plus some livestock. By agreement with the company, during his period of employment White developed his own pastoral interests and he took possession of his primary grant of 1280 acres at the junction of the Isis and Pages Rivers, naming the property Broomfield.

From 1828 to 1839 White was employed as overseer at Ravensworth during which time eight of James's and his wife Sarah's (nee Crossman) children were born: James White Jnr, Francis, George, William Edward, Frederick Robert, Henry Charles and Edward. The eldest daughter Jane, born at Gloucester Estate, drowned at the property and the Whites' last child born a number of years later was also named Jane. (The grave located at the homestead complex is assumed to be the resting place of Jane White.)

White rapidly expanded his land holdings once he left Ravensworth, purchasing Edinglassie near Muswellbrook from George Forbes in c1839 and Timor station on the Isis River (it appears) from James Bowman in c1840 and Boorrooma on the Barwon River.

_

¹⁵ Binney, K.R., 2005; *Horsemen of the First Frontier (1788-1900) and the Serpent's Legacy*, Volcanic Productions, p. 421; *Free Settler or Felon?*; https://www.jenwilletts.com/james_white.htm

Following White's untimely death, his property was inherited equally by all his children and in 1848 James, Francis and George leased (and later purchased) the property Belltrees near Scone (owned by H.C. Semphill), purchased Plashett (owner Sir John Robertson) and Martindale (owner J.H. Bettington). These properties, together with acquisitions of the estates Waverly (another property associated with James Bowman and Richard Hart Davis, chairman of the Court of Directors of the A.A. Company) and Ellerston and much later Segenhoe (originally owned by Thomas Potter McQueen), consolidated the White pastoral dynasty in the Hunter region.

Captain William Russell (1807-1866)¹⁶

Captain William Russell, born in Woodbridge, Suffolk, England, the son of Andrew Hamilton and Sarah Blundell, was a pastoralist and agriculturalist. Russell served in the 20th Regiment of Foot in the Napoleonic Wars and arrived in New South Wales in c1837. In 1841, Russell married Jane Rebecca Griffiths Jamison, the daughter of Sir John Jamison, in Penrith.

Russell acquired extensive freehold property in settled districts and in 1859 held 117,041 acres of adjacent land under the pre-emptive leases allowed big landowners. He also held 11,840 acres in settled districts under auction lease and squatted in the Gwydir district. His properties included Ravensworth, the 50,000-acre run "Eena" on the McIntyre, Blue Nobby and Wallangra, 'Glenridding' at Singleton and William Sim Bell's grant of Cheshunt Park on the Hunter River directly south of Ravensworth. Russell also made trips overseas to buy better merino rams and 4,000 grape vines a year old for planting at Cheshunt.

From 1861 to 1865, Russell represented Patricks Plains in the Legislative Council. Russell died in 1866 and is buried in St Stephen's Anglican Church Cemetery, Penrith. A memorial plaque to Russell and his son, Lieutenant J.W. Russell is located in St. James's Church, Sydney.

Duncan Forbes Mackay Jnr. (1834-1887)¹⁷

Duncan Forbes Mackay junior was born at Prince Edward Island, North America, arriving in New South Wales with his father and grandparents in 1839. Duncan Forbes Mackay Jnr was the sixth child and fourth son of John and Sybella Mackay.

His uncle, Duncan Forbes Mackay Snr. had already arrived in Australia in 1826, being appointed Superintendent of Prison's and Public Works at Newcastle in 1827 and then the first Post Master at Newcastle in 1828. In the late 1820s, Duncan Snr. received a grant of 640 acres in the County of Durham on the Williams River, which became his Melbee estate. This was followed in 1829 by an additional 4,500 acres adjoining this land and including a Village Reserve- Dungog. The land to the south of Dungog was the Cangon estate, where his father William Mackay resided when he arrived in NSW.

Duncan Forbes Mackay Snr. did not marry and had no children but, in the 1830s, he encouraged his brother John to join him at his property. John, his wife Sybella and seven children, came to Melbee about 1839. By 1850, Duncan Forbes Mackay Snr. made over his estate to his brother's family.

-

¹⁶ NSW Parliament, Members details: https://www.parliament.nsw.gov.au/members/Pages/member-details; Family History Society Singleton Inc.

¹⁷ State Heritage Inventory: *Minimbah and Outbuildings*, database no. 14293; *Mackay Family History*, W. P. Howey, 2017, http://sconevetdynasty.com.au/mackay-family-history/

During the latter half of the 19th century, the Mackays became one of the principal grazing and cattle breeding families in NSW, controlling vast pastoral leases in NSW and Queensland, with lavish residential establishments in the Hunter Valley.

In the 1860's and 1870's Duncan Forbes Mackay Jnr took up extensive cattle runs in the St George and Roma areas, in Queensland. He eventually became a large stockholder and held a number of stations breeding his stock at Tilpal station on the Gulf of Carpentaria and then shifting them to Ravensworth and Whittingham (Minimbah) for fattening. 18

By the 1870's Duncan Forbes Mackay and his wife had five children. Duncan bought land, formerly a 2000 acre grant made in October 1823 to John Cobb (Minimbah), who had previously used the land for sheep farming. The property became renowned for, among other attributes, the breeding of excellent horses. Mackay increased the size of the property to 30,000 acres and had a large mansion built to designs by architect Benjamin Backhouse.

Alexander Couchrian Reid (c1863-1925)

Born in Kiama to prominent business man Samuel Reid who ran the Beehive Store, Alexander Couchrian Reid followed in his father's footsteps by purchasing the business of Alexander McIntosh in Moree in 1907 and erecting a large general store (still standing) known as A.C. Reid & Co. Shortly thereafter, Reid built a similar emporium at Cowra (also still standing), known as Reid, Smith & Co.

Known more widely as a successful grazier, Reid owned Euroka Station in the Walgett district (site of the invention of the Wolseley Shearing Machine by former station owner Frederick Wolseley) and was a member of the Graziers' Association. 19

On his death, bachelor Reid left legacies to his extended family as well as to a range of charitable and public institutions including the Royal Hospital for Women, Paddington, Royal Alexandra Hospital for Children, Camperdown, the Bush Nursing Association, Cowra Public Hospital, and the building fund of the Cowra Presbyterian Church.²⁰

A.C. Reid took over the ownership of the Ravensworth Estate in c1916 and continued with the subdivision and sale of the land as smaller farming allotments, a process that had commenced under F.J.L. Measures.

A.C. Marshall (1891-1983)

Augustine Campbell Marshall better known to most as Campbell or "Cam" was born on September 20th 1891 in Cooma in the Monaro district. He was the son of Presbyterian Minister, the Reverend James Marshall and his wife Agnes nee Quinn. Campbell was one of five sons and three daughters. It would appear Campbell's first name Augustine was his father's younger brother's name who died in 1876 aged 14 years old. Campbell lived in various places due to his father's Ministries.

Campbell enlisted in WW1 aged 24 years on October 12th 1915, SERV No.1636. Serving in the Middle East in the 6th Squadron 2nd Australian Remount Unit he did not return to until the end of the war in 1919. His Remount Unit was a highly specialised unit responsible for the horses that were used

¹⁸ ATCJ, 25 June 1887, p 1315

^{19 &}quot;Ravensworth Estate", Muswellbrook Chronicle, Saturday 6th January 1917, p.7; "Graziers' Association

Meeting of Members", Sydney Stock and Station Journal, Friday 12th July 1916, p. 5

²⁰ "Wills and Bequests"; *The Sydney Morning Herald*, Tuesday 16th February 1926, p. 7

to replace horses wounded or killed in action. The Unit helped break the horses in, train and look after them; getting them ready for war.

He returned and was discharged on 24 October 1919.²¹

On September 15th 1924 at St Stephens in Sydney, Campbell married local girl Enid Raby Moore who was born on 16th October 1900. Enid was the daughter of Edgar Raby Moore and Margaret Alice nee Briggs. Enid grew up on the "Bayswater" property (formed from land excised from the Ravensworth Estate in the 1860s). Campbell and Enid had three children Ruth, Jane and Geoffrey who all received Campbell as their middle name.

In December 1938 Campbell was first elected to the former Patrick Plains Shire Council serving some 34 years in total. Receiving a leave of absence from his Council duties during WW2 Campbell joined the RAAF on January 23rd 1942, SERV No. 264468 and served in the capacity of Flight Lieutenant until July 1945 when he returned to life at Ravensworth and his family.

With the Electricity Commission requisitioning more than half of the Marshall holding for the Liddell Power Station in the late 1960s, Campbell secured the remainder of his soldier's settlement grant (Ravensworth) outright and received clear title from the Crown.

A.C. Marshall's son Geoffrey (Geoff) and his wife Jenny later ran Ravensworth which remained in the Marshall family until 1997. Geoff relayed that Campbell maintained a strong interest in all aspects of the property until his death at age 92 years. Campbell and Enid are interred at St Clements Camberwell having passed away on May 1st 1983 and March 27th 1993 respectively.²²

Other Places Associated with the Ravensworth Estate

Given the long history of the Ravensworth Estate and the known associations with persons of note throughout this history (see above), there are numerous other properties and sites historically associated with the place. Of particular note is the range of other homesteads/estates located throughout the Hunter Valley region that have some historic link to Ravensworth via past owners and overseers (see Figure 3 below). The following is a brief outline of other places associated with the history of the Ravensworth Estate.

The broader Ravensworth Estate lands

Although for the purposes of this report, the Place has been defined as the three land grants initially obtained by Dr. James Bowman in 1824, within the immediate vicinity Bowman was granted a number of other parish portions throughout the 1820s and 1830s as he gradually developed and expanded the Ravensworth Estate. These other land parcels are illustrated below (see Figure 3), however of particular note is Portion 70 of parish Vane which Bowman obtained in 1834.

_

²¹ B2455 World War One Army Personnel File, 1636, A C Marshall, Barcode 8218310, NAA
²² The Patrick Plains Gazette Newsletter of the Family History Society Singleton Inc. Volume 34/Number 3/2017

2. Response Lucas stapleton johnson & partners pty ltd

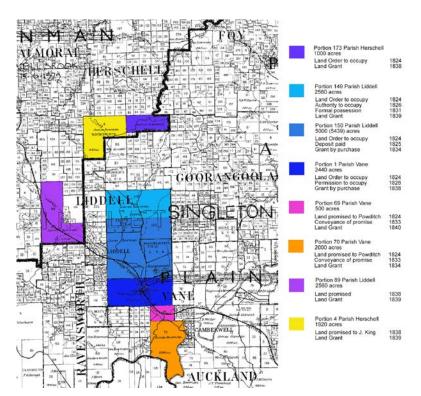


Figure 3: (Figure 4. 23 in Appendix 23a) County of Durham plan showing parish portions and coloured to indicate James Bowman's land grants of the 1820s and 1830s comprising the Ravensworth Estate and immediate surrounds. Source: NSW LPI-Historical Land Records Viewer

St. Clement's Church, Camberwell

Located to the south of the core estate lands of the Ravensworth Estate and to the west of Glennies Creek (formerly Falbrook Creek) is situated St Clement's Church and cemetery, Camberwell. Constructed between 1842 and 1851, the church and cemetery are situated on land that formed part of James Bowman's land, being Portions 69 and 70 of the Parish of Vane.

In 1840, the town of Camberwell was established and a portion of land, outside of the village boundaries, on the western bank of Glennies Creek was nominated as a church site. It is unclear whether or not Bowman donated the land or provided any funds towards the building of the church. Another church yard was also marked out further to the north, adjacent to Glennies Creek Road (formerly Powditch's Old Road), however, this church yard appears not to have been developed. (See Figure 4.)

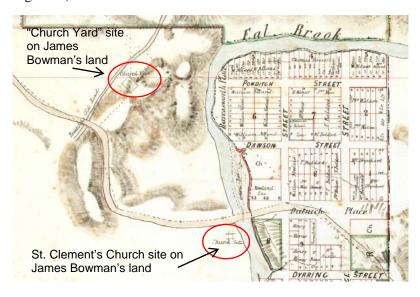


Figure 4: (Figure 4. 24 in Appendix 23a) Detail from 1892 Plan of the Village of Camberwell showing location of the church site and church yard. Source: NSW LPI- Historical Land Records Viewer



Figure 5: (Figure 4. 25 in Appendix 23a) Detail from church records with photograph of St Clement's Church, Camberwell in 1920. Source: Anglican Diocese of Newcastle - Churches and Rectories album - A5352b, University of Newcastle

In September 1841, Dr. James Bowman and his wife donated 2 acres of land adjacent to the main road for a church and burial site.²³ The foundation stone for the church was laid in the following year by Bishop Broughton, who visited the site again in 1843 to view the building progress. St Clement's Church was constructed between 1842 and 1851. Lack of funds delayed initial construction although by 1848/49 it was noted that work was once again underway with the contractor Mr. Kains having "made a beginning".²⁴

Based on "Marriage Notices" in newspapers of the time, it appears that the church was functioning by 1851²⁵ and in 1855 the church was consecrated by the first Anglican Bishop of Newcastle, Bishop William Tyrrell (1807-1879).

In 2008, the church was badly damaged by fire as a result of an act of vandalism and in 2013, the Newcastle Anglican diocese deconsecrated the church after 160+ years of service. The building is currently vacant. The church and cemetery are listed as local heritage items under Schedule 5 of the *Singleton Local Environmental Plan* 2013 (Item No. I16).

Ashton Farm

The southern land portions of Ravensworth Estate, being Portions 69 and 70 in the Parish of Vane, were originally granted to Captain William Powditch in 1824. In c1834, both Portions were purchased by James Bowman and amalgamated into the Ravensworth Estate.

Known as Ashton Farm, Powditch's grant appears in Henry Dangar's 1828 "Index and directory to map of the country bordering upon the River Hunter" and the accompanying map indicates that a dwelling/building was located on the land at that time (see Figure 6 below). The property appears to have been principally used for the fattening of stock. A newspaper advertisement in 1827 offers the farm as grazing land for "persons having more stock than their respective runs can maintain....". Application could be made to a "Mr. Wm. Vivers, Bailiff, on the farm", ²⁶ indicating that Ashton Farm was under management and not Powditch's primary residence.

William Powditch (1795-1872) arrived in Australia as the commander of the Royal George that brought Thomas Brisbane, Governor of NSW, to Sydney in 1821. By the mid 1820s Powditch had settled in the Hunter Valley and together with Frederick Boucher had started a general warehouse at Newcastle for the supply of the new settlers in the area. The firm operated as "Powditch and

²³ Glencore, 2017; *Ravensworth Open Cut: Plan for Heritage Management*, p. 21; no documentary evidence of this assertion has been located, although given the church is located on land owned by James Bowman, it is likely that the family donated the land.

²⁴ Article: "St. Clement's, Camberwell", Singleton Argus, Tuesday 5th April 1927, p. 2

²⁵ "Married", *The Sydney Morning Herald*, Monday 3rd February 1851, p. 3

²⁶ Advertising: "Grazing", *The Australian*, Friday 9th November 1827, p. 2

Boucher". In 1831, while a trader in the Bay of Islands, he was appointed by the Postmaster General of NSW to receive and return mail, thus starting the first postal service between Australia and New Zealand. In 1845 he moved to Auckland and in 1853 was elected in the Pensioner Settlements electorate in the first election of the Auckland Provincial Council.²⁷

It does not appear that any early buildings survive in the area where the original farm building is indicated as being located, although the majority of the land forming Portion 70 appears to continue to be used for agricultural/pastoral purposes today (see Figures 7).



Figure 6: Figure 4. 26 in Appendix 23a) Detail from Dangar's map showing Ashton Farm (parish portion 70 parish Vane). Source: Dangar, Henry, *Map of the River Hunter and its branches...*, NLA Map NK 646

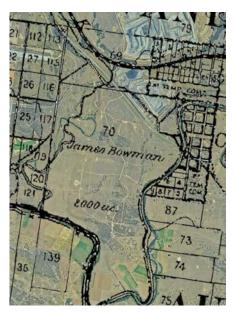


Figure 7: Figure 4. 27 in Appendix 23a) Current aerial view of land to the southwest of the village of Camberwell overlaid with parish portion boundaries showing that former Ashton Farm land remain pastoral in character. Source: GoogleMaps, 2018

Other James Bowman Properties

James Bowman, the owner of the Ravensworth Estate from 1824 to 1846, is also associated with numerous other properties throughout N.S.W, including the following:

Lyndhurst, Glebe

Bowman's town residence built for him in 1833-1837 to designs by John Verge. The Bowmans resided there until the late 1830s when James and his family relocated to Ravensworth. The house survives as a private residence, having been fully restored in the 1980s, and is listed as a State Heritage item (SHR No. 00158).



Figure 8: (Figure 4. 28 in Appendix 23a) Lyndhurst c1880. Source: SLNSW, SPF1027

²⁷ "William Powditch" https://en.wikipedia.org/wiki/William_Powditch

General Hospital (Rum Hospital), Sydney

As Principal Surgeon of the colony from 1819-1823, Bowman was closely involved with the functions of the General Hospital, Macquarie Street, Sydney. Bowman was responsible for a number of improvements including reorganising the wards, nursing staff, the general dietary scheme and the system of rationing convict patients, the addition of a mortuary and dissecting-room, and arrangements made for the adequate supplies of instruments, all under Bowman's leadership.²⁸

In 1829, following the establishment of the Legislative Council in 1823 most of the northern wing of the General Hospital (built between 1811 and 1816) was taken over for meeting of the Council. The northern wing housed the Principal Surgeon (Bowman) and Assistant Surgeons of the hospital.²⁹ Initially, the Council had use of six of the eight rooms of the building, while the Principal Surgeon retained the ground and first floor rooms at the south end of the same building.³⁰ The whole of the north wing of the hospital now forms part of NSW Parliament House and is listed as a State Heritage item (SHR No. 1615).



Figure 9: (Figure 4. 29 in Appendix 23a) Old Sydney Hospital c1870 (now NSW Parliament House). Source: NAA A1200-11775028

Australian Agricultural Co. lands

As a member of the Colonial Committee of the A.A. Co. (1824-1830) and shareholder, Bowman is associated with the development and administration of the A.A. Co. lands throughout N.S.W. The A.A. Co. continues today, operating out of the Goonoo Goonoo Station on the Peel River in the Liverpool Plains (originally established in 1832 by Edward Parry), as well as in Queensland and the Northern Territory. The company now focuses on beef production.

Other Hunter Valley lands

James Bowman is also known to have amassed considerable areas of land throughout the Hunter Valley to support his pastoral enterprises. Other land holdings of note include:

- Waverley Station on the Isis River, was initially selected by Thomas Potter Macqueen in the name of Richard Hart Davis MP (Director of the Australian Agricultural Co.) in 1833.³¹ The station was then purchased by Bowman in c1839 and later was purchased by James White Jnr. and was amalgamated in the Belltrees Estate. Waverley Station survives having been separated from the Belltrees Estate in the late 20th century.
- Segenhoe on the Pages River, originally granted to Thomas Potter Macqueen in 1826 and purchased by Bowman in the mid to late 1830s. Segenhoe survives today as a horse stud called Vinery Stud and the homestead with outbuildings are listed as local heritage items under Schedule 5 of the *Upper Hunter Local Environmental Plan* 2013 (Item No. I61). The name 'Segenhoe' has been transferred to another horse stud to the north.

27 Cultural Resources Management [Wendy Thorp], 1980, Archaeological and Archival Report, Parliamen House, Macauarie Street, Sydney, Vol I: Archival Report, n.p. (Sections I and II)

²⁸ Nancy Gray, 'Bowman, James (1784–1846)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, http://adb.anu.edu.au/biography/bowman-james-1812/text2067 ²⁹ Cultural Resources Management [Wendy Thorp], 1980, *Archaeological and Archival Report, Parliament*

³⁰ Clive Lucas, Stapleton & Partners, 2012; NSW Parliament House: Conservation Management Plan, p. 13

³¹ Pemberton, P.A.; 1991, *The London Connection: the Formation and Early Years of the Australian Agricultural Company*, ANU thesis, p. 69

• Via family and business links with the Macarthur family, James Bowman is also associated with Macarthur family properties including Elizabeth Farm, Parramatta and Camden Park Estate and Belgenny Farm, Camden, both of which survive and are State Heritage items (SHR Nos. 00001, 00341 and 01697).

• Various other smaller allotments along the Isis River, Sandy Creek and Rouchel Brook to the north of Ravensworth, purchased by Bowman in the late 1830s. Current status of these lands has not been established.

Refer also to Figure 3 above.

John Larnach Associations

John Larnach was the overseer of the Ravensworth Estate from 1823 to c1827, and is associated with the following other properties:

Castle Forbes

James Mudie (1779-1852), officer of marines, landowner and author, arrived at Sydney in July 1822 with an order for a land grant and was given 2150 acres (870 ha) on the Hunter River, which he named Castle Forbes after his patron. Mudie acquired 2000 adjoining acres (809 ha) in 1825 and, with the assistance of many assigned convicts and his overseer, John Larnach, who became his son-in-law and partner, Castle Forbes was turned into one of the finest agricultural establishments in the colony, producing substantial quantities of wool, meat and wheat.³² Larnach continued in this role until 1836 when Mudie sold Castle Forbes and returned to England.

The property remains with its original name, although whether the 1830s homestead survives is not known at this time.

Rosemount (Baroona)

Established in the early 1830s by John Larnach, Rosemount was located across the Great North Road to the west of Castle Forbes. The original house on the property, Rosemount, was built by John Larnach on a grant of 4000 acres and the Larnach windmill, a local landmark, stood on top of the hill. Following the sale of Castle Forbes in 1836, Larnach arrived on his agricultural and pastoral pursuits at Rosemount, where he died in 1869.

The property was then sold to Albert Dangar (son of Henry Dangar). Dangar employed the architect Benjamin Backhouse to renovate the existing house and build around it. It was renamed Baroona and survives today. The property is a local heritage item under Schedule 5 of the *Singleton Local Environmental Plan* 2013 (Item I154).

³² Bernard T. Dowd and Averil F. Fink, 'Mudie, James (1779–1852)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, http://adb.anu.edu.au/biography/mudie-james-2487/text3345

James White Associations

James White was the overseer of the Ravensworth Estate from 1829 to c1839, and is associated with following other properties:

Stroud Estate, Port Stephens, A.A. Co.

As superintendent of the A.A. Co. and before his time at Ravensworth, James White and his wife Sarah lived on the A.A. Co estate at Stroud where their first son James was born in 1828. Stroud House was developed as a residence for the company's superintendents and notable guests. Constructed by convict labour in 1827 and extensively refurbished in 1832 by former convict Thomas Laman, Stroud House is a two storey residence with servants' quarters that is included on the State Heritage Register (SHR 01969).

Figure 10: (Figure 4. 30 in Appendix 23a) Recent photograph of Stroud House Source: Gloucester Advocate 2nd May 2016 www.gloucesteradvocate.com.au

Broomfield

In 1831 James White took possession of his primary grant of 1280 acres at the junction of the Isis and Pages Rivers, north of the town of Gundy, naming the property Broomfield after his Somerset home. The property adjoined the southern boundary of James Bowman's Waverly Estate (purchased in trust for Richard Hart Davis). The property was amalgamated into the Belltrees estate during the period of ownership by James White Jnr. Today, the property survives with the name Broomfield, although whether any original or early buildings survive is not known at this time.



Figure 11: (Figure 4. 1 in Appendix 23a)
Detail from 1892 parish map of the Parish of
Alma showing James White's 1280 acre
property at the confluence of the Pages River
and the Isis River, north of Gundy. Source:
NSW LPI, HLRV

Edinglassie

In 1836 James White purchased land originally granted to George Forbes (the brother of the Chief Justice Francis Forbes of NSW) in 1825 known as Edinglassie. A homestead (c1833) had already been constructed when White purchased the property and he noted that he was 'delighted with the purchase of his property and homestead at Edinglassie', according to the White family records. The property remained in the White family until 1959. The present house was built in two stages, c.1880 and 1895 to a design by J. Horbury Hunt. The property survives as a thoroughbred stud and is a State Heritage Item (SHR 00170).



Figure 12: (Figure 4. 32 in Appendix 23a) Edinglassie homestead built in the late 19th century to a design by Horbury Hunt. Source: www.edinglassie.net.au/history

³³ Binney, K. R., 2005; *Horsemen of the First Frontier (1788-1900) and the Serpent's Legacy*, Volcanic Productions, p. 421

2. Response Lucas stapleton johnson & partners pty ltd

Timor Station, Gundy

Timor Station on the Isis River was established by James White in 1839. The land once again was adjoining other Bowman property that (it is assumed) formed part of his pastoral lands. The dwelling and outbuildings at Timor Station date from the 1880s, the period when the property was managed by James White Jnr. and Frederick White. Timor Station still survives today as a cattle station and polo club and is listed as a local heritage item under Schedule 5 of the *Upper Hunter Local Environmental Plan* 2013 (Item No. I210).

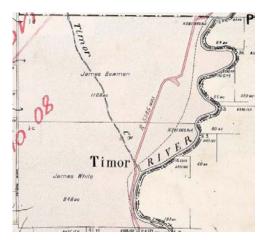


Figure 13: (Figure 4. 33 in Appendix 23a) Detail from 1882 parish map of the Parish of Timor showing James White's Timor Station purchase adjoining James Bowmans land on the Isis River. Source: NSW LPI, Historical Land Records Viewer

Captain William Russell Associations

Captain William Russell was the owner of the Ravensworth Estate from 1853 to 1866, and is associated with following other properties:

Cheshunt Park, Whittingham

William Simms Bell occupied land on the Hunter River as a stocking station from 1821 and was granted the land in 1825, known as Cheshunt Park. The property of 1000 acres, including a dwelling house, was purchased by Captain Russell in the late 1840s and was developed into a horse stud by the 1860s. A property noted as Cheshunt Park off Archerfield Road survives although whether any of the buildings relate to the Bell and/or Russell periods of ownership is unknown at this time.

Glenridding, Patrick's Plains

Granted to John Earl, a free settler, in 1823, the 1500 acres property was named Glenridding after a village in the Lakes District of England (where Earl come from). The land was purchased by Russell in the mid 1840s. Whether any of the buildings on the land today relate to the Earl and/or Russell periods of ownership is unknown at this time.



Figure 14: (Figure 4. 34in Appendix 23a)
Detail from 1892
parish map of the
Parish of Lemington
showing William
Bell's 1000 acre grant
of Cheshunt Park.
Source: NSW LPI,
HLRV



Figure 15: (Figure 4. 35 in Appendix 23a) Detail from 1921 parish map of the Parish of Whittingham showing John Earl's Glenridding Estate. Source: NSW LPI, HLRV

Duncan Forbes Mackay Associations

Duncan Forbes Mackay was the owner of the Ravensworth Estate from 1882-1911, and is associated with following other properties:

Melbee, Dungog

Duncan Forbes Mackay secured his first land grant in c1829 with a 640 acres grant on the Williams River which he named Melbee. The original homestead, a single storey dwelling of local stone, was built at this time, later replaced in 1886, although the original kitchen and barn reportedly still survive. ³⁴ Duncan encouraged his brother John to join him and the family later purchased adjacent land to the south of Dungog, known as Cangon. This estate also survives as a horse stud and remains in the hands of the Mackay family. Both properties are listed as local heritage items under Schedule 5 of the Dungog Local Environmental Plan 20104 (Items Nos. I73 & I38).

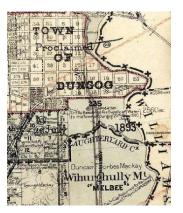


Figure 16: (Figure 4. 36 in Appendix 23a) Detail from 1935 parish map of the Parish of Dungog showing the Mackay family properties: Melbee and Cangon. Source: NSW LPI, HLRV

Other Estates

In the 1850s, Duncan Forbes Mackay made over his estate to his brother John and his descendants. The Mackay family went on to become one of the most successful grazier families in N.S.W and via this family link, the following properties in the Hunter Valley region are also somewhat associated with the Ravensworth Estate:

- Anambah, Maitland
- Minimbah (Dulcalmah), Whittingham
- Melbee, Dungog
- Cangon, Dungog

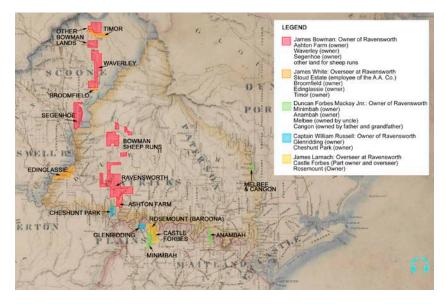


Figure 17: (Figure 4. 37 in Appendix 23a) Map showing the spread of properties and historic estate lands throughout the Hunter Valley region associated with the Ravensworth Estate. Base map: "This map of the colony of New South Wales...", prepared by Robert Dixon, 2nd edition dated 1841. Source: NLA, Map F 892

3/1

³⁴ Dungog Heritage Study, 1987, Inventory Sheet: "Melbee"

2.1.2. Conclusion to NSW Heritage Item 1: Historical Associations

The Statement of Significance provided in Appendix 23a: *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (HA&SoS), incorporates the above analysis of connections with significant people and places, as well as taking into account the history of the place.

For ease of reference, the significance of the place under *Criterion (b) Historical Associational Significance* is repeated below: ³⁵

Criterion (b) Historical Associational Significance

An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's (or the local area's) cultural or natural history.

The Ravensworth Estate is of significance on both a <u>State and local level</u> for its associations with a number of people of historical note and places of historical note located throughout NSW. The richness of these historic associations provides further evidence of the significance of the history of the Ravensworth Estate.

Historical associations with notable persons include:

- Dr James Bowman (1784-1846), principal surgeon of the colony and inspector of colonial hospitals and local committee member of the Australian Agricultural Co. (A.A. Co.), who was granted the land, established and expanded the property as a sheep run and named the property Ravensworth. He is said to be buried on the property (location unknown).
- Mary Bowman (1795-1852), daughter of John Macarthur, whose dowry of 2000 sheep and 200 cattle allowed James Bowman to apply for the initial land grant that became the Ravensworth Estate.
- John Macarthur (1767?-1834), entrepreneur, pastoralist and founder of the A.A Co. the oldest continuously operating company in Australia, and his sons James Macarthur (1798-1867) politician, and William Macarthur (1800-1882) an influential horticulturalist, who financially assisted the Bowmans with the management of the estate lands throughout its early history.
- Edward Macarthur Bowman (1826-1872), eldest son of Dr James and Mary Bowman was a botanical collector and botanist who lived at and managed Ravensworth from 1843 to 1848. In cooperation with his friend botanist John Carne Bidwill, Edward participated in some of the first efforts at plant breeding in Australia including the hybridisation of gladioli being among the experiments carried out at Ravensworth. Edward Bowman became a botanical collector in northeast Australia and he is best-known for his discovery of *Ptychosperma alexandrae* (Alexandra palm) named for Alexandra, Princess of Wales.
- James White (1801-1842), former employee of the A.A. Co. and founder of the White pastoral dynasty (other White family estates in the Hunter region include Edinglassie, Belltrees, Merton, Martindale and Waverley), who was an early overseer at Ravensworth and for whom the homestead was constructed.
- John Larnach (1805-1869), partner of James Mudie at Castle Forbes and joint author *Vindication* of James Mudie and John Larnach, From Certain Reflections on Their Conduct Contained in Letters Addressed to Them ... Relative to the Treatment by Them of Their Convict Servants in 1834, and who was an early overseer at Ravensworth.

³⁵ Lucas Stapleton Johnson & Partners, 2019; pp. 342-344

• Jackey-Jackey (d.1827), a local Aboriginal man, who following his capture for an attack on James Bowman's men on the Ravensworth Estate lands was executed without trial at Wallis Plains by Lieutenant Nathaniel Lowe of the Mounted Police, this led to a military officer being brought before the courts for actions against Aboriginal people for the first time in 1827.

- Later owners including Captain William Russell (1807-1866), pastoralist who also owned Cheshunt Park and substantial squatting properties; Duncan Forbes Mackay Jnr. (1834-1887), successful horse breeder and owner of the Anambah and Minimbah properties and Tilpil Station (amongst others); both of whom continued running the Ravensworth Estate as a pastoral property.
- F.J.L Measures (1863-1936) and A.C. Reid (c1863-1925), developers, who subdivided the estate lands into smaller agricultural parcels in the early 20th century.
- Later owner Augustine Campbell Marshall (1891-1983), a Light Horse veteran who obtained a portion of the original estate lands (Portion 228) containing the homestead complex under the *Closer Settlement Scheme* in 1920; and his descendant, son Geoffrey and his wife Jenny Marshall who took over the property and held the land until 1997. The Marshall family are notable for being the owners of the homestead for the longest continuous period.
- Noted NSW architect J.W. Pender who designed the 1880s woolshed (no longer surviving) and local architect James Warren Scobie, who undertook renovations at the homestead in the early 1900s.

Historic places of significance associated with the history of the Ravensworth Estate include:

- Lyndhurst, Glebe, Bowman's Sydney residence, designed by John Verge in c1835.
- The General Hospital (Rum Hospital), Sydney where Bowman was Principal Surgeon of the colony from 1819-1823.
- Numerous other parcels of land throughout the Hunter Valley owned by Bowman and forming
 part of the extended Ravensworth Estate lands, including Ashton Farm and at one time Segenhoe
 and the Waverley Estate.
- The Australian Agricultural Company lands throughout NSW, where Bowman formed part of the Colonial Committee for the company.
- The former Ravensworth village and the Ravensworth Public School (now a ruin), and the former Hebden village including the Hebden Public School (now a ruin), Hebden Community Hall (relocated) and Hebden Church (relocated).
- The former Bayswater Estate, owned by Edgar Raby Moore (grandfather of former owner of the Ravensworth homestead, Geoffrey Marshall), which formed part of Bowman's original "10,000" acres until the 1880s.
- St. Clement's Anglican Church, Camberwell (deconsecrated), constructed on land donated by Bowman, out of the extended Ravensworth Estate lands.
- Numerous other smaller farming allotments located across the estate lands resulting from the subdivision of the estate lands in the early 20th century under F.J.L. Measures and A.C. Reid.
- Numerous other Hunter Valley pastoral stations owned by early overseers (John Larnach and James White) and later owners.
- Other works by noted NSW architect J.W. Pender, including Belltrees, Scone, Anambah homestead, Gosforth and Saumarez homestead, Armidale.
- Other works by Maitland architect J.W. Scobie, including Maitland Town Hall, Maitland and Langford homestead, Walcha.

The Summary Statement of Significance provided in Appendix 23a: *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (HA&SoS), includes the following references to persons of significance associated with the history of the Ravensworth Estate:

Established in 1824, the Ravensworth Estate is associated with a range of significant colonial places and people including Dr. James Bowman, principal surgeon of the colony of NSW, who established the estate and is one of only a few places where, under Edward Bowman, horticultural experimentation first started in Australia. The place retains tangible evidence of the colonial period including substantial archaeological remains, landscape features and cultural plantings and made more meaningful by the surviving c1832 homestead complex including its siting and configuration. ³⁶

2.2. Point 2e) Item 2

Point 2 e) Item 2 of the Heritage NSW correspondence included the following comments:

The acknowledged connection of John Verge, one of Australia's pre-eminent colonial architects, with the design of the Ravensworth Homestead and Stables, referred to in both this report (HHAA, p59) [Hunter Estates: A Comparative Heritage Study of pre 1850s Homestead Complexes in the Hunter Region, prepared by Clive Lucas Stapleton & Partners, March 2013] and in previous studies by the authors, has not been sufficiently considered. The analysis should include a precautionary approach including a comparison of Ravensworth with other examples of work by Verge. Furthermore, the link to Verge and the MacArthur's should be referenced in the Statement of Significance.

2.2.1. Response:

Appendix 23a Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance (HA&SoS), prepared by Lucas, Stapleton, Johnson & Partners, dated November 2019 provides a discussion of the possible associations with architects and gentlemen architects of the early 19th century with the design and construction of the Ravensworth Homestead Complex. ³⁷

Section 4.6.2 Architectural Significance of Homestead Group within the HA&SoS includes a discussion regarding the suggestion that John Verge may have been the designer of the Stables building at the Ravensworth Homestead Complex.³⁸

Specifically, the east elevation treatment of the building has led to the suggestion that John Verge may have been the designer, as it is similar to an unbuilt design by Verge for Camden Park and to the existing stables complex at Wivenhoe, Cobbitty. Dr. James Bowman, the owner of the Ravensworth Homestead Complex, may have had knowledge of Verge's designs for the stables at Camden Park, as Bowman was married to the daughter of John Macarthur (owner of Camden Park) and Bowman and his family are known to have visited Camden Park and, of course, had a close relationship with the Macarthurs.

Verge's designs for the stables at Camden Park (dated c1832) obviously influenced his eventual designs for the stables complex at Wivenhoe (completed c1838). Similarly, the Verge design of three

³⁶ Lucas Stapleton Johnson & Partners, 2019; pp. 349

³⁷ Lucas Stapleton Johnson & Partners, 2019; *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (Appendix 23a), pp. 325-328

³⁸ Lucas Stapleton Johnson & Partners, 2019; pp. 323-324

arches with corresponding openings behind shown in the Camden Park stables is also found at the Ravensworth stables, however there is no breakfront or pediment to define the entryway.³⁹

The arched entry of the Ravensworth stables appears more as a design idea not fully realised rather than a developed architectural feature, and as Broadbent notes, "the untutored handling of the arcade in the flanking range and the clumsy break in levels and roof lines clearly show that in that time and place- the Hunter Valley in the late convict era- the limits of architectural expertise available did not match the aspirations of its proprietor". ⁴⁰

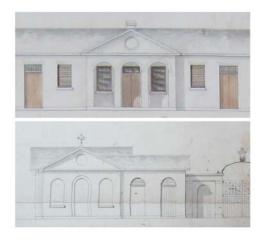


Figure 18: Details from Verge's designs for stables for Camden Park (not built). Source: 'Paper Houses': John Macarthur and the 30 year design process of Camden Park; S. E. Hill, 2016, unpublished report, University of Sydney, Figure 9.43, p. 291



Figure 19: c1984 photograph by Daphne Kingston of the stables and coach house complex at Wivenhoe, Cobbitty, completed in c1838 and attributed to John Verge. Source: Camden Council library, CHS1528



Figure 20: View of the eastern elevation of the Stables building at Ravensworth. Source: LSJ



Figure 21: Detail of the central bay of the Stables building at Ravensworth. Source: LSJ

³⁹ It is also suggested that the original ground floor frontage to Glenlee, Menangle, designed by Henry Kitchen and constructed in c.1823, consisted of an arcade of five arches, replaced in the early 1880s with lintel and columns. Broadbent, J., 1997; *The Australian Colonial House: Architecture and Society in New South Wales* 1788-1842, Hordern House, Sydney p. 111

⁴⁰ Refer to Dr. J. Broadbent's text "The Heritage Significance of Ravensworth", dated May 2020

2. Response Lucas stapleton johnson & partners pty ltd

Other reasons for the suggested connection include known associations between Verge and Dr. James Bowman.

It is known that James Bowman engaged John Verge after the beginning of construction of Ravensworth (c1832) to design his house Lyndhurst, Glebe, Sydney (1833-1837); and this association has been used to also suggest that he may have designed the buildings at Ravensworth.



Figure 22: Lyndhurst, Glebe. Source: The Glebe Society

The publication *The Australian Colonial House: Architecture and Society in New South Wales 1788-1842* (J. Broadbent, 1997) includes an extensive discussion of John Verge's architectural works of the 1830s. In this it is noted that, although practicing as an architect for only a period of 7 years (1830-1837), Verge's clients were primarily the rich and socially prominent colonists.⁴¹

For these people, including John Macarthur (Camden Park) and James Bowman (Lyndhurst), Verge "produced elegant houses, well scaled, competently built and decorated with beautifully designed and resolved Greek Revival detailing; moulded shouldered architraves within and without, incised pilasters, Doric columns and egg-and-dart cornices. It is this detailing, rather than in the planning of his houses, that the strength of Verge's work lies." Broadbent notes that "from house to house, from house to chapel, from chapel to shop" Verge utilises the same finely detailed forms, more or less elaborately, depending on the client. None of these distinctive architectural details are found in the buildings at Ravensworth.

Broadbent notes further that Verge's work is in keeping with late-English Neo-classical architecture, including details such as tripartite windows, French doors with external architraves, and entablatures, pilasters and parapets that distinguish Verge's work in NSW.⁴⁴ Again, none of these attributes are exhibited at Rayensworth.

When examining Verge's work for rural or country residences, the same Georgian Revival details as discussed above are used. Examples include Camden Park (Figure 23), Denham Court (Figure 24), Aberglasslyn (Figure 25), Tempe House (Figure 26), Vineyard or Subiaco (demolished) (Figure 27) and Wivenhoe (Figure 28). As can be seen, the brokenback bungalow style of the Main House at Ravensworth is far different from the sophisticated Regency villa designs known to be by John Verge and his assistant John Bibb.

⁴³ Ibid. p. 193

-

⁴¹ Broadbent, J., 1997; *The Australian Colonial House: Architecture and Society in New South Wales 1788-1842*, Hordern House, Sydney p. 193

⁴² Ibid. p. 193

⁴⁴ Ibid. p. 193



Figure 23: Camden Park, Narellan in c.1970. Photograph by Wes Stacey. Source: NLA, PIC Cold Store Row A2/3/2 #PIC/14196/1721



Figure 25: Aberglasslyn, Maitland in 2016.Source: Maitland Mercury, 7th November 2016



Figure 27: Vineyard or Subiaco, Rydalmere shortly before demolition in 1961. Source: Sydney Living Museums



Figure 24: Denham Court, Ingelburn in c.1970. Photograph by Wes Stacey. Source: NLA< PIC Cold Store Row A2/3/2 #PIC/14196/1746



Figure 26: Tempe House, Tempe (undated). Photograph by Stewart Watters. Source: NSW Heritage, www.environment.nsw.gov.au



Figure 28: Wivenhoe House, Camden. Source: Camden Council

Two country residences that are not considered to be typical of Verge's work are Wyoming Cottage, Gosford (Figure 29) and Bedervale, Braidwood (Figure 30).

2. Response Lucas stapleton johnson & partners pty ltd



Figure 29: Wyoming Cottage, Gosford (undated). Wyoming Cottage was built for Frederick Hely, Principal Superintendent of Convicts to designs by John Verge in c.1832. The cottage was not built until after Hely's death in 1837 and completed in 1843. Source: Historic Houses Trust



Figure 30: Bedervale, Braidwood in 1999. It was designed by John Verge in 1836 and finished about 1842 for Captain James Coghill, an early pastoralist and MLC. Photograph by Trisha Dixon. Source: NLA, PIC/5375/26 LOC Cold store PIC Dix T

Both of these houses are described by James Broadbent as being examples of a "verandahed cottage rather than a bungalow". ⁴⁵ Salisbury Court (Rose Bay Lodge) in Rose Bay (now the council chambers of Woollahra Municipal Council) is another example of a Verge "verandahed cottage".

Wyoming is a five-bayed house with shuttered French doors glazed with margin bars, on either side of a panelled front door with sidelights (similar in design to Experiment Farm Cottage). Its joinery however is not as refined as that at Experiment Farm, suggesting that Verge neither detailed nor supervised it. The main hipped roof ended in wide eaves and from beneath these extended the original verandah.

Similarly, Bedervale is a large single storey, Georgian Revival style country house, built of brick stuccoed and lined to simulate stone. Roman Doric columns support a pedimented entablature over an opening flanked by arched semi-circular recesses. 46

Although atypical of Verge's work, the verandahed cottage was not new in the 1830s and is identified by having its verandah separate to and contrasting with the main roof of the house, rather than the integrated verandah form of the bungalow as is found at Ravensworth. Broadbent suggests that such verandahs may possibly have been regarded as "less 'colonial' than bungalow verandahs."⁴⁷

In the publication *The Golden Decade of Australian Architecture: The Work of John Verge* (Broadbent, J; Evans, I & Lucas, C.; 1978), the suggestion is made that Ravensworth may have been by Verge as there are no "Verge-like" design features, in much the same way that Wyoming Cottage, Gosford, does not have any Verge details even though it is known to have been designed by Verge. ⁴⁸ This argument is hardly strong, particularly given that Verge's oeuvre was mainly Regency villas and verandahed cottages.

Two examples of bungalows with associations to Verge are Elizabeth Farm, Rose Hill and Brownlow Hill, Camden.

-

⁴⁵ Broadbent, J., 1997; p. 316-318

⁴⁶ "Bedervale", State Heritage Register listing, SHR no. 00017, database no. 5045345

⁴⁷ Broadbent, J., 1997; p.317

⁴⁸ The *Hunter Estates: A Comparative Analysis of Pre-1850s Homestead Complexes in the Hunter Region*, Volume 1 (Clive Lucas Stapleton & Partners, 2013), also makes a passing mention of the possible connection of Verge with the Ravensworth Homestead, refer to page 59

2. Response LUCAS STAPLETON JOHNSON & PARTNERS PTY LTD

The bungalow at Brownlow Hill, constructed for Colonial Secretary Alexander Macleay in c.1827, was originally built as two small separate wings of bricks at right angles to one another, with a separate kitchen at the rear making up the third side of a courtyard. In 1834 alterations were made transforming the house by joining the two small wings and forming an L-shaped building.⁴⁹ This work has been attributed to John Verge as he designed Elizabeth Bay House for Macleay and there are similarities in the planning and detailing between Brownlow Hill and Verge's work at Camden Park, Elizabeth Bay House, Elizabeth Farm and Lyndhurst. 50

Likewise, Verge was involved with repairs and remodelling of Elizabeth Farm cottage, constructed in 1793 by John Macarthur. In 1833 Verge is attributed with extending the house, enlarging the kitchen wing, refinishing the external walls and constructing a coach house and stables (since demolished), although the full extent of his work is uncertain.⁵¹ Architectural plans of "additional sleeping rooms" and "additional building" by Verge for Elizabeth Farm survive. 52

In both these examples Verge is working with existing bungalows and undertaking alterations and remodelling only.

2.2.2. Conclusion to Point 2 e) Item 2

Regardless of the above, the suggestion exists that Verge may have been the designer for the Main House of the Ravensworth Homestead Complex and this is possible given his connections with both Bowman and Macarthur, although no definitive documentary evidence has, at this stage, been found to substantiate the suggestion.

As part of the research undertaken for the HA&SoS (Appendix 23a), available primary documentary sources were examined to try and locate any evidence that Verge was involved with the design of the Ravensworth Homestead Complex.

Verge's ledgers and surviving papers contain no evidence of the Ravensworth connection.

In addition, surviving financial records for Bowman in the form of cheque butts, receipts and banking ledgers both held as colonial bank records and personal accounts and transactions⁵³ were also searched.

Two payments to John Verge were located, one for a small amount (approximately £30) in 1831 and a second payment in July 1840 in the amount of £226/6/3. Given that the main house at Ravensworth has been dated to c.1832, while Lyndhurst was not completed until c.1837, it seems more likely that this large payment to Verge relates to his work at Lyndhurst, where it is known that he was involved.

Considering the above, and at the request of the Heritage Council, the Statement of Significance included in the HA&SoS (Appendix 23a) could be amended to state the following:

⁴⁹ "Brownlow Hill Estate" State Heritage Register listing, SHR no. 01489, database no. 5051301

⁵⁰ Broadbent, J., et al, 1978; The Golden Decade of Australian Architecture: The Work of John Verge, David Ell Press, Sydney; No. 21

⁵¹ Broadbent, J., et al, 1978; No. 14 and Elizabeth Farm Draft Conservation Plan, Historic Houses Trust, 1996,

⁵² Ibid, 1978 and 1996

⁵³ Papers of James Bowman, 1796-1860, James Bowman Account books/Bank books, 1817-1842, A4264, Macarthur Family Papers, ML and ANZ bank records. Research undertaken by Victoria Grey of University of Newcastle

The group of buildings comprising the complex and including the adjacent privy are of aesthetic significance on a <u>State level</u> for their fine dressed stonework and finely made roof carpentry, simple architectural detailing and high-quality detailed design and execution; the group was likely designed, possibly informally, by an architect or gentlemen architect of the 1820s and 1830s and, although unproven, it is possible that Henry Kitchen, John Verge or Robert Scott influenced the design of the homestead complex.

2.3. Point 2e) Item 3

Point 2 e) Item 3 of the Heritage NSW correspondence included the following comments:

Point 2 e) in relation to Ravensworth Homestead, the EIS must include: a detailed heritage significance assessment of the homestead, including consideration of its surrounding garden and landscape.

The assessment of the heritage significance of the homestead including its surrounding garden and landscape and subsequent Statement of Significance in the EIS is considered inadequate for the following reasons:

The EIS has a lack of definition of the curtilage or setting of Ravensworth Homestead and lacks an assessment of the cumulative impact of the works on the significance of the Core Estate Lands.

2.3.1. Response:

Curtilage

The Heritage Office publication *Heritage Curtilages*⁵⁴ provides guidance for identifying, conserving and managing the curtilage and setting of heritage items. "Curtilage" is described as the extent of land around a place which "should be defined as encompassing its heritage significance". This area of land is known as a heritage curtilage.

There are four types of heritage curtilage identified by the Heritage Office:

- Lot Boundary Curtilage: where the legal boundary of the allotment is defined as the heritage curtilage. The allotment will in general contain all related features, for example outbuildings and gardens within its boundaries.
- Reduced Heritage Curtilage: where an area less than total allotment is defined as the heritage
 curtilage, and is applicable where not all parts of a property contain places associated with its
 significance.
- Expanded Heritage Curtilage: where the heritage curtilage is actually larger than the allotment, and is predominantly relevant where views to and/or from a place are significant to the place.
- Composite Heritage Curtilage: relates to a larger area that includes a number of separate places, such as heritage conservation areas based on a block, precinct or whole village.

⁵⁴ Heritage Office, Department of Urban Affairs and Planning, 1996; Heritage Curtilages

The publication *The Seventh Edition Conservation Plan* by James Semple Kerr⁵⁵ provides the following explanation of the term:

"A curtilage is a piece of land attached to a building. Its Latin origin suggests a sense of enclosure, but this aspect has only partly survived. It remains an elusive legal concept; depending on interpretation, inclusions within a curtilage may, or may not, be affected by subdivision, changes of ownership and use, as well as by new construction and demolition. The problem is exacerbated by the legal use of the word 'curtilage' with either no definition or a distinctly ambiguous one. The word is therefore best used sparingly and then only in the general sense advocated by most dictionaries.

Where the precise identification of the extent of a place is needed it is better to use the word 'boundary'. This, at least, is an uncomplicated and well understood term capable of leaving no doubt of what is included and what excluded (the boundary must, of course, be identified). Similarly, if a more general designation of a surrounding area, such as a visual catchment, is required, then 'setting' is appropriate. Whatever words are chosen, they should not be given unusual meanings—even meanings peculiar to particular disciplines should be avoided where possible. Where local or heritage authorities have already defined an appropriate 'curtilage' for a listed place the term and its scope may be continued."⁵⁶

Appendix 23a *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (HA&SoS), prepared by Lucas, Stapleton, Johnson & Partners, dated November 2019 defines the extent of the place within *Section 1: Introduction*.⁵⁷

The following discussion provides an abridged version of the definition of the extent of the place contained in the HA&SoS.

The boundaries of the Ravensworth Estate and the Ravensworth Homestead Complex

At its largest extent the Ravensworth Estate comprised a series of land parcels stretching from Davis Creek and Rouchel Brook near Mount Scrumlo in the north to the Hunter River near the town of Camberwell in the south, with the Ravensworth Homestead Complex at the centre of the pastoral operations of the property.

Today, due to the history of subdivision that has occurred since the late 19th century and the subsequent sale of portions of the original estate lands, the land that once comprised the Ravensworth Estate is now owned by various individuals, corporations and government agencies and has been developed for a mix of purposes by current and past owners.

Given the former size of the Ravensworth Estate and in order to clearly identify and analyse the principal components of the estate lands, the area of land that forms the basis of the HA&SoS was broken into three components:

- the Place;
- the Core Estate Lands; and

⁵⁵ Kerr, J. S., 2013; *The Seventh Edition Conservation Plan: A Guide To The Preparation of Conservation Plans for Places of European Cultural Significance*, Australia ICOMOS Inc.

⁵⁶ Kerr, J.S., 2013; p. 40

⁵⁷ Lucas, Stapleton, Johnson & Partners, 2019; *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (Appendix 23a), pp. 4-11

• the Ravensworth Homestead Complex.

Refer to Figures 31, 32, 33 and 34 below (extracted from Section 1: Introduction of the HA&SoS).

Defining the Place

In order to firstly, undertake a thorough assessment of the significance of the Ravensworth Homestead Complex and the associated former Ravensworth Estate lands; and secondly, to undertake an assessment of the potential impacts as a result of the proposal on features, items and areas of significance located within and in the vicinity of the proposed Glendell Mine Extension works, an area of land that encompassed the principal historic components of the Ravensworth Estate and its subsequent development (including the Ravensworth Homestead Complex), and that also encompassed all of the area of land affected by the proposal was selected. This is defined as **the Place**.

The Place has been defined as being all the land located within the historic boundaries of the three land grants forming the main centre of the Ravensworth Estate; that is Portions 149 and 150 of the Parish of Liddell and Portion 1 of the Parish of Vane. Together this land comprises Dr. James Bowman's original "10,000" (10,439) acre land grants applied for under Governor Brisbane in 1824.

This approach to defining the extent of the place was employed in the HA&SoS in order to take into account the extent of the proposal for the Glendell Continued Operations Project SSD9349. The extent of the proposal covers not only the land contained within the current legal boundaries of the Ravensworth Homestead Complex (Lot 228 DP 752470) but also land to the north, south, southwest and west of this allotment.

Located throughout **the Place** are a number of individual sites, features and components that relate to the history of development of the Ravensworth Estate, and some (but not all) will be impacted on by the proposed Glendell Mine Extension. Physical evidence of the colonial era of development of the Ravensworth Estate surviving outside of the Core Estate Lands (see Figures 1.3 and 1.4 below) but within the boundaries of the Place consists only of Hebden Road and other early road alignments, the legal boundaries of the "10,000" acre land grants (still evident in cadastral plans) and some fence lines defining those boundaries.

Defining the Core Estate Lands

In the course of research and investigations undertaken for the production of the HA&SoS, it became apparent that there was an extended area of land surrounding the Ravensworth Homestead Complex that retained physical evidence of the earliest period of European colonisation of the estate lands.

Investigations and research undertaken to establish the location of the surviving physical evidence associated with the colonial period of the Ravensworth Estate included research of land titles documentation, historic maps, plans and images and contemporary written descriptions of the estate lands; site investigations; and an extensive historical archaeological test excavation program undertaken by Casey & Lowe in 2019. (Refer to *Appendix 23c: Historical Archaeological Test Excavation Report and Impact Statement for the Core Estate Lands*, Casey & Lowe, 2019.)

The area of land that was established as retaining physical evidence of the earliest period of European colonisation of the estate lands, for the purposes of the HA&SoS, has been identified as the **Core Estate Lands** and is defined by the allotment containing the Ravensworth Homestead Complex (Lot 228 DP 752470) together with land to the west between Yorks Creek and Bowmans Creek.

The boundaries of the **Core Estate Lands** are defined by the following attributes:

- The legal boundaries of the allotment containing the Ravensworth Homestead Complex;
- The western most extent of the proposed works for the Glendell Mine Extension;
- The majority of the land held by the Marshall family (the later owners of the Ravensworth Homestead Complex) following the subdivision of the estate lands by Measures and Reid in the early 20th century,
- The alignment of Bowmans Creek; and
- The location of historical archaeology and landscape features with tangible links to the establishment period of the Ravensworth Estate in the colonial era and more particularly to the functioning of the Ravensworth Homestead Complex during the early 19th century.

The **Core Estate Lands** contain the majority of recognisable, tangible evidence of the colonial era of development of the Ravensworth Estate. Features include the potential site of the first homestead at the Ravensworth Estate, the existing Ravensworth Homestead Complex, cultural plantings, evidence of cultivation areas, stone lined dams and wells as well as a range of historical archaeological remains.

Defining the Ravensworth Homestead Complex

Although no longer functioning as the main homestead for a large pastoral property, **the Ravensworth Homestead Complex** nevertheless remains the historic focus of the locality and is the main surviving evidence of the establishment and subsequent development of the Ravensworth Estate.

Constructed in c1832, the complex consists of a symmetrical group of agricultural buildings with homestead and attached kitchen, located in a garden setting. The complex also contains a barn, stables, privy, men's quarters building, yard areas, paddocks and associated site and landscape features dating from the early 19th century through to recent years. The complex is clearly delineated from its immediate setting and the broader Core Estate Lands by being contained within agricultural fencing (of varying forms and dates) and is a distinctive and rare group of farm buildings.

Defining the Curtilage of the Ravensworth Homestead Complex

As the Core Estate Lands contain most of the physical remains and historical archaeology relating to the colonial development of the Ravensworth Estate and given that the early history of the estate is no longer readily apparent in the remainder of the lands within the boundaries of the Place, the Core Estate Lands could be considered to be an appropriate heritage curtilage for the Ravensworth Homestead Complex.

2. Response Lucas stapleton johnson & partners pty ltd

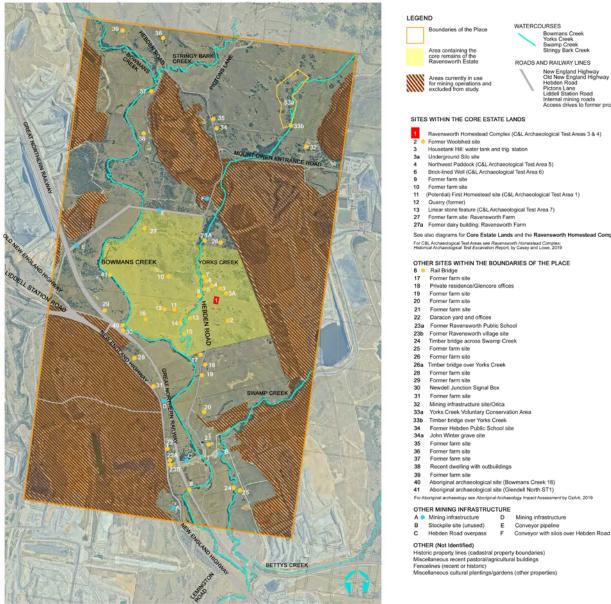


Figure 31: (Figure 1. 3 in Appendix 23a) Aerial view of the Place identifying the location of the principal components of the place, the Ravensworth Estate core remains and other sites within the boundaries of the place. Source: Base aerial and mapping information courtesy of Glencore/Umwelt, 2018

Figure 32: (Figure 1. 4 in Appendix 23a) Legend for Figure 1.3.



Key Ravensworth Estate Sites/

- 1 Ravensworth Homestead Complex (C&L Archaeological Test Areas 3 & 4)
- 2 Former Woolshed site
- 3 Housetank Hill: water tank and trig. station
 3a Underground Site site
- 3a Underground Silo site
 4 Northwest Paddock (C&L Arch)
- 6 Brick-lined Well (C&L Archaeological Test Area 6)
- 9 Former farm site
- 11 (Potential) First Homestead site
- (C&L Archaeological Test Are
- 12 Quarry (former)
- 27 Former farm site: Ravensworth Farm

27a Former dairy building: Ravensworth Farm

Potential Early Dams and Modified Early Dams (pre 1850s) Note: Recent dams are not shown

D1-D14 Potential Early Dams (pre 1850s)
Dma-Dmf Potential Early Dams modified more reco

Potential Early Cultivation Sites and Early Plantings (pre 1850s)

arly Plantings (pre 1850s) G1 Narrow-leafed Ironbar

VG2 Kurrajong VG3 Black Locust

VG4 African olive
VG5 Black Locust windbreak
(C&L Archaeological Test Ar

VG6 Possible early cultivation area

VG7 Oleander

VG8 Black cypress pine

VG9 Elm VG10 Possible early cultivation area

VG11 Possible windbreak
VG13 Former orchard (early 20th cnetury)

VG12 Former orchard (early 20th cnetury) VG13 Former orchard (early 20th century)

VG14 8 Acre Garden (C&L Archaeological Test Area 6)

VG16 Possible early cultivation area
VG17 Channel leaf Orchid/Tiper Orchid/location unknown

VG18 Aleppo pine

For C&L Archaeological Test Areas see Ravensworth Homestead Complex: Historical Archaeological Test Excavation Repo

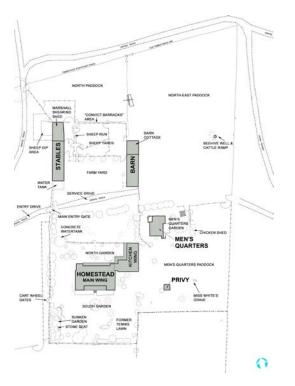


Figure 33: (Figure 1. 5 in Appendix 23a) Aerial view of the Core Estate Lands identifying the location of the Ravensworth Homestead Complex and other sites associated with the early development of the estate lands. Source: Base aerial and mapping information courtesy of Glencore/Umwelt, 2018

Figure 34: (Figure 1. 6 in Appendix 23a) Site plan of the Ravensworth Homestead Complex.

Setting

The Australia ICOMOS Burra Charter (2013) defines "setting" as per the following:

"Article 1.12 Setting means the immediate and extended environment of a place that is part of or contributes to its cultural significance and distinctive character." 58

The explanatory notes add: "Setting may include: structures, spaces, land, water and sky; the visual setting including views to and from the place, and along a cultural route; and other sensory aspects of the setting such as smells and sounds. Setting may also include historical and contemporary relationships, such as use and activities, social and spiritual practices, and relationships with other places, both tangible and intangible." ⁵⁹

The publication *The Seventh Edition Conservation Plan* by James Semple Kerr provides the following explanation of the term:

"The setting is an area surrounding a place whose limits are primarily determined by sensory criteria: for example, visual (enclosing ridgelines, roofscapes, waterscapes or plantation edges), auditory (adjacent waterfalls or gravel quarries) and olfactory (tannery district or garden for the blind). See also 'curtilage'." ⁶⁰

The setting of the Ravensworth Homestead Complex is discussed within *Section 3: Physical Evidence* of the HA&SoS under the headings of landscape setting, siting and views and visual catchment.⁶¹

The following discussion provides an abridged version of the analysis of the setting of the Ravensworth Homestead Complex contained in the HA&SoS.

Landscape Setting of the Homestead Complex within the Core Estate Lands

The current Ravensworth landscape around the homestead presents as tracts of largely open farmland with lines of riparian vegetation (mainly along Yorks Creek), a backdrop of denser woodland and clusters of more recent woodland regeneration.

Current perceptions of the overall landscape are also being shaped by the changing peripheral landforms as a result of continuing mine overburden emplacement formations on the neighbouring Ravensworth East mine to the east and Ravensworth Operations to the south and southwest. These overburden emplacement landforms are generally long, broad ridges contrasting with the generally more finely articulated, undulating natural site topography.

Overburden emplacements are largely open and grassy to the east with those to the north-east now dense plantations of woodland species. Over coming decades, it is expected that these large-scale overburden emplacements will eventually reconfigure, and dominate, this part of the regional Hunter Valley landscape.

It is known that the Ravensworth lands were beginning to be cleared from the time they were first settled shortly after Henry Dangar wrote of them in 1824. The landscape continued to be cleared over

⁶⁰ Kerr, J.S., 2013; p. 49

_

⁵⁸ The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 2013, p. 3

⁵⁹ Ibid. p. 3

⁶¹ Lucas, Stapleton, Johnson & Partners, 2019; pp. 164-175

subsequent decades with some particularly ambitious clearing during the ownership of Duncan Forbes Mackay being reported. However, the early description of the Ravensworth lands by Dangar noted that the landscape already appeared open. It was not a continuous expanse of woodland or forest but had grassy tracts enough for Dangar to especially mention it. This is consistent too, with other early descriptions of this area and neighbouring Upper Hunter Valley landscapes as having a park-like appearance.

It is also consistent with the numerous landscape examples cited by Bill Gammage as indicative of a fire-managed landscape prior to interventions associated with European land selection and grants. Gammage describes a sophisticated approach to land management by the pre-1788 Aboriginal people that involved deliberately managed grassy clearings with bordering woodland or forest.

Whatever the origins of cleared, grassy tracts throughout this overall area, an open, grassland character has importantly featured, more or less, to the present.

Siting of the Ravensworth Homestead Complex within the Core Estate Lands

The Homestead Complex is positioned conveniently close to local drainage lines for easy access to water while being carefully sited on a rise overlooking the creeks and away from potential flooding.

The siting of the Ravensworth Homestead Complex enhances the landscaped setting of the group of buildings.

A consideration of the creek lines in the vicinity of the Ravensworth Homestead Complex, helps inform an understanding as to part of the rationale for siting the various key structures – both former and extant - associated with the Ravensworth estate. For the five contiguous land portions that James Bowman was permitted to use from 1824 the common riparian thread running through them was Bowmans Creek (formerly Foy Brook). Although the Hunter River (forming the southern boundary of the estate) would have been the most reliable permanent water source for the estate, Bowmans Creek and its principal tributaries (Yorks Creek and Swamp Creek) watered the majority of the central grant portions.

This local proximity to water sources partly explains the siting of the earliest farm group (Site 11) in the 1820s over the southern end of a rise between Bowmans and Yorks Creeks as much as it does the siting of the current homestead group adjacent Yorks Creek and one of its tributaries. The traditional siting of farm groups in relation to local water bodies fulfilled both functional and aesthetic purposes.

On approach from the south along Hebden Road, the homestead is at first obscured by the dense vegetation in its front garden. From this perspective, only the sandstone stables block with its two-part gabled roof is immediately apparent. Further along the road, the homestead emerges from its garden setting and the roofs of the barn behind also become apparent. Together, the dense concentration of plantings and the ensemble of buildings define the homestead group, which is perceived to sit within a gently undulating expanse of largely open grassland. So, when approached from the west and southwest – the traditional approach off Hebden Road - the homestead group is seen with a scenic backdrop of rising land to the east and northeast and appears nestled into its contextual landscape.

2. Response

Views and Visual Catchment of the Homestead Complex with the Core Estate Lands

From the various ridges between Bowmans Creek and the eastern edges of the Ravensworth property, it is possible to appreciate views back to the homestead group. The same views also allow an appreciation of the various contextual landscape features associated with the homestead group and their longstanding proximity to one another. Such features include the line of Hebden Road and the vegetated course of Yorks Creek through the local area as well as distinctive topographic landmarks beyond the immediate estate area.

It should also be noted however that in virtually every view there is visible mine rehabilitation and exposed overburden emplacements, usually in the middle to far distance.

Important views to the homestead group include those from the ridge to the west (where the first Ravensworth cottage was probably sited- Site 11); from Hebden Road on approach to the homestead; from the ridge behind the homestead group to the northeast (House Tank Hill- Site 3); and from the existing dams and (presumed) former cultivation site along the tributary of Yorks Creek to the west. These are regarded as key views because of the historical importance of these places and their connection with the homestead from the earlier part of the 19th century. In many of these views, the vegetated, sinuous course of Yorks Creek is not only a dominant attribute of the local landscape, it also defines discrete landscape spaces.

Views to the homestead group from the western ridge (between Bowmans Creek and Hebden Road) reveal the open, grassland character of the local landscape and enable an excellent appreciation of the compactness and discreteness of the homestead group within its landscape context. The partly forested landform in the middle ground, across most of the horizon, is rehabilitated mine overburden emplacement. This new landform has permanently changed the broader landscape setting for the homestead. Despite this, some distant landmarks are still visible such as the forested peak to the northeast within Mount Royal National Park, Mount Dyrring to the east and more local hills either side of Hebden.

With its lower elevation, views to the homestead from Hebden Road reveal less of the mine emplacement landforms on the horizon but do provide views of the distinctive Hebden hills – local reference points that would have been long appreciated since, at least, the 19th century.

Views looking south to the homestead group from the enclosing ridge to the northeast (Site 3 and 3a) further reinforce the sense of the remnant estate buildings being nestled into their local landscape.

Where the panoramic skyline would have been dominated by the extensive ranges of the Broken Back Range system in the past, the horizon to the south now features the long, mounded forms of mine overburden emplacements. Many of these are currently active emplacement areas and will be progressively rehabilitated.

Adding to the perception of a growing presence of industrial land uses within the upper Hunter Valley are views from these prospects of the Liddell Power Station site (see Figures 3.73 and 3.75). Again, these views emphasise the generally cleared nature of the landscape around the homestead group and, if not for the retained riparian vegetation, the overall local area would appear almost denuded of substantial tree cover. Views to the west past the Liddell Power Station site also feature Mount Arthur as a longstanding traditional scenic feature. (Mount Arthur is noted as such on Dangar's 1828 plan.)

Other important views relating to the Ravensworth homestead include those to the House Dam to the immediate south of the homestead complex and those to the west to the dams and (presumed) former

cultivation area (Site VG14) along the tributary to Yorks Creek. Reciprocal views from the latter site back to the homestead would have been notable when the inner estate flourished in its earlier decades.

View shed

The following view shed diagrams (see Figures 3.81 and 3.82 below) illustrate graphically the geographical areas visible from two key locations: firstly, from within the south garden of the Ravensworth Homestead Complex and secondly, from House Tank Hill (Site 3) to the north of the homestead complex. Both diagrams demonstrate that available views from the Ravensworth Homestead Complex are to the southwest, west and northwest. Views to the east, northeast and southeast are limited due to both natural and manmade landforms.

Defining the Setting of the Ravensworth Homestead Complex

In an analysis of any significant place, it is normal to nominate the setting of that place. As discussed above, the setting is essentially what exists outside of the place and includes those aspects that contribute to overall significance. In these terms, the setting of the Place could be said to be extensive, taking into account the whole of the Place and extending from the Hebden locality to the Hunter River and from the village of Camberwell to Liddell.

However as much of this land has undergone substantial change and contains little that has direct, tangible links with the Ravensworth Homestead Complex, this expansive setting is not considered to be a useful concept. In our view it is more useful to consider the setting of the Ravensworth Homestead Complex, rather than the whole of the Place.

Because the defined area of the Place is so big, the 'place' could be the area that is defined as the core estate lands and the setting of the core estate lands as being what is defined as the boundaries of the Place. When considering the setting of the Ravensworth Homestead Complex, the visual curtilage or the Core Estate Lands, could be considered to be an appropriate heritage curtilage for the place.



Figure 35: Figure 3. 81 in Appendix 23a) Viewshed from the Ravensworth Homestead Complex. Source: Umwelt, 2019



Figure 36: (Figure 3. 82 in Appendix 23a) Viewshed from House Tank Hill (Site 3) to the north of the Ravensworth Homestead Complex. Source: Umwelt, 2018

Significance of the Setting of the Ravensworth Homestead Complex within the Core Estate Lands

The Statement of Significance provided in Appendix 23a: *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (HA&SoS), addresses the significance of the Place as a whole incorporating the above analysis of the extent of the place and of the landscape and visual setting of the Ravensworth Homestead Complex and the Core Estate Lands.

For ease of reference, the significance of the extent of the place and the setting included under *Criterion* (c) *Aesthetic and/or Technical Significance* is repeated below: ⁶²

Criteria (c) Aesthetic and/or Technical Significance

"The Place, containing the remnants of the Ravensworth Estate, is of some aesthetic significance on a Local level as a representational example of a Hunter Valley landscape. The rural landscape of the place including scattered remains of early 20th century farms is punctuated by the two main creek lines, Bowmans Creek and Yorks Creek, pockets of lightly forested lands and gentle rises in the landform that provide expansive views of the floodplains and grazing lands leading southwards down to the Hunter River. The various isolated historic buildings, cultural plantings, landscape and agricultural features located across the landscape, are of some aesthetic significance, being indicative of the 20th century agricultural and community-driven development of the broader locality."

"The Place retains its historic visual catchment, most clearly viewed from highpoints between Bowmans and Yorks Creek and these district views to the south-east, south-west, north-west and south towards the Hunter River, in the past would have attached considerable scenic value to the setting of the Ravensworth Homestead Complex. Today however, these views and the aesthetic values of the rural landscape are somewhat reduced by the encroachment of large-scale industrial structures and modified landforms associated with open cut mining along the skyline to the south, east and west."

2.3.2. Conclusion to Point 2e) Item 3

Cumulative Impact of the Works on the Significance of the Core Estate Lands

The HA&SoS notes that the Core Estate Lands are primarily of moderate significance, although within the boundaries of the Core Estate Lands are individual items, features and groups of items that are of little, moderate, high and exceptional significance (refer to Figure 37 below extracted from the HA&SoS, p. 360).⁶³

The Glendell Mine Extension, Ravensworth NSW: Statement of Heritage Impact (Appendix 23b) (SoHI), prepared by Lucas, Stapleton, Johnson & Partners, October 2019 provides a comprehensive assessment of the potential impact of the Glendell Mine Extension works on the cultural significance of the Place, the Core Estate Lands, the Homestead Complex, as well as the setting and individual features and items located within the boundaries of the Place.

Section 3.1 Methodology 1: Assessment against Significance of the SoHI deals with the individual components of the overall proposal potentially impacting on the heritage values of the Ravensworth Estate. Of relevance to this discussion, the assessment undertaken against Item 1.1 which addresses

_

⁶² Lucas Stapleton Johnson & Partners, 2019; p.344

⁶³ Ibid. Section 5.4.4 Gradings of the Components of the Core Estate Lands, pp. 356-360

extending open cut mining operations north from the existing Glendell Mine, includes the following comments: ⁶⁴

Comment/Recommendation	Heritage Impact	Mitigation
The existing Glendell Mine is partly located within the boundaries of the original Ravensworth Estate lands (the "10,000 acres) and the Project is to extend this mine further within the historic Ravensworth Estate ("the Place"). Whilst the change is high, generally the land is of moderate significance and therefore the impact is notable.	Notable heritage impact.	The proposed rehabilitation of the land would form a low-level mitigation of this impact.
Some of the mining would occur within the Core Area of the estate which is generally of moderate significance and so the impact here would be of note.	Notable heritage impact.	The proposal includes full salvage archaeology of these areas and this would be a substantial mitigation.
The proposal includes mining within the visual catchment of the Ravensworth Homestead Complex (RHC) which is of moderate significance and so the heritage impact would be of note.	Notable heritage impact.	The proposal includes full salvage archaeology of these areas and this would be a substantial mitigation.
The proposal includes mining the immediate setting and beneath and around the RHC which is of high , and in some aspects of exceptional significance . It would completely change the physical aesthetic values of the setting and destroy the existing archaeological potential of the land. As a high degree of change is proposed and the item is of high/exceptional significance, the heritage impact would be high.	High heritage impact.	The proposal includes full salvage archaeology which would be a substantial mitigation. The proposal also includes the relocation of the RHC to a new setting which has verisimilitude to the existing and this would be a substantial mitigation.
The proposed mining activities would impact on the scientific significance of the Aboriginal archaeology located throughout the Ravensworth Estate. Surviving Aboriginal archaeology has been graded as being of little/moderate scientific significance. As per above, the proposal would destroy the existing Aboriginal archaeological potential of the land as well as the known Aboriginal archaeological sites at the place. As a high degree of change is proposed and the Aboriginal archaeology is of little/moderate significance, the heritage impact would be notable. Refer to Appendix 22: Aboriginal Cultural Values Assessment Report (ACHAR).	Notable heritage impact	The proposal includes conserving Aboriginal archaeological sites outside of the identified Additional Disturbance Area, salvaging (collecting and recording) all surface artefacts at all sites within the Additional Disturbance Area and undertaking additional archaeological excavation to confirm the nature of archaeological deposits. This work would be a substantial mitigation.

⁶⁴ Lucas, Stapleton, Johnson & Partners, Oct. 2019; *Glendell Mine Extension, Ravensworth NSW: Statement of Heritage Impact* (Appendix 23b); p. 29 and 48

Comment/Recommendation	Heritage Impact	Mitigation
The proposal would also impact the social significance of the Ravensworth Estate as a marker of the historic locality of Ravensworth, which is of high significance. The proposal includes mining the setting of the Ravensworth Homestead Complex taking in historic markers across the landscape (including the RHC, Yorks Creek and Hebden Road) and the heritage impact would	High heritage impact.	The relocation of the RHC to Ravensworth Farm Recipient Site, the diversion of Yorks Creek, the re-alignment of Hebden Road and the retention of the names: Ravensworth, Yorks Creek and Hebden at the place would be substantial mitigations.
be high.		

Based on the above, it can be said that the proposal will have a high or substantial cumulative impact on the significance of the Core Estate Lands as a whole.

The east side and central area of the Core Estate Lands will be recorded and then removed or relocated. The west side of the Core Estate Lands will remain intact with a substantial overlay of alterations.

Where archaeological features are removed (historical and Aboriginal), salvage archaeology will provide a substantial mitigation.

Where the homestead is relocated, there will be some mitigation; Option 1 being much preferred to Option 2; as Option 1 will put the buildings in an appropriate setting, involve the least damage to the significant fabric and provide the most likelihood of ongoing sympathetic use, treatment and maintenance.





Figure 37: (Figure 5. 2 in Appendix 23a) Diagram of the Core Estate Lands showing indicative grades of significance for the principal components.

2.4. Point 2e) Item 4

Point 2 e) Item 4 of the Heritage NSW correspondence included the following comments:

The comparative analysis with pre 1850s Hunter homesteads [Hunter Estates: A Comparative Heritage Study of pre 1850s Homestead Complexes in the Hunter Region (CHS), prepared by Clive Lucas Stapleton & Partners, March 2013] is inadequate to enable an assessment of the significance of Ravensworth as the following have not been considered:

- The main house on the Ravensworth property (called Ravensworth) has been identified as one of very few homesteads from the initial establishment period to survive relatively unchanged in terms of its vernacular form (CHS, p57).
- There are 4 properties identified in the 2013 comparative study which also include a House and Primary Farmyard with five or more buildings with a single nucleus, including Bolwarra (modified by later additions), Negoa, Kinross and Abbey Green. Existing SHR items with similar features include Tocal Homestead (SHR00147) and Dunmore House (SHR01887). Direct comparisons between Ravensworth and these properties have not been made.
- The use of architects in the design and construction of the early homesteads is rare. It appears that Ravensworth is a rare example of this.
- The known archaeology and written records existing for Ravensworth relating to its Aboriginal history is an uncommon and highly significant aspect of the place, particularly regarding its history as a place associated with frontier conflict between European and Aboriginal people.
- Although incidents of violent conflict between European and Aboriginal peoples are likely to have been more common, only approximately 16 of these incidents in the 1820s are well documented. Six of these incidents are associated with the Ravensworth property, including one incident popularly referred to as the Ravensworth Massacre. Other incidents are noted to have occurred in the vicinities of Gostwyck, Invermein and Segenhoe, and existing SHR item, Merton (SHR00159). The site with the most available documentation, and therefore the closest comparative example in this sense, is Gostwick. Direct comparisons with these properties have not been made.
- The post contact history of interaction with Aboriginal people is also seen in documentation of places of Aboriginal employment such as Merton (SHR00159) and Caergwrle, camp sites such as Invermein, Bolwarra and Glendon, corroborree and/or ceremonial sites such as Segenhoe and Bolwarra, and sites selected with the help of Aboriginal guides such as Bolwarra, Glendon and Segenhoe. Direct comparisons between Ravensworth and these properties have not been made.

The following discussions aim to address the first three issues raised by the Heritage Office; that is, the intactness of the main house, the configuration of the complex and the possible involvement of an architect in the design of the buildings at Ravensworth.

The issues raised by the Heritage Office relating to the contact and post-contact history of the place with Aboriginal peoples are dealt with separately. Refer to the *Response to Submissions* document and the updated *Aboriginal Cultural Heritage Assessment Report* (ACHM, 2020).

2.4.1. Response:

Pre 1850s Hunter Estates

In 2013, this firm undertook a comprehensive comparative heritage study of pre 1850s homestead complexes located throughout the Hunter Region for the NSW Heritage Division (*Hunter Estates: A Comparative Heritage Study of pre 1850s Homestead Complexes in the Hunter Region*, prepared by Clive Lucas Stapleton & Partners, March 2013). The study aimed to contextualise the homestead complexes found throughout the region and included a preliminary examination of the historical context of Ravensworth.

The study found that surviving pre 1850s Hunter Estates are a unique historical and cultural phenomenon in the history of the settlement of NSW. They are the tangible evidence of the initial surveying of the land and its development from the 1820s to c1850, the people who settled in the region, the convict labour, the tenant farmers, the industries, the homestead complexes and the agricultural and pastoral lands. These elements together form the foundation of the Hunter Region as we know it today.

The study included a desk top review of other heritage studies for the Hunter Region which resulted in approximately 200 potential comparative sites being identified together with a basic list of characteristics that were common to the majority of these identified places.

A document review was prepared by Dominic Steele Consulting Archaeology, dated November 2012, entitled *Early Nineteenth Century Hunter Region Homesteads Heritage Review: Identifying Aboriginal Archaeological & Historical Heritage Connections.* This report reviewed interrelated lines of Aboriginal archaeological, historical and landscape evidence to identify a range of Aboriginal associations that appeared to be linked to a number of the Hunter Estates.

A baseline historical archaeological assessment was prepared by Edward Higginbotham & Associates Pty Ltd, dated September 2012, entitled *Nineteenth Century Rural Homestead Complexes in The Hunter Region: Historical Archaeological Survey*. This assessment was undertaken to provide accurate and up-to-date property information, to confirm the identification of already listed places, to provide quantifiable information on the number of houses, cottages and outbuildings on each property and to assist in the selection of sites for site survey.

By examining the history, configuration, associations and uses of over 200 known pre 1850s estates it was established that as the Hunter Valley was opened up to European colonisation for a particular purpose (based on Commissioner Bigge's principles for the better management of convicts by private landowners on large pastoral estates), there is a consistency in the types of people who settled the region, a consistency in their purpose for settling and a consistency in the use and subsequent development of the estates.

This consistency in the historical development of pre 1850s estates was established via the production of a database that catalogued the approximately 200 known Hunter Estates, together with:

- the date of initial land grant and size of initial grants in acres;
- the first and second owners of each property (where known) and their contributions to the development of the Hunter Region or NSW more broadly;
- a brief description of the main homestead and outbuildings (where known);

- any known associations with architects;
- the type of industry undertaken;
- the current configuration of the estates (based on aerial photography);
- the documented Aboriginal history and/or archaeology associated with the estate; and
- whether or not the place was heritage listed.

Based on the full database of Hunter Estates (included as Appendix 1 in the original report) key characteristics were identified that defined the "Hunter Estate" and a list of properties was developed and recommended to the NSW Heritage Division for inclusion on the State Heritage Register. Essentially, these sites demonstrated the following key characteristics:

- Large land grants/purchase;
- Notable person as settler (political, judicial and/or social profile);
- Architectural significance (the homestead);
- Surviving outbuildings or important archaeology;
- Aboriginal archaeology and history from the settlement period;
- Prominent or foundation industry.

The Ravensworth Estate displays all of the key defining characteristics of the initial colonisation period of the Hunter Region, including:

- Initial land grants made to a notable, influential and wealthy person in Australian society;
- Initial grants amounted 10,000 acres;
- The main house is of architectural and aesthetic significance;
- The place retains a collection of surviving early outbuildings and important historical archaeology;
- Documentary evidence exists of interactions with Aboriginal people during the colonial settlement period and Aboriginal archaeology survives at the place; and
- The place is associated with the development of sheep farming in NSW and is known to be one of only a small number of places associated with early experimentation in plant breeding.

The 2013 Hunter Estates study recommended that the Ravensworth Estate be included on the State Heritage Register for its historical, historical associational and aesthetic heritage values and for its research potential.

NSW Heritage Issue: Intactness

The main house on the Ravensworth property (called Ravensworth) has been identified as one of very few homesteads from the initial establishment period to survive relatively unchanged in terms of its vernacular form (CHS, p57).

As discussed in the Pre 1850s Hunter Estates study, throughout the Hunter Region, as elsewhere in NSW, the distinctly Australian colonial bungalow was the dominant style of early 19th century homestead constructed by large scale landowners with social and economic standing in colonial NSW at the time.

"As a house style, the bungalow is typically single storey, three bay, two rooms deep with a central hall, encircling verandah, and enclosed wings. The verandah, a distinctive feature of the building was

a practical solution to the heat of the Australian climate. It also allowed for expansion of the house by incrementally enclosing portions of the verandah as required. This basic form of building was usually built to plan, although some earlier homesteads may have been converted into this form from a simpler vernacular form of house.

Very few homesteads survive from the initial establishment period unchanged from this basic form. Examples include Wambo, Warkworth (1844 - 47), Tocal, Maitland (1841 with a second storey), Dunmore, Maitland (1833), Gostwyck, Paterson (1836), Kinross at Raymond Terrace (c1834), Thornthwaite, Scone (1846); Clifton, Lochinvar (1850); Cliffdale, Wingen (1840s); Lewinsbrook, Gresford (c1839); Invermein, Scone (1830s); Segenhoe, Scone (late 1820s), Ravensworth, Singleton (1830-35) and Terragong, Merriwa (1839)."⁶⁵

It should be noted that an understanding of the form and relative intactness of the main homesteads at Ravensworth, Gostwyck, Kinross, Clifton, Cliffdale, Invermein and Terragong included in the 2013 heritage study was based on documentary and photographic evidence only, as site inspections of these properties were not possible at that time.

The intactness or otherwise of the homesteads examined as part of the 2013 Hunter Estates study was based on whether or not the homestead had been substantially altered and added to by later owners such as occurred at Baroona, Negoa, Woodlands, Martindale, Brindley Park and Cawarra (amongst others).

As not all 200 Hunter Estates were visited and inspected in 2013 (or since), the number of surviving homesteads in the region that are relatively intact to their original colonial form and construction may be either greater or lower in number.

As a result of the additional research and investigations (including site inspections) undertaken in the preparation of Appendix 23a of the EIS: *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (HA&SoS), it has been established that the Main House at the Ravensworth Homestead Complex is of heritage interest as an example of an Australian colonial bungalow building that is relatively intact. The Main House has undergone some change, particularly to the north elevation, but is still substantially intact in terms of materials, form and configuration and could be restored/reconstructed to its original or early configuration.

As stated in the HA&SoS, the Main House at Ravensworth is a good example of a colonial bungalow as "the fabric is relatively intact and it exhibits many of the typical features of an Australian colonial bungalow including single storey rectilinear plan form with broken back roof profile, recessed verandahs, symmetrical planning, multi-pane timber sash windows, 6-panelled doors and stone flagged verandahs. All these features are relatively intact and constructed in high quality workmanship.

Constructed generally prior to 1840, this building type is relatively rare in Australia and indicative of Australian colonial building practise. Nevertheless, there are numerous surviving examples of buildings of this type, particularly around the oldest colonised areas of the country. This example [Ravensworth] is made more significant by the quality of the stonework and carpentry construction."⁶⁶

⁶⁵ Clive Lucas Stapleton & Partners, 2013; *Hunter Estates: A Comparative Heritage Study of pre 1850s Homestead Complexes in the Hunter Region*, p. 57

⁶⁶ Lucas Stapleton Johnson & Partners, 2019; *Ravensworth Estate*, *Singleton, NSW: Heritage Analysis and Statement of Significance* (Appendix 23a), p. 320

The comparative analysis included in the HA&SoS examined further other colonial bungalows of single storey rectilinear plan form with broken back roof profile throughout the Hunter Region and notes that the colonial bungalow is the predominant form for surviving early homesteads (dating from the 1820s and 1830s) throughout the region and a number display the broken back roof type including: Lewinsbrook, Terrigong, Booral House, Alderley House and Laguna House.⁶⁷

However, as also identified in the HA&SoS, what distinguishes Ravensworth from all of its contemporaries in the Hunter Region is the 'H' plan form of the bungalow with porch *in antis* to both the front and rear elevations, making Ravensworth a very rare example of the colonial bungalow house type, with only two other extant examples of this house form known to survive in NSW (Horsley Park and Glenlee). ⁶⁸

Refer also to Appendix A of this document which provides an analysis of the configuration and fabric of the Ravensworth Homestead Complex prepared by Dr. James Broadbent.

Conclusion

Based on the above analysis, the Statement of Significance included within the HA&SoS should be amended to include the following:

The intactness of the Main House of Ravensworth makes the place relatively rare within the context of the Hunter Region and of high significance, however the original "H plan" form of the Main House of Ravensworth makes the place extremely rare and of exceptional significance on a State level.

NSW Heritage Issue: Farmyard Configuration

There are 4 properties identified in the 2013 comparative study which also include a House and Primary Farmyard with five or more buildings with a single nucleus, including Bolwarra (modified by later additions), Negoa, Kinross and Abbey Green. Existing SHR items with similar features include Tocal Homestead (SHR00147) and Dunmore House (SHR01887). Direct comparisons between Ravensworth and these properties have not been made.

As discussed above, a baseline historical archaeological assessment was undertaken as part of the preparation of the 2013 Hunter Estates report. This assessment entitled *Nineteenth Century Rural Homestead Complexes in The Hunter Region: Historical Archaeological Survey*, prepared by Edward Higginbotham & Associates Pty Ltd, September 2012 was included as an appendix (Appendix 3) to the full report.

The historical archaeological assessment was a desktop analysis and was not supported by site survey on the ground. While the availability of online documentation made the survey much easier to complete, it was noted that vertical aerial photography does not compare with the information that can be recorded by site inspection. The desktop analysis was adapted to provide meaningful information from the online resource, but shortcomings included the limited ability to date buildings from their roof style or to ascribe a use to the farm buildings. The assessment was therefore intended to provide sufficient information to determine which sites warranted further assessment through site survey.⁶⁹

_

⁶⁷ Lucas Stapleton Johnson & Partners, 2019; pp. 332-334

⁶⁸ Lucas Stapleton Johnson & Partners, 2019; pp. 325-327

⁶⁹ Edward Higginbotham & Associates, 2012; *Nineteenth century Rural Homestead Complexes in The Hunter Region: Historical Archaeological Survey*, p. 33

The baseline archaeological assessment recorded the number of homesteads, attached buildings and outbuildings. It also recorded the layout of the main homestead and its primary farmyard.

In many cases there were a number of other settlement nodes or nuclei on the property, comprising houses, cottages or outbuildings. Some properties had up to 5 settlement nuclei, in addition to the main homestead and primary farmyard. All of the buildings were added into the quantified database for each property, although a number of outbuildings were excluded from the quantified database, such as stock shelters and large sheds for modern pig or poultry production.

The nature of landscaping and plantings on each property was also recorded, including the presence of mature gardens, mature exotic or native trees, avenues, hedges and windbreaks.

The results of the baseline archaeological assessment allowed the database of homestead complexes to be analysed in accordance with three principal classifications:

- 1. Typology of Sites, namely the numbers of buildings, outbuildings and settlement nuclei.
- 2. Farm Layout.
- 3. Plantings and Landscaping.⁷⁰

The analysis of each property within the database in relation to the three principal classifications described above was refined by ascribing numerical values or multiple choice options to assist in the comparative evaluation process. The database was therefore reduced to the recording of a number of fields reflecting the potential date of the main house, the extent of outbuildings and the number of settlement nodes or nuclei on each property.

The following **Typology of Sites** were adopted as the most useful means of collating the information provided by the desktop survey:⁷¹

- 1.1. House and Primary Farmyard, with 20 or more buildings; single nucleus.
- 1.2. House and Primary Farmyard, with 20 or more buildings; multiple nuclei.
- 2.1. House and Primary Farmyard, with 15 or more buildings; single nucleus.
- 2.2. House and Primary Farmyard, with 15 or more buildings; multiple nuclei.
- 2.3. Primary Farmyard, with 15 or more buildings; single nucleus
- 3.1. House and Primary Farmyard, with 10 or more buildings; single nucleus
- 3.2. House and Primary Farmyard, with 10 or more buildings; multiple nuclei
- 3.3. Primary Farmyard, with 10 or more buildings; multiple nuclei
- 3.4. House with 10 or more buildings; multiple nuclei
- 4.1. House and Primary Farmyard, with 5 or more buildings; multiple nuclei with 10 or more buildings.
- 4.2. Primary Farmyard, with 5 or more buildings; multiple nuclei with 10 or more buildings
- 4.3. House and Primary Farmyard, with 5 or more buildings; multiple nuclei with less than 10 buildings.
- 4.4. House and Primary Farmyard, with 5 or more buildings; single nucleus
- 4.5. Primary Farmyard, with 5 or more buildings; single nucleus
- 4.6. House with 5 or more buildings; single nucleus

⁷⁰ Edward Higginbotham & Associates, 2012; p. 36

⁷¹ Ibid.; p.62

5.1. House and Primary Farmyard, with 4 or less buildings; multiple nuclei with 20 or more buildings

- 5.2. House and Primary Farmyard, with 4 or less buildings; multiple nuclei with 15 or more buildings
- 5.3. House and Primary Farmyard, with 4 or less buildings; multiple nuclei with 10 or more buildings
- 5.4. House and Primary Farmyard, with 4 or less buildings; multiple nuclei with 5 or more buildings
- 5.5. House and Primary Farmyard, with 4 or less buildings; multiple nuclei with 4 or less buildings
- 5.6. House and Primary Farmyard, with 4 or less buildings; single nucleus
- 5.7. House with 4 or less buildings; single nucleus.
- 6.1 Archaeological Site
- 7.1. Modern Farm

The following terminology for **House and Primary Farmyard Layout** was adopted as the most useful means of collating the information provided by the desktop survey.

- 1.1. House and Farmyard, rectangular blocks, designed
- 1.2. House and Farmyard, non-rectangular blocks, designed
- 1.3. House Block, non-rectangular, designed
- 1.4. Farmyard, irregular, 2 alignments; remnants of rectangular block, designed
- 2.1. House and Farmyard, rectangular blocks
- 2.2. House and Farmyard, rectangular blocks, 2 alignments
- 3.1. House Block, rectangular
- 4.1. House Block rectangular; Farmyard irregular, single alignment
- 4.2. House Block rectangular; Farmyard irregular, 2 alignments
- 4.3. House Block rectangular; Farmyard irregular, multiple alignments
- 5.1. House and Farmyard, irregular, single alignment
- 5.2. House and Farmyard, irregular, 2 alignments
- 5.3. House and Farmyard, irregular, multiple alignments
- 5.4. House block, irregular
- 6.1. Farmyard, irregular, single alignment
- 6.2. Farmyard, irregular, 2 alignments not used as yet.
- 6.3. Farmyard, irregular, multiple alignments

The above terminology makes a distinction between rectangular and rectilinear layouts. While a farm may be planned on a rectilinear layout, the house and farmyard blocks may not be rectangular. In some cases, it was difficult to fit the farm layouts exactly into the above categories and in these cases a best-fit description was adopted from the existing categories.⁷²

For the Ravensworth Homestead Complex, the baseline archaeological assessment identified the following attributes:

⁷² Edward Higginbotham & Associates, 2012; p. 63

- Typology of the Site: 4.4. House and Primary Farmyard, with 5 or more buildings; single nucleus.
- House and Primary Farmyard Layout: 1.1. House and Farmyard, rectangular blocks, designed.⁷³

The Hunter Estates Database⁷⁴ identifies a total of 28 other Hunter Estates with the same "Typology of the Site" (4.4 House and Primary Farmyard, with 5 or more buildings; single nucleus) as the Ravensworth Estate:

- Bolwarra, Bolwarra Heights
- Dalwood, Dalwood
- Dunmore, Bolwarra
- Archerfield, Warkworth
- Balikera, Port Stephens
- Balmoral, Muswellbrook
- Brandon, Seaham
- Burrowel, Seaham
- Cory Vale and Vacy, Vacy
- Dalmar (Bengalla), Muswellbrook)
- Dulwich, Camberwell
- Eelah, Maitland Vale
- Elms Hall, Vacy
- Elmswood, Gundy

- Hinton (Rosemount), Hinton
- Kinross, Raymond Terrace
- Manresa, Glendonbrook
- Martindale, Martindale
- Maryville, Allynbrook
- Mount Leonard, Bulga
- Negoa, Kayuga
- Old Barraba, Ellalong
- Overdene, Muswellbrook
- Piercefield, Denman
- Stobo, Rawdon Vale
- Wambo, Warkworth
- Woodside, Mount George
- Brookfield, Brookfield

However, the Hunter Estates Database identifies only 1 other Hunter Estate with the same "House and Primary Farmyard Layout" (1.1 House and Farmyard, rectangular blocks, designed) as the Ravensworth Homestead Complex; that is Dunmore, Bolwarra (est. 1833).

Dunmore House, Bolwarra

Dunmore House, Bolwarra is located on 1000 acres of land granted to George Dunmore Lang in c1822. The property is located on the Paterson River between the villages of Largs and Paterson. George died in 1825 and the estate was taken over by his brother Andrew Lang who constructed the main homestead in c1833. Dunmore House is a very fine and early example of a convict-built Colonial Georgian homestead complex. ⁷⁵

As per the State Heritage Register listing for the place, ⁷⁶ the homestead is an identifiable group of buildings when viewed from the north, south and eastern approaches to the site. Dunmore House and its site consists of four principal buildings forming four sides of a quadrangle.

"The main house is a large two storey residence that displays the symmetry of a classical Georgian (Regency) building..... A flagged verandah enclosed in part extends around all four sides.The

⁷³ Clive Lucas Stapleton & Partners, 2013; Appendix 1: Hunter Estates Database

⁷⁴ Ibid

⁷⁵ "Dunmore House" SHR No. 01887, database no. 5056380

⁷⁶ Ibid

interiors comprising four rooms on two levels are largely intact featuring fine cedar joinery and an original cantilevered stone staircase off the central ground floor entrance hall."⁷⁷

"Forming a courtyard at the rear are two single storey stone outbuildings, which predate the main house, dating from the 1820s. The eastern outbuilding was formerly a stable, with stone flagged flooring, and a wine cellar and larder. The western building formerly functioned as a bakehouse, bread oven, kitchen and laundry, with a workshop to the north. It is understood that the eastern building was the earliest of the stone outbuildings to be constructed, with the western building following; being utilised by the Langs as a temporary residence during the construction of the main residence." The southern building appears to be a later addition vertical timber slab barn.



Figure 38: North east view of the 1830s residence. Image by: Stephen Booker. Source: SHR database no. 5056380



Figure 39: Northern view of the group from the Barn at the south. Image by: Stephen Booker. Source: SHR database no. 5056380



Figure 40: West pavilion. Image by: Stephen Booker. Source: SHR database no. 5056380



Figure 41: Detail from SHR Plan 2536 with aerial view of the Dunmore House homestead complex showing the configuration of the main house (to the northeast) with the two rear wings forming a central courtyard and enclosed to the southwest by a smaller, later addition barn. Source: SHR database no. 5056380

Comparison with Ravensworth Estate

As noted above, both Ravensworth and Dunmore House display a similar configuration in relation to the placement of the house and associated outbuildings, including their symmetrical placement around a courtyard or farmyard.

However, the Ravensworth Homestead Complex is distinct for being a group of individual farm buildings with main house and kitchen wing enclosing a farmyard; whereas Dunmore House is configured as a house with two rear wings forming a courtyard, although it is acknowledged that one of the rear wings did function as a farm building.

The Ravensworth Homestead Complex is also distinct from Dunmore House as a designed group of stone buildings, architecturally complementary to each other and constructed at the same time.

78 Ibid.

⁷⁷ Ibid.

As noted in the State Heritage Register listing for Dunmore House, ⁷⁹ the stone pavilions were constructed prior to the main house and altered in their appearance by the application of dressed facing stones as a veneer, to reference the detail of the stone work of the north façade of the main house, "as a final aesthetic touch to relate the earlier buildings to the newer homestead in their detail and outward presentation."

Conclusion

The Statement of Significance prepared for Ravensworth, included in the HA&SoS, under *Criteria* (c) *Aesthetic/Technical Significance* notes:

"The homestead complex of the Ravensworth Estate constructed in c1832, is of aesthetic significance on a <u>State level</u> as a fine example of a very rare, relatively intact 'architecturally planned' group of colonial farm buildings located in its late 19th century landscaped setting.....

The conscious design of the symmetrical compound is reinforced by the inclusion of stone decorative quoins at the outer extremities of the group and inclusion of blank window recesses on the western elevations of the main homestead and the barn, suggesting that the building group was designed to be approached and viewed from the west. The formality of composition of the complex of buildings is further reinforced by surviving evidence of the early planning of the broader homestead precinct with an early dam (albeit modified) to the south of the homestead complex, placed on axis with the main house and the 1830s stone grave located to the east placed along the longitudinal axis of the main house.

Refer also to Appendix A of this document which provides an analysis of the configuration and fabric of the Ravensworth Homestead Complex prepared by Dr. James Broadbent.

The group of buildings comprising the complex and including the adjacent privy are of aesthetic significance on a <u>State level</u> for their fine dressed stonework and finely made roof carpentry, simple architectural detailing and high-quality detailed design and execution.....⁸¹

No change is proposed to the above section of the Statement of Significance, with respect to the comparison with Dunmore House.

Other Sites identified by NSW Heritage

The following properties have been identified by NSW Heritage as being comparable with Ravensworth Estate:

Bolwarra, Bolwarra Heights

The remains of the Bolwarra Estate are located on portions of the 2030 acres of land originally granted to John Brown, in 1822. The property was sold on to Thomas Potter MacQueen (owner of Segenhoe) in 1826 via his agent Peter McIntyre and it was McIntyre who initially developed the estate including establishing hops and tobacco and constructing the original homestead (c1833) and a large convict built, stone barn (c1833). When sold to Richard Jones in 1833, the property was described as having a

80 Ibid.

Ravensworth Estate, Ravensworth, NSW Expanded Analysis of the Ravensworth Homestead Complex

⁷⁹ Ibid.

⁸¹ Lucas, Stapleton, Johnson & Partners, 2019; *Ravensworth Estate, Singleton, NSW: Heritage Analysis and Statement of Significance* (Appendix 23a), p. 345

new dwelling, detached kitchen, store house, blacksmith's shop, barn, dairy, two stables, men's huts, rickyard and garden. 82



Figure 42: Aerial view of Bolwarra showing location of the main house (indicated with a blue arrow) and the barn (indicated with a red arrow), now on a separate allotment. Source: GoogleMaps

In 1843, the property was purchased by James and David Dickson who built a large two storey villa next to the earlier homestead (which appears to have been converted into the kitchen wing) and surrounded it with a large garden. The 1840s house was added to by J.W. Pender in 1858-1863 and again in the 1880s and eventually substantially modified in c1919 as a single storey Edwardian bungalow. ⁸³ The surrounding lands were subdivided throughout the mid to late 19th century and the site of the original homestead complex is now surrounded by residential development.

It is not known what survives of the 1830s complex of buildings purchased by Richard Jones other than the stone barn, which still stands although is now on a separate allotment from the main house and has been converted into a private residence. The original house may survive in part, having been converted to the kitchen wing.

The separation of the Barn from the Main House and the lack of a formal layout of the main farmyard means that Bolwarra is not comparable with the Ravensworth Homestead Complex.

Negoa, Kayuga

Negoa is located on land formed by a 4000 acre grant to William Cox Snr and a 4000 acre grant to William Cox Jnr, both in the year 1825. William Cox Jnr purchased his fathers' land grant, forming the 8000 acre Negoa estate. William Cox Jnr did not reside at Negoa, instead his son John Hobart Cox managed and held the estate until his death in 1891.

_

⁸² Advertising, "Pre-emptory sale of Hunter River property: the Bolwarra Estate", *The Australian*, Friday16th August 1833, p. 4

^{83 &}quot;Bolwarra" Inventory sheet prepared for the 2013 Hunter Estates study



In 1845, tenders were called for the construction of a shingled cottage on the estate, with the plans and specifications to be seen at Mr James Atkinson's, Windsor. In 1864, the estate was advertised for lease and described as containing a house (brick and stone, two stories, ten rooms), kitchen, laundry, stores, stables, woolshed etc. all in excellent repair. In 1952, the estate was once again advertised for sale and described as containing a 2-storey homestead of stone and brick, plaster walls containing 8 rooms, kitchen, bathroom and pantry, large verandah, underground cellar, detached man's room and lumber room of brick. 84

Figure 43: Aerial view of Negoa.



Figure 44: South elevation of original brick cottage with stone two storey addition at Negoa. Source: LSJ, 2012



Figure 45: The brick men's room located directly to the north of the Main House with carport adjacent. Source: LSJ, 2012

Based on a site inspection undertaken in 2012, the main house was built in two sections, the earliest (c1836) is a single storey L-shaped sandstock brick cottage on stone foundations with cellar with hipped iron roof and brick chimneys and it originally had a symmetrical front with 12 paned windows and a brick verandah. The second portion is a two storey Ashlar stone wing, one room deep added in c1854 and features fine masonry French windows with shutters to the front. Evidence of a timber verandah and balcony (removed), although the stone paving at the front remains.

A brick man's room with attached laundry is located directly behind (to the north) the Main House, although no formal courtyard layout is created. A slab stables and assorted yards and an old dairy remain as well as modern agricultural buildings, all located on either side of the entry drive leading to the south elevation of the Main House.

As Negoa is not configured around an enclosed farmyard and does not have a courtyard area, the place is not comparable with the Ravensworth Homestead Complex.

Kinross, Raymond Terrace

Kinross is located on the remnants of a 640 acre grant made to George Thomas Graham in 1827. In c1830, Sir (William) Edward Parry (Commissioner of the AA Co.) visited Kinross on his way to Newcastle and described the homestead at that time as "a miserable slab hut of their own building open to admit the wind and rain in most parts badly thatched with reeds....no floor.. the fireplace a recess made of slabs...".

⁸⁴ "Negoa" Inventory sheet prepared for the 2013 Hunter Estates study



Figure 46: Aerial view of Kinross. Source: GoogleMaps

In 1834, the estate was advertised for sale and the main house was at that time under construction being described as "the frame of a substantial and commodious verandah cottage residence of 4 rooms with a kitchen detached has been erected and part of the materials for completing it were on the ground. A large substantial slab barn, with stock yard, huts are built." This appears to describe a timber house.

The estate was purchased by Archibald Windeyer in 1839.⁸⁵



Figure 47: Photograph of the courtyard area and rear elevation of the Main House at Kinross. Source: Register of the National Estate Place_ID 1323. Photograph by John Houldsworth, 1986



Figure 48: Photograph of stone Barn at Kinross. Source: Register of the National Estate Place_ID 1323. Photograph by John Houldsworth, 1986

A site inspection was not possible in 2012 for the preparation of the 2013 Hunter Estates report, however the inventory sheet for the local listing of the property describes the place as being "constructed of Muree sandstone with a roof of slate. The main house forms the centre of a U-shaped group, the service wings enclosing a large courtyard at the rear. The slope of the ground enabled the inclusion of large cellars beneath the building". 86

The Register of the National Estate listing for the place provides further description: "Single storey sandstone Colonial Georgian house with attic built by John Windeyer, of symmetrical design with hipped slate roof and verandah to three sides supported on simple rectangular timber shafts. Shuttered French windows open onto the sandstone paved verandah. Internally the home possesses most of its original cedar joinery with simple, steep attic stair. Builder's name was Bowen. Fine group of sandstone outbuildings and fences." 87

As Kinross is configured as a house with a rear wing and a separate barn building forming two sides of a courtyard, it is not comparable with the Ravensworth Homestead Complex which is a designed group of stone buildings, architecturally complementary to each other and constructed at the same time.

Abbey Green, Mount Thorley

^{85 &}quot;Kinross" Inventory sheet prepared for the 2013 Hunter Estates study

^{86 &}quot;Kinross including stone shed and landscape setting" State heritage inventory, database no. 2280160

⁸⁷ "Kinross, Outbuildings and Curtilage"; Register of the National Estate Place ID 1323, Australian Heritage Database

Abbey Green is located on the remains of a 4000 acre grant of land originally issued to Archibald Mosman in 1838. The estate was expanded by subsequent owners until it was approximately 10,000 acres under its third owner, George Andrew Loder.

In 1861 George Andrew Loder had the Victorian mansion built according to the design of Thomas Rowe, one of Australia's leading architects of the Victorian era. The complex comprises a homestead which is a distinctively Victorian building of sandstock brick with slate roof and with the drawing room thrust forward, woolshed, stables, slab octagonal building, courtyards and remains of Victorian gardens. Assorted other outbuildings, yards and fenced enclosures are scattered throughout the property. The construction date of the agricultural outbuildings are not known at this time.



Figure 49: Aerial view of Abbey Green. Source: GoogleMaps

Abbey Green is not comparable with Ravensworth Homestead Complex given that it is a Victorian era homestead complex and is configured as a Main House with single rear wing forming two sides of courtyard.

Tocal, Paterson

The Tocal estate is located on a 4,000 acre land grant to James P. Webber in 1822, who established it as a productive farm. In 1834 Webber sold Tocal to Caleb and Felix Wilson. The Wilson family built the homestead in the 1840s to designs by architect William Moir (who was apprenticed to Mortimer Lewis) for use as a country residence and the Wilson family held the property till 1907.



Figure 50 (left): Aerial view of Tocal. Source: GoogleMaps

The Homestead consists of a late Georgian/Regency Revival rendered sandstock brick two storey homestead, with verandahs (flagged sandstone) on three sides, set on a knoll overlooking the Paterson River and surrounding areas. The site also consists of a wide range of vernacular timber buildings, stockyards, post and rail fences, underground silos and other elements representing technology of a 19th century farm. These consist of convict-built sandstock brick residential buildings, as well as a large stone barn built in 1830 by convicts with a 1920s addition, a 1860s timber barn designed by architect Edmund Blacket and yards, fences etc. 88

Tocal is not comparable with the Ravensworth Homestead Complex as the configuration of the place is sprawling rather than symmetrical and there is no courtyard or farmyard defined by the principal agricultural outbuildings as is found at Ravensworth.

^{88 &}quot;Tocal homestead", State Heritage Register listing, SHR No. 00147, database no. 5045676

Conclusion

In analysing the selection of other Hunter Estates nominated by the Heritage Office and their similarities and differences with the Ravensworth Estate, it is apparent that Ravensworth is distinct from the others examples discussed. See also Appendix A of this document for further discussion prepared by Dr. James Broadbent.

It should be noted that although the existence and dates of some outbuildings at other homesteads is known, over all little is still known and there are very few records relating to surviving outbuildings of many of these homesteads. New, detailed surveying and recording of the configuration and fabric of outbuildings located at other Hunter Estates that would allow comparison of dates, construction, use etc. with Ravensworth is considered beyond the scope of this project.

Abbey Green, Bolwarra and Kinross exhibit some similarity with Ravensworth in that they both have an attached wing located at right angles to the main house, forming two sides of a courtyard area. In 1982, David Sheedy prepared a report for the then NSW Department of Environment and Planning entitled *Hunter Region Heritage Study: Nineteenth Century Buildings*. In this report, Sheedy noted that the most common form of homestead found in the Hunter Region was comprised of a main house with attached wing or wings added at various stages of a property's growth. ⁸⁹ As such, this configuration is not considered to be unusual and can be found at numerous other homesteads and farms throughout the Hunter Region and NSW more broadly. In addition, Abbey Green is a Victorian homestead complex (c1861) and the configuration of the main house with kitchen wing is not considered rare or unusual for either the colonial or Victorian periods.

Negoa, Bolwarra and Kinross are also similar to Ravensworth being small complexes, comprised of only 4 or 5 buildings in the group, and all also retain at least one building within the group dating from the 1830s. The retention of at least one building dating from the 1830s as part of a homestead complex is not considered to be rare in the context of the Hunter Region. As Sheedy points out, at the time his report was prepared, the Hunter Region possessed probably the richest and most diverse collection of 19th century buildings to be found in any comparable area of Australia and that with relatively few exceptions, the vast number of buildings erected after 1830 have survived. However, many of these outbuildings being working agricultural buildings have been substantially altered overtime, as their continual renewal or reconfiguration is part of the adaptive nature of an outbuilding.

Ravensworth is distinct in this respect, as unlike the majority of Hunter Estates, which were added to, altered and reconfigured over time, particularly during the Victorian era, Ravensworth has retained the majority of its original principal buildings relatively intact and continues to present as a c.1832 homestead complex.

Tocal in comparison, is completely different to Ravensworth in relation to the configuration of the complex, being sprawling rather than symmetrical. There is no courtyard or farmyard defined by the principal agricultural outbuildings as found at Ravensworth and Tocal exhibits a range of building types from a range of construction periods, although the place does retain at least one 1830s building, the stone barn (with later additions).

Ravensworth is distinct from the above selection of Hunter Estates for retaining five relatively intact colonial farm buildings, all constructed in c1832 with complementary architectural detailing and in the

⁸⁹ Sheedy, D., 1982, Hunter Region Heritage Study: Nineteenth Century Buildings, prepared for the NSW Department of Environment and Planning; pgs. 28-30

⁹⁰ Sheedy, D., 1982, p. 16

same material, configured as a symmetrical, designed group of buildings, forming an enclosed farmyard.

Based on the above analysis, the Statement of Significance included within the HA&SoS should be amended to include the following: *The configuration, construction date, intactness and design attributes of the Ravensworth homestead complex makes the place very rare in the context of the Hunter Region and is of State level significance.*

NSW Heritage Issue: Early Architects

The use of architects in the design and construction of the early homesteads is rare. It appears that Ravensworth is a rare example of this.

The above statement is agreed with. Further discussion in relation to the use of architects in pre 1850s homestead complexes is provided below.

The 2013 Hunter Estates report notes that the use of architects in the design and construction of the early homesteads was very rare due to the isolation of the region and the necessity (due to grant requirements) to place capital into the development of the farm, rather than into any display of wealth. In the main, early homesteads were probably constructed using convict labour and architectural refinements were only possible if a landowner, overseer or a convict had a particular interest or previous experience.

Of the 200+ Hunter Estates surveyed only a small number of properties were identified where an architect is known to have been involved or an architect has been attributed to designing the pre-1850 homestead. However, given the lack of detailed documentary evidence regarding the construction of the majority of the Hunter Estates, there may be more as yet unaccounted for. The following Hunter Estates have known associations with architects:

- Aberglasslyn (1842) which is alternately attributed to John Verge and Henry Robertson;⁹¹
- Tomago, Port Stephens (1840-45) and later the verandah addition at Kinross, Raymond Terrace (1840s), have been credited to Mortimer Lewis, who was the architect for the Windeyer family;
- Tocal, Paterson (1845) is known to have been designed by William Moir; ⁹⁴ and
- Lyndhurst Vale, Dungog (c1830), it is assumed that John Verge designed his own house at his Williams River property.

In addition to practicing, professional architects, local landowners possessing a particular interest or skill in building design also operated as amateur architects, or gentlemen architects.

Of particular note are the brothers Robert and Helenus Scott, who during the 1830s appear to have established a local reputation as architects and were consulted by their Hunter Valley neighbours on

^{91 &}quot;Aberglassyn", State Heritage Register listing, SHR No. 00195, database no. 5045377

^{92 &}quot;Tomago House and Tomago Chapel", State Heritage Register listing, SHR No. 00207, database no. 5045718

⁹³ Broadbent, J., 1997, *The Australian Colonial House: Architecture and Society in New South Wales 1788-1842*, Hordern House, Sydney, p. 216

⁹⁴ "Tocal Homestead", State Heritage Register listing, SHR No. 00147, database no. 5045676

house and farm building designs.⁹⁵ As well as their own homestead Glendon (built in two stages 1826 and 1837),⁹⁶ the Scotts are also attributed with being involved with Cliffdale (1840s),⁹⁷ Terragong (1838-39), and the stables for Leslie Duguid of Kaludah, Lochinvar (1840s).⁹⁸

Others included Henry Dumaresq, an engineer who built his own house St Heliers (1830s); ⁹⁹ George Wyndham who built his residence Dalwood (1829-1833)¹⁰⁰ and Joseph Docker, a man of many artistic talents who designed and built his own residence Thornthwaite (1840s). ¹⁰¹ The Scott brothers probably also influenced Wyndham ¹⁰² and Docker. ¹⁰³

Ravensworth has previously been attributed to John Verge and further discussion of this association is provided for in the response to Point 2 (e) Item 2 of the Heritage NSW correspondence.

The HA&SoS undertook further examination into the question of whether or not Ravensworth may have been designed by an architect or gentleman architect. Key indicators that an architect or gentleman architect was possibly involved in the design of the homestead complex include:

- The symmetrical layout of the farmyard comprised of a group of designed buildings that complement each other architecturally;
- The "H plan" of the Main House with porch in antis to the front and rear elevations all under one bellcast hipped roof (albeit altered);
- The use of architectural details such as stone quoins at each corner of the farmyard and the blank window recesses on the elevations viewed on approach on the homestead complex from the west.

Together these aspects of the architectural design of the place indicate a high degree of design consideration was involved in the original construction and laying out of the place.

The rarity of the "H plan" of the Main House alone is a strong indicator that an architect or gentleman architect was involved with the design of Ravensworth.

Henry Kitchen associations

Dr. James Broadbent, in the seminal book *The Australian Colonial House* (1997) discusses the double recessed porch, mainly in relation to the work of Henry Kitchen (c1793-1822) and links it directly to the designs of Palladio. Kitchen is known to have owned a copy of Palladio's *I quattro libri dell'architettura* (*The Four Books of Architecture*), 1570.

Although Kitchen was long dead by the time Ravensworth was being built, it is not impossible he was involved with the design through his work for John Macarthur, which involved proposed Greek Revival additions to Elizabeth Farm. ¹⁰⁴ Bowman, having married Mary Macarthur in 1823 could certainly have interacted with Kitchen at an earlier time.

⁹⁵ Broadbent, J., 1997, p. 274

⁹⁶ Ibid

⁹⁷ Based on stylistic similarities with Glendon

⁹⁸ Broadbent, J., 1997, p. 275

⁹⁹ Broadbent, J., 1997; p. 247

¹⁰⁰ Broadbent, J., 1997, p. 247-250

¹⁰¹ Docker, E., "Docker, Joseph (1802–1884)", *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, http://adb.anu.edu.au/biography/docker-joseph-3420/text5093

¹⁰² Broadbent, J., 1997, p. 274¹⁰³ Based on stylistic similarities with Glendon

¹⁰⁴ See Broadbent, Chapter 6

One of Kitchen's few surviving works is Glenlee at Menangle, NSW which interestingly contains recessed porches (front and back), a broken back roof profile and also heavily expressed quoin stones, all featured at Ravensworth.

Robert and Helenus Scott associations

Broadbent also discusses the designs of the Scott brothers, Robert and Helenus, ¹⁰⁵ and those illustrated demonstrate a preoccupation with creating recessed and return verandahs on bungalow verandah designs. The Scott brothers were notable gentlemen architects operating in the Hunter Region in the 1820s, notably at their property Glendon, Singleton (from 1824).

After arrival in Australia in 1822, the Scotts also became friends with John Macarthur and could have known Bowman as well. Recent research has established a direct commercial connection between Bowman and the Scotts at Ravensworth in 1828. 106

Broadbent also notes that the Scotts traced or redrew Kitchen's designs for the home farm/stables at Camden Park, NSW. 107

The Scott brothers undated symmetrical design for a house and farmyard illustrated in Broadbent ¹⁰⁸ shows great similarity with the layout of Ravensworth farmyard, albeit the house, kitchen and farm building plans are individually different. Regardless, Broadbent notes that "Bowman, therefore, should perhaps be included in the list of those who sought the Scotts' architectural advice." ¹⁰⁹

Other similarities of note: the end rooms of the Glendon addition (c1837) are broader than the front and back verandahs, a feature which also occurs at Ravensworth, even though it is structurally silly (indicating that the design was more important than the structure). Also, at Glendon and Thornthwaite, Scone (where the Scott brothers are attributed to assisting Docker in the design), the Scotts used paired posts on the front verandahs which again, occurs at Ravensworth.

As stated in the HA&SoS, ¹¹⁰ from the above, it is really beyond doubt that an architect or gentleman architect was involved in the design of the Ravensworth Homestead Complex. However, at this stage, exactly who the designer was cannot be definitively nominated.

Conclusion

Based on the above analysis, the Statement of Significance included within the HA&SoS should be amended to include the following:

The Ravensworth Homestead Complex is relatively rare in the context of the Hunter Region for most probably being an example of an early homestead designed by an architect or gentlemen architect.

_

¹⁰⁵ See Broadbent, Chapter 12

¹⁰⁶ J. Bowman cheque butts for 5th July 1828 notes payment to "Robert Scott for 193 bushels of wheat supplied to Hunters River".

¹⁰⁷ Pers. Comm. J. Broadbent

¹⁰⁸ Broadbent, J., 1997; p 278

¹⁰⁹ Ibid.

¹¹⁰ Lucas, Stapleton, Johnson & Partners, 2019, p. 328

2.5. Point 2e) Item 5

Point 2 e) Item 5 of the Heritage NSW correspondence included the following comments:

The Casey & Lowe report completed quite extensive assessment against the NSW Heritage Criteria, which is missing from the Statement of significance and should be included as the site is likely to provide unique insights into:

- A newly-established frontier and contact/interaction with Aboriginal people.
- o Rural lifeways, including tastes and customs through the 19th to early 20th centuries.
- Material culture and lives of significant colonial people.
- Convict lives and the assignment system and how it was implemented within this landscape.
- Use of technology and management of water, changing transportation and economics and how they shaped life on the estate.

The Statement of Significance has been revised to incorporate the Assessment of Significance under Criteria (c) Aesthetic and/or Technical Significance included in the Statement of Significance prepared by Casey & Lowe (refer to Appendix 23c: *Historic Archaeological Test Excavation Report and Impact Statement for the Core Estate Lands*, Casey & Lowe, 2019).

2.6. Point **2g**) Item **6**

Point 2 g) Item 1 of the Heritage NSW correspondence included the following comments:

"If relocation is selected as the preferred option, please include an analysis of all feasible relocation options...

Further clarification in relation to the above was provided by the Department of Planning, Industry & Environment and NSW Heritage via an online meeting held on 16th April 2020.

At this meeting NSW Heritage noted that if the Ravensworth Homestead Complex was removed from its significant landscape then it is highly likely the relocated buildings will no longer meet the criteria for listing on the State Heritage Register because of the loss of heritage values. It was further noted that even if the architectural values of the Ravensworth Homestead Complex are able to be maintained following relocation, the place could not be included on the State Heritage Register if it only meets one of the significance criteria, unless the place is of such particular significance that it should be listed under that one criteria.

Both DPIE and NSW Heritage requested that further investigation be undertaken to address how each of the relocation options (Option 1 Intact Move and Option 2 Disassembled Move) address the significance criteria for State Heritage listing. The investigation is required to provide a comparison between each relocation option and what the likelihood is that the established heritage values for the place under each significance criteria are able to be retained following relocation.

We are providing the following opinion for the Heritage Council and NSW Heritage as it is not our role to recommend listing or otherwise of the homestead complex. Rather, it is the prerogative of the

Heritage Council to assess the homestead complex against their significance criteria and to select a suitable curtilage.

Generally, the threshold for Local listing is, in our view, a relatively low bar, and any intact Federation house normally qualifies. On the other hand, the threshold for State listing is quite high, and even the best landmark corner hotel in a regional town does not qualify.

Analysis of the Ravensworth Homestead Complex undertaken in Appendix 23a *Ravensworth Estate*, *Singleton, NSW: Heritage Analysis and Statement of Significance* (2019) has indicated that the homestead complex is of very high significance. Accordingly, because it is well above the threshold for State level significance, some slight impact would not push it below the threshold.

It should be noted that our client has observed that in making the Option 1 proposal they are not suggesting necessarily that the homestead complex would retain State level heritage values, but that it would retain heritage values none the less.

2.6.1. Opinion of Significance Before & After Relocation/Rebuilding

The following opinion addresses the significance of the Ravensworth Homestead Complex group of buildings before and after relocation/rebuilding (excluding Aboriginal Cultural Values).

Heritage Value	Existing	Option 1: The Complex at Ravensworth Farm	Option 2: The Complex at Broke		
Historical:					
Early colonial homestead	State	Of some interest only because of similar setting, use and reused plantings.	Of little interest only as a remnant.		
Associations:					
Bowman, Macarthur	State	Local (actual buildings but not actual location).	Local (rebuilt buildings- Macarthur association lost)		
Aesthetic:					
 Architecture Designed by gentleman architect Quality of stonework and carpentry 	State	State (definite configuration proposedless than existing but still meets threshold).	Local depending on changes (only approximate design and rebuild)		
Landscape setting	Local	Of interest because of similar setting, use and reused plantings.	Nil interest		
Technical:					
Stone and carpentry	State	State	Local (rebuilt)		

Heritage Value	Existing	Option 1: The Complex at Ravensworth Farm	Option 2: The Complex at Broke			
Scientific:						
Historical archaeology	State	Local (some archaeology survives within built structure).	Nil (all values transferred to written record)			
Social:						
Public esteem	Local (not widely known)	Local (still in Ravensworth vicinity).	Of interest only (not at Ravensworth location)			
Rarity:						
"H" plan of main house and farmyard arrangement	State	State (actual buildings in exact configuration - less than existing but still meets threshold).	Of interest only (as remnant rebuilt and not fully in designed configuration)			

As shown in the above table, it is the opinion of LSJ that retention of State levels of significance across multiple criteria is achievable for Option 1, though is not possible for Option 2.

2.7. Revised Statement of Significance

The following revised Statement of Significance takes into account the above issues raised by the Heritage Office and additional research and analysis undertaken with respect to the issues raised. Revised or new text is included in blue.

Criterion (a) Historical Significance

An item is important in the course, or pattern, of NSW's (or the local area's) cultural or natural history.

The land on which the Ravensworth Estate is located is of historical significance on a <u>Local level</u> as forming part of the land of the Wonnarua that stretched over much of the Hunter Valley. Regardless of the history of European colonisation, agricultural development and mining uses, the Ravensworth Estate retains physical evidence of the past lives of the Wonnarua people.

The history of Aboriginal dispossession in the locality sits alongside the colonial history of the place, with reports of interactions between Aboriginal people and convicts and colonists dating from the early 1800s. The estate lands are of historical significance on a <u>Local level</u> for being located in a district that witnessed a series of attacks and retributions between Aboriginal people and the newly arrived Europeans in the central Hunter Valley between 1825 and 1827. The Ravensworth Estate was one of a number of reported locations of violence during this period.

The land that forms the Ravensworth Estate today is also of historical significance on a <u>Local level</u> for being the substantial remnants of an early (1824) pastoral estate in the Upper Hunter region of NSW.

The place is of historical significance on a <u>Local level</u> for being one of a surviving group of pastoral estates established shortly after the opening up of the Hunter Region to European colonisation in the early 1820s by Governor Brisbane and Commissioner Bigge, and evidence of this important historical period remains in the property boundaries, the road alignments, remnant landscape features (including the alignment of fence lines, vegetation modification, early dams and evidence of early cultivation), historical archaeological sites (including the potential for a convict barracks, the underground silo together with evidence of an extensive range of former outbuildings) and the surviving c1832 homestead complex including its configuration and landscape setting.

The Ravensworth homestead garden is also of historical significance on a <u>State level</u> as being, along with Camden Park, Camden, NSW, among the few places where the first experiments with plant breeding were carried out in Australia. Edward Macarthur Bowman and William Macarthur undertook this early work at the place in coordination with John Carne Bidwill.

The Ravensworth Estate is historically significant on a <u>Local level</u> for being located along an important regional transport corridor (that remains in place today), connecting the city of Sydney with the agricultural regions of the Hunter Valley and the Liverpool Plains (and beyond) as evidenced by the remnants of the early (1820s and 1830s) roads located across the estate lands. The strategic location of the estate lead to the place being known as a destination point and a place of note to the broader community from the 1820s onwards, as evidenced by early written accounts of the estate lands and the numerous well-known persons who visited the estate in the 1820s and 30s, including surveyor Henry Dangar, A.A. Co. commissioner Sir Edward Parry, pastoralists Robert and Helenus Scott and missionaries James Backhouse and George Washington Walker. The importance of the location led to

Ravensworth becoming a known locality in the district and across NSW, with the Ravensworth Estate and homestead complex at its centre.

The later history of the Ravensworth Estate is of some historical significance on a <u>Local level</u> for demonstrating a pattern of development that is found throughout the central Hunter Region and NSW. From being a large pastoral estate for sheep fattening for most of the 19th century, from the late 19th century onwards the estate underwent speculative subdivision, eventually being used for smaller allotment mixed farming including dairying throughout the 20th century, until the 1960s when large portions of the former lands of the Ravensworth Estate were developed for open-cut coal mining. The allotment that contains the Ravensworth Homestead Complex is also of historical significance for being the remnants of a soldier's settlement purchase taken up by A.C. Marshall in 1920.

The estate lands are of some historical significance on a <u>Local level</u> for being identified as early as the 1840s as one of the locations in the Hunter Valley with a likely presence of coal, and for being the location of early drilling expeditions and subsequent underground coal mining from the 1890s.

Criterion (b) Historical Associational Significance

An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's (or the local area's) cultural or natural history.

The Ravensworth Estate is of significance on both a <u>State and local level</u> for its associations with a number of people of historical note and places of historical note located throughout NSW. The richness of these historic associations provides further evidence of the significance of the history of the Ravensworth Estate.

Historical associations with notable persons include:

- Dr James Bowman (1784-1846), principal surgeon of the colony and inspector of colonial hospitals and local committee member of the Australian Agricultural Co. (A.A. Co.), who was granted the land, established and expanded the property as a sheep run and named the property Ravensworth. He is said to be buried on the property (location unknown).
- Mary Bowman (1795-1852), daughter of John Macarthur, whose dowry of 2000 sheep and 200
 cattle allowed James Bowman to apply for the initial land grant that became the Ravensworth
 Estate.
- John Macarthur (1767?-1834), entrepreneur, pastoralist and founder of the A.A Co. the oldest continuously operating company in Australia, and his sons James Macarthur (1798-1867) politician, and William Macarthur (1800-1882) an influential horticulturalist, who financially assisted the Bowman's with the management of the estate lands throughout its early history.
- Edward Macarthur Bowman (1826-1872), eldest son of Dr James and Mary Bowman was a botanical collector and botanist who lived at and managed Ravensworth from 1843 to 1848. In cooperation with his friend botanist John Carne Bidwill, Edward participated in some of the first efforts at plant breeding in Australia including the hybridisation of gladioli being among the experiments carried out at Ravensworth. Edward Bowman became a botanical collector in northeast Australia and he is best-known for his discovery of *Ptychosperma alexandrae* (Alexandra palm) named for Alexandra, Princess of Wales.
- James White (1801-1842), former employee of the A.A. Co. and founder of the White pastoral dynasty (other White family estates in the Hunter region include Edinglassie, Belltrees, Merton, Martindale and Waverley), who was an early overseer at Ravensworth and for whom the homestead was constructed.

- John Larnach (1805-1869), partner of James Mudie at Castle Forbes and joint author *Vindication* of James Mudie and John Larnach, From Certain Reflections on Their Conduct Contained in Letters Addressed to Them ... Relative to the Treatment by Them of Their Convict Servants in 1834, and who was an early overseer at Ravensworth.
- Jackey-Jackey (d.1827), a local Aboriginal man, who following his capture for an attack on James Bowman's men on the Ravensworth Estate lands was executed without trial at Wallis Plains by Lieutenant Nathaniel Lowe of the Mounted Police, this led to a military officer being brought before the courts for actions against Aboriginal people for the first time in 1827.
- Later owners including Captain William Russell (1807-1866), pastoralist who also owned Cheshunt Park and substantial squatting properties; Duncan Forbes Mackay Jnr. (1834-1887), successful horse breeder and owner of the Anambah and Minimbah properties and Tilpil Station (amongst others); both of whom continued running the Ravensworth Estate as a pastoral property.
- F.J.L Measures (1863-1936) and A.C. Reid (c1863-1925), developers, who subdivided the estate lands into smaller agricultural parcels in the early 20th century.
- Later owner Augustine Campbell Marshall (1891-1983), a Light Horse veteran who obtained a portion of the original estate lands (Portion 228) containing the homestead complex under the *Closer Settlement Scheme* in 1920; and his descendant, son Geoffrey and his wife Jenny Marshall who took over the property and held the land until 1997. The Marshall family are notable for being the owners of the homestead for the longest continuous period.
- Noted NSW architect J.W. Pender who designed the 1880s woolshed (no longer surviving) and local architect James Warren Scobie, who undertook renovations at the homestead in the early 1900s.

Historic places of significance associated with the history of the Ravensworth Estate include:

- Lyndhurst, Glebe, Bowman's Sydney residence, designed by John Verge in c1835.
- The General Hospital (Rum Hospital), Sydney where Bowman was Principal Surgeon of the colony from 1819-1823.
- Numerous other parcels of land throughout the Hunter Valley owned by Bowman and forming part of the extended Ravensworth Estate lands, including Ashton Farm and at one time Segenhoe and the Waverley Estate.
- The Australian Agricultural Company lands throughout NSW, where Bowman formed part of the Colonial Committee for the company.
- The former Ravensworth village and the Ravensworth Public School (now a ruin), and the former Hebden village including the Hebden Public School (now a ruin), Hebden Community Hall (relocated) and Hebden Church (relocated).
- The former Bayswater Estate, owned by Edgar Raby Moore (grandfather of former owner of the Ravensworth homestead, Geoffrey Marshall), which formed part of Bowman's original "10,000" acres until the 1880s.
- St. Clement's Anglican Church, Camberwell (deconsecrated), constructed on land donated by Bowman, out of the extended Rayensworth Estate lands.
- Numerous other smaller farming allotments located across the estate lands resulting from the subdivision of the estate lands in the early 20th century under F.J.L. Measures and A.C. Reid.
- Numerous other Hunter Valley pastoral stations owned by early overseers (John Larnach and James White) and later owners.
- Other works by noted NSW architect J.W. Pender, including Belltrees, Scone, Anambah homestead, Gosforth and Saumarez homestead, Armidale.
- Other works by Maitland architect J.W. Scobie, including Maitland Town Hall, Maitland and Langford homestead, Walcha.

Criteria (c) Aesthetic and/or Technical Significance

An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or in local area).

The Place, containing the remnants of the Ravensworth Estate, is of some aesthetic significance on a Local level as a representational example of a Hunter Valley landscape. The rural landscape of the place including scattered remains of early 20th century farms is punctuated by the two main creek lines, Bowmans Creek and Yorks Creek, pockets of lightly forested lands and gentle rises in the landform that provide expansive views of the floodplains and grazing lands leading southwards down to the Hunter River. The various isolated historic buildings, cultural plantings, landscape and agricultural features located across the landscape, are of some aesthetic significance, being indicative of the 20th century agricultural and community-driven development of the broader locality.

The Place retains its historic visual catchment, most clearly viewed from highpoints between Bowmans and Yorks Creek and these district views to the south-east, south-west, north-west and south towards the Hunter River, in the past would have attached considerable scenic value to the setting of the Ravensworth Homestead Complex. Today however, these views and the aesthetic values of the rural landscape are somewhat reduced by the encroachment of large-scale industrial structures and modified landforms associated with open cut mining along the skyline to the south, east and west.

The homestead complex of the Ravensworth Estate constructed in c1832, is of aesthetic significance on a <u>State level</u> as a fine example of a very rare, relatively intact "architecturally planned" group of colonial farm buildings located in its late 19th century landscaped setting. The group of early buildings is complemented by a late Victorian Men's Quarters.

The main homestead with kitchen wing and the surviving two balanced farm buildings (barn and stables) form a very rare, symmetrical compound composition of aesthetic appeal and consistent detailing, comparable with Glenrock, Marulan; the ruins of the Lake Innes House, Port Macquarie; Malahide, Tasmania and Rosedale, Tasmania and very few others. The symmetrical composition of the group of colonial stone buildings is of aesthetic and technical significance on a <u>State level</u>.

The conscious design of the symmetrical compound is reinforced by the inclusion of stone decorative quoins at the outer extremities of the group and inclusion of blank window recesses on the western elevations of the main homestead and the barn, suggesting that the building group was designed to be approached and viewed from the west. The formality of composition of the complex of buildings is further reinforced by surviving evidence of the early planning of the broader homestead precinct with an early dam (albeit modified) to the south of the homestead complex, placed on axis with the main house and the 1830s stone grave located to the east placed along the longitudinal axis of the main house.

The group of buildings comprising the complex and including the adjacent privy are of aesthetic significance on a State level for their fine dressed stonework and finely made roof carpentry, simple architectural detailing and high-quality detailed design and execution; the group was likely designed, possibly informally, by an architect or gentlemen architect of the 1820s and 1830s and, although unproven, it is possible that Henry Kitchen, John Verge or Robert Scott influenced the design of the homestead complex.

The main house is a fine and relatively rare example of a colonial Georgian bungalow with relatively intact internal configuration and finishes (albeit partially reconstructed after termite attack). As originally designed, the single pile "H" plan with central flagged hall, and porch *in antis* on the front and rear elevations all under one bellcast hipped roof (albeit altered) is extremely rare and comparable

with very few other colonial period houses, aside from Horsley, Horsley Park; Glenlee, Menangle and Glendon (1837 extension), Singleton. This form is of note for being of Palladian stylistic derivation.

The main homestead contains a number of other colonial architectural features of note including the stone quoins, stone flagging, stone mantelpieces, blank window recesses and six panelled colonial doors and twelve-pane colonial windows.

The complement of outbuildings, the stables, barn and privy are all of high-quality stonework and the stables in particular is of architectural interest with its symmetrical layout and arcaded recessed porch to the tack room, all similar in style to the stables at Wivenhoe, Narellan and the stables at Camden Park (not built), both designed by John Verge. The barn, although simple in style and character is of architectural interest and relatively rare being stone built (usually timber built in NSW).

The garden of the main homestead provides the immediate landscape setting for the house and is of some aesthetic significance on a <u>Local level</u> being a remnant of a late 19th/early 20th century garden planted within an 1830s-40s layout. A profusion of discarded stones from demolished structures creates an evocative historical rural atmosphere.

The technical or research value of Ravensworth Homestead Complex lies in its potential to contribute to our understanding of a range of research questions, including but not limited to:

- The group of surviving 1830s homestead buildings and other surviving colonial-built agricultural features (including the brick beehive cistern and underground silo) have a high potential to provide further information regarding colonial architecture and building practices.
- Information relating to the use of assigned convicts, a newly established system by Commissioner Bigge, in the development of the pastoral estates in early to mid-19th century NSW. The archaeology of this place may also provide information on the lives of individual convicts within the much harsher assignment system and longer penalties of imprisonment imposed by the British courts.
- Early transport systems, roads and railway lines that provide information regarding the gradual spread of colonial settlement through the northwest of NSW during the early to mid-19th century.
- Early frontier life and the nature of contact and conflict between British settlers and Aboriginal people and their traditional practices as set out in the written sources.

Bowman Period (1824-1846)

- The lives of Aboriginal people and the nature of interaction with the British arrivals in the contact period as documented in the written sources.
- The level of fortification of the place (the original "House" site and the homestead), if any, for a newly established estate on a frontier.
- Evidence for how convicts were managed or treated in this isolated place, including attitudes to punishment in a non-institutional or non-military setting, and segregation of male and female convicts.
- The differences between free and convict residents and how they operated on the estate.
- Evidence for habitation and living in this remote environment, such as the nature of diet (faunal material and fossil pollen evidence for possible vegetables grown in the gardens), and the possible modification of scarce material culture resources, such as tools (how they were reused, adapted, modified, stolen, hidden and general resistance to control and enforced labouring on the property).

• Material culture of the main household which may be associated with the Bowman family and how it expresses their status in the colony.

- Changes made to the estate once the Bowman family relocated to this site following their financial collapse and sale of Lyndhurst.
- Nature of early pastoral and agricultural practices and how this is represented and amended in the landscape.

Generally

- The construction, modification and subsequent use of the homestead complex and associated lands through the later 19th and 20th centuries.
- Material culture of lives of families who lived on the estate during later years.
- Evolving nature of the archaeological landscape as people and practices changed and different requirements were placed on the landscape to support economic requirements.

There is extensive documentation about the Ravensworth Estate, and the settlement and development of the Hunter Valley more generally, which serves to complement and interact with the physical evidence creating a wealth of documentary and physical evidence of past practices and traditions. This provides a significant opportunity to consider the nature of the oral and written sources to further the understanding of how the archaeological record supports, amends or challenges the written history of this period. This evidence when considered together will offer considerable new insights into the history and archaeology of the Ravensworth Estate.

There is moderate to high potential for the archaeological resource within the Ravensworth Estate to provide information that is unavailable from other sources. The ability of a site to reflect knowledge that no other resource can is dependent upon the research questions which are posed and the methodology employed to investigate the archaeological resource.

The potential research significance of the archaeological remains at Ravensworth Homestead Complex are likely to be significant at both a <u>State and Local level</u>.

Criterion (d) Social, Cultural or Spiritual Significance

An item has strong or special association with a particular community or cultural group in NSW (or local area) for social, cultural or spiritual reasons.

The region of the Upper Hunter, in which the Ravensworth Estate is located, holds high cultural significance (including cultural, historic and aesthetic values) for many Wonnarua people, and the wider landscape of the Hunter Valley is deeply imbued with meaning for Wonnarua people.

Forming part of the broader locality of Ravensworth, the Ravensworth Estate is of social significance on a <u>State level</u> for providing the historical name of the place and for being the tangible focus of the Ravensworth locality. Ravensworth homestead also provides a strong sense of place for past local residents, many of whom continue to live in the Upper Hunter region. The homestead complex, together with other markers across the broader landscape, including the ruins of the Ravensworth Public School and the Hebden School, as well as the scattered remains of agricultural buildings and other features, provide physical markers of the history of the locality of Ravensworth and are reminders of the late 19th and early 20th century history of a distinct community living in the area.

More generally, as one of a group of surviving colonial pastoral estates of the Hunter Region, Ravensworth Homestead Complex is held in high esteem by portions of the local community as well

as the broader NSW community as indicated by the statutory and non-statutory heritage listings existing for the area and its components. There is also a wealth of research, books, images, heritage studies, published and unpublished histories, memoirs, family archives and other documentation relating specifically to the agricultural development of the region and its people from the early 19th century to date.

Criterion (e) Research Potential

An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).

The Ravensworth Homestead Complex and its immediate surrounds has potential for retaining physical evidence of the history of use of the land by the Wonnarua people, although evidence examined thus far indicates that many sites have low scientific significance as they generally have a low artefact density and are located in landforms that have been modified by agriculture. No archaeological evidence from the early contact period, including Aboriginal burials, has so far been recorded in the area despite extensive investigations.

The place has moderate to high potential for retaining physical evidence of the history of agricultural uses dating from the mid-1820s to date, particularly in those areas relatively undisturbed by mining activity such as adjacent to the creek lines and within the flood plains between. With an accumulation of fence lines, tracks, timber bridges, cattle ramps, timber yards and other agricultural structures and features, as well as the remains of the Ravensworth and Hebden villages, together with the historical archaeology, all have the potential to provide further information regarding colonial farming practices, 19th century sheep runs, early 20th century soldier settlements and smaller scale farming and dairying and late 19th and early 20th century small rural villages.

The homestead complex and its immediate surrounds have moderate to high potential to provide further information of significance in relation to colonial building practices and architecture, agriculture and horticultural practices as well as the use of convicts in a non-institutional setting and modes of living dating from the early 19th century through to the early to mid 20th century.

The group of surviving c1832 homestead buildings have a high potential to provide further information regarding colonial building practices and architecture in the early to mid 19th century in NSW (although recent recording work has lessened this potential in some areas). Of particular note is the configuration of the complex and the timber roof framing of the homestead complex buildings. Underfloor areas and building cavities of the group of buildings have moderate to high potential to reveal items of material culture relating to the long history of domestic and agricultural use. An archaeological feature of note is the evidence of a large stone building that once enclosed the northern side of the farmyard, anecdotally referred to by former owners as the "convict barracks".

The landform of the garden and farmyard of the homestead complex is evidence of the Bowman period and the vegetation is remnant of the Hill family period (late 19th to early 20th century). Features of note include the stone seat and historic plant species including *Ficus macrophylla* (Moreton Bay fig), aloes, *Dovyalis caffra* (Kei apple), cactus or epiphyllum, *Phoenix canariensis* (Canary Island palms), *Nerium oleander* Splendens, *Pinus halepensis* (Aleppo pine) and *Rosa* cv. Although recently partly recorded, the documentary and archaeological evidence relating to the front (south) garden and the immediate landscape setting of the homestead complex, has the potential to (via further study including archaeological investigation) provide further information into colonial lifestyles and horticultural practices as well as the aesthetic concerns of James and Mary Bowman and their early managers/overseers.

The other surviving colonial-built agricultural features in the surrounds of the homestead complex also have a moderate to high potential to yield important information regarding colonial building practices and 19th and early 20th century agricultural practices (via further study including archaeological investigation). Features and archaeological sites of note include the brick beehive cistern, the brick lined well, the underground silo, the stone lined dams, footings of former buildings and other structures immediately to the north of the homestead complex, cultural plantings forming wind breaks, the former woolshed and sheep dip, the configuration of paddocks and their fencing and evidence of early cultivation.

The 1830s stone grave (Miss White's) has the potential to provide some further information of importance into colonial burial practices at (what was) an isolated, rural establishment.

Because the subsequent development of the homestead complex and its surrounds was modest, there exists a relatively large and undisturbed (though weathered) archaeological record relating to the colonial period of the homestead complex and together with documentary evidence, there is potential for the homestead locality to provide good, and potentially rare, evidence of the use and treatment of convicts in a non-institutional setting from the early 1820s to the late 1830s.

The research potential of the place for European settlement phases is rare and of high historic significance on a <u>State and local level</u>.

Criterion (f) Rarity

An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).

The Ravensworth Homestead Complex and adjacent landscape and features are relatively rare on a Local level, as the substantial remnants of an early colonial pastoral estate.

The intactness of the Main House of Ravensworth makes the place relatively rare within the context of the Hunter region and of high significance, however the original "H plan" form of the Main House of Ravensworth makes the place extremely rare and of exceptional significance at a State level.

The configuration, construction date, intactness and design attributes of the Ravensworth Homestead Complex makes the place very rare in the context of the Hunter region and is of State level significance.

The Ravensworth Homestead Complex is relatively rare in the context of the Hunter region for most probably being an example of an early homestead designed by an architect or gentlemen architect.

The Ravensworth Estate also contains the following relatively rare components:

- The finely built (stone and timber), architecturally planned group of colonial farm buildings configured symmetrically around a farmyard compound.
- The original colonial Georgian bungalow style house of single pile "H" plan with porch *in antis* on the front and rear elevations, all under one bellcast hipped roof.
- The form of the stables with an arcaded recessed porch to the tack room.
- The stone-built barn.

• The breadth of the historical archaeological evidence at the place, which survives intact (although weathered), is an important, relatively undisturbed record of the workings of an early 19th century pastoral property that relied on convict labour for its establishment and initial growth.

- Individual historical archaeological sites and landscape features of note dating from the 1820s and 1830s including:
 - o The remains of a substantial, stone building enclosing the northern side of the farmyard;
 - o The underground silo (Site 3a) [refer to Figures 1.4 and 1.5 in Appendix 23a];
 - o Remains of an extensive early outbuilding group north-west of the house complex;
 - O The site of an extensive kitchen/produce garden with evidence of early associated structures (including evidence of herringbone brick paving) in proximity to the homestead complex (the "8 acre garden" and the Northwest Paddock);
 - o The dam adjacent to Yorks Creek with log and stone wall (Dam D4);
 - o An extensive network of remnant early dams as evidence of concerted efforts to drought proof the property;
 - O Surviving evidence of the layout and planning of the estate core (e.g. the deliberate address of the homestead southwards to the house dam and westwards to the approach road and the location of the stone grave); and
 - o Rare surviving evidence of early alluvial terrace cultivation (defined by the senescent Black Locust trees).
- The place is also rare for being one of only a few places, along with Camden Park, Camden, NSW where the first experiments in plant breeding were carried out in Australia.

The Ravensworth Homestead Complex and its immediate surrounds are rare on a <u>State and local</u> level.

Criterion (g) Representativeness

An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or environments (or a class of the local area's cultural or natural places or environments).

The place is a representative example of a large pastoral property subdivided in the early 20th century under the *Closer Settlement (Amendment) Act* 1904, instigated by the government to encourage agricultural development of smaller rural allotments by ex-service personnel and migrants. Evidence of this period of development survives in the current cadastral property boundaries located across the estate lands and in the form of boundary fencing, former farms and dairies and other associated buildings and agricultural features.

The Place also contains Aboriginal archaeological sites that are representative of artefact sites located throughout the upper Hunter Valley, both in terms of the types of artefacts recorded and the raw materials from which the artefacts were manufactured.

Ravensworth Estate, established in 1824, is representative of the implementation of a new and highly significant government policy introduced in 1822 by Governor Brisbane and Commissioner Bigge in the Hunter Region aimed at the economic and agricultural development of the colony through the management of land and convicts by private landowners. This policy resulted in the rapid colonisation of the region in the period 1820s to 1840s and the Ravensworth Estate is one of a number of surviving former pastoral estates which together form the foundational layer of the European settlement of the Hunter region.

The later history of the Ravensworth Estate is also representative of the history of changing land uses in the Hunter Valley, when from the mid to late 20th century former pastoral estate lands and smaller farming allotments began to be mined for coal. From this period onwards, the Ravensworth Estate entered a new phase of consolidation and development, a pattern of land use that is found in relatively large pockets of land throughout the Upper and Central Hunter Valley today.

The principal characteristics of Ravensworth Estate including its associations with important persons in the development of the colony (Dr. James Bowman and the Macarthur family), the establishment of the property as a sheep run, the c1832 homestead buildings, garden and associated agricultural features located adjacent to a water course (Yorks Creek and Bowman Creek), and the use of overseers/managers with assigned servants in the establishment of the estate, are all representative of a significant pattern of colonisation and history of development that occurred throughout the Hunter Valley and other parts of NSW in the 1820s and 1830s.

2.7.1. Revised Summary Statement of Significance

The place forms part of the traditional lands of the Wonnarua people of the Hunter Valley and is made more meaningful by the recorded reports of interactions and conflicts between the Wonnarua and the colonists within and around the Ravensworth locality.

The Ravensworth Estate is representative of the rapid colonisation of the Hunter region in the period 1820s to 1840s and the history of the place has led to the area of Ravensworth becoming a known locality in the State of NSW, with the Ravensworth Estate and homestead complex at its centre.

Established in 1824, the Ravensworth Estate is associated with a range of significant colonial places and people including Dr. James Bowman, principal surgeon of the colony of NSW, who established the estate and is one of only a few places where, under Edward Bowman, horticultural experimentation first started in Australia. The place retains tangible evidence of the colonial period including substantial archaeological remains, landscape features and cultural plantings and made more meaningful by the surviving c1832 homestead complex including its siting and configuration.

The Ravensworth Homestead Complex includes a rare, formally designed farmyard complex of colonial buildings including a good example of a colonial bungalow, with stonework and roof carpentry of note. As originally built, the "H" plan bungalow is a rare feature, indicating a design (potentially) by a gentleman architect.

The Ravensworth Homestead Complex is important as an archaeological landscape containing an 1820s colonial house and associated outbuildings which were modified throughout the 19th and 20th centuries, and the archaeology of the estate. The homestead buildings, the remnant 19th-century farm and garden layout built by assigned convicts all provide evidence of this landscape and its history. This can testify to the way in which this early occupation by Surgeon James Bowman with expansion of the wool industry into the Upper Hunter Valley, aided by assigned convicts, irrevocably changed the lives of Aboriginal people and modified the landscape of the Hunter Valley.

Because of the relatively modest history of development throughout the 19th and 20th century, the Place has the potential to provide information, by way of further study and archaeological investigation, into colonial building techniques, 19th century lifestyles, agricultural and horticultural practices and the working lives of convicts in a non-institutional setting, which is considered very rare.

2. Response

LUCAS STAPLETON JOHNSON & PARTNERS PTY LTD

PAGE INTENTIONALLY LEFT BLANK

LUCAS STAPLETON JOHNSON & PARTNERS PTY LTD Appendices

Appendix A

The Heritage Significance of Ravensworth

Prepared by Dr. J. Broadbent, May 2020

Appendices

PAGE INTENTIONALLY LEFT BLANK

The heritage significance of Ravensworth homestead lies overwhelmingly in its early to mid 19th century fabric. It is significant because that fabric richly evidences the ambitions, both achieved and failed, of an important, informed, early colonist ,James Bowman,his and his fellow pastoralists' tastes and skills, the society they established , the resources of expertise, labour, craftsmanship and materials available to them, their financial optimism and eventual ruin.

These significances are most readily and clearly understood by analysing the homestead* in its parts, but, firstly, the complex a whole.

It is rare for a colonial homestead to be as formally and grandly planned as Ravensworth. Mostly the vernacular farmhouse or bungalow was sustained by an <u>ad-hoc</u> collection of out-buildings of various sizes, forms and materials (generally inferior to the house) clustered or straggling behind the house. More common in Tasmania, but rare in New South Wales, is a large enclosed yard- as at Ravensworth- behind the house, defined by carefully aligned ranges, <u>en-suite</u>, of the same materials and of the same craftsmanship as the house.

At Ravensworth the wish for an architectural character for the whole is evident, but the untutored handling of the arcade in the flanking range and the clumsy break in levels and roof lines clearly show that in that time and place- the Hunter Valley in the late convict era- the limits of architectural expertise available did not match the aspirations of its proprietor. Architectural aspiration, thwarted by the limits of expertise, place and time, is also seen in the house itself.

Departing from the vernacular bungalow form of a single range of rooms encompassed by verandahs and a rear skilling, nor quite a standard "verandah-cottage", the house asserts its architectural- and hence social- superiority as the house of the prominent colonist.

The house originally presented two similar elevations to front and back, with verandahs recessed between flanking side rooms. (The rear elevation is now obscured and disfigured by later additions). The front (south) elevation was more generously designed, as is one side elevation (west)- presumably seen from the entrance drive- self-consciously detailed with a central blind window for balance. The other side elevation (east) is less finished and adjoins the domestic offices which form a rear flanking wing or pavilion. The craftsmanship is good; there is little refined detailing other than quoins, and all has a telling provinciality. The quality of the homestead's construction- its ashlar work and roof framing-rather outstrips the quality of its architectural detailing.

In the planning of the house, domestic offices and farm ranges, and particularly in the west range's arcade, the hand or influence of an architect perhaps may be detected: most obviously that of John Verge who designed Bowman's Sydney house, Lyndhurst, but there is nothing to suggest any developed design or supervision by a professional designer.¹

The bucolic, naïve yet self-confident character of the planning and design however does have a peculiar resonance with other, coevil houses in the Hunter Valley: those of a coterie of better-educated pastoralists gathered round the brothers Robert and Helenus Scott of Glendon.

This is important for the understanding of the possible architectural intent of Ravensworth's design and for the placing of Bowman socially within that flock of notable- sometimes infamous- Hunter Valley "Pure Merinos".

The Scott brothers designed not only their own simple bungalow and its sophisticated later addition at Glendon, but also advised on, or discussed with, their neighbours the design of houses and outbuildings: men like George Wyndham of Dalwood and Joseph Docker of Thornthwaite. Numerous drafts survive in the Scott brothers' papers for houses, farmyards and outbuildings built, unbuilt or yet to be identified. *

Although there are no designs in these papers identifiable as directly relating to Ravensworth, the essence of the design, both house and farmyard, is that of the Scotts' work. One quirk of design is common: the structurally illogical pitching of the house roof requiring complicated framing.

By planning the house with flanking rooms wider than the verandahs, and wanting the hips to terminate at the chimneys, each hip springs, not from a structural side wall, but from partway over the side rooms. This solecism, where plan and logical construction are not in unison, tells of the architectural amateur and is found in the Scott's designs.

Ravensworth's planning evidences Bowman's place within the society of the Hunter Valley's proud, confident, colonial pastoralists. It also demonstrates the hierarchy of Ravensworth's household. The separation of the main house from its domestic offices, the domestic offices from the farm buildings, and the precedence of various functions within the side wings is clear enough, showing the strata of colonial domestic society and not unusual, What is less clear, and curious, is the planning of the house itself.

Bowman's house appears to be of one build, but its plan is unusual. What seems to be at first glance a standard arrangement of central corridor with reception rooms and bedrooms appears, on closer analysis, to be a set of apartments with a communal reception room (probably a dining room or parlour).

There is no wide entrance hall as expected in a house of this status and only one bedroom is linked internally to another room. The other bedrooms were all accessed from the verandahs, front and back, while the western rooms (one

^{*}For a fuller account of the Scott brothers design see James Broadbent, The Australian Colonial House, published by Hordern House, 1997

sizeable, one smaller) appear to act as a separate suite. Little is known of the domestic arrangements and management of Ravensworth before the 1840s' depression, Could it be that the house was planned for a manager, a (largely) absent proprietor and gentleman travellers or guests? Unfortunately, later additions hinder understanding and confuse appreciation of this unusual planning.

Most importantly these additions greatly diminish the understanding and appreciation of what is, arguably, Ravensworth's greatest social (as opposed to architectural) significance: its unfinished state. Although the central block of the house is complete, a corresponding wing to the domestic offices was surely planned (to result in a tri-partite or "pseudo-Palladian" composition). But how was the yard to be completed at each end of the side ranges, linking them to the domestic wings and how was the northern end to be enclosed?

In 1842 the great colonial depression began, and, bankrupt, James Bowman died in 1846. Within this unfinished yard is a history of over-confidence, fictitious prosperity, over-speculation and failure. It is Bowman's legacy, but also the legacy of the Hunter Valley grandees and, indeed, of the early colony itself. Therein is the significance of Ravensworth- not in its later modifications and additions.

It is easy- and often convenient - to avoid analysis, assessment and judgement and to retreat into the fallacious argument that all alterations or additions are "significant". Sometimes they are, but that argument leads, ad absurdum, to the abnegation of responsibility, informed judgement and action, all change, decay, neglect, even demolition, being "part of the history of the place". Rather, what needs to be argued is why changes are significant- or not.

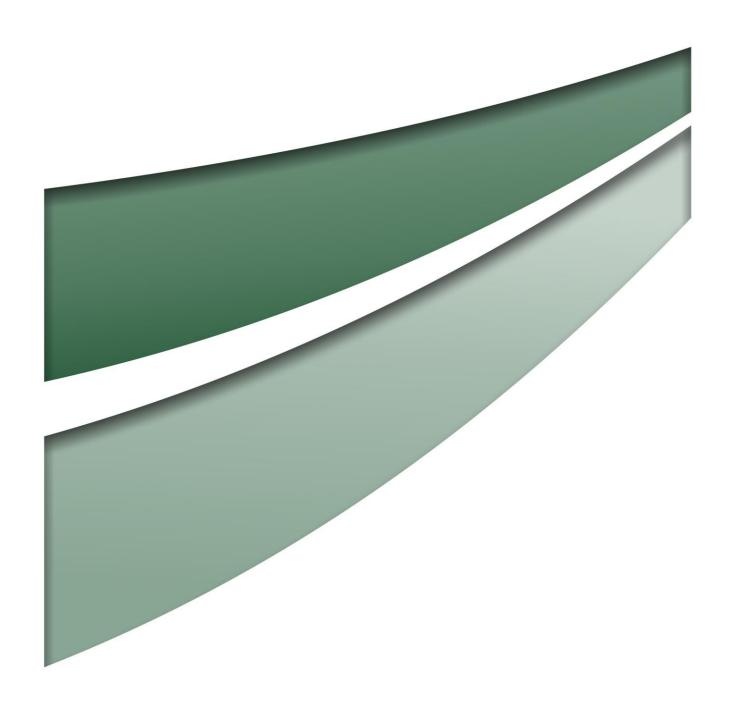
Compared with the vibrant history of early colonial Ravensworth later changeseither well built, badly built, aesthetically sympathetic or disruptive - are of little social or cultural importance. The heritage significance of Ravensworth is substantial despite, not because of, these changes. These additions obscure and diminish the understanding of Ravensworth's heritage significance.

Any addition, alteration or change is part of the history of a place, but three questions should be posed:

- What is the significance that they add to a place?
- How do they affect the significance of the original?
- Have they an intrinsic significance that warrants their exclusive listing irrespective of the original?

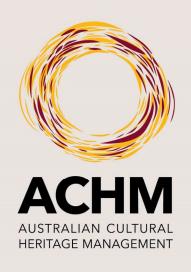
At Ravensworth the answers to these questions are surely in the negative.

Dr James Broadbent May 2020



APPENDIX 3

Revised ACHAR



Glendell Continued Operations Project

Aboriginal Cultural Heritage Assessment Report

By: Dr Shaun Canning

Date: 2 September 2020

Client Name: Umwelt Environmental and Social Consultants

Client Contact: Bridie McWhirter

Address: 75 York Street, Teralba, NSW, 2284

Phone: 02 4950 5322

Email: bmcwhirter@umwelt.com.au

ADELAIDE

BRISBANE MELBOURNE

PERTH

SYDNEY

1300 724 913 email@achm.com.au www.achm.com.au

Glendell Continued Operations Project

Aboriginal Cultural Heritage Assessment Report

By: Dr Shaun Canning

Date: 2 September 2020

Client Name: Umwelt Environmental and Social Consultants

Client Contact: Bridie McWhirter

Address: 75 York Street, Teralba, NSW, 2284

Phone: 02 4950 5322

Email: bmcwhirter@umwelt.com.au

Aboriginal Cultural Heritage Present within the Activity Area: Yes

www.achm.com.au 1300 724 913 email@achm.com.au

ADELAIDE | BRISBANE | MELBOURNE | PERTH | SYDNEY



Document Control Information

Document information

Client: Umwelt Environmental and Social Consultants

Client Contact: Bridie McWhirter

Title: Glendell Continued Operations Project

Subtitle: Aboriginal Cultural Heritage Assessment Report

Our Ref: P18-0089 Date: 2 September 2020

Version	Date	Details
1	17 September 2019	EIS Version
2	1 0	Updated to include PCWP values and redistributed to RAPs for 28-day review period. RAP feedback received on revised ACHAR incorporated.
3	2 September 2020	Final Version. Updated to include additional RAP feedback on ACHAR received after the 28-day review period.

Recipient Name	Organisation	Hardcopy	Electronic	Transmission Method	Purpose	Date	
Bridie McWhirter	Umwelt		Х	Share	Final Version	1 Sept 2020	

Author, Reviewer and Approver details						
Prepared by:	Dr Shaun Canning	Date: 1 Sept 2020	Signature:	Bung		
Reviewed by:	Numerous	Date: 2020	Signature:			
Approved by:	Dr Shaun Canning	Date: 1 Sept 2020	Signature:	Burk		

Ownership and Disclaimer

Ownership of the intellectual property rights of ethnographic information provided by Aboriginal people remains the property of those named persons.

Ownership of the primary materials created in the course of the research remains the property of Australian Cultural Heritage Management (Victoria) Pty Ltd.

This document remains the property of Umwelt Environmental and Social Consultants. This document may not be used, copied, sold, published, reproduced or distributed wholly or in part without the prior written consent of Umwelt Environmental and Social Consultants.

This document has been prepared in accordance with the brief provided by Umwelt Environmental and Social Consultants and has relied upon information provided by the client, or collected during the completion of the document and under the conditions specified in the document. All findings, conclusions and recommendations contained in the document are based on the aforementioned circumstances. The document is for the use of Umwelt Environmental and Social Consultants in addressing their brief and no responsibility is taken for the documents use by other parties.

The professional advice and opinions contained in this document are those of the consultants, Australian Cultural Heritage Management (Victoria) Pty Ltd, and do not represent the opinions and policies of any third party.

The professional advice and opinions contained in this document do not constitute legal advice.

Spatial Data

Spatial data captured by Australian Cultural Heritage Management (Victoria) Pty Ltd in this document for any newly recorded sites has been obtained by using hand held or differential GPS units using the GDA94 co-ordinate system.

P18-0089 Page | iii

Executive Summary

The Glendell Continued Operations Project (the Project) is a Glencore project to extend the life of coal mining operations at Glendell Mine to approximately 2044 and provide for ongoing employment for its existing workforce and contractors. The Project would also involve the ongoing use of the Mount Owen Complex Coal Handling and Preparation Plant (CHPP) and associated coal handling and transport infrastructure to approximately 2045. The new development consent being sought for the Project will include the current approved mining operation (and associated rehabilitation requirements) relating to the Glendell Pit at the Glendell Mine and therefore the Glendell Consent will be surrendered should approval be granted for the Project. In accordance with section 4.63(3) of the Environmental Planning and Assessment Act 1979 (EP&A Act), the consent authority is not required to re-assess the likely impact of continued development which is already approved pursuant to the existing Glendell Consent.

The Glendell Mine forms part of the Mount Owen Complex located in the Upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres (km) north-west of Singleton, 24 km south-east of Muswellbrook and to the north of Camberwell (see Map 1-1).

In addition to the Glendell Mine, the Mount Owen Complex comprises mining operations at the Mount Owen Mine (North Pit) and Ravensworth East Mine (Bayswater North Pit). The Mount Owen Complex also includes a coal handling and preparation plant (CHPP) and coal handling and transport infrastructure (see Map 1-2).

Mt Owen Pty Limited (Mount Owen) operates the Ravensworth East (Bayswater North Pit), the CHPP and Glendell mining operations at the Mount Owen Complex, with mining operations at the Mount Owen Mine North Pit operated by Thiess Pty Ltd pursuant to a contractual arrangement with Mount Owen. The Mount Owen Complex is adjacent to the Integra Underground, Liddell Coal Operations and Ravensworth Operations, which are also operations owned and operated by subsidiaries of Glencore and its joint venture partner (JV). Glencore and the JV partner also hold a number of exploration licences surrounding the Mount Owen Complex.

The Glendell Mine currently operates under development consent DA 80/952 (Glendell Consent). The Glendell Consent regulates the mining of coal from the Glendell Pit and the rehabilitation of the mining area. The processing of coal mined from the Glendell Pit is regulated by development consent SSD-5850 (Mount Owen Consent) which also regulates mining at the Mount Owen and Ravensworth East Mines, and associated activities. Liddell Coal Operations operates under development consent DA 305-11-01 (Liddell Consent). This consent regulates open-cut mining from the South Pit and Entrance Pit and associated facilities.

Australian Cultural Heritage Management (ACHM) has been engaged by Umwelt Environmental and Social Consultants (Umwelt) on behalf of Glencore to complete an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Project. This assessment forms part of an Environmental Impact Statement (EIS) being prepared by Umwelt to accompany an application for development consent. Under Section 4.5 of the EP&A Act, the consent authority for development applications for SSD is the Minister for Planning and Public Spaces unless otherwise prescribed by an environmental planning instrument. Clause 8A of the SSD SEPP prescribes the Independent Planning Commission as the consent authority in the following circumstances:

- (a) development in respect of which the council of the area in which the development is to be carried out has duly made a submission by way of objection under the mandatory requirements for community participation in Schedule 1 to the Act,
- (b) development in respect of which at least 50 persons (other than a council) have duly made submissions by way of objection under the mandatory requirements for community participation in Schedule 1 to the Act,
- (c) development the subject of a development application made by a person who has disclosed a reportable political donation under section 10.4 to the Act in connection with the development application.

At the time of submission of the development application, the Proponents had not made a reportable political donation as described in clause 8A(1)(c). Accordingly, the determination of consent authority for the Project will be dependent on the number and nature of objections received following the public exhibition of the applications and EIS.

Aboriginal Cultural Heritage Assessment Report

The process followed to consult with the Registered Aboriginal Parties (RAPs) has been a continuation of Glencore's overall approach to cultural heritage assessment in the Hunter Valley as previously utilised for the Bulga, Mount Owen, United Wambo JV and Mangoola EIS processes. Alongside this ACHAR, the existing Mount Owen Aboriginal Cultural Heritage Management Plan covers the Glendell Mine and part of the Project Area and has on-going consultation mechanisms through the working group convened under that plan.

When engaging in Aboriginal cultural heritage assessments within the Hunter Valley, members of the Aboriginal community(s) have self-nominated to be part of either (a) representative bodies or (b) to participate in cultural heritage assessment processes as individuals.

The representative bodies for the Project are known as 'Knowledge Holder Groups' in this ACHAR, and they are:

- Wonnarua Nation Aboriginal Corporation (WNAC)
- Plains Clans of the Wonnarua People (PCWP), and the
- Individuals and groups not involved in the consultation and reporting processes of the Knowledge Holder Groups but who registered as RAPs were consulted separately, and their values are reported on by ACHM in this report. These individuals are referred to throughout this report as the 'Community RAPs'.

The process provided consultation and engagement for all the RAPs and allowed opportunities for additional information, stories and knowledge from Wonnarua people to be made known.

Cultural values assessment for the Community RAPs was undertaken by ACHM. The understanding of significance and the RAPs recommendations has also informed the Project on the development of a range of cultural heritage management recommendations. Any publicly disclosed documents from the Knowledge Holder Groups are included in this report.

Through the involvement of RAPs who identify a range of connections to both country and community, and through several past cultural heritage investigations (most notably the extensive assessments and consultations through the Mount Owen Continued Operations Project ACHAR undertaken between 2011-2013) the region surrounding the Project Area is known to contain a number of archaeological sites and to also hold certain cultural, historic and aesthetic values. The wider region has been identified as being of high cultural significance to many Wonnarua people, however the Project Area has been assessed during this ACHAR process as holding lower cultural significance than much of the surrounding region.

This ACHAR also presents a summary of the archaeological values assessment of the GCOP as well as a synthesis of the values and recommendations of all RAPs who participated in the cultural heritage assessment process.

Assessment Approach

This ACHAR has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) for the Project, the requirements of the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment (DEC 2005), the Community Consultation guidelines of the current Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010a), and the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011). It has also been prepared in accordance with, and it also complies with the intent, requirements and assessment methodologies outlined in the Burra Charter (Australia ICOMOS 1999). The ACHAR has also been informed by the results of the Aboriginal Archaeological Impact Assessment (AAIA) undertaken by OzArk (2019).

Consultation Process

Consultation for the Project was undertaken consistent with the DEC (2005) and DECCW (2010a) guidelines and in accordance with the principles of the Burra Charter (Australia ICOMOS 1999). This has involved four consultation stages as detailed below.

Stage 1: Formal notification of the proposed Project and the ACHAR process and provided the opportunity for Aboriginal people to formally register their interest in the Project.

Stage 2: Initial Project description consultation, which included presenting information on the proposed Project to all Aboriginal parties who registered an interest in **Stage 1**. This consultation included details of the Project Area and potential impacts, and a description of works proposed. During the initial consultation phase, the draft Aboriginal cultural heritage survey methodology and archaeological testing methods (OzArk 2018) were issued for review by the RAPs. Consultation with the RAPs involved a combination of methods, including some one on one meetings, small and large group briefing sessions, including onsite inspections. **Stage 2** also included correspondence with PCWP to provide them with either the option to participate in the workshop process or to produce their own cultural values report for inclusion in this ACHAR.

Stage 3: Further consultation which refined the cultural heritage assessment approach with the WNAC and Community RAPs. The approach actively involved the WNAC and Community RAPs in the assessment of their cultural heritage values, the likely Project impacts, and the development of management measures. Consultation with the Knowledge Holder Groups was also proposed via a series of cultural values workshops.

Stage 4: Lengthy consultation was undertaken in relation to the RAPs review of the draft ACHAR, so as to seek feedback, modify this ACHAR as appropriate, receive and review submissions and to incorporate any additional

input into the finalised ACHAR. The AAIA (OzArk 2019) report was also circulated to the RAPs for 28-day review and comment. This process took over 12 months, as discussed in more detail below.

Registered Aboriginal Parties

Throughout the course of the consultation program, 32 parties registered an interest in the Project.

The RAPs included individuals from:

- Two Knowledge Holder Groups (PCWP and WNAC);
- The Wanaruah Local Aboriginal Land Council; and
- Community RAPs.

A full list of all RAPs is contained in Appendix A.1

All RAPs were invited to participate in the assessment process from the time of their registration, with extensive consultation undertaken to inform the Project, the ACHAR, the AAIA (OzArk 2019) and the broader environmental assessment of the Project.

Participation opportunities have been provided to the RAPs through:

- Two workshops;
- Discussions and/or meetings with individuals;
- Provision of archaeological survey and test pit methodologies for review,
- Archaeological investigations including survey and test excavation fieldwork onsite;
- Historic research and archaeological excavation fieldwork onsite; and
- Extensive correspondence between RAPs and the Project team via phone and email.

Throughout the Project, information was provided to RAPs in formal meetings or presentations and via mail, email or phone contact. Full details of the consultation process undertaken in relation to the ACHAR are contained in **Section 5** and copies of correspondence are contained in **Appendix B** (Consultation Records).

The consultation approach also provided the RAPs with opportunities to decide in what manner they wanted their information shared and to identify any restricted access provisions. The process provided opportunities to identify a range of Aboriginal cultural values within the Project Area.

Glencore has engaged with the PCWP since the commencement of the Project's environmental assessment. This has included numerous meetings and phone calls. At the time of finalisation of the ACHAR in November 2020, the PCWP had not elected to participate in a Values and Recommendations Workshop. Since this time, PCWP have provided a Values Report on 12 June 2020 and the ACHAR has subsequently been updated to include consideration of these Values.

Engagement has raised the PCWP's concerns regarding colonial frontier violence and claims of a massacre of Aboriginal people. This was also the subject of an Application under section 10 of the Aboriginal Torres Strait Islander Heritage Protection Act 1984 (ATSIHP Act), made by some members of the PCWP. This has since been withdrawn and is discussed further in Section 1.5.1. It is also the focus of the additional work that was commissioned for this Project which is discussed in Section 3.2 and Section 3.3.

Since the receipt of the PCWP Values report on 12 June 2020, a revised Application was lodged by the PCWP under the ATSIHP Act section 9 and 10 on 7th July 2020 seeking to protect a Specified Area which includes the Project Area.

Additional RAP Feedback

Following receipt of the PCWP Cultural Values Report, this ACHAR was revised to include PCWP values. Due to the revisions made to the ACHAR and in accordance with the Guide (DECCW, 2010), the revised ACHAR was provided to the Project's RAPs for a 28 day review period from 21 July to 19 August 2020 so as to enable the RAP's to provide any feedback. Additional feedback was received from 8 RAPs and that feedback has been incorporated in Appendix G of this ACHAR.

Aboriginal Archaeology Impact Assessment Report

An AAIA was undertaken by OzArk alongside this ACHAR. The full AAIA report is included as Appendix D.

The majority of Aboriginal sites identified have been assessed as having low scientific significance. The overall low scientific significance of the new sites is directly related to the extensive and long-running previous disturbances within the Project Area.

Aboriginal Cultural Heritage Assessment Report

RAPs consulted for the ACHAR identified concerns with current and future mining within the broader region, and that this mining poses a significant threat to Aboriginal cultural heritage values. Many RAPs expressed the view that mining continues to cause fragmentation to the cultural, spiritual and historic values of the cultural landscape including degradation to important waterways. There were also some concerns expressed about the fate of the Ravensworth Homestead complex.

Direct Impacts

The Project will directly impact a number of archaeological sites if approved, as discussed in the AAIA. The Project will also have direct impact to the Ravensworth Homestead complex.

Indirect Impacts

The Project may also result in indirect impacts on Aboriginal cultural heritage values. The indirect impacts often identified by RAPs include:

- Difficulty in remembering the landscape as it was prior to mining;
- Difficulty for Wonnarua people in accessing much of the land in the Hunter Valley due to private ownership and/or mining;
- Regardless of the current condition and/or status of the land in question, Wonnarua people still feel a direct connection to the country of their ancestors, which would be further disrupted by more mining; and
- The predicted direct and indirect impact on the Aboriginal cultural heritage values of the Project Area add to the cumulative impact of mining development on the cultural heritage resources of the Upper Hunter Valley.

RAPs provided positive feedback regarding the indirect intergenerational impacts of this ACHAR process. The process has allowed stakeholders to (a) involve themselves in detailed archaeological and cultural values consultations and (b) to have discussions with family members and particularly Elders who may not otherwise have been involved in the assessment processes. This has allowed the RAPs the opportunity to engage with these Elders to ensure thorough consultation providing positive intergenerational outcomes.

Cumulative Impacts

Though the Project has been designed to avoid harm wherever practicable and the archaeological significance of the majority of sites within the Additional Disturbance Area is low, the Project's impacts will further contribute to the cumulative loss of Aboriginal cultural values and archaeological sites within the local area, and the region more generally. The direct impacts to the Ravensworth Homestead complex will also further contribute to the perceived loss of cultural values in the Project Area, however the relocation of the building group will mitigate some of the heritage loss associated with the Project.

Avoidance of Harm

In developing the footprint and the disturbance zone of the proposed Project, the Proponent has considered numerous mining options, layouts, overburden emplacements and infrastructure arrangements to optimise the Project's final design to avoid harm to as many Aboriginal sites as possible.

Aboriginal Cultural Heritage Management Measures

The management measures proposed for the Project align to the Principles of the Burra Charter (ICOMOS, 1999) and to the Aboriginal Community Wellbeing toolkit and criterion from OEH (OEH 2012). As a result of this assessment process, three of the eight wellbeing principles have been identified as priority areas most aligned to the context of the GCOP Project. Most of the recommendations from the RAPs for this project are more oriented towards social values (i.e. employment, education and training) rather than purely cultural values, however the recommendations should be viewed considering their cultural context.

The three principles most aligned are the following:

- Caring for Land and/or Cultural Awareness;
- Bringing People Together; and
- Education and learning.

P18-0089 Page | **vii**

These principles, in conjunction with the consultation outcomes with the RAPs, have informed the development and evaluation of management measures proposed for the GCOP Project.

Further, the following key considerations also guide the GCOPs recommendations and management outcomes:

- Alignment of the outcomes with the principles of the Strengthening Aboriginal Community Wellbeing Toolkit (OEH 2012) and the Burra Charter (2013);
- Aligning the recommendations with the findings of this ACHAR;
- Delivery of proposed management measures which are achievable;
- Includes a mix of short term and long-term management measures and implementation periods; and
- Foster and promote intergenerational equity through caring for country, education and research initiatives.

Management Recommendations

A range of management recommendations are presented in Section 8. These recommendations have been developed in conjunction with the RAPs for the Project.

The management measures are based on the key themes and values of the RAPs which have been identified through the ACHAR process.

The proposed management and mitigation measures have also been separated into those located onsite (within the Project Area) and those which are offsite (outside the Project Area or not requiring physical works within the Project Area). The management and mitigation measures have also been developed to address intergenerational equity aspects and to respect the regional significance of culturally significant features which surround the Project Area. These management measures have been developed in order to be consistent with the management measures recommended by the RAPs during this ACHAR process.

Conclusions

Alongside a previous ACHAR over the wider Project area (the Mount Owen Continued Operations Project ACHAR), this ACHAR has reaffirmed that there are no *traditional cultural values* associated with the Project Area (directly and specifically) held by the participants in this ACHAR process. By '*traditional*' cultural values, we refer to these in the Native Title sense as an inherited and cohesive body of '*traditional*' knowledge, laws and customs that are still observed and maintained by a particular Indigenous group.

However, in common with many urbanised communities, strong contemporary cultural values exist in almost universal claims of 'connection' to the land in question, and a sense of anguish and/or anger at having been 'disconnected' from the land in question by historical circumstances. In this case, the RAPs also expressed a potential for there to have been connections through time with the Ravensworth Homestead complex, however none of the RAPs had any direct knowledge of any of their ancestors having a direct association with the property.

It is the opinion of the author that the Project Area has undergone considerable modification since European settlement. Traditional Aboriginal lifeways and customs began to disappear in the early days of contact with Europeans and had largely disappeared before the turn of the 19th Century. Much of the natural landscape no longer exists in any cohesive manner, as the long history of agriculture in the area has irreversibly altered the landscape. Combining the historical disconnection of people from place with the extensive landscape modification since settlement means that the Project Area has a relatively low cultural significance when compared to other places within the wider region. This is also consistent with the archaeological assessment, which has determined that most of the archaeological sites are of low to moderate scientific significance.

P18-0089 Page | **viii**

Table of Contents

Ow	nershi	p and [Disclaimer	iii
Spa	itial Da	ta		iii
Exe	cutive	Summ	ary	iv
1	Intro	ductior	1	1
	1.1	Proje	ct Overview	1
	1.2	Struc	ture of the Report	4
	1.3	Key Is	ssues	4
		1.3.1	Roadmap of the Report	5
		1.3.2	Aboriginal Cultural Heritage Assessment Approach and Objectives	5
	1.4	Regis	tered Aboriginal Parties	6
		1.4.1	Other Consultant Input	6
		1.4.2	About Dr Shaun Canning	6
	1.5	Legis	ative Environment	7
		1.5.1	Commonwealth Legislation	7
		1.5.2	State Legislation	8
2	Desci	ription	of the Site	9
	2.1	Land	Ownership	9
	2.2	Envir	onmental Overview	9
		2.2.1	Topography / Landforms and Drainage	9
		2.2.2	Geological Features and Resource Description	9
		2.2.3	Existing Environmental Conditions	11
		2.2.4	Climate	11
3	Histo	rical Ba	ackground	12
	3.1	Histo	rical Narrative of the Region	12
		3.1.1	Prior to White Settlement	12
		3.1.2	Post European Settlement	15
	3.2	Comr	nent on Potential Massacre Sites	17
		3.2.1	Umwelt (2004 assessment of the Ravensworth Massacre Site (#AHIMS 37-3-0390)	17
		3.2.2	Mt Owen ACHAR (ACHM 2013)	18
	3.3	Dr M	ark Dunn's Historical Research	20
		3.3.1	Upper Hunter Valley Massacre Site Card (#AHIMS 37-3-0390)	20
	3.4	Post-	Contact Land Use within the Project Area	20
4	Archa	aeology	of the Project Area	23
	4.1	Abori	ginal Archaeological Impact Assessment	23
	4.2	Asses	sment of Scientific Significance	24
		4.2.1	Likely Impacts to Aboriginal Cultural Heritage as a result of the Project	28

	4.3	Archa	aeological Management of Known Aboriginal Sites	30
		4.3.1	Archaeological salvage	30
		4.3.2	Sites requiring specific management to prevent harm	35
		4.3.3	Sites located on LCO owned land	35
	4.4	Histo	orical Archaeology	36
		4.4.1	Potential location of early house: Test Area 1	36
		4.4.2	Potential agricultural/ garden features: Test Area 2	36
		4.4.3	Main house and immediate surrounds: Test Area 3	36
		4.4.4	Potential convict barracks: Test Area 4	37
		4.4.5	Yards and Buildings: Test Area 5	37
		4.4.6	Buildings, Potential Gardens and Agricultural Features: Test Area 6	37
		4.4.7	Potential European Burial: Test Area 7	37
		4.4.8	Results	37
		4.4.9	Significance of Ravensworth Homestead	38
5	Abor	iginal C	Community Consultation	40
	5.1		ultation Objectives and Approaches	
	5.2		ral Heritage Assessment Process for the Project	
		5.2.1	Four Stages of Consultation and Assessment	
		5.2.2	Agency Notification	
		5.2.3	Public Notification	
		5.2.4	Written Notification to invite Participation in the ACHAR Process	
		5.2.5	Registration of Aboriginal Parties	
		5.2.6	Draft Archaeological Survey Methodology	
		5.2.7	Draft Archaeological Test Pitting Methodology	
	5.3	Stage	e 4 Consultation – Draft ACHAR Review	
		5.3.1	Comment on the Draft ACHAR	
		5.3.2	Additional RAP Feedback	44
	5.4	Sumr	mary of Consultation Activities	44
6	Cultu	ıral Her	ritage Values and Significance Assessment	4 5
Ū	6.1		nition of Cultural Significance	
	6.2		re of Cultural Significance	
	0.2	6.2.1	Aesthetic Value	
		6.2.2	Historic Value	
		6.2.3	Scientific Value	
		6.2.4	Social Value	
		6.2.5	Spiritual Value	
	6.3		ee of Cultural Significance	
	5.5	6.3.1	Rarity	
		6.3.2	Representativeness	
		6.3.3	Condition, Integrity and Authenticity	
		0.5.5	Condition, integrity and Addictionly	4/

	6.4	Col	ecting Cultural Values Information	47
		6.4.1	Questionnaire	47
	6.5	WN	AC Cultural Values Workshops	48
	6.6	Hic	key's Cultural Values Workshops	48
	6.7	PCV	VP Cultural Values	48
	6.8	Cor	nmunity RAPs Cultural Values	49
	6.9	Dor	ninant Themes	49
		6.9.1	Limitations	49
	6.10	Cor	solidated Cultural Values	50
	6.11	Cul	cural Significance	52
		6.11	1 Summary Opinion	52
		6.11	2 Draper Report (2020)	53
		6.11	3 OzArk Response to Draper Report	54
		6.11	4 Dr Mark Dunn Response to Draper Report	60
	6.12	Cor	clusions	63
7	Avoid	ance	of harm	64
	7.1	Pro	ject Rationale	64
	7.2	Opp	portunities to avoid impact	64
	7.3	Sus	tainable Development Principles	64
8	Recor	nme	ndations	65
	8.1		oduction	
	8.2		nagement Measures	
		8.2.1		
		8.2.2		
		8.2.3		
		8.2.4	Proposed Management Measures	69
	8.3	Ma	nagement Measures - No Project Approval Scenario	74
9	Riblio	gran	hy	75
,				
10	Gloss	ary		77
App	endix	Α	Table of all Consultation Activities	85
App	endix	В	Consultation Documentation	90
App	endix	С	ACHAR 28-Day Review Feedback	241
App	endix	D	Aboriginal Archaeology Impact Assessment (AAIA) Report	249
App	endix	E	PCWP Cultural Values Report	250
Арр	endix	F	Upper Hunter Valley Contact History by Dr Mark Dunn	251
Apr	Appendix G		Further ACHAR Feedback - August 2020	252

List of figures

Figure 3-1:	The boundary lines of the Wonnarua and their neighbours according to Norman Tindale (1940)	13
Figure 4-1:	Front entrance of the Ravensworth Homestead (Photograph by Shaun Canning)	36
Figure 5-1:	The integrated ACHAR approach utilised for this Project	41
Figure 6-1:	Test analysis of the questionnaire responses from 17 of the RAPs who provided feedback	48
Figure 10-1:	Public Notice in the Muswellbrook Chronicle	91
Figure 10-2:	Public Notice in the Singleton Argus.	92
List of	maps	
	cation of the Glendell Continued Operations Project	2
	pposed Project	
•	nd Ownership.	
	Mile Radius of Chilcot's and Alcorn's Huts	
	nements within the Project Area	
List of	tables	
Table 1-1:	Report Roadmap	5
Table 1-2:	EIS and ACHAR Consultants.	6
Table 1-3:	Secretary's Environmental Assessment Requirements	8
Table 4-1:	Scientific significance of newly recorded sites	24
Table 4-2:	Significance assessment of previously recorded sites.	26
Table 4-3:	All known sites within or closely adjacent to the Additional Disturbance Area	28
Table 4-4:	Management recommendations for sites within the Proposed Disturbance Footprint	30
Table 4-5:	Sites requiring specific management to ensure conservation	35
Table 4-6:	Sites located on LCO owned land	35
Table 5-1:	Agency Notifications	42
Table 6-1:	Consolidated Cultural Values	51
Table 8-1:	Community RAP recommendations	66
Table 8-2:	Recommendations made by the Wanaruah Local Aboriginal Land Council	66
Table 8-3:	Recommendations made by the Wonnarua Nation Aboriginal Corporation	67
Table 8-4:	Recommendations made by the Plains Clan of the Wonnarua People	67
Table 8-5:	This table is a consolidated management recommendations and options table based on management recommendations from the WLALC, WNAC, PCWP and Community RAPs for this and other ACHAR's.	68
Table 8-6:	Proposed On-Site Management Measures from the Project	
Table 8-7:	Proposed Off-Site Management Measures. The following are indicative off-site	
	management measures and more detailed measures are being developed as the ACHAR process continues.	72

1 Introduction

ACHM has been engaged by Umwelt Environmental and Social Consultants to complete an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Glendell Continued Operations Project (the Project). The purpose of the assessment is to form part of an Environmental Impact Statement (EIS) being prepared by Umwelt to accompany an application for development consent under Divisions 4.1 and 4.7 of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) for the Project.

This ACHAR has been prepared in accordance with the SEARs the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010a), and the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011). It also been prepared in accordance with, and it also complies with the intent, requirements and assessment methodologies outlined in the Burra Charter (Australia ICOMOS 1999).

A stand-alone Aboriginal Archaeological Impact Assessment (AAIA) report was prepared by OzArk Environmental and Heritage Management (OzArk) to assess the archaeological values of the Project Area and provide management recommendations for sites within the Project Area. The results of that archaeological assessment have been incorporated into this ACHAR. Historical archaeological investigations were also undertaken at the Ravensworth Homestead complex and surrounds by Casey & Lowe Pty Ltd.

At the time of completion of this ACHAR in November 2019 and its subsequent inclusion within the Project EIS, PCWP had not provided their Values Report for inclusion into the ACHAR. Glencore has now received a Values Report from the PCWP in July 2020. The ACHAR has been updated to include consideration of these Values.

1.1 Project Overview

The Glendell Mine is part of the Mount Owen Complex located in the Upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres (km) north-west of Singleton, 24 km south-east of Muswellbrook and to the north of Camberwell.

In addition to the Glendell Mine, the Mount Owen Complex comprises mining operations at the Mount Owen Mine (North Pit) and Ravensworth East Mine (Bayswater North Pit). The Mount Owen Complex also includes a coal handling and preparation plant (CHPP) and coal handling and transport infrastructure (refer to Map 1-2).

Mt Owen Pty Limited (Mount Owen) operates the Mount Owen CHPP, Ravensworth East and the Glendell mining areas with mining operations at the Mount Owen Mine North Pit operated by Thiess Pty Ltd pursuant to a contractual arrangement with Mount Owen. The Mount Owen Complex is adjacent to the Integra Underground, Liddell Coal Operations and Ravensworth Operations, which are also operations owned and operated by subsidiaries of Glencore Coal Assets Australia Pty Limited (Glencore) and its joint venture partner (JV). Glencore and the joint venture partner also hold a number of exploration licences surrounding the Mount Owen Complex.

The Glendell Mine currently operates under development consent DA 80/952 (Glendell Consent). The Glendell Consent regulates the mining of coal from the Glendell Pit and the rehabilitation of the mining area. The processing of coal mined from the Glendell Pit is regulated by development consent SSD-5850 (Mount Owen Consent) which also regulates mining at the Mount Owen and Ravensworth East Mines, and associated activities. Liddell Coal Operations operates under development consent DA 305-11-01 (Liddell Consent). This consent regulates open-cut mining from the South and Entrance Pits and associated activities.

This proposed extension of the current open cut mining operations at the Glendell Mine would extract approximately an additional 135 million tonnes (Mt) of run of mine (ROM) coal. This extension of the Glendell Pit is referred to as the Glendell Pit Extension. The Glendell Pit Extension will extract reserves down to and including the Hebden Seam. The Project would extend the life of mining operations at Glendell to approximately 2044.

In addition to the existing operations, this development consent would cover the Glendell Pit Extension and works directly associated with the pit extension including:

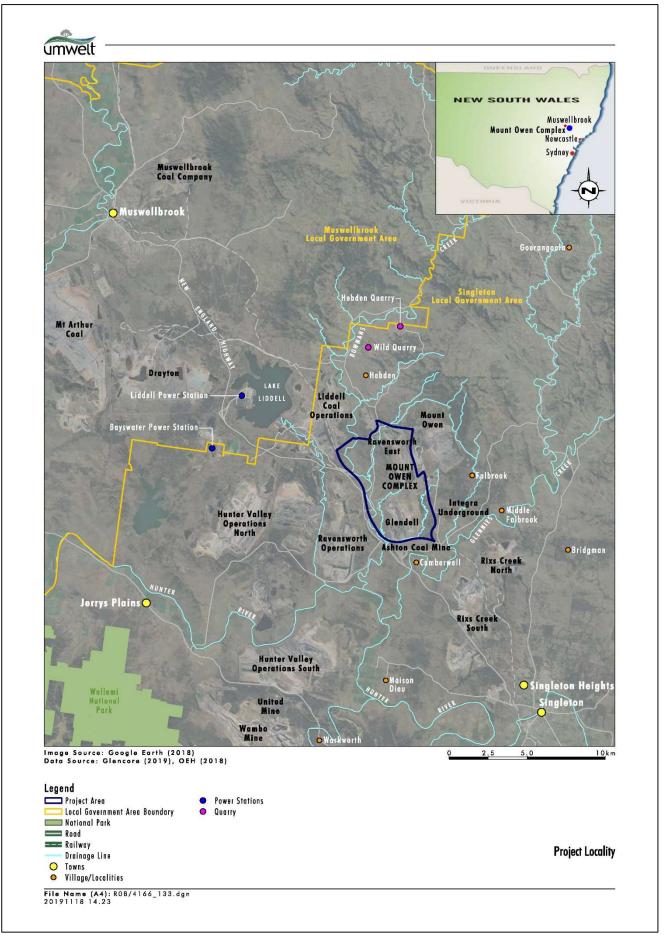
Rehabilitation of areas disturbed by mining activities, including overburden emplacement areas

Realignment of a section of Hebden Road

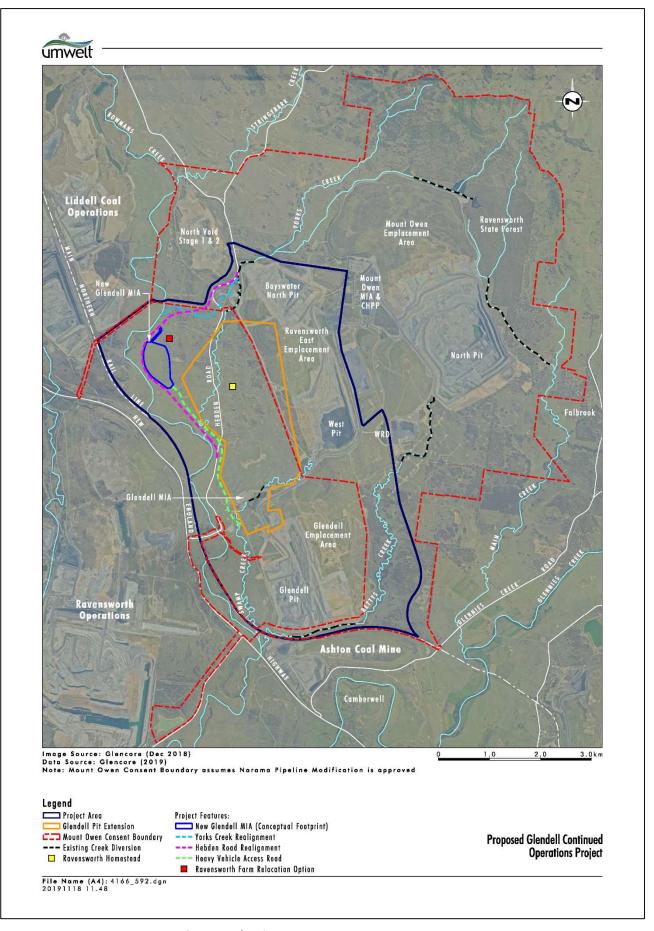
Relocation of Ravensworth Homestead

Realignment of the lower section of Yorks Creek

Construction and use of new mine infrastructure area (MIA) facilities, related infrastructure and associated access roads.



Map 1-1: Location of the Glendell Continued Operations Project



Map 1-2: Proposed Project

1.2 Structure of the Report

The format of this report mirrors the format recommended by the Office of Environment and Heritage (OEH) in the 'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in New South Wales' (OEH 2011).

The process followed to consult with the Registered Aboriginal Parties (RAPs) has been a continuation of Glencore's overall approach to cultural heritage assessment as previously utilised for the Bulga, Mount Owen, United Wambo JV and Mangoola EIS processes. When engaging in Aboriginal cultural heritage assessments within the Hunter Valley, members of the Aboriginal communities may choose to be part of representative bodies or to participate in cultural heritage assessments as individuals.

The representative bodies for this Project are known as 'Knowledge Holder Groups' in this ACHAR, and they are:

- Wonnarua Nation Aboriginal Corporation (WNAC)
- Plains Clan of the Wonnarua People (PCWP),

RAPs whose views were not captured by those Knowledge Holder Groups were also consulted for this ACHAR, and their cultural values, care and control and conservation recommendations have been included in this report.

This ACHAR presents a summary of the archaeological values assessment of the Project Area as well as a synthesis of the values and recommendations of all RAPs who participated in the cultural heritage assessment process.

Section 1 of this report introduces the Project and the ACHAR within the Project, EIS and legislative contexts.

Section 2 of this report describes the Project Area and presents a discussion of the land ownership and environmental background of the Project Area. A review of historical land use practices and previous approvals for other mining activities relevant to the Project are also discussed.

Section 3 presents a historical narrative of the Project Area.

Section 4 includes the results of the AAIA (OzArk 2019) undertaken for the Project and concludes with an assessment of the scientific significance of Aboriginal sites and objects identified through the archaeological assessment. Historical archaeological investigations of the Ravensworth Homestead complex are also discussed. The AAIA is contained in **Appendix D**.

Section 5 outlines the extensive consultation processes undertaken with RAPs for this ACHAR.

Section 6 presents a discussion on cultural heritage values and significance assessment in general, alongside a consolidated statement of significance for the Aboriginal Places within the Project Area formulated according to the cultural heritage industry best-practice guidance of the Burra Charter (Australia ICOMOS 1999).

Section 7 discusses opportunities for avoiding and/or mitigating harm to Aboriginal cultural heritage.

Section 8 presents management recommendations developed by the Project stakeholders for both 'Project Approval' and 'No Project Approval' scenarios. Specific recommendations regarding intergenerational equity are also discussed.

1.3 Key Issues

The Aboriginal community of the Hunter Valley shares many similarities with other Aboriginal communities throughout Australia. One of those similarities is a degree of division among the people living in the Hunter Valley. There are divisions between several family groups, Knowledge Holder Groups and individuals, which at the time of writing showed no progress towards resolution. Resolving this issue is beyond the scope of this report. Because of these divisions within the community and groups, the individuals who registered as RAPs could not be consulted as a single group, and an alternative approach was required.

Following initial public notification and targeted invitations, 29 parties registered for this project. By the end of the process, there were 32 RAPs.

In the interests of ensuring that all interested Aboriginal parties were consulted, the Project embarked on a process of consultation and reporting that has been utilised previously by Glencore for the Bulga, Mount Owen, United Wambo JV and Mangoola projects.

Glencore has engaged with the PCWP since the commencement of the Project's environmental assessment. This has included numerous meetings and phone calls. At the time of finalisation of the ACHAR in November 2019, the PCWP had not elected to participate in a Values and Recommendations Workshop. Since this time, PCWP have provided a Values Report on 12 June 2020 and this ACHAR has subsequently been updated.

Engagement has raised the PCWP's concerns regarding colonial frontier violence and claims of a massacre of Aboriginal people. This was also the Subject of an Application under section 10 of the ATSIHP Act, made by some members of the PCWP. This has since been withdrawn and is discussed further in Section 1.5.1. It is also the focus of the additional work that was commissioned for this Project which is discussed in Section 3.2 and Section 3.3.

Since the receipt of the PCWP Values report on 12 June 2020, a new section 9 and 10 Application was lodged by some members of the PCWP on 7 July 2020 seeking to protect a Specified Area which includes the Project Area.

The key points of the ACHAR consultation process are as follows:

- There were two Knowledge Holder Groups (WNAC and PCWP) registered for the Project.
- Individuals not involved in the consultation and reporting processes of the two knowledge holder groups but who registered as RAPs were consulted separately, and their values are reported on by ACHM in this report. These individuals are referred to throughout this report as the 'Community RAPs'
- One family group requested that they be consulted separately to all other groups (Hickey family). Feedback from the Hickey's has been included with the feedback from the Community RAPs.
- When this ACHAR was originally finalised, the PCWP were yet to provide their values for input. However, in
 the ensuing 8 months Glencore has continued to engage with the PCWP and ultimately received their Values
 Report in June 2020. This ACHAR has subsequently been updated to include consideration of the PCWP's
 Values.
- The process provided consultation and engagement for all the RAPs and allowed opportunities for additional information, stories and knowledge from Wonnarua people to be made known.

1.3.1 Roadmap of the Report

For ease of reference, the following table provides page numbers and reference points to key issues in this report.

Key Item	Section	Page
Project Overview	1.1	3
ACHAR Objectives	1.3.2	8
SEARs	1.5.2	10
Consultation Processes	4.4	31
Cultural Values and Significance Assessment	6.0	66
Recommendations	8.0	81

Table 1-1: Report Roadmap

1.3.2 Aboriginal Cultural Heritage Assessment Approach and Objectives

The cultural values and archaeological assessments culminating in the preparation of this ACHAR have been undertaken to provide:

- 1. Extensive and meaningful opportunities for engagement and consultation with Knowledge Holders and RAPs for the Project,
- 2. Full compliance with the Secretary's Environmental Assessment Requirements (SEARs),
- 3. Full compliance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010a),
- 4. Full compliance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011),
- 5. An objective archaeological assessment to determine the scientific significance of the archaeological places within the Project Area, and
- 6. The identification of cultural values and the determination of cultural significance which are consistent with the guidance provided in the Burra Charter and Indigenous Cultural Heritage Management Practice Note (Australia ICOMOS, 2013).

The objectives of this report are to:

1. Present the Project's consultation methodologies and processes as agreed with the RAPs and utilised in this Project, and

- 2. Ensure that Aboriginal people can participate in and improve the outcomes of the assessment by:
- (d) Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the Project Area,
- (e) Influencing the design of the method to assess cultural and scientific significance of Aboriginal object(s) and/or place(s) within the Project Area,
- (f) Actively contributing to the development of cultural heritage management options and recommendations for any Aboriginal object(s) and/or place(s) within the Project Area; and
- (g) Commenting on draft assessment reports before they are submitted by the proponent as part of the EIS.

1.4 Registered Aboriginal Parties

This report is a consolidation of cultural values assessments undertaken and reported on with the RAPs by ACHM for this Project. It also relies heavily on the extensive cultural values assessments completed for the Mount Owen Continued Operations Project ACHAR in 2011 and 2012 (ACHM, 2013). Any information produced by the consultation processes as utilised for this report were compliant with the 2010 OEH Draft Guidelines for Community Consultation, and the results of that information is consolidated and presented in this ACHAR.

The groups who registered and were consulted are:

- WNAC,
- 2. PCWP, and
- 3. Community RAPs

The Community RAPs are not usually members of the Knowledge Holder Groups but are RAPs for the Project. ACHM was also contracted to undertake the community consultation and cultural values reporting with this group. The results of that consultation process are presented in this report. The Hickey family are a part of the Community RAPs; however as noted, they requested a separate consultation process.

The consultation process has involved consultation with all 32 RAPs from the discrete groups. The process has also facilitated the knowledge holder groups having the ability to consult with Aboriginal people who (a) were not RAPs for the Project but (b) are traditional owners of the Hunter Valley area, and therefore constitute important stakeholders.

1.4.1 Other Consultant Input

Several parties have been involved in the preparation of components of this report.

Alongside the consultants noted in Table 1-2, below, Project personnel have also provided extensive amounts of information and support for the final report.

Organisations	Individual(s)	Role	
ACHM	Dr Shaun Canning	ultural values recording, consultation workshops, significance assessment, ACHAR consolidation and reparation	
OzArk	Ben Churcher	Archaeological survey, excavation and reporting	
Casey & Lowe	Mary Casey	listoric archaeological excavations and reporting	
Umwelt	Bridie McWhirter	EIS preparation, GIS, environmental and proposed development sections, mapping, historic heritage	
Mark Dunn	Mark Dunn	Historical research and reporting on interactions between Aboriginal people and early settlers within and around Ravensworth Estate	

Table 1-2: EIS and ACHAR Consultants.

This report has been prepared by Dr Shaun Canning, Principal Heritage Advisor with ACHM.

1.4.2 About Dr Shaun Canning

Dr Shaun Canning is the Managing Director and the Principal Heritage Advisor of Australian Cultural Heritage Management (Vic) Pty Ltd. (ACHM), which specializes in cultural heritage assessment, expert advice, management of complex and large-scale cultural heritage management projects (primarily in relation to Australian Indigenous culture and heritage), native title advice and research, Indigenous community consultation and development matters, geographic information systems, cartography and analysis. Shaun has been involved extensively in the completion of over 500 cultural heritage management projects nationally.

Shaun holds a Bachelor of Arts degree majoring in Cultural Heritage Studies and Anthropology, a Bachelor of Applied Science (Hons) degree in Parks, Recreation and Heritage, and a PhD in Australian Indigenous Archaeology

(La Trobe), specialising in predictive modelling and cultural heritage management in southern Victoria. Shaun was the recipient of a 3-year Australian Postgraduate Award Scholarship to complete his PhD. Shaun has extensive experience in Indigenous cultural heritage management in the resources, urban development, infrastructure and public land management sectors, alongside considerable experience in community consultation and Aboriginal education. Shaun has expertise in complex project management, and the use of GIS and predictive modelling in archaeological, cultural and natural heritage management contexts.

Shaun is a Fellow of the Australian Anthropological Society (F.AAS), a member of the International Council on Monuments and Sites (M. ICOMOS), a full member of the Australian Association of Consulting Archaeologists (M. AACAI) and a Certified Environmental Practitioner (CenvP) through the Environment Institute of Australia and New Zealand (EIANZ).

Shaun is an 'Expert Member' of the ICOMOS International Committee on Archaeological Heritage Management (ICAHM), an Honorary Research Associate of the Archaeology Program at La Trobe University, a member of the Indigenous Relations Working Group committee of the Minerals Council of Australia, and a member of the EnviroDevelop Technical Standards Development Taskforce for the Urban Development Institute of Australia (UDIA). He is the current Chair of the EIANZ Heritage Special Interest Section (SIS).

1.5 Legislative Environment

The following sections present the Commonwealth and State statutory controls that provide legal protection for Aboriginal cultural heritage in NSW, and that identify the approval processes for any proposed Project that seeks to impact Aboriginal cultural heritage places and objects.

1.5.1 Commonwealth Legislation

Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (the ATSIHP Act) provides for the declaration by the Minister for the protection of Aboriginal cultural heritage of significance to Indigenous Australians, generally in circumstances where State or Territory laws fail to do so. The power to make declarations is a last resort process, after the relevant processes of the state or territory have been exhausted.

The Minister for the Environment received a written application under section 10 of the Act for a declaration for the protection and preservation of an area described as the 'Ravensworth Estate Homestead Complex and Surrounds' on the basis of its Aboriginal significance and a Reporter was appointed to review the application.

The application was made by Mr Scott Franks and Mr Robert Lester, as representatives of the 'Plains Clan of the Wonnarua People'. Mr Lester is the Chairperson of the PCWP Aboriginal Corporation, the representative body for a native title claim by the Plains Clan of the Wonnarua People over an area of land that includes the Specified Area.

The DoEE appointed Reporter for the process noted the Application in the Australian Government Gazette in June and July 2019, and invited Representations in response. The Australian Government Gazette noted the claims regarding events of colonial frontier violence, noting the mid 1820's including the claim of a massacre of Aboriginal people in reprisal for the killing of two settlers. Eleven Representations were made, including government departments, community members, other Aboriginal stakeholders, Infrastructure owners, other mining companies and Glencore. The Reporter also requested further information from the Applicants. Following the provision of Representations to the Reporter (21 August 2019), the Applicants withdrew the Application on 6 September 2019. The further information requested by the Reporter from the Applicants was not provided.

Following receipt of the PCWP Values Report in June 2020, a revised section 9 and 10 Application was lodged on 7 July 2020 by some members of the PCWP seeking to protect a Specified Area which includes the Project Area.

Native Title Act 1993

The Native Title Act 1993 provides for the recognition and determination of native title in Australia, processes for how future activity can proceed on native title land, and to provide compensation where native title is impaired or extinguished. Native Title Act processes for the purposes of the Project are not discussed in this report as Native Title is extinguished within the Project area. The Plains Clans of the Wonnarua people where a Registered Native Title Claimant at the beginning of this ACHAR, however their claim was withdrawn in March 2020.

Protection of Movable Cultural Heritage Act 1986

The Protection of Movable Cultural Heritage Act 1986 (the PMCH Act) implements Australia's obligations under the UNESCO Convention on the Means of Prohibiting the Illicit Import, Export and Transfer of Ownership of

Cultural Property. Under the PMCH Act it is unlawful to export a 'protected object' from Australia without a certificate or permit from the Environment Minister. This Act is not directly relevant to this report.

1.5.2 State Legislation

Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act) is the main piece of legislation regulating land use in NSW. The Act is administered by the Department of Planning and Environment (DPE) and guides the process of land development, including the assessment and management of cultural heritage impacts.

This ACHAR (including the AAIA) has been prepared in accordance with SEAR's.

Specific to the assessment of Aboriginal cultural heritage impacts, the SEAR's require that the EIS must include:

• An assessment of the potential impacts of the development on Aboriginal heritage (cultural and archaeological), including consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage;

The archaeological and cultural values assessments along with this ACHAR have been prepared in accordance with the SEARs.

Table 1-3: Secretary's Environmental Assessment Requirements

SEAR	Where Addressed
An assessment of the potential impacts of the development on Aboriginal heritage (cultural and archaeological), including consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage.	Chapters 4-7
During the preparation of the EIS, you must consult with relevant local, State and Commonwealth Government authorities, service providers, Aboriginal stakeholders, community groups and affected landowners.	Chapters 5 through 7

National Parks & Wildlife Act 1974

The National Parks & Wildlife Act 1974 (NP&W Act) is the primary law in NSW that provides protection for Aboriginal cultural heritage.

Under section 86(1) and 86(4) of the Act, it is an offence to harm an Aboriginal objector an Aboriginal place. The NP&W Act provides for several defences to prosecution for harming Aboriginal objects or places including that the person harmed the object or place in accordance with an Aboriginal Heritage Impact Permit (AHIP) or that the person exercised due diligence.

Under Section 4.41 of the EP&A Act, an AHIP is not required, and the NP&W Act provisions prohibiting harm to Aboriginal objects and places are not applicable, to State Significant Development that is authorised by development consent.

Heritage Act 1977

The *Heritage Act 1977* provides for the protection of natural, cultural and built heritage that are of State or local heritage significance in NSW, through the register of heritage places or items on the State Heritage Register and the making of interim heritage orders and emergency orders to protect heritage items or places at risk.

The registration on the State Heritage Register or the making of interim register order places limits on what can be done to the heritage, although interim heritage orders made by a council do not apply to State Significant Development under the EP&A Act.

2 Description of the Site

The Project area is in the order of 2,900 hectares.

2.1 Land Ownership

The land within the Project Area is owned by Glencore or associated entities except for some Crown land, and the road reserve for Hebden Road for which Singleton Council is the Roads Authority. A small parcel of Crown land is located within the proposed Glendell Pit Extension area. A claim under the Aboriginal Land Rights Act 1983 has been lodged over this parcel of Crown Land, however Native Title has been extinguished over that land.

Land ownership in the area is shown in Map 2-1.

2.2 Environmental Overview

The Project Area has been predominantly and historically cleared for agriculture and contains native and exotic grasslands with scattered patches of native regenerated vegetation. Intact mature vegetation occurs along the creeks and tributaries of the area including along Yorks Creek, Swamp Creek and Bowmans Creek. The Project Area has historically been used for agriculture since the 1800s and is comprised predominately of degraded grazing land and patches of native woodland.

2.2.1 Topography / Landforms and Drainage

The Project Area is situated centrally on the floor of the Hunter Valley (Central Lowlands) and occurs within the wider Hunter River catchment which covers approximately 22,000 km2 of land bordered by the Liverpool Ranges, the Great Dividing Range, the Mount Royal Range and the Barrington Tops. The Project Area is situated approximately 87 km from the coast and 150 km from the western extremity of the Hunter catchment at the Great Dividing Range.

The Project Area is typical of the Central Lowlands of the Hunter Valley, which are characterised by undulating to low rolling hills formed on weak sedimentary rocks with low local relief (Kovac and Lawrie 1991). The topography of the Project Area is characterised by an undulating and hilly landscape extending to lower areas associated with the creek lines that traverse the Project Area. Elevations range between 70 mAHD in the south and 400 mAHD in the northern extent of the Project Area, west of Mount Owen Mine. The Glendell Pit extension will affect land with elevations of between approximately 70 mAHD and 130 mAHD (excluding areas of the Ravensworth East emplacement areas impacted by the Glendell Pit extension).

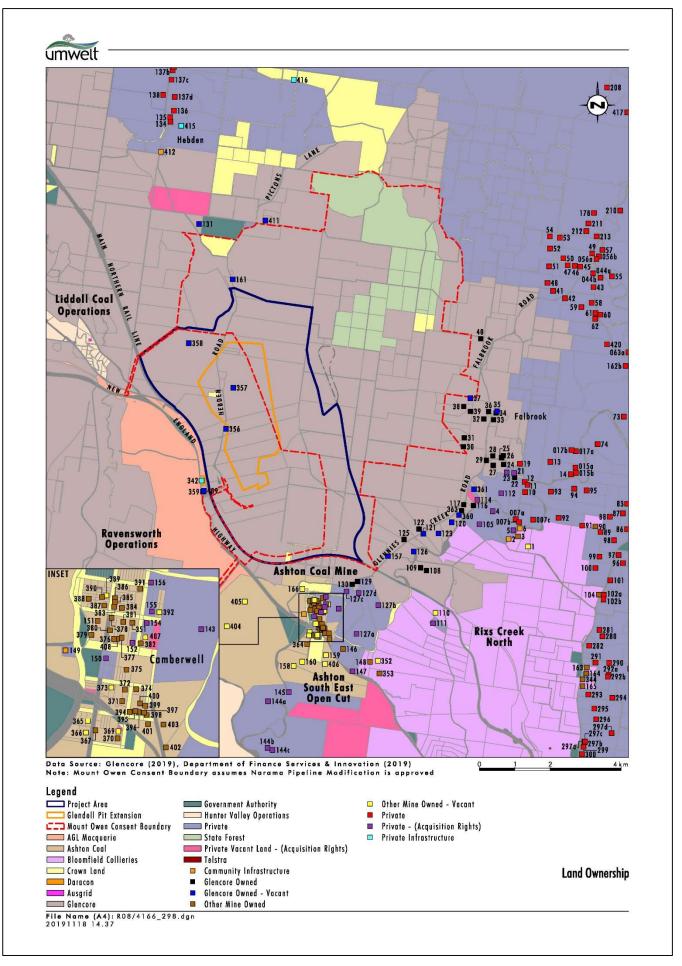
Approximately 18 km to the south of the Project Area are the dissected sandstone plateaus of Wollemi and Yengo National Parks, while approximately 30 km to the north, the foothills of the Barrington Tops and Mount Royal Range adjoin the Hunter Valley floor, which is bounded by the Hunter Thrust System (Peake 2006). To the east and west of the Project Area extend the highly eroded Permian lowlands of the floor of the Hunter Valley. The topography across the majority of the Project Area is generally flat to gently undulating with 0 to 5-degree slopes with the exception of Ravensworth State Forest and those steeper slopes created by the existing approved mining operations.

The Project Area is located within the Bowmans Creek catchment. Bowmans Creek is a tributary of the Hunter River. Mining in the proposed Glendell Pit extension is primarily within two sub-catchments of Bowmans Creek, namely Yorks Creek and Swamp Creek. The Project will result in relatively minor modifications to the approved Glendell Mine final landform, which will also modify the Bettys Creek catchment.

2.2.2 Geological Features and Resource Description

The proposed Glendell Pit extension, like the current Glendell Pit, is located along the Camberwell Anticline. The Camberwell Anticline is the major structural feature in the area and runs in a general north-south alignment through the proposed Glendell Pit Extension. The Camberwell Anticline exhibits steep dips (>20 degrees) on its eastern flank and dips up to 12 degrees on its western flank. The main open cut resources occur along the axis of the anticline with deeper resources present on the western and eastern margins.

The two other major geological features present in the area are the Block Fault Zone (which occurs towards the northern extent of the proposed Glendell Pit Extension) and the Hunter Valley Dyke, (which occurs to the northwest of the proposed Glendell Pit extension). Both features run in a general north-east/south-west alignment. The target coal reserves for the Glendell Pit Extension are the Burnamwood, Bulga and Foybrook Formations, which are the lowermost coal bearing formations of the Wittingham Coal Measures. Seven seams with open cut potential exist from the Bayswater seam to the Hebden seam and range in depth to approximately 240 m. The Bayswater and Upper Lemington Seams are limited to the eastern extent of the proposed pit.



Map 2-1: Land Ownership.

In addition to the hard rock strata, the surface drainage channels host Quaternary to recent unconsolidated alluvial and colluvial materials of variable thickness and extent.

To determine the soils and the likely age of the parent material they are derived from, a review of detailed soil landscapes mapping and geological mapping was undertaken to determine whether Permian derived soils occur within the Project Area. The Project Area is situated on the edge of the Permian Singleton Coal Measures mapping with much of the surface geology being formed by the Triassic Narrabeen group (as determined both from regional geological mapping and from detailed geological investigations undertaken within the Project Area). The detailed soil survey undertaken within the Project Area found that the soils have mostly been derived from the Triassic Narrabeen group.

2.2.3 Existing Environmental Conditions

The Potential Additional Disturbance Area has been predominantly and historically cleared for agriculture and contains native and exotic grasslands with scattered patches of native regenerated vegetation. Intact mature vegetation occurs along the creeks and tributaries of the area including along Yorks Creek, Swamp Creek and Bowmans Creek.

The broad plant community types that are likely to occur in the Potential Additional Disturbance Area include:

- Narrow-leaved Ironbark-Grey Box Grassy Woodland of the Central and Upper Hunter
- Spotted Gum Narrow-leaved Ironbark Shrub Grass Open Forest of the Central and Lower Hunter
- Bull Oak Grassy Woodland of the Central Hunter Valley
- River Oak Riparian Grassy Tall Woodland of the Western Hunter Valley
- Swamp Oak Weeping Grass Grassy Riparian Forest of the Hunter Valley.

Threatened Ecological Communities (TECs) are ecological communities which are at risk of extinction. Under the EPBC Act, there are three categories for listing TECs: critically endangered, endangered and vulnerable. The Potential Additional Disturbance Area is likely to include the following TECs:

- Central Hunter Ironbark Spotted Gum Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions endangered ecological community (EEC) listed under the BC Act.
- Central Hunter Grey Box Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions EEC listed under the BC Act
- Central Hunter Valley Eucalypt Forest and Woodland critically endangered ecological community (CEEC) listed under the EPBC Act.

No threatened flora species listed under the BC Act or EPBC Act have been recorded within the Potential Additional Disturbance Area. Three endangered flora populations listed under the BC Act have been previously recorded close to or within the Potential Additional Disturbance Area being:

- Cymbidium canaliculatum (tiger orchid) population in the Hunter Catchment
- Eucalyptus camaldulensis (river red gum) population in the Hunter Catchment
- Acacia pendula (weeping myall) population in the Hunter Catchment.

2.2.4 Climate

The nearest Bureau of Meteorology (BoM) record station to the Project Area is situated at the Singleton STP location (BoM 2018). Climate statistics from the Singleton STP indicate that the region experiences a mostly temperate climate with temperatures above zero during the cooler months. The climate statistics show that the highest mean monthly temperatures are in January (31.9°) and the lowest mean monthly temperatures are in July and August (4.3°). Rainfall is greatest in February (mean rainfall: 85.6 millimetres [mm]) and the lowest in July (mean rainfall: 24.3 mm). The annual average rainfall is 659.1 mm.

3 Historical Background

3.1 Historical Narrative of the Region

Literature and research concerning the Wonnarua of the central Hunter Valley area is incomplete, largely as a result of omissions, silence and antiquated concepts of ethnology. In relation to New South Wales' Indigenous population, ethnohistoric attention has focused on coastal communities to the detriment and exclusion of those inland, thereby making the material about the Wonnarua patchy at best, but more commonly absent (Brayshaw, 1987: 74). Research into the language group was further hampered by changing notions of significance. In considering the lack of historical and archaeological information about campsites, Koettig (1990: 35) for example acknowledges that they were neglected as an important subject matter by her peers for many, many decades, because they were regarded as relatively unimportant, especially when compared to ceremonial sites. Even though they are now deemed to be of significance, the literature remains largely silent about them.

Nolan (2012:78) reminds her readers there was a popular concept during the colonial period that time (and therefore history) in the new colony of New South Wales began with the arrival and occupation of Europeans. Consequently, there was a lack of activity in recording the detailed lives of Indigenous people at the commencement of European settlement. This, however, began to change from the 1830s, yet by this time, these communities had already been adversely and irretrievable effected by disease, violence, displacement and dispossession and so the accounts were not a true reflection of how they once had lived (Umwelt, 2011).

3.1.1 Prior to White Settlement

The land of the Wonnarua was vast and stretched over much of the Hunter Valley. Tindale (1974: 201) estimated that it covered over five thousand square kilometres. Its borders were somewhat vague and, as a result, often erroneously recorded in the literature, possibly because of the new settlers' lack of understanding of the complexity of Indigenous society and its association with land. Tindale (1974: 201) defined Wonnarua country as being located on the 'upper Hunter River from a few miles above Maitland west to Dividing Range. The southern boundary with the Darkinjang is on the divide north of Wollombi'. The Wonnarua's neighbours were the Darkinung (to the south), the Awabakal (to the south east), the Worimi (to the east) and the Wiradjuri (to the west) (Horton, 1994). They had close ceremonial ties to the Darkinung and Wiradjuri people (Macquarie University, 2009). See Figure 3-1, below.

The population of the Wonnarua prior to European settlement is unknown, and approximations vary widely. Estimates vary and were most likely made well after populations had declined, so must be treated with caution. Discrepancies also arose partly because when official census were conducted, Indigenous people often went unseen by Europeans, either intentionally or unintentionally. When travelling through the area in 1825, Cunningham observed that although no Aboriginal people had been seen 'their recent marks on the trees and fired country' showed that they had been in the area (Cunningham (1825) cited in Bradshaw 1987: 20).

The structure of Indigenous communities was complex. The Wonnarua comprised a nation, or language group. They all spoke the one language and shared similar customs and beliefs. However, within that group there was clans, each with their own territories. According to Fawcett (1898: 180), Wonnarua men belonged to one of four skin groups: either of the *Ippye*, *Kumbo*, *Murree* or *Kubbee*. Women, conversely, were either *Ippatha*, *Butha*, *Matha* or *Kubbitha*. With marriage within skin groups strictly forbidden, members of different clans lived together in small communities or familial groups.

As Miller (1985) discusses, kinship was the very thing that 'welded Koori society together' since everyone was related to one another in a web of obligations, biological connections and spiritual associations. While the mother and father were important people in a child's life, a boy or girl's uncle (mother's brother) was particularly significant as it was he who taught them many things in their early lives. For males, this relationship altered, though, when boys were initiated after reaching puberty and were transformed into men.

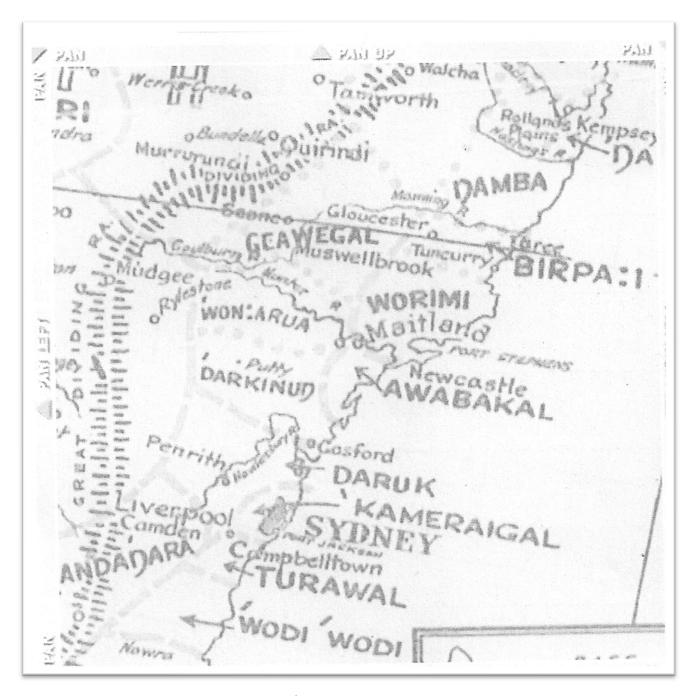


Figure 3-1: The boundary lines of the Wonnarua and their neighbours according to Norman Tindale (1940).

Spiritual kinship also united the Wonnarua with one another, the landscape and everything in it, 'thus kinship interwove throughout Aboriginal society, creating a very complex dynamic in which every individual had a specific relationship with every other individual, with the food they ate, and with the land' (Bradshaw, 1987: 37). Before a child was born, he or she was assigned totems and skin groups according to that of the biological father (Miller, 1985). The child's mother was from the opposite totem and skin group. The totem system linked them with the Dreaming as it was a 'legacy of the spirits' (Miller, 1985).

Life for the Wonnarua was intensely spiritual, as it was for all Indigenous people. Everything in the landscape was created by the spirits. A newborn baby was perceived as a spirit in physical, human form (Miller, 1985). Events, natural or otherwise, were perceived as the workings of benevolent or malevolent spirits. Everything from food shortages and droughts to births and deaths could be explained by the actions of unseen evil or benign actors. Consequently, the Wonnarua along with most Australian Indigenous people saw themselves not as the owners of resources or land but rather as custodians, for these were all created in the Dreamtime by the ancestral or mythical beings. The myths that surrounded and influenced their daily lives were passed on from one generation to another and 'each clan acted as caretakers for those legends which were manifested in the topography of their region' (Needham, 1981: 4).

The Wonnarua lived a semi nomadic life but, it was not random wanderings. The position of camps was often determined by the availability of natural resources, like food and water, which were sometimes seasonal or affected by floods, droughts and other climatic events. The availability of water was especially important in choosing a location, *'irrespective of the size of the watercourse.'* The smaller the waterway, the smaller the camp (Koettig, 1990). Many creeks and creek junctions were particularly popular, as is evident in the archaeological record of the Singleton, Muswellbrook and Jerrys Plain region (Brayshaw, 1987: 96). Koettig (1990: 118) reinforces this with her modelling of a variety of Indigenous sites types in the Hunter Valley, the vast majority of which are located in close proximity to water courses.

The sourcing of other natural resources besides food and water also dictated campsite locations. For example, the construction of a canoe being in proximity to a place with suitable trees that had just the right bark to construct it, as did the making of implements (like boomerangs and shields) or the sourcing of other raw materials, such as stone, ochre or resin (Umwelt 2011). Together with natural resources, a suitable vantage point in case of conflict was often considered when deciding on a camp site (Umwelt 2011).

At other times, social events and obligations also influenced a camp's location. Interaction between different nations and clans was an essential aspect of life for all Wonnarua. It provided them with opportunities to trade goods, participate in important ceremonies and strengthen kinship and trading relationships. During the hot summer months when fish were most plentiful, the Wonnarua visited the cooler coastal lands of the Worimi or Awabakal while in the cooler months, the neighbours journeyed to Wonnarua country and took part in 'ritual' kangaroo hunts (Brayshaw 1987: 82). Such activities not only provided participants with food but also strengthened social and economic ties between the various groups.

Trading relationships between inland and coastal Indigenous communities provided each group with opportunities to procure items that were unavailable in their traditional lands or were in short supply. The Wonnarua traded possum skins for shells with coastal tribes as neither group could source such materials from their traditional lands. The shells were used for a range of purposes such as sharpening tools to fashioning fishhooks (Brayshaw 1987: 67).

Ceremonies were an important aspect of life for the Wonnarua. They were frequently held when natural resources, like food and water, were plentiful. There is now little evidence detailing where such events took place, but it is known that they rotated around various sites, thereby allowing 'the local environment to fully recover from periods of intensive exploitation' (Umwelt 2011). Initiation ceremonies were important rites of passage for boys having reached puberty. It 'would make them spiritually as well as physically different from women. No longer would they eat the female species of game or collect fruits and yams or even eat with the women' (Miller 1985). It was a time when they assumed greater responsibilities as they went from being a boy to a man. The actual ceremony was one occasion when neighbours participated in the event. A messenger would be sent to other clans or nations inviting them to the gathering. Two circular clearings would be prepared with a connecting pathway, creating sacred ground where certain parts of the ceremony would take place. These areas were known as 'Bora' grounds.

Being a hunter and gatherer society, much time was spent procuring food and it was frequently sourced within about five kilometres (or a day's walk) of the campsite. The Wonnarua consumed a diet high in protein and obtained this from kangaroo, emu, bandicoot, possum, native rats, fish, insect lava, lizards, snakes, grubs and caterpillars. The water lily was also a popular item of food (Fawcett 1898: 152). Food gathering was performed according to strict gender roles. Men fished, hunted larger game, like wallaby and kangaroo, and used bark nets knitted by women to catch eels, emus and other animals. Women, on the other hand, gathered fruits, grubs, roots, plants and hunted smaller animals, like lizards (Miller 1985).

The landscape provided the Wonnarua with all the tools and items they required for daily living. Bark was one of the most common materials used by the Wonnarua, possibly because of its adaptability (Brayshaw 1987: 59). It was utilised in the construction of many things, from shelters and transportation to shields and implements. Cord from different types of bark was also made and was used for a variety of purposes, such as in the weaving of nets or the securing of stone points to spear shafts (Brayshaw 1987: 60-63). The manufacture of string by women was a sight of interest and intrigue for some early Europeans:

They twist and roll the bark in a curious manner with the palm of the hand upon the leg; with this string they form nets of curious workmanship. In some the meshes are very small and neat, and the whole knit without a knot, excepting at its completion (Ebsworth in Brayshaw 1987: 63).

With a number of large rivers and creeks in the region, bark canoes were important objects for the Wonnarua. The canoes were usually made from one piece of bark and then shaped with the use of fire which made the material malleable (refer to Figure 3-2??). The Australian Museum's Morrison Collection has two bark canoes from the Hunter Valley region (Nolan 2012: 32). Since the vessels were not built to withstand the rigors of the ocean,

Nolan (2012, p. 34) speculates that they were constructed by one of the valley's inland tribes and used for some of the area's calmer waters.

Along with bark, hard wood was also used to create several different tools. Women's yam sticks, often left undecorated and used in food gathering and preparation, were constructed from wood and were sometimes up to two metres in length (Brayshaw 1987: 65). Hard wood shields and boomerangs were also made.

Boomerangs were important hunting and fighting implements. Their unique, aerodynamic shape enabled the hunter to kill or wound prey from a great distance and, in the hands of a skilled thrower, with great accuracy. They also served as percussive instruments during ceremonies and as fire lighting aids (Australian Museum, 2010.). The Morrison Collection also contains a number of boomerangs from the Hunter Valley region. Since Alexander Morrison sourced many of his artefacts from the St Clair Mission which accommodated a large number of Wonnarua people, it is possible that some of the boomerangs and other objects were made by the Wonnarua (Gray, 2010; Nolan, 2012).

Animals not only provided food for Indigenous communities but a variety of other items. Kangaroo bone was shaped into sewing implements, such as needles, which were needed for making animal skin capes, mending garments or the repair of other goods (Brayshaw 1987:67). Kangaroo and possum skins provided the Wonnarua with warmth and were often sewn together to create articles of clothing, like cloaks or the 'belts' men wore (Brayshaw 1987: 67). A cloak currently housed in the Smithsonian Institute in the United States of America was made in the Hunter Valley and comprises twenty-two possum (*Trichosurus vulpecula*) skins and one grey kangaroo (*Macropus giganteus*) skin (Brayshaw 1987: 72).

Aboriginal people were adept at modifying the landscape to suit their needs (Brayshaw 1987: 20). Fire was one of the tools the Wonnarua people used for 'herding' kangaroos. About a month prior to the hunt, Wonnarua people deliberately burnt areas of grassland, thereby attracting kangaroos when the newly germinated grasses grew some weeks later. One visitor to the region in 1830 observed 'a large flock of kangaroos feeding upon young and tender grass which had sprung up after a fire of the natives' (Brayshaw 1987: 21). The deliberate lighting of fire also increased an area's biodiversity and facilitated travel by destroying the undergrowth that sometimes-made movement through the country more arduous. The Wonnarua also altered waterways by creating weirs and fish traps to assist in the sourcing of fish, eels and other water creatures. This was sometimes achieved by the use of grasses (Brayshaw 1987: 77).

3.1.2 Post European Settlement

The first official European excursion into the Hunter Valley occurred in 1801 when Lieutenant-Colonel Paterson led a party of men along the Coal River (later Hunter River) to explore the region's coal supplies (Brayshaw 1987: 9). Just over a decade later, Europeans were residing at Patersons Plains and Wallis Plains (now known as Maitland) (Umwelt 2011). The establishment of a penal colony at Port Macquarie from 1804 to 1821 slowed the area's settlement but by 1821, the area near Ravensworth had been occupied by the new arrivals, thereby making James Bowman's Ravensworth property the most northern settlement in the valley. By 1826 surveying of the central Hunter Valley had been completed by Henry Dangar which only served to open it up to further development and exploitation (Brayshaw 1987: 9). Soon after completing his survey, Dangar commented on the speed of the transformation, writing that

'... this division of country ... which, in 1822, possessed little more than its aboriginal [sic] inhabitants, in 1826-7, more than half a million of acres were appropriated and in a forward state of improvement' (Brayshaw 1987: 10).

The Hunter Valley was one of the first areas in the new colony to be settled outside of Sydney and Newcastle. Land with river frontages along the Goulburn and Hunter Rivers and their larger tributaries were the first properties to be acquired by the new occupants. By 1827, 25% of the valley had been appropriated by Europeans (Daly & Brown 1964: 53). For the new settlers, the region 'seemed [like] a pastoral arcadia of thinly wooded alluvial flats, long grass and abundant game' where profits could be readily made (Nolan 2012: 15). In 1826, one man commented that 'in all these luxuriant plains there is scarcely a superfluous tree to be seen... [The land is] is only requiring the instrumentality of the plough to produce abundant crop' (Nolan 2012: 15).

With European settlement, radical changes to the landscape soon followed. Tracts of land were denuded of the already relatively sparse timber to make way for agriculture and livestock and coal was mined to build, develop and power the new colony. According to Dangar, 25,000 horned cattle and 80,000 sheep soon roamed the Valley (Brayshaw 1987: 10). Animals not only damaged native vegetation by eating and stamping on it, but also necessitated the felling of trees and the parcelling of land with fences to contain them and support the people who were entrusted with their care. Such actions affected the habitats and habits of the plants and animals that were central to the day to day existence of the Wonnarua.

As Europeans appropriated the central Hunter Valley for their own purposes, the Wonnarua were forced off their lands. Initially the settlers occupied the best, flat locations along rivers and creeks but soon spread further afield as they appropriated more and more land. This forced Indigenous clans to retreat further and further inland. Consequently, they were driven to seek resources beyond their traditional boundaries in ways that contravened millennia old systems of obligations, customs and responsibilities, and led to conflict with neighbouring groups. As Fawcett (1898: 152) described in 1898:

Their tribal boundaries were both well-defined and clearly understood both by themselves and the members of their neighbouring tribes. So strictly were all rights and privileges understood, that for one tribe to enter into the district of another in pursuit of game was considered an offence of great magnitude and a good ground for a hostile meeting.

As displacement became more widespread, violent disputes between the Wonnarua and European settlers intensified. Initially when Europeans settled in the region 'the natives were acknowledged to be a harmless, inoffensive race of people, and for the first two or three years they continued on the best terms with the colonists. Subsequently, however, quarrels arose through their ignorance of [English] laws relative to the right of property' (Breton 1833: 218-219). For the Europeans, land ownership equated to rights (such as restricted access) yet for the Wonnarua, it concerned both rights and obligations. While the new settlers saw the taking of their stock as theft, and therefore punishable, the Indigenous community perceived it very differently (Umwelt 2011). Not surprisingly, relations between the two deteriorated.

Some people in the Hunter Valley, like Reverent Lancelot Threlkeld, believed they were 'in a state of warfare' with the Indigenous population and, in 1826, landowners petitioned Governor Darling for protection from the armed 'tribes of black natives' as they feared the 'revenge and depredation of these infuriated and savage people' (Umwelt 2011). Darling's response to the petition may have inadvertently 'encouraged the settlers to use 'vigorous measures' to establish ascendancy over the Aboriginal resistance, resulting in the forming of many vigilante groups' (Umwelt 2011). European arms soon proved too powerful and that resistance by the valley's original occupants had largely ceased by 1830, less than three decades after Europeans arrived in the area.

The ensuing breakdown of Indigenous communities is largely attributed to the dispossession of their land, and the subsequent loss of traditional lifestyle, but this is not the only cause. The onset of new, introduced diseases, such as measles and smallpox, and infections such as sexually transmitted syphilis, decimated communities as they had no natural resistance to these ailments. The smallpox epidemic of 1789 killed many even before Europeans had forayed beyond Sydney and this was followed by a second outbreak in 1829-31 (Brayshaw 1987: 49). A submission from the Reverend William Ross, Minister of the Church of Scotland to a Select Committee of Inquiry, established to investigate Aboriginal affairs in the colony in 1846, noted that 'the number [of Indigenous people] has greatly diminished; within the last seven years the decrease has certainly been one-third of the number'. The writer explained that the camps of between eighty and ninety people he had seen seven years earlier were now no more than twenty-five (Select Committee on the Condition of the Aborigines, 1846).

Deaths resulting from disease or sickness frequently affected those most vulnerable - the young and the elderly, which had profound ramifications on Aboriginal communities long into the future. The death of the elderly not only meant that there were fewer and fewer elders to guide and unite communities, but also that the passing down of important responsibilities, teachings and knowledge from one generation to the next was irrevocably interrupted. The death of the young resulted in smaller communities since births could no longer replace those lost. The inability to produce future generations was further hampered by the spread of sexually transmitted diseases which left a large number of Indigenous adults infertile and increased the number of miscarriages and still births. Fawcett (1898: 153) lamented that 'half a century of British debauchery, disease, and vice and their accompaniments, have almost wiped [the Wonnarua] out altogether. A few years and their land will know them no more'.

With the loss of their land and lifestyle, the *Wonnarua* were forced to rely ever more on European settlers. According to Umwelt (2011) the traditional way of life for the *Wonnarua*, including the continuation of their ceremonies, had all but gone by the 1870s and they began to increasingly adopt the ways of Europeans. Initially, Aboriginal farm labourers and itinerant workers were sought after, but this declined from the middle of the 1870s for a variety of reasons, including the introduction of wire fencing (which reduced the number of required farm hands) and the arrival of more white workers in the region.

Others settled on religious or government run reserves or missions. From the 1860s, reserves became increasingly popular in New South Wales as they were perceived as a means of controlling and attending to the welfare of Indigenous populations. The missions also provided Colonial authorities with the opportunity to *'civilise'* Aboriginal people by teaching them the English way of life, from customs and beliefs to daily activities and language [Nolan 2012, p. 24). Seldom does such civilisation come at such a high price.

From 1890, many of the local Indigenous population, including *Wonnarua, Awabakal, Worimi and Darkinung* people, resided at the St Clair mission. Founded by Reverend J S White, the sixty-acre property was established in Carrowbrook, between Muswellbrook and Singleton (Nolan 2012). There the residents farmed the land whilst maintaining some traditional aspects and rituals of their culture. In 1905, the Baptist run Aborigines Inland Mission took over the site and the continuation of traditional ways was no longer acceptable (Gray 2010). In 1918, the site came under the control of the Aborigines Protection Board and was renamed the Mount Olive Reserve. Under the new managers, adherence to strict rules was expected and any breaches resulted in removal (Umwelt, 2011). The reserve remained operational until 1923 when it closed, forcing its residents to move elsewhere. Many of these twice dispossessed people chose to settle around the township of Singleton and the surrounding region.

3.2 Comment on Potential Massacre Sites

The question as to whether massacre site(s) existed on the Ravensworth Estate has been addressed in several studies over the last 15 years and was central to the cultural values assessments undertaken for the Mount Owen ACHAR (2013). During the consultation processes for the Mt Owen ACHAR and this ACHAR specific concerns have been raised by the PCWP in regard to frontier violence during the early colonial period and the potential for evidence of massacre(s) to be present in the Project Area, in particular the massacre which is recorded on the AHIMS 37-3-0390 site card is thought by some to be in the Project Area.

Conflict between Aboriginal people and white settlers is a common thread in Australia's early colonial history. The Hunter Valley is no exception, with widespread conflict being reported into the 1830's. In 1826, the perceived threat from Aboriginal people in the Hunter Valley was such that settlers petitioned Governor Darling for military protection. Darling's responded to the settlers that:

'Vigorous measures among yourselves would more effectively establish your ascendancy than the utmost power of the military...I strongly recommend you to take measures for your own defence, and you may be satisfied that in any exertion you make, you shall receive every necessary support (Darling quoted in Reynolds 1996: 39-40).

During the fieldwork and workshops undertaken for the Mount Owen Continued Operations project ACHAR (2011-2013) and this ACHAR, there were numerous comments from RAPs about the potential for evidence of massacre(s) to be present within the Project Area, and in particular the massacre which is recorded on the AHIMS 37-3-0390 site card is thought by some to be in the Project Area.

This issue has also been addressed in other projects undertaken in close proximity to this ACHAR, and in particular by Umwelt (2004) in the archaeological values assessment for the Glendell Open Cut Mine, which is immediately to the south of the Project Area, and all located within what is known as the Ravensworth Estate. The Mount Owen ACHAR (ACHM 2013) assessed the cultural values over the same area prior to this ACHAR. The following section is from the Umwelt (2004) report to the DEC specifically in response to queries about potential or existing massacre sites in the vicinity of the historic Ravensworth estate.

In further response to this matter, as part of the GCOP, Glendell engaged Dr Mark Dunn to undertake a further detailed expert review of this period of history in and around the Project Area. This report is included in Appendix Appendix E.

The following sections provide an overview of the relevant work addressing the massacre issue, including:

- Glendell Mine Assessment (Umwelt, 2004);
- Mt Owen Continued Operations Assessment (ACHM, 2013);
- Historical Research by Dr Mark Dunn (2020).

3.2.1 Umwelt (2004 assessment of the Ravensworth Massacre Site (#AHIMS 37-3-0390)

At the time of the preparation of the original Glendell material in 2003-2004 the site card for what was then called the 'Ravensworth massacre site' was missing and discussions with the Aboriginal groups involved in the assessment failed to obtain any information in relation to the site. The site card, however, was later found by Steve Brown (NPWS) and information from the site card indicated that the recording of the site originated from a reference to the massacre in the book 'Waterloo Creek' written by Roger Milliss in 1992. The primary references were obtained from the Mitchell Library to obtain, if possible, further detail in relation to the nature and location of the massacre site.

The primary references provide the following details:

1. 28 August 1826: Aboriginal people killed two settlers at Alcorn's hut within Bridgman Estate, on Fal Brook, one mile upstream from Dulwich (James Glennie) and a quarter of a mile from Chilcott's hut.

- 2. The Aboriginal people that took part in the attack are said to have headed in the direction of the mountains;
- 3. The Sydney Gazette (9 September 1826) noted that the Aborigines were part of a 'mountain tribe' making them 'very difficult to capture or subdue'.
- 4. On the morning or afternoon of the third day a pursuing party caught up and shot and killed between two and 18 Aboriginal people using muskets.
- 5. The Aboriginal people that were shot are said to have been pursued from Bridgman Estate for 20 miles (32 kilometres) or more; and
- 6. Scott and MacLeod (3 October 1826) mention a black woman that was taken prisoner (HRA XII: 612).

This evidence implies that the Aboriginal people who took part in the attack at Alcorn's Hut came from the mountains and were returning to the mountains when the reprisal attack took place. The account by Scott and MacLeod (HRA XII 1826: 612) also suggests that at least one woman was included in the Aboriginal group attacked. If the Aboriginal attackers had travelled 20 miles (approximately 32 kilometres) in the direction of the mountains (or even into the mountains) they could have travelled in a northerly or easterly or (less likely) southerly direction from Bridgman Estate. There are no mountains in a westerly direction (and no significant range to the south). A westerly direction would have taken the fleeing Aborigines and their pursuers up the valley rather than into the mountains. If the Aboriginal people that attacked the hut at Bridgman Estate travelled towards the mountains, they would have travelled away from the Project area. Thus, the massacre site is highly unlikely to be located within the Glendell ML or within the Ravensworth Estate. Even if the Aboriginal people had travelled in an easterly direction they would have passed through the area of the present Glendell ML and the Ravensworth Estate by the time they had travelled 7 miles, rather than the 20 miles they were reported as travelling prior to the pursuing party catching up with them.

Based on these conclusions the site recorded as the 'Ravensworth Massacre Site' cannot have been within the area now defined as the Ravensworth Estate and that the name given to the massacre site is misleading in this regard. Refer to Section 3.3.1 (below) for further detail regarding the reported events and its recently updated AHIMS site card.

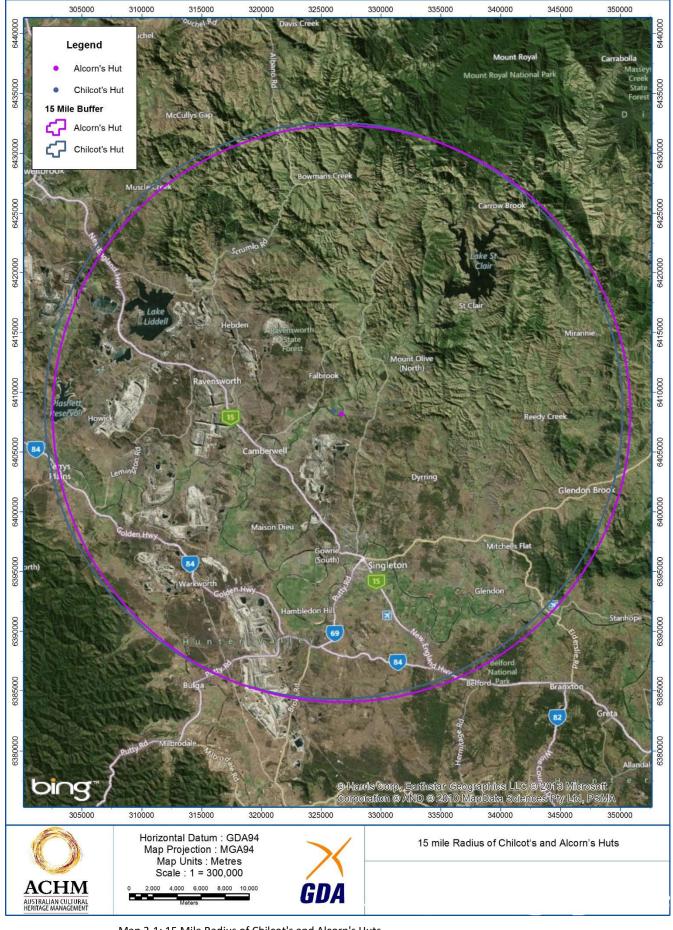
In relation to the Aboriginal people that were killed in the Ravensworth area, there was no anecdotal evidence located of how their bodies were disposed (except for one person executed by the police who was buried and then later exhumed and thrown in the river). They may have been buried/burned where they were killed by their attackers or their bodies may have been left where they fell. In the case of the Aborigines it is probable that they were collected by relatives and buried in an area dictated by custom if that was still possible under the circumstances, or somewhere where it was safe to perform the appropriate ceremonies if that was not possible.

3.2.2 Mt Owen ACHAR (ACHM 2013)

The question of a massacre within the Ravensworth Estate area arose once again during the consultation processes for the Mt Owen ACHAR between 2011 and 2013. ACHM reviewed the various literature sources and the Umwelt (2004) report and then mapped the various key historical places to determine the events of concern could not have happened at Ravensworth Estate.

The available historic evidence and analysis by Umwelt (2004) does not dispute that a mass killing of Wonnarua people took place in late 1826, however the conclusions drawn indicate that the murders reported in the book 'Waterloo Creek' (Milliss 1992) occurred well beyond the Ravensworth Estate. Many Wonnarua people hold the view that there were numerous unreported and undocumented killings in the vicinity of Ravensworth estate in the early days of white settlement. While these views are important and deeply held, it is also difficult to establish the veracity of these widely held oral histories. Compounding the difficulty, there is no other primary recorded historical evidence documenting any other killings in the immediate vicinity of the Project Area. Consequently, there is currently no known 'massacre sites' within the Project area, including the Ravensworth Estate, nor is likely that this type of place will be identified within the Project Area.

Using the historical evidence to map the huts mentioned (i.e. Alcorn's and Chilcot's huts) and utilising a more conservative 15-mile radius, it is possible to construct a map which shows an approximate area where the killings reported by Milliss (1992) cannot have occurred. We can hypothesize that it was not possible for this set of events to have occurred anywhere within the mapped circle, nor therefore in the Project Area. The historic evidence suggests that this event (Milliss 1992) took place at least '20 miles' from Alcorn's hut, well outside the zone mapped below (See Map 3-1).



Map 3-1: 15 Mile Radius of Chilcot's and Alcorn's Huts.

3.3 Dr Mark Dunn's Historical Research

Historian Dr Mark Dunn was commissioned by Glencore to further review the available historical documents and records relating to the early occupation of Ravensworth Estate and surrounding areas, and particularly evidence of conflict between Aboriginal people and the early settlers between 1824 and the mid 1830's.

Dr Dunn has a master's degree in applied history from the University of Technology, Sydney and was awarded a PhD from the University of NSW for his thesis "A Valley in a Valley: Colonial Struggles over land and resources in the Hunter Valley, NSW 1820-1850". Dr Dunn has served as Chair of the Heritage Committee, NSW Heritage Office and Chair of the Professional Historians Association of NSW and ACT and has previously been the Deputy Chair of the Heritage Council NSW, and President of the History Council.

In his detailed historical report of early conflict (refer Appendix F) for a full transcript) Dunn (2020) concludes that:

The years 1825-1827 cycled through a series of tit-for-tat attacks and retributions between Aboriginal people and Europeans in the middle Hunter Valley. A combination of increasing pressures on traditional food sources by the influx of settler's livestock, the locking off of land through fencing and farming, provocation by convicts against Aboriginal people all combined to create an atmosphere of tension and the potential for violence. A close reading of the available evidence, through newspapers, depositions and enquiries appears to show not a series of random attacks, or rampaging bands of warriors, but rather targeted attacks against individuals and isolated workers. Bowman's large estate was the site of three attacks resulting in two Europeans killed and two wounded, with one Aboriginal man wounded'(Dunn, 2020).

Dunn concluded that not all interactions between Aboriginal people and settlers during the 1820's and 1830's was violent. Indeed, 'many of the estates and farms also employed Aboriginal people in work, paying them with food, tobacco and blankets' (Dunn, 2020). There is, however, no evidence of James Bowman (owner of Ravensworth estate) employing Aboriginal workers at that time.

An attack by Robert Scott and a party of men which originated from James Glennies property (Fal Brook) and was eventually reported by The Australian occurred some 20 miles (32 kilometres) from Alcorn's Hut and resulted in the death of 18 Aboriginal people. Richard Alcorn was an overseer for Captain Robert Lethbridge and his hut was located in Fal Brook, now known as Glennies Creek. Even though the exact location of this event is unknown, the plotting of a 20-mile (32 kilometre) radius from Alcorn's Hut situates this event (often referred to as the 'Ravensworth massacre') well beyond Ravensworth Estate, which lies approximately 5 miles (8 kilometres) to the north-west (Dunn, 2020).

Dr Dunn's conclusions concur with the previous conclusions of both the Mt Owen ACHAR and the Umwelt (2004) report.

3.3.1 Upper Hunter Valley Massacre Site Card (#AHIMS 37-3-0390)

As a result of the considerable evidence brought to light during the various relevant ACHAR and AAIA processes, an application was successfully made in June 2020 to AHIMS to have the 'Ravensworth Massacre' site record renamed as the 'Upper Hunter Valley Massacre' site card.

Altering the name of the AHIMS site record more accurately reflects the nature of the historical record in this region as discussed by Dunn (2020) (See Section 3.3, 6.11.4 and Appendix F), as none of the historical reports identify a location for this tragic event. As shown above, the event is reported to have occurred after an attack on Alcorn's hut on (current) Glennies Creek, with the location of the massacre not recorded. There is no historical evidence to associate Ravensworth Estate with any such event.

3.4 Post-Contact Land Use within the Project Area

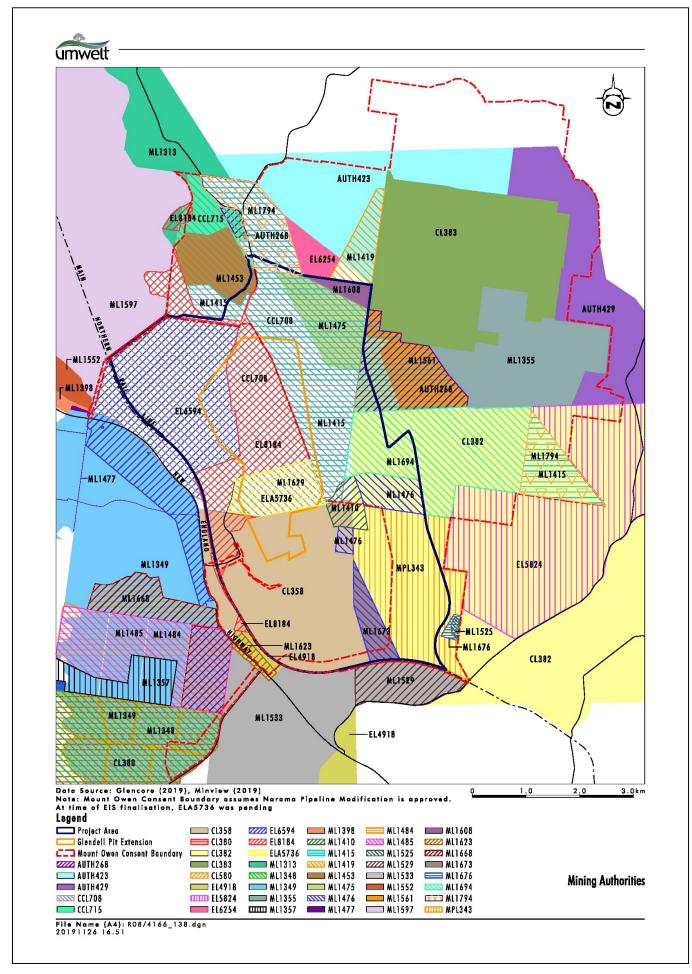
The land uses within the Project Area and surrounds are currently dominated by mining operations. Glencore operates the Mount Owen Complex, Integra Underground operations to the south-east, Liddell Coal Operations to the north-west and Ravensworth Surface Operations to the south-west (refer to Map 3-2). Ashton Coal Mine is located to the south of the Project Area while Rix's Creek North is located to the south-east of the Project Area.

Other land uses within the surrounding area include grazing and rural residential holdings and the Hebden and Wild Quarries to the north-of the Project Area. The Bayswater and Liddell Power Stations are located further to the west and north-west, respectively, of the Project Area. With a variety of landscapes, the Upper Hunter region supports a diverse range of agricultural industries. Similarly, Singleton and Muswellbrook LGAs have a long history of agricultural land use, particularly in regard to cropping and grazing. Cropping within the Project Area and immediate surrounds has historically been largely limited to the flatter alluvial terraces associated with Bowmans

Creek. There has been limited cropping of alluvial terraces in recent years other than localised areas used for improved pastures for grazing.

Where not used for mining related activities, land owned by Glencore and its subsidiaries within and surrounding the Project Area is utilised for cattle grazing and rural residential leases (subject to environmental conditions). The cattle grazing operations are currently managed and operated by Colinta Holdings Pty Ltd, a Glencore subsidiary.

There are a number of rural localities within proximity to the Project Area including Hebden to the north, Falbrook and Middle Falbrook to the east and south respectively (refer to Map 3-2). Camberwell (refer to Map 3-2) is located approximately 1 km from the southern boundary of the Project Area where the majority of the existing residences are mine owned or have acquisition rights under approved mining development consents. Other rural residential land holdings are present within the surrounding area. These are predominantly located to the south-east of the Project Area (refer to Map 3-2).



Map 3-2: Tenements within the Project Area

4 Archaeology of the Project Area

4.1 Aboriginal Archaeological Impact Assessment

OzArk Environmental & Heritage Management Pty Limited (OzArk) were engaged by Umwelt Environmental & Social Consultants (Umwelt) to complete an Aboriginal Archaeology Impact Assessment (AAIA) for the Project.

The fieldwork component of the AAIA consisting of survey and test excavation was conducted by OzArk, with the assistance of Registered Aboriginal Parties (RAPs) and Wonnarua Knowledge Holders over the course of several weeks in April and September 2018. The field survey and the test excavation were conducted over five weeks and involved 25 field days in total.

69 sites were recorded during the survey consisting of:

- 39 artefact scatters,
- 29 isolated finds; and
- A scarred tree (located outside the disturbance zone)

Of the artefact scatters, 32 sites recorded less than 10 artefacts and no site contained more than 70 artefacts. Only at nine locations was it assessed that there are subsurface deposits. One of these sites was determined to have a moderate artefact density (Glendell North OS6), however, none of the recorded sites was remarkable in its manifestation; either in terms of the types of artefacts recorded, the raw material the artefacts were manufactured from or the density and nature of the surface artefact manifestation. The recorded sites are also very representative of artefact sites in the upper Hunter Valley both in terms of the types of artefacts recorded and the raw materials from which the artefacts were manufactured.

The test excavation program involved excavation of 152 0.5 m by 0.5 m excavation squares at 12 separate localities: a total of 38 square metres. From this area of excavation, 180 artefacts were recovered; an average of 4.7 artefacts per square metre or 1.18 artefacts per excavation square. This density of artefacts is extremely low and only two excavation squares that recorded artefacts in numbers greater than 15.

Most of the excavation squares did not have overt evidence of disturbance, apart from Area 12 where historic items we recorded in one of the excavation squares. However, as most of the squares had what can be described as a very truncated A1 Horizon and a leached A2 Horizon, the implication is that the landscape has been subject to the stripping of the A1 Horizon and the exposure of the A2 Horizon. The implicit conclusion is, therefore, that the landscape has undergone a high general disturbance from soil loss that has compromised the archaeological deposits across the Additional Disturbance Area. As such, the general condition of the archaeological landscape within the Additional Disturbance Area is assessed to be poor.

As a result, undertaking an assessment of scientific significance for all sites within the Additional Disturbance Area shows that 87.5% of sites have a low scientific significance as they are either isolated finds or low-density artefact scatters. A few sites have low-moderate scientific significance, five sites have moderate scientific significance, and no sites have been assessed as having high scientific significance.

An assessment of potential impacts to the archaeological values in the Additional Disturbance Area shows that 52 of the 69 newly recorded sites are within or in very close proximity to the Additional Disturbance Area and 44 previously recorded sites are within the Additional Disturbance Area.

In total, 91 sites are located within the Additional Disturbance Area and will be impacted should the Project be approved. 55 of these sites are artefact scatters (15 of which have Potential Archaeological Deposit (PAD) and 36 are isolated finds (one of which has PAD). In general, the artefact scatters have a low artefact density with most sites recording less than 10 artefacts.

Management recommendations are made in Section 4.3 to mitigate this loss of archaeological value. These recommendations include:

- Conserving all sites outside of the Additional Disturbance Area by extending the current site monitoring and verification protocols contained in the Mt Owen Aboriginal Cultural Heritage Management Plan (ACHMP);
- Undertaking a collection and recording of all surface artefacts at all sites within the Additional Disturbance Area where there is a surface manifestation of artefacts; and
- To undertake limited manual archaeological excavation at four locations to confirm the nature of the archaeological deposits.

4.2 Assessment of Scientific Significance

As a result, most newly recorded sites have a low scientific significance as they generally have:

- A low artefact density;
- No associated subsurface deposits;
- No remarkable features and are generally representative of other artefact sites in the upper Hunter Valley;
- A high likelihood of being in a secondary context; and
- A limited ability to inform on the nature and spatial extent of past Aboriginal occupation in the Additional Disturbance Area.

Table 4-1 lists the newly recorded sites and their associated scientific significance.

Table 4-1: Scientific significance of newly recorded sites

Site Name	Feature(s)	Potential for subsurface deposits	Scientific Significance	Justification
Glendell North OS1	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS2	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS3	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS4	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS5	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
Glendell North OS6	Artefact scatter	Yes (moderate density)	Moderate	Moderate artefact density and high probability of further subsurface deposits present
Glendell North OS7	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS8	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS9	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS10	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS11	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS12	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS13	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS14	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS15	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS16	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
Glendell North OS17	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS18	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS19	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
Glendell North OS20	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS21	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS22	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS23	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context

Clossiall	A = + a f = - +	A I CI	1	Low out of part along its who of a secretariate devices of the secretariate of the sec
Glendell North OS24	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS25	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
Glendell North OS26	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS27	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS28	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS29	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS30	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS31	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS32	Artefact	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell	scatter Artefact	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed
North OS33 Glendell	scatter Artefact	Yes (low density)	Moderate	Low density with known subsurface deposits
North OS34 Glendell	scatter Artefact	Yes (low density)	Low-moderate	Low density with low density subsurface deposits
North OS35	scatter			, , ,
Glendell North OS36	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
Glendell North OS37	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS38	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
Glendell North OS39	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits as no A-Horizon present
Glendell North IF1	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF2	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF3	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF4	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF5	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF6	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF7	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF8	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF9	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF10	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF11	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF12	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF13	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a
Glendell	Isolated	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a
North IF14 Glendell	find Isolated	Nil	Low	secondary context Isolated artefact without associated subsurface deposits. Likely in a
North IF15 Glendell	find Isolated	Nil	Low	secondary context Isolated artefact without associated subsurface deposits. Likely in a
North IF16 Glendell	find Isolated	Nil	Low	secondary context Isolated artefact without associated subsurface deposits. Likely in a
North IF17	find			secondary context

Glendell North IF18	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF19	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF20	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF21	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF22	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF23	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF24	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF25	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF26	Isolated find	Yes (low density)	Low	Isolated subsurface artefact formerly present but now excavated during the test excavation program. Any information gained would only address limited research questions
Glendell North IF27	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF28	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North IF29	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
Glendell North ST1	Scarred tree	Nil	Moderate	Relatively rare site type which remains extant within the Hunter Valley region

There are 40 previously recorded sites within the Additional Disturbance Area. All these sites were re-assessed during the 2018 survey to determine their current condition and significance.

Table 4-2 (below) lists the 40 previously recorded sites in the Additional Disturbance Area.

Table 4-2: Significance assessment of previously recorded sites.

ID	AHIMS	Site name	Site type	Scientific significance	Justification
70	37-3-0294	Site 2; (MORL2)	Artefact scatter	Low	Artefacts unable to be located
71	37-3-0343	Mt Owen 1 (1996)	Artefact scatter	Low	Precise location of site is unknown
73	37-3-0469	Bowmans/Swamp Creek Trench 1	Artefact scatter	Moderate	Moderate artefact density and high probability of associated subsurface deposits however these will be in a disturbed context
75	37-3-0521	MO-IF1	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
76	37-3-0612	Bettys Creek 22	Isolated find	Low	Artefacts unable to be located
79	37-3-0689	G11 Glendell	Artefact scatter	Low	Low artefact density with low potential for further subsurface deposits
81	37-3-0744	York Creek 1	Artefact scatter	Low	Low artefact density; low potential for associated subsurface deposits; disturbed context
82	37-3-0745	York Creek 2	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; secondary context
83	37-3-0746	York Creek 3	Artefact scatter	Low	Low artefact density; low potential for associated subsurface deposits; disturbed context
84	37-3-0747	York Creek 4	Artefact scatter	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
85	37-3-0748	York Creek 5	Artefact scatter	Low	Low artefact density; low potential for associated subsurface deposits; disturbed context
86	37-3-0749	York Creek 6	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context

	1			T	1
87	37-3-0750	York Creek 7	Low-moderate	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
88	37-3-0751	York Creek 8	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
89	37-3-0752	York Creek 9	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; secondary context
90	37-3-0753	York Creek 10	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
91	37-3-0754	York Creek 11	Artefact scatter	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
92	37-3-0755	York Creek 12	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
93	37-3-0756	York Creek 13	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
94	37-3-0757	York Creek 14	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
95	37-3-0758	York Creek 15	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; likely in secondary context
96	37-3-0759	York Creek 16	Artefact scatter	Low	Low artefact density and lack of associated subsurface deposits
97	37-3-0760	York Creek 17	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
98	37-3-0761	York Creek 18	Artefact scatter	Low-moderate	Low density subsurface deposits present. Any information gained would only address limited research questions
99	37-3-0762	Bowmans Ck 6	Artefact scatter	Low	Low artefact density and lack of associated subsurface deposits
100	37-3-0763	Bowmans Ck 7	Artefact scatter	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
101	37-3-0764	Bowmans Ck 8	Artefact scatter	Low	Artefacts unable to be located
102	37-3-0765	Bowmans Ck 9	Artefact scatter	Low	Low density scatter without associated subsurface deposits. Likely in a secondary context
103	37-3-0766	Bowmans Ck 10	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; secondary context
107	37-3-0773	Swamp Ck 10	Isolated find	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
109	37-3-1155	MT OWEN ISOLATED FIND2	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
110	37-3-1156	MT OWEN ISOLATED FIND1	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
111	37-3-1158	RPS DLW IF1	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
114	37-3-1198	MOCO OS-10	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context. Partially destroyed
415	27.0.4.00	6	1		
115	37-3-1490	Swamp Creek IF-4	Isolated find	Low	Isolated find in a secondary context
116	37-3-1492	Swamp Creek IF-2	Isolated find	Low	Isolated find in a secondary context
117	37-3-1493	Swamp Creek IF-3	Isolated find	Low	Isolated find in a secondary context

118	37-3-1494	Swamp Creek IF-1	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
122	37-3-1499	Swamp Creek-OS1	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
124	37-3-1503	Yorks Creek 19	Artefact scatter	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions

4.2.1 Likely Impacts to Aboriginal Cultural Heritage as a result of the Project

The AAIA has determined the following:

- 52 of the 69 newly recorded sites are within or in very close proximity to the Additional Disturbance Area; and
- 40 previously recorded sites are within the Additional Disturbance Area.

In total, 91 sites are located within the Additional Disturbance Area and will be impacted should the Project be approved. 55 of these sites are artefact scatters (15 of which have PAD) and 36 are isolated finds (one of which has PAD). In general, the artefact scatters have a low artefact density with most sites recording less than 10 artefacts.

Table 4-3 lists the 91 sites within the Additional Disturbance Area. As shown in Table 4-3, the majority of the sites that will be impacted by the Project have a low scientific significance. Thirteen of these sites have scientific values due to the presence of subsurface deposits.

Table 4-3: All known sites within or closely adjacent to the Additional Disturbance Area

ID	AHIMS ID	Site name	Easting	Northing	Site type	Scientific significance	Consequence of harm (Total/Partial/No Loss of Value)
2	37-3-1559	Glendell North OS2	317930	6413515	Artefact scatter	Low	Total loss of value
3	37-3-1558	Glendell North OS3	317792	6413230	Artefact scatter	Low	Total loss of value
4	37-3-1557	Glendell North OS4	317761	6413127	Artefact scatter	Low	Total loss of value
5	37-3-1569	Glendell North OS5	316619	6413304	Artefact scatter with PAD	Low-moderate	Total loss of value
6	37-3-1571	Glendell North OS6	316443	6413081	Artefact scatter with PAD	Moderate	Total loss of value
8	37-3-1549	Glendell North OS8	316386	6412999	Artefact scatter	Low	Total loss of value
11	37-3-1554	Glendell North OS11	318126	6412284	Artefact scatter	Low	Total loss of value
12	37-3-1553	Glendell North OS12	316810	6412250	Artefact scatter	Low	Total loss of value
13	37-3-1552	Glendell North OS13	317915	6411844	Artefact scatter	Low	Total loss of value
14	37-3-1551	Glendell North OS14	317705	6411820	Artefact scatter	Low	Total loss of value
15	37-3-1550	Glendell North OS15	317055	6412013	Artefact scatter	Low	Total loss of value
16	37-3-1573	Glendell North OS16	317599	6410970	Artefact scatter with PAD	Low-moderate	Total loss of value
17	37-3-1542	Glendell North OS17	317850	6410521	Artefact scatter	Low	Total loss of value
18	37-3-1541	Glendell North OS18	317852	6410274	Artefact scatter	Low	Total loss of value
19	37-3-1572	Glendell North OS19	317790	6410020	Artefact scatter with PAD	Low-moderate	Total loss of value
20	37-3-1540	Glendell North OS20	317856	6409957	Artefact scatter	Low	Total loss of value
21	37-3-1539	Glendell North OS21	318418	6410236	Artefact scatter	Low	Total loss of value
22	37-3-1538	Glendell North OS22	319293	6410281	Artefact scatter	Low	Total loss of value
23	37-3-1537	Glendell North OS23	318500	6410083	Artefact scatter	Low	Partial loss of value
25	37-3-1570	Glendell North OS25	318367	6408758	Artefact scatter with PAD	Low-moderate	Total loss of value
26	37-3-1548	Glendell North OS26	318224	6410798	Artefact scatter	Low	Total loss of value
29	37-3-1547	Glendell North OS29	318291	6408381	Artefact scatter	Low	Total loss of value
30	37-3-1546	Glendell North OS30	318530	6408206	Artefact scatter	Low	Total loss of value
31	37-3-1545	Glendell North OS31	318827	6407525	Artefact scatter	Low	Total loss of value
34	37-3-1574	Glendell North OS34	317447	6411053	Artefact scatter with PAD	Moderate	Total loss of value

	1	1		1	T	,	I
35	37-3-1567	Glendell North OS35	317371	6411106	Artefact scatter with PAD	Low-moderate	Partial loss of value
36	37-3-1568	Glendell North OS36	316670	6413398	Artefact scatter with PAD	Low-moderate	Total loss of value
37	37-3-1562	Glendell North OS37	317843	6412369	Artefact scatter	Low	Total loss of value
38	37-3-1565	Glendell North OS38	317557	6411704	Artefact scatter	Low	Total loss of value
39	37-3-1576	Glendell North OS39	318028	6409888	Artefact scatter	Low	Total loss of value
41	37-3-1534	Glendell North IF2	317146	6413503	Isolated find	Low	Total loss of value
42	37-3-1533	Glendell North IF3	317120	6413414	Isolated find	Low	Total loss of value
43	37-3-1532	Glendell North IF4	316962	6412937	Isolated find	Low	Total loss of value
44	37-3-1531	Glendell North IF5	318054	6412783	Isolated find	Low	Total loss of value
47	37-3-1528	Glendell North IF8	316956	6412606	Isolated find	Low	Total loss of value
49	37-3-1526	Glendell North IF10	318745	6411655	Isolated find	Low	Total loss of value
50	37-3-1525	Glendell North IF11	317221	6411282	Isolated find	Low	Total loss of value
51	37-3-1524	Glendell North IF12	317765	6410903	Isolated find	Low	Total loss of value
52	37-3-1523	Glendell North IF13	317688	6410830	Isolated find	Low	Total loss of value
53	37-3-1522	Glendell North IF14	317752	6410825	Isolated find	Low	Total loss of value
54	37-3-1521	Glendell North IF15	317683	6410588	Isolated find	Low	Total loss of value
55	37-3-1520	Glendell North IF16	319072	6410845	Isolated find	Low	Total loss of value
56	37-3-1519	Glendell North IF17	317777	6409943	Isolated find	Low	Total loss of value
57	37-3-1518	Glendell North IF18	317723	6409918	Isolated find	Low	Total loss of value
59	37-3-1515	Glendell North IF20	318022	6409310	Isolated find	Low	Total loss of value
60	37-3-1514	Glendell North IF21	318328	6408936	Isolated find	Low	Total loss of value
61	37-3-1516	Glendell North IF22	317984	6410954	Isolated find	Low	Total loss of value
63	37-3-1512	Glendell North IF24	318253	6411466	Isolated find	Low	Total loss of value
65	37-3-1566	Glendell North IF26	318253	6408957	Isolated find with PAD	Low	Total loss of value
66	37-3-1564	Glendell North IF27	317260	6411851	Isolated find	Low	Total loss of value
67	37-3-1563	Glendell North IF28	317241	6411913	Isolated find	Low	Total loss of value
68	37-3-1575	Glendell North IF29	317613	6411755	Isolated find	Low	Total loss of value
70	37-3-0294	Site 2; (MORL2)	321168	6410327	Artefact scatter	Low	Total loss of value
71	37-3-0343	Mt Owen (1996) 1;MtO1;	318524	6414512	Artefact scatter	Low	Total loss of value
73	37-3-0469	Bowmans/Swamp Creek Trench 1	318072	6409137	Artefact scatter with PAD	Moderate	Total loss of value
75	37-3-0521	MO-IF1	319123	6410319	Isolated find	Low	Total loss of value
76	37-3-0612	Bettys Creek 22	321138	6410296	Isolated find	Low	Total loss of value
79	37-3-0689	G11 Glendell	319223	6410211	Artefact scatter with PAD	Low	Total loss of value
81	37-3-0744	York Creek 1	317440	6411356	Artefact scatter	Low	Total loss of value
82	37-3-0745	York Creek 2	317577	6411112	Artefact scatter	Low	Total loss of value
83	37-3-0746	York Creek 3	317745	6411008	Artefact scatter	Low	Total loss of value
84	37-3-0747	York Creek 4	317373	6411322	Artefact scatter	Low-moderate	Total loss of value
85	37-3-0748	York Creek 5	317365	6411471	Artefact scatter	Low	Total loss of value
86	37-3-0749	York Creek 6	317501	6411813	Artefact scatter	Low	Total loss of value
87	37-3-0750	York Creek 7	317484	6412170	Artefact scatter with PAD	Low-moderate	Total loss of value
88	37-3-0751	York Creek 8	317496	6412805	Isolated find	Low	Total loss of value
89	37-3-0752	York Creek 9	317685	6411312	Artefact scatter	Low	Total loss of value
90	37-3-0753	York Creek 10	317865	6412266	Artefact scatter	Low	Total loss of value
91	37-3-0754	York Creek 11	317782	6412443	Artefact scatter with PAD	Low-moderate	Total loss of value
92	37-3-0755	York Creek 12	317846	6412581	Artefact scatter	Low	Total loss of value
93	37-3-0756	York Creek 13	318352	6411400	Artefact scatter	Low	Total loss of value
94	37-3-0757	York Creek 14	318417	6411813	Isolated find	Low	Total loss of value
95	37-3-0758	York Creek 15	317849	6411202	Artefact scatter	Low	Total loss of value
96	37-3-0759	York Creek 16	317827	6411497	Artefact scatter	Low	Total loss of value
97	37-3-0760	York Creek 17	317626	6412595	Isolated find	Low	Total loss of value
				•			

98	37-3-0761	York Creek 18	317712	6412158	Isolated find with PAD	Low-moderate	Total loss of value
99	37-3-0762	Bowmans Ck 6	317645	6410765	Artefact scatter	Low	Total loss of value
100	37-3-0763	Bowmans Ck 7	316542	6413142	Artefact scatter with PAD	Moderate	Total loss of value
101	37-3-0764	Bowmans Ck 8	317205	6412329	Artefact scatter	Low	Total loss of value
102	37-3-0765	Bowmans Ck 9	316878	6412410	Artefact scatter	Low	Total loss of value
103	37-3-0766	Bowmans Ck 10	316833	6412566	Artefact scatter	Low	Total loss of value
107	37-3-0773	Swamp Ck 10	319006	6411169	Isolated find	Low	Total loss of value
109	37-3-1155	MT OWEN ISOLATED FIND2	317854	6411236	Isolated find	Low	Total loss of value
110	37-3-1156	MT OWEN ISOLATED FIND1	318001	6410455	Isolated find	Low	Total loss of value
111	37-3-1158	RPS DLW IF1	317148	6412677	Isolated find	Low	Total loss of value
114	37-3-1198	MOCO OS-10	317840	6409364	Artefact scatter	Low	Total loss of value
115	37-3-1490	Swamp Creek IF-4	318805	6407340	Isolated find	Low	Total loss of value
116	37-3-1492	Swamp Creek IF-2	318807	6407327	Isolated find	Low	Total loss of value
117	37-3-1493	Swamp Creek IF-3	318805	6407330	Isolated find	Low	Total loss of value
118	37-3-1494	Swamp Creek IF-1	318640	6407727	Isolated find	Low	Total loss of value
122	37-3-1499	Swamp Creek-OS1	318819	6407300	Artefact scatter	Low	Total loss of value
124	37-3-1503	Yorks Creek 19	317369	6411237	Artefact scatter with PAD	Low	Total loss of value

4.3 Archaeological Management of Known Aboriginal Sites

4.3.1 Archaeological salvage

As a result of the current and previous assessments, 91 sites have been recorded within the Additional Disturbance Area.

As seen in Table 4-4 (below) the most common management strategy recommended on archaeological grounds alone is for the salvage of a site through the recording and collection of surface artefacts. This recommendation is made due to:

- The nature of the recorded sites (84.6% of sites are isolated finds or low-density artefact scatters with no associated subsurface deposits);
- Generally thin A-Horizon soils that preclude subsurface archaeological deposits;
- · Generally high previous disturbance from a range of factors including erosion and land use practices; and
- The low archaeological values assigned to the sites.

Sites designated for surface artefact collection have a very limited ability to further inform the community about the history and culture of the area. While any potential research questions are limited, some information can nevertheless be gained.

Table 4-4 sets out the recommended archaeological management of all sites within or adjacent to the Additional Disturbance Area.

Table 4-4: Management recommendations for sites within the Proposed Disturbance Footprint

AHIMS ID	Site name	Site type	Scientific Significance	Degree of harm	Comment	Management strategy
37-3- 1559	Glendell North OS2	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1558	Glendell North OS3	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1557	Glendell North OS4	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1569	Glendell North OS5	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very	No action required as no surface artefacts present

					low density of subsurface artefacts	
37-3- 1571	Glendell North OS6	Artefact scatter with PAD	Moderate	Total	Moderate density artefact scatter with subsurface deposits	Mapping, description and collection of surface artefacts. Archaeological excavation to gain a better understanding of the nature of deposits on the spur landform adjacent to Bowman's Creek
37-3- 1549	Glendell North OS8	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1554	Glendell North OS11	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1553	Glendell North OS12	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1552	Glendell North OS13	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1551	Glendell North OS14	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1550	Glendell North OS15	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1573	Glendell North OS16	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefact
37-3- 1542	Glendell North OS17	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1541	Glendell North OS18	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1572	Glendell North OS19	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefact
37-3- 1540	Glendell North OS20	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1539	Glendell North OS21	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1538	Glendell North OS22	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1537	Glendell North OS23	Artefact scatter	Low	Total (although only part of the site extent is within the Additional Disturbance Area, it is recommended that the entire site be salvaged)	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1570	Glendell North OS25	Artefact scatter with PAD	Low - moderate	Total	Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefact
37-3- 1548	Glendell North OS26	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1508	Glendell North OS28	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1547	Glendell North OS29	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1546	Glendell North OS30	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1545	Glendell North OS31	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1574	Glendell North OS34	Artefact scatter with PAD	Moderate	Total (although only part of the site extent is within the Additional	Low density artefact scatter with known subsurface deposits	Mapping, description and collection of surface artefacts Archaeological

				Disturbance Area, it is recommended that the entire site be salvaged)		excavation to gain a better understanding of the nature of deposits associated with the confluence of Yorks and Bowman's Creek (Section 9.5.2).
37-3- 1567	Glendell North OS35	Artefact scatter with PAD	Moderate	Total (although only part of the site extent is within the Additional Disturbance Area, it is recommended that the entire site be salvaged)	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	No action required as no surface artefacts present
37-3- 1568	Glendell North OS36	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	No action required as no surface artefacts present
37-3- 1562	Glendell North OS37	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1565	Glendell North OS38	Isolated find	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1576	Glendell North OS39	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 1534	Glendell North IF2	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1533	Glendell North IF3	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1532	Glendell North IF4	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1531	Glendell North IF5	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1528	Glendell North IF8	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1526	Glendell North IF10	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1525	Glendell North IF11	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1524	Glendell North IF12	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1523	Glendell North IF13	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1522	Glendell North IF14	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1521	Glendell North IF15	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1520	Glendell North IF16	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1519	Glendell North IF17	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1518	Glendell North	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1515	Glendell North IF20	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1514	Glendell North IF21	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1516	Glendell North IF22	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1513	Glendell North IF23	Isolated find	Low	Total (although the site is located 5 m from the Additional Disturbance Area, it is recommended that the site be salvaged)	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1512	Glendell North IF24	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact

37-3-	Glendell North	Isolated	Low	Total	Isolated artefact with	No action required as no	
1566	IF26	find with PAD			very low-density subsurface deposit. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	surface artefacts present	
37-3- 1564	Glendell North	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact	
37-3- 1563	Glendell North IF28	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact	
37-3- 1575	Glendell North IF29	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact	
37-3- 0294	Site 2; (MORL2)	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact	
37-3- 0343	Mt Owen (1996) 1;MtO1;	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact	
37-3- 0360	Mt Owen (1996) 2;	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact	
37-3- 0469	Bowmans/Swamp Creek Trench 1	Artefact scatter with PAD	Moderate	Total (already partially destroyed)	Moderate density artefact scatter	Mapping, description and collection of surface artefact Archaeological excavation to gain a better understanding of the nature of deposits associated with Bowman's and Swamp Creek (Section 9.5.2).	
37-3- 0521	MO-IF1	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact	
37-3- 0612	Bettys Creek 22	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact	
37-3- 0689	G11 Glendell	Artefact scatter with PAD	Low	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefacts	
37-3- 0727	Yorks Creek (Mt Owen Mine) 2	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts	
37-3- 0744	York Creek 1	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts	
37-3- 0745	York Creek 2	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts	
37-3- 0746	York Creek 3	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts	
37-3- 0747	York Creek 4	Artefact scatter	Low - moderate	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefacts	
37-3- 0748	York Creek 5	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts	
37-3- 0749	York Creek 6	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact	
37-3- 0750	York Creek 7	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	No action required as no surface artefacts present	
37-3- 0751	York Creek 8	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact	

	T	ı	I	I	т	
37-3- 0752	York Creek 9	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 0753	York Creek 10	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 0754	York Creek 11	Artefact scatter with PAD	Low- moderate	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefacts
37-3- 0755	York Creek 12	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 0756	York Creek 13	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 0757	York Creek 14	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 0758	York Creek 15	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 0759	York Creek 16	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3- 0760	York Creek 17	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 0761	York Creek 18	Artefact scatter with PAD	Low	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	No action required as no surface artefacts present
37-3- 0762	Bowmans Ck 6	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3- 0763	Bowmans Ck 7	Artefact scatter with PAD	Moderate	Total	Moderate density artefact scatter with known subsurface deposits	Mapping, description and collection of surface artefacts. Archaeological excavation to gain a better understanding of the nature of deposits on the spur landform adjacent to Bowman's Creek (Section 9.5.2).
37-3- 0764	Bowmans Ck 8	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3- 0765	Bowmans Ck 9	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3- 0766	Bowmans Ck 10	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3- 0773	Swamp Ck 10	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1155	MT OWEN ISOLATED FIND2	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1156	MT OWEN ISOLATED FIND1	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1158	RPS DLW IF1	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1194	MOCO OS-6	Artefact scatter	Low	Partial (already partially destroyed)	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3- 1198	MOCO OS-10	Artefact scatter	Low	Total (already partially destroyed). Although only part of the site extent is within the Additional Disturbance Area, it is recommended that the entire site be salvaged.	Low density artefact scatter	Mapping, description and collection of surface artefacts

37-3- 1490	Swamp Creek IF-4	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1492	Swamp Creek IF-2	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1493	Swamp Creek IF-3	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1494	Swamp Creek IF-1	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3- 1498	Swamp Creek- OS2	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3- 1499	Swamp Creek- OS1	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3- 1503	Yorks Creek 19	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefacts

4.3.2 Sites requiring specific management to prevent harm

There are three sites that are closely adjacent to the Additional Disturbance Area and may be unintentionally harmed by the Project unless specific management is undertaken to avoid impacts (See Table 4-5). Due to their close proximity to proposed works, these sites are at greater risk of unintentional impact when compared to sites located further away. These sites should be permanently fenced and signed prior to works beginning to provide adequate protection.

MOCO OS-6 is partially located within the Additional Disturbance Area, however, those portions of the site extent outside the Additional Disturbance Area will need to be fenced and signed.

Table 4-5: Sites requiring specific management to ensure conservation

AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Scientific Significance
37-3-1194	MOCO OS-6	320718	6409739	Artefact scatter	low
37-3-1560	Glendell North OS1	316820	6413702	Artefact scatter	Low
37-3-1543	Glendell North OS33	319166	6407069	Artefact scatter	Low

See **Appendix Appendix D** for full details of the sites requiring specific management measures.

4.3.3 Sites located on LCO owned land

There are six new and seven previously recorded sites that are located on land owned by Liddell Coal Operations?? (LCO), west of Bowmans Creek that were recorded or re-assessed during the survey lists these sites.

Table 4-6: Sites located on LCO owned land

AHIMS ID	Site Name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Notes
37-3-0686	Bowmans Ck 13	315983	6412942	Artefact scatter	
37-3-0688	G12	315806	6412691	Artefact scatter	
37-3-0768	Bowmans Ck_13	315982	6412940	Artefact scatter	Duplicate of 37-3-0686
37-3-0770	Bowmans Ck 11	315824	6412493	Artefact scatter	Same site as 37-3-0688
37-3-0771	Bowmans Ck 15	315825	6412677	Artefact scatter	Same site as 37-3-0688
37-3-1166	LIDEE - IF3	315930	6413149	Artefact scatter	
37-3-1503	Yorks Creek 19	317369	6411237	Artefact scatter	
37-3-1536	Glendell North OS7	316412	6413195	Artefact scatter	
37-3-1556	Glendell North OS9	315698	6412992	Artefact scatter	
37-3-1555	Glendell North OS10	315557	6412542	Artefact scatter	
37-3-1530	Glendell North IF6	315966	6412883	Isolated find	
37-3-1529	Glendell North IF7	315514	6412657	Isolated find	
37-3-1561	Glendell North ST1	316124	6412405	Scarred tree	

4.4 Historical Archaeology

This section provides a high-level summary of the historical archaeology research and fieldwork undertaken at the Ravensworth Estate homestead (See Figure 4-1, below).

Casey & Lowe, Archaeology & Heritage were engaged by Glencore to undertake historic archaeological test excavations on the Ravensworth Estate, situated within the original 1824 Ravensworth Estate land grant. The following information was prepared by Casey & Lowe (2019) to establish the historical archaeological potential and archaeological significance of the Ravensworth Estate to inform the EIS for the Project. For a complete discussion of the mining history and historical archaeology, please see Casey & Lowe (2019), which is an appendix to the Heritage Impact Statement within the EIS.



Figure 4-1: Front entrance of the Ravensworth Homestead (Photograph by Shaun Canning).

Seven key areas were identified for archaeological testing. Three of these were located to the west of Hebden Road and four were located to the east of it, where the current homestead is situated. The following is a brief description of each of the Test Areas.

The wider area surrounding the Project Area was first granted to James Bowman in 1824, who soon after occupied 12,160 acres of land, along with 2,000 sheep, 200 cattle and a number of convicts. The location of the first cottage on the property is approximately 850m west of the current homestead complex (Dunn, 2020).

4.4.1 Potential location of early house: Test Area 1

Test Area 1 is situated approximately 300 m west of Yorks Creek, on the opposite side of Hebden Road to the homestead. Testing in this area was based upon evidence from the natural topography and the presence of a building marked "house" in or around this area on Dixon's road plan and other historic plans. The area measured approximately 225 m from north to south and up to 95 m from east to west. The natural topography sloped off steeply to the south and west of this area. The area was sparsely covered in grass with occasional small bushes.

4.4.2 Potential agricultural/garden features: Test Area 2

Test Area 2 was situated immediately west of Yorks Creek southeast of Test Area 1. It covered an area of 100 m from north to south by approximately 90 m from east to west. Testing for agricultural and garden features in this area was based on evidence present in LiDAR and aerial photography. The ground here was relatively flat. The area was covered by grass and occasional small bushes.

4.4.3 Main house and immediate surrounds: Test Area 3

Located around the Ravensworth homestead to the east of Hebden Road, this area covered approximately 140 m from east to west and 160 m from north to south. The area incorporated the domestic portion of the Ravensworth homestead and an area of farmland to the south and east of the homestead buildings. The area contained the main house and its associated extensions, an array of garden features (walls, flower beds, etc.), an ablution

building, garden trees, a later sandstone turning circle, and a dirt track running from east to west to the north of the main house.

4.4.4 Potential convict barracks: Test Area 4

Situated to the north of the main house, this area extends from between two extant outbuildings into the paddock to the north. The test area measured approximately 60 m from north to south and 75 m from east to west. The area was divided into two by an east-west running stone wall. The area south of the dividing wall was covered in grass and contained several stone walls apparently used to corral livestock. The north part of the area was in a paddock and displayed a linear depression running parallel with the wall. This part of the area was strewn with stone blocks, several of which were worked architectural pieces. Re-used architectural pieces were also identified in the stone wall which divided the area.

4.4.5 Yards and Buildings: Test Area 5

Located immediately to the north of Test Area 4 and in the same paddock as the north part of it, this area measured approximately 125 m by 125 m. The area was covered in grass with some stone and occasional timber building components visible on the surface. A dirt track traversed the west side of this area in a north-south direction.

4.4.6 Buildings, Potential Gardens and Agricultural Features: Test Area 6

This was the largest of the test areas. It was located along the east bank of Yorks Creek, to the north and west of Test Area 5. The area covered an area measuring approximately 200 m from east to west and 350 m from north to south. The area was generally flat with a slight slope in places towards the creek. The area contained up to three linear-shaped dams, at least one of which was still functioning. A patch of herringbone brick paving was observed in the east of the area. A partially covered brick well was observed in the west of the area, not far from the creek. Two registered AHIMS artefact scatters Yorks Creek 10 (37-3-0753) and Yorks Creek 11 (37-3-0754) are located within the test area.

4.4.7 Potential European Burial: Test Area 7

Located on the west side of Hebden Road, this area is adjacent to the east bank of Yorks Creek. Ground penetrating radar (GPR) data revealed the remains of a possible rectangular structure in the east of the area. Most of the area was flat with a notable, sharp drop off in the west, down to the creek. The area measured approximately 20 m from east to west and 25 m from north to south. The surface was covered with grass and a linear stone feature measuring approximately 9 m from north to south was visible. This feature ran roughly parallel with the creek, close to where the land dropped off towards the east bank.

4.4.8 Results

The archaeological test excavation program at the Ravensworth Homestead and surrounds has confirmed the survival of early and later 19th and early 20th-century archaeological remains across the site. Testing confirmed the presence of intact archaeological remains dating to between 1830-1890s and has shown that their integrity is medium to high. The date and context of these remains means they are considered to be of State heritage significance.

The main archaeological results included:

- Intact archaeological remains of a large partitioned structure/ building in the form of foundations in the area that local oral history said contained the 'convict barracks' (Test Area 4).
- Intact archaeological remains of buildings / structures in the form of stone foundations, post holes, wall cuts and paths to the north / northwest of the main house (Test Areas 5 and 6).
- Evidence of a previously unknown structure but no burial (Test Area 7).
- Test Area 1 revealed no evidence of the earlier house site no historic features or relics were identified / recovered.
- Archaeological evidence of agricultural activity in various areas, including plough marks (Test Area 2, 6 and 8).

The archaeological remains across the Project Area have been variously impacted by 19th and 20th-century agricultural activities (including the demolition of structures and the loss of some underfloor deposits) and are being further truncated by environmental processes (wind, weathering, animals etc.), all of which have contributed to the loss of topsoil (A horizon) across the site and the wider Project Area.

As a result, the archaeological remains are subject to ongoing environmental and land management processes, which will continue to impact and erode the archaeology over time.

The analysis of the archaeological relics recovered revealed an array of information regarding the dates and potential uses of the areas / structures including:

- Test excavations (Test Areas 3 and 4) beside the main house and immediate outbuildings revealed that the upper deposits and fills contained artefacts relating to the preparation, serving and consumption of food and drink. It is likely that more artefacts will be found nearby and underneath floors in more secure contexts that will provide greater insight into the lives of the many occupants of the farm over time.
- The architectural items reveal that bricks with wide shallow frog, used in association with sandstone masonry in some structures, were locally hand-made from the clays and gravels, most probably on the property somewhere along one of the creek lines. These have not been previously recorded. As they were probably made by convict or itinerant brickmakers for the original owner of Ravensworth homestead, James Bowman, they provide a significant contribution to our knowledge of early construction in the region and provide a good comparison for recent studies of early brickmaking in Sydney, Parramatta, and Newcastle. The bricks were used in a large well in Test Area 6 (context 158); herringbone paving (Context 126), a chimney and other components of a multiroom structure investigated in Test Area 6. Future work may determine if they were used to construct structural elements of the original house and outbuildings.
- Trenches to the north of the homestead complex (Test Area 5) revealed evidence of structures (walls, postholes, floors) and artefacts strongly indicating blacksmithing and horse farriering activities. These include large pieces of unworked and worked iron for structures, vehicles, various horse and possibly oxen shoes and equipage, and a leather hole punch presumably for straps and belts.
- Scattered within and around the various structures in Test Area 3-6 were numerous fragments of ceramics and glassware used by the occupants over time. The table and tea wares were mostly imported from the UK. The glass represented a range of beverages and food, various pharmaceuticals and other products.
- The investigation also recorded scatters and dumps of similar ceramics and glassware in different parts of the property, including the wall of the main dam and in several paddocks.
- Consumption of food by the residents at the site were represented by small numbers of animal bone, mostly from sheep. Several of the examples had butchery marks and one was burnt. In the future these may assist in our understanding of slaughtering practices at Ravensworth and what cuts of meat were preferred.
- A full suite of recommendations is provided in the final report compiled by Casey & Lowe (2019).

4.4.9 Significance of Ravensworth Homestead

The Ravensworth Homestead is important as an archaeological landscape containing an 1830s colonial house and associated outbuildings which were modified throughout the 19th and 20th centuries, and the archaeology of the estate. The homestead buildings, the remnant 19th-century farm and garden layout built by assigned convicts all provide evidence of this landscape and its history. This can testify to the way in which this early occupation by Surgeon James Bowman with expansion of the wool industry into the Upper Hunter Valley, aided by assigned convicts, irrevocably changed the lives of Aboriginal people and modified the landscape of the Hunter Valley.

The archaeology of the place is associated with a number of prominent individuals: James Bowman, Mary Bowman (née Macarthur), John Macarthur, overseers James White and John Larnach, as well as later owners Captain William Russell and the Marshall family. This cultural landscape with its buried sites, works, relics, and ruins should provide evidence of technical achievements associated with an evolving pastoral activity, notably early wool production. Aspects of these archaeological values may? be important to the local community, notably evidence of the material culture and rural technology of the residents, the main families, lives of convicts and free persons.

The homestead's potential research significance relates to its ability to demonstrate the way of life, tastes, customs and functions in a rural context through the 19th to early 20th centuries. From its establishment, the site is a good example of a colonial rural estate built on convict labour. The intactness of the site's structures and their landscape settings enhances its role as a site of archaeological and scientific importance. Key research themes relate to the nature of lives on a newly-established frontier and contact with Aboriginal people, material culture and lives of significant colonial people, convict lives and the assignment system and how it is implemented within this landscape, use of technology and management of water, changing transportation and economics and how they shaped life on the estate.

The survival of the existing building indicates that archaeological excavation may contribute further information about the layout of the house, to understanding phases of its construction, potential alterations and the uses of rooms. These may be able to be interpreted and attributed to periods corresponding to the occupation of the Bowmans, White's or Lanarch's. In addition, underfloor deposits within the floor cavity are likely to be present in some rooms, surviving beneath original or later flooring. These deposits have the potential to tell us about the

status of the household and the use of spaces, although they may not be directly attributable to the Bowman era or to later ownership.

The Ravensworth Estate is rare for its contribution as part of the new convict assignment system and the beginnings of sheep husbandry outside the Cumberland Plain and its association with the Macarthur and Bowman families. Representative values are expressed through its 1820-1840s homestead and estate, pattern of pastoralism and closer settlement. The archaeological landscape, sites and material culture of this place could be of both State and local significance.

5 Aboriginal Community Consultation

Aboriginal people have rights and interests in the assessment and control of cultural heritage objects and places. In recognising these rights and interests, all parties concerned with identifying, conserving and managing cultural heritage should acknowledge, accept and act on the principles that Aboriginal people:

- are the primary source of information about the value of their heritage and how this is best protected and conserved;
- must have an active role in any Aboriginal cultural heritage planning process;
- must have early input into the assessment of the cultural significance of their heritage and its management so they can continue to fulfil their obligations towards their heritage; and
- must control the way in which cultural knowledge and other information relating specifically to their heritage is used, as this may be an integral aspect of its heritage value.

Consultation with Aboriginal people about cultural heritage places and the way those places should be managed is required under Part 6 of the NP&W Act. The processes of consultation are specifically outlined in the Department of Environment, Climate Change and Water publication 'Aboriginal cultural heritage consultation requirements for proponents 2010'.

This project has followed these guidelines and has also been consistent with the DECC 2005 guidelines.

Appendix A outlines the extensive series of consultation activities and workshops conducted by the Project throughout the preparation of this ACHAR.

5.1 Consultation Objectives and Approaches

'Consultation with Aboriginal people is an integral part of the process of investigating and assessing Aboriginal cultural heritage. Aboriginal people who hold cultural knowledge about the area, objects and places that may be directly or indirectly affected by the proposed activity must be given the opportunity to be consulted. This is done through the process of investigating, assessing and working out how to manage the harm from the proposed activity. Consultation must adhere to the requirements set out in Clause 80C of the NPW Regulation' (OEH 2011:2).

'Conservation, interpretation and management of a place should provide for the participation of people for whom the place has special associations and meanings, or who have social, spiritual or other cultural responsibilities for the place' (Australia ICOMOS 1999).

Based on the SEAR's and OEH guidelines for Aboriginal cultural heritage assessment in NSW, Aboriginal participation and involvement in all stages of cultural heritage assessment and management has been fundamental to the Project's ACHAR.

After formal notification and expressions of interest in the Project by the RAPs, Project staff approached the knowledge holder groups (WNAC and the PCWP) to understand if they wished to use the consultation model that has been developed during the consultation process for other Glencore sites (namely the Bulga Optimisation Project, the Mt Owen Continued Operations Project, the United Wambo JV Project and Mangoola Coal Continued Operations Project).

The consultation process was developed to encourage the active participation of all RAPs in the assessment of Project impacts, and the development of management recommendations and measures relevant to the Aboriginal cultural significance values statements and assessment concerns.

The steps employed in the cultural heritage assessment for the Project include(d):

- Workshop discussions with the Community RAPs
- Distribution of survey methodologies,
- Receiving comments and sharing of historic information including Project Area land use information;
- Reference to OzArk archaeological reports to gain an understanding of other components of the Aboriginal cultural heritage assessment;
- Facilitation of RAPs consultation on the cultural values of the Project Area, and Walks on Country to discuss Aboriginal cultural heritage values;
- · Archival investigation;

- Consultation with OEH; and
- Assessment of the key cultural heritage issues for the Project, considering relevant guidelines, policies and plans and input from RAPs including Traditional Owners and Knowledge Holders.

As an outcome of this process, this ACHAR presents a combined understanding of Aboriginal cultural heritage values of the Project Area, as identified by all RAPs, historical research, and the archaeological assessment, including the PCWP Values Report. This ACHAR also presents an impact assessment that incorporates the views of all RAPs and presents a series of management measures and recommendations that have been prepared in consultation with the RAPs who participated.

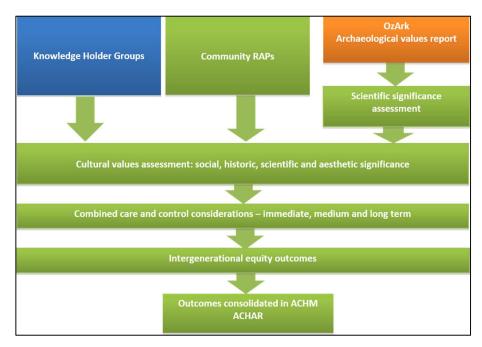


Figure 5-1: The integrated ACHAR approach utilised for this Project.

Throughout the ACHAR process, Glendell has engaged with representatives of the PCWP to gain their input into the ACHAR as has been successfully undertaken with the PCWP for the Mount Owen, United Wambo JV and Mangoola ACHAR's. This has included numerous meetings and phone calls. At the time of finalisation of the ACHAR in November 2019, the PCWP had not elected to participate in a Values and Recommendations Workshop. Since this time, PCWP have provided a Values Report and this ACHAR has subsequently been updated to include consideration of these Values.

The following sections provide a summary of the key stages of consultation with the involvement of the RAPs who chose to participate in the various consultation formats. The information gathered from the workshops combined with the results of the Project's archaeological assessments and historical research have been compiled to provide a comprehensive assessment of the cultural values of the Project Area, and to provide a consolidated management framework for the Project that are cognisant of intergenerational equity and Care and Control considerations.

5.2 Cultural Heritage Assessment Process for the Project

The key stages of the cultural heritage assessment process used by the Project are derived from the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011).

The stages of consultation and assessment, as described in the Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005) include:

- Undertaking a preliminary assessment to determine if the Project is likely to have an impact on Aboriginal cultural heritage
- Identifying the Aboriginal cultural heritage values associated with the area through consultation with Aboriginal people with cultural knowledge or responsibilities for country in which the proposed project occurs, written and oral research and field investigations
- Understanding of the significance of the identified Aboriginal cultural heritage values
- Assessing the impacts of the proposed development on Aboriginal objects and Aboriginal places

- Describing and justifying the proposed outcomes and alternatives, and
- Documenting the Aboriginal cultural heritage impact assessment and the conclusion and recommendations to afford appropriate protection of Aboriginal cultural value.

5.2.1 Four Stages of Consultation and Assessment

Consultation consistent with the DEC (2005) and DECCW (2010a) guidelines and in accordance with the principles of the Burra Charter (Australia ICOMOS 1999) has involved four consultation stages as detailed in the DECCW (2010a) guidelines outlined below.

Stage 1: During Stage 1 the Project undertook formal notification of the proposed Project and the ACHAR process, and the opportunity for Aboriginal parties to formally register their interest in the Project. Stage 1 of the DECCW (2010) consultation process aims to 'Identify, notify and register Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and / or places in the area of the proposed Project'.

5.2.2 Agency Notification

In accordance with Section 4.1.2 of DECCW (2010), the following organisations were notified about the project on the 24th November 2017, and the Project sought information on any Aboriginal people or organisations who may hold cultural knowledge relevant to determining any cultural values or significance associated with the Project Area.

Date Date Agency Response Notified Response Wanaruah Local Aboriginal Land Council 24/11/2017 27/11/2017 Provided a list of RAP's (WLALC) Office of the Registrar of Aboriginal Land 24/11/2017 28/11/2017 Advised that there were no Registered Aboriginal Owners Rights Act (ORLAR) pursuant to Division 3 of the Aboriginal Land Rights Act 1983 Office of Environment and Heritage (OEH) 24/11/2017 04/12/2017 Responded with list of individuals who might have interests in the Project. Native Title Services Corporation (NTSCorp) 24/11/2017 No response National Native Title Tribunal (NNTT) 28/11/2018 24/11/2017 Advised that there are no overlapping native title claims over the Project Area Muswellbrook Shire Council (MSC) 24/11/2017 No response Hunter Local Land Services (HLLS) 24/11/2017 No response

Table 5-1: Agency Notifications

5.2.3 Public Notification

Advertisements were placed in the following publications seeking registrations of interest for the Project

- Singleton Argus (20th December 2017)
- Muswellbrook Chronicle (22nd December 2017)

A copy of these advertisement is provided in Appendix B.1.2.

5.2.4 Written Notification to invite Participation in the ACHAR Process

Following the newspaper advertisements and correspondence mentioned above, a comprehensive list was developed containing the contact details of 102 Aboriginal parties. A written notification was posted or emailed to each of these on 22nd November 2017 to provide the opportunity to register an interest in the Project and participate in the assessment activities.

As specified in Section 4.1.5 of DECCW (2010a) guidelines, all RAPs were afforded the opportunity to withhold their information being provided to OEH.

A copy of the initial letter sent to the identified individuals and organisations is shown in **Appendix B.1.1.**

5.2.5 Registration of Aboriginal Parties

In accordance with Section 4.1.3 of DECCW (2010), all 102 Aboriginal parties identified through the process noted above were sent notification letters, introducing the Project and inviting their registrations of interest by 31st January 2018. At the close of the registration period, the Project had 32 Registered Aboriginal Parties.

A full list of all RAPs is included in Appendix A.1.

During this phase (Stage 2) the Project, OzArk and ACHM conducted initial Project description consultation, which included presenting information on the proposed Project to all Aboriginal parties who registered an interest in **Stage 1**. Copies of this information was shared with all RAPs. Consultation with the RAPs involved a combination of consultation forums, including meetings, briefing sessions and included inspections of the Project Area. **Stage 2** also included the briefings to the PCWP and WNAC groups. In accordance with Section 4.2.1 of DECCW (2010a), the RAPs who had registered an interest in the Project during **Stage 1** were sent a letter on 16th March 2018 inviting their participation in the archaeological surveys commencing on the 9th April 2018.

5.2.6 Draft Archaeological Survey Methodology

In accordance with Sections 4.2, 4.3.1 and 4.3.2 of DECCW (2010a), the Draft Archaeological Survey Methodology, including a Project Community Information Sheet was mailed out to Registered RAPS for comment (28-day review) on 21st February 2018. This feedback is presented in **Appendix B.1.9**.

5.2.7 Draft Archaeological Test Pitting Methodology

In accordance with Sections 4.2, 4.3.1 and 4.3.2 of DECCW (2010a), the Draft Archaeological Test Pitting Methodology and archaeological survey results summary was sent out to RAPS for comment (28-day review) on 6th April 2018. The Project received positive feedback from several RAPs.

This feedback is presented in Appendix B.1.20.

Stage 3 of the DECCW (2010a) consultation process relates to (a) gathering information about the cultural significance and cultural values of an assessment area, (b) seeking Aboriginal registrant information that will enable the cultural significance of the place to be determined and (c) providing Aboriginal registrants with the opportunity to provide input on cultural heritage management options. During Stage 3, OzArk conducted extensive archaeological fieldwork and ACHM facilitated cultural values workshops, site visits and consultation with WNAC and the Community RAPs in conjunction with Umwelt and Glencore personnel.

As part of the overall assessment approach, Glencore personnel also conducted regular consultation; and provided feedback to the PCWP and WNAC in relation to the Project, and specifically in relation to the cultural values workshops. To assist the groups, Glencore provided access to materials and facilitated land access, to enable these groups to assess their cultural heritage values, the significance of Aboriginal cultural places and artefacts, the likely Project impacts, if approved, and their management measures. Many of the RAPs were also involved in the archaeological fieldwork.

The Project team (including Umwelt, Glencore and ACHM personnel) conducted workshop sessions during Stage 3. However, not all Community RAPs and Knowledge Holder Groups accepted the offer to attend those workshops. The intent of the workshops was to review and discuss the Community RAPs and the Knowledge Holder Group values and recommendations, prior to the issue of the ACHAR reports for their 28-day review period. This approach provided the opportunity for all RAPs to discuss recommendations and to provide further comment on Aboriginal cultural heritage values and management measures.

Glendell has engaged with the PCWP since the commencement of the GCOP. At the time of initial finalisation of the ACHAR in November 2019, the PCWP had not elected to participate in a Values and Recommendations Workshop. Since this time, PCWP have provided a Values Report and this ACHAR has subsequently been updated to include consideration of these Values.

During Stage 3 activities included:

- WLAC cultural values site visit and workshop held 31st July 2018
- WNAC cultural values site visit and closed values meeting / workshops (held August 2nd and 17th-19th September 2018). The discussions from the 17th September meeting were not to be disclosed to the Project.
- Community RAP cultural values site visit and workshops (held July 1st August and 21st September 2018)
- Hickey Family cultural values workshop (held 1st August and 20th September 2018)
- Invitations to RAP's for participation in the archaeological survey (sent out 19th January 2018)
- Invitations to RAP's for participation in the archaeological test pitting (sent out 6th April 2018)
- Archaeological survey (including PCWP representatives in the fieldwork)
- Archaeological test excavation (including PCWP representatives in the fieldwork).

5.3 Stage 4 Consultation – Draft ACHAR Review

5.3.1 Comment on the Draft ACHAR

Some commentary was received from various RAP's regarding the draft ACHAR between September 2019 and July 2020.

Comments from the RAP's are included in Appendix C.

5.3.2 Additional RAP Feedback

Following receipt of the PCWP Cultural Values Report, this ACHAR was revised to include PCWP values. Due to the revisions made to the ACHAR and in accordance with the Guide (DECCW, 2010), the revised ACHAR was provided to the Project's RAPs for a 28 day review period from 21 July to 19 August 2020 so as to enable the RAP's to provide any feedback. Additional feedback was received from 8 RAPs and that feedback has been incorporated in Appendix G of this ACHAR.

5.4 Summary of Consultation Activities

Appendix A provides a detailed log of all consultation activities undertaken for the Project.

6 Cultural Heritage Values and Significance Assessment

Assessing the cultural significance of cultural heritage sites or objects is central to both understanding and managing heritage places and is a requirement of the Aboriginal Cultural Heritage Assessment reporting process. This section briefly describes the process and presents the cultural significance assessment for the Aboriginal heritage in the Project Area.

This section of the report specifically recognises that Aboriginal people are the primary determinants of information regarding the significance of cultural heritage objects, places or values. Indeed, this primacy is explicitly recognised by the Office of Environment and Heritage:

OEH recognises and acknowledges Aboriginal people as the primary determinants of the cultural significance of their heritage. In recognising these rights and interests, all parties concerned with identifying, conserving and managing cultural heritage should acknowledge, accept and act on the principles that Aboriginal people:

- Are the primary source of information about the value of their heritage and how this is best protected and conserved,
- Must have an active role in any Aboriginal cultural heritage planning process,
- Must have early input into the assessment of the cultural significance of their heritage and its management so they can continue to fulfil their obligations towards their heritage, and
- Must control the way in which cultural knowledge and other information relating specifically to their heritage is used, as this may be an integral aspect of its heritage value.

6.1 Definition of Cultural Significance

Cultural significance can be associated with or attached to any place, concept or object by any group or groups of people and is embodied in the place itself (i.e. its fabric, use, associations, and meanings, relationship to other concepts, places or objects). Place means any geographically defined area, and may include features, elements, objects, spaces and views. The place may have tangible (physically identifiable) or intangible (conceptual ideas or spiritual beliefs) values or a combination of both, or a range of values held by different individuals or groups. Places can be large or small, discrete or widespread. The concept of place can embody all of the physically identifiable elements of a landscape (i.e. historical, indigenous or natural heritage values). Place may also exist in the intangible realm, where conceptual or spiritual values are held over places or landscapes with little observable physical evidence or fabric (Australia ICOMOS, 2013).

6.2 Nature of Cultural Significance

The nature of cultural significance is determined by understanding the interrelationship of the following core values, and the constituent factors assessed. These values are:

6.2.1 Aesthetic Value

A concept, place or object can have cultural significance if it is significant in exhibiting particular aesthetic characteristics. Such as:

- Importance to a community for aesthetic characteristics.
- Importance for its creative, design or artistic excellence, innovation or achievement.
- Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or
- Otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.

6.2.2 Historic Value

A concept, place or object can have cultural significance if it is significant in exhibiting particular historic characteristics. Such as:

- It is significant in the evolution or pattern of the history of a locality, region, state, nation or people.
- Importance for the density or diversity of cultural features illustrating the human occupation and evolution of the locality, region, state or nation.

- Importance in relation to an event, phase or activity of historic importance in the region, state or nation
- Importance for close association with an individual or individuals whose life, works or activities have been significant within the history of the region, state or nation
- Importance as an example of technical, creative, design or artistic excellence, innovation, or achievement in a period.

6.2.3 Scientific Value

A concept, place or object can have cultural significance if it is significant in exhibiting scientific characteristics. Such as:

- It has demonstrable potential to yield information that will contribute to an understanding of the natural or cultural history of the region, state or nation
- Importance for information contributing to a wider understanding of natural or cultural history by its use as a research site, teaching site, type locality, reference or benchmark site.
- Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the locality, region, state or nation.
- It is significant in demonstrating a high degree of technical innovation or achievement.

6.2.4 Social Value

A concept, place or object can have cultural significance if it is significant in exhibiting social characteristics. Such as:

- Association with a community or cultural group for social, cultural, educational or spiritual reasons.
- Importance as a concept, place or object highly valued by a community or cultural group for reasons of social, cultural; religious, spiritual, aesthetic or educational associations.
- Importance in contributing to a community's sense of place and/or identity.

6.2.5 Spiritual Value

The Draft 2013 ICOMOS practice note 'Understanding and Assessing Cultural Significance' defines 'spiritual value' as the 'intangible values and meanings embodied in or evoked by a place which give it importance in the spiritual identity, or the traditional knowledge, art and practices of a cultural group. Spiritual value may also be reflected in the intensity of aesthetic and emotional responses or community associations and be expressed through cultural practices and related physical structures' (ICOMOS, 2013: 1).

The physical qualities of the place may inspire a strong and/or spontaneous emotional or metaphysical response in people, expanding their understanding of their place and purpose in the world, particularly in relation to the spiritual realm. The term spiritual value was recognised as a separate value in the 1999 Burra Charter (Australia ICOMOS 1999). It is still included in the definition of social value in the Commonwealth and most state jurisdictions. Spiritual values may be interdependent on the social values and physical properties of a place and its surrounding landscape.

A place may exhibit spiritual values if:

- The place contributes to the spiritual identity or belief system of a cultural group
- The place is a repository of knowledge, traditional art or lore related to spiritual practice of a cultural group
- The place is important in maintaining the spiritual health and well-being of a culture or group
- The physical attributes of the place play a role in recalling or awakening an understanding of an individual or group's higher purpose and place in relation to the spiritual realm.
- The spiritual values of the place find expression in cultural practices or human-made structures or inspire creative works.

6.3 Degree of Cultural Significance

Once the nature of the cultural significance of a place or object is understood, it is essential to understand the extent or degree of that cultural significance. This is typically established by considering:

6.3.1 Rarity

A concept, place or object can have cultural significance if it:

- Demonstrates or possesses rare, uncommon or endangered aspects of the cultural heritage of a locality, region, state or nation.
- Demonstrates or possesses rare, endangered or uncommon structures, landscapes or phenomena.
- Demonstrates or possesses a distinctive way of life, custom, process, land-use, function or design no longer practiced in, or in danger of being lost from, or of exceptional interest to, the region, state or nation.

6.3.2 Representativeness

A concept, place or object can have cultural significance if it:

- Is significant in demonstrating the characteristics of a class of cultural concepts, objects, places or environments in the State.
- Is important in demonstrating the principal characteristics of a range of concepts, objects, landscapes or environments, the attributes of which identify it as being characteristic of its class.
- Is important in demonstrating the principal characteristic of the range of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the locality, region, state or nation.

6.3.3 Condition, Integrity and Authenticity

- Condition refers to the current state of the concept, place or object in relation to each of the values for which that concept, place or object has been assessed. Condition reflects the cumulative effects of management and environmental events.
- Integrity is a measure of the likely long-term viability or sustainability of the values identified, or the ability of the concept, place or object to restore itself or be restored, and the time frame for any restorative process.
- Authenticity refers to the extent to which the fabric of the concept, place or object is in its original state.

6.4 Collecting Cultural Values Information

Cultural Values information was collected during a series of site visits and two separate cultural values workshops for each group held during August and September 2018 respectively. During these activities, ACHM discussed the importance of including any 'cultural values' in the ACHAR to both demonstrate connection to the places concerned but also to preserve any cultural knowledge which might exist regarding the Project Area.

Most of the outcomes from the cultural values workshops were more management oriented than an exposition of any cultural values.

Over the course of the cultural values workshops and site visits very little traditional or cultural knowledge was forthcoming, despite considerable efforts being applied to elicit any such knowledge or values. Many of the participants felt that this knowledge had generally been lost largely through historical circumstance (i.e. dispossession and forced resettlement) and through the passage of time (i.e. loss of elders and distance of contemporary people to past events).

Consistent with the results from previous ACHAR's (i.e. the Mount Owen Continued Operations ACHAR), the participants in the workshops and site visit expressed a strong contemporary 'connection to country' and were generally opposed to mining and the environmental damage which this may entail, but did not demonstrate any traditional lore, ritualised usage or customary connection to the Project Area.

6.4.1 Questionnaire

During the workshops held in September 2018, a questionnaire was developed and handed out to workshop participants to augment the collection of cultural values information from the RAP's (see example in **Appendix B.1.16**). The questionnaire was handed out to all participants in the workshops (for both Mangoola and this Project together), however only 17 were completed and returned. An analysis of the resulting information from those who completed the questionnaires (n=17) provided the following key focus areas.



Figure 6-1: Test analysis of the questionnaire responses from 17 of the RAPs who provided feedback.

6.5 WNAC Cultural Values Workshops

An initial workshop was held with the WNAC in Singleton in August 2018. A very well attended 2-day workshop was then held on the 18-19th September with WNAC in Singleton. This 2-day session followed a one-day 'in-house' workshop held by WNAC where the group assembled to discuss the Project with no outside attendees. The WNAC workshop focused broadly on employment, health, business opportunities and training for WNAC members, with only generic references to the cultural values of the Project Area.

6.6 Hickey's Cultural Values Workshops

Representatives of the Hickey family requested that they be consulted separately by the Project. To facilitate this, the Project arranged for separate workshops in August 2018 and September 2018. There were no attendees at the August 2018 workshop. Two individuals who were not RAPs attended the September 2018 workshop to represent the Hickey's; however, they did not feel comfortable commenting on behalf of the Hickey family. During the workshop discussions however, the two participants were provided with project updates and information to pass back to the Hickey Family. There were also discussions about the Aboriginal cultural values of the Project area.

6.7 PCWP Cultural Values

The PCWP provided a cultural values report for the GCOP project to Glencore in June 2020. The cultural values expressed by the PCWP in their report, along with their recommendations are included in sections 6.9 and 8.2, below.

The cultural values report provided by PCWP comprises largely the same information provided by the PCWP previously for other Glencore projects (i.e. for the ACHARs for the recent Mangoola Continued Operations Project and the Mount Owen Continued Operations Project).

In summary, the PCWP members who contributed their cultural values to the ACHAR expressed strong association with all Wonnarua country, but most particularly the area around Glennies Creek (which is outside the Project Area). The report exerts that the PCWP people are the only Wonnarua people who should be consulted for purposes such as this ACHAR (see Page 6 of the PCWP Glendell Aboriginal Cultural Values Assessment Report, attached in Appendix E (below) and twice on Page v of the Draper report, discussed below). It must be noted that the PCWP are one of a number of RAP's for the project. The consultation requirements specified by the Department of Planning, Industry and Environment in the SEARs for the Project are outlined in the appropriate guidelines and require consultation with all RAPs. This has been undertaken in the development of this ACHAR.

One difference between this version of the PCWP report and previous versions of similar reports prepared by the PCWP is that PCWP commissioned an anthropological report regarding the PCWP members cultural values for the GCO project area. The full scope of work for this independent report is not known to Glencore. The 'Glencore Glendell Continued Operations Coal Project Aboriginal Cultural Heritage Assessment' (12 June 2020) report was written by Associate Professor Neale Draper. The Draper report (2020) is discussed in detail in Section 6.11.2 below.

6.8 Community RAPs Cultural Values

An initial workshop was held with the Community RAP group in Singleton in August 2018. A one-day workshop was then held on the 21 September with the Community RAP group in Muswellbrook. The workshop focused broadly on employment, health, business opportunities and training, with only generic references to the cultural values of the Project Area.

6.9 Dominant Themes

There can be little doubt that the wider region surrounding the Project Area is an area that holds high cultural value(s) for all Wonnarua people. The wider landscape of the Hunter Valley is one deeply imbued with meaning to Wonnarua people.

Many of the values expressed by those consulted throughout this project (and for neighbouring Glencore projects) related to the wider region rather than just the Project Area specifically. Senses of loss and longing, a variety of expressions of 'connectedness' and 'belonging' to landscapes, waterways, vegetation and animal communities, connection to other known significant places within the region (i.e. Baimie Cave or various waterways) were expressed by those consulted. Alongside the loss and longing, there is also an element of celebration in that those who are speaking for country today have survived for nearly 200 years since first settlement and have adapted to and overcome much adversity.

Many of the RAPs present at the workshops and site visit were deeply anti-mining, which is not an uncommon sentiment among many Aboriginal communities Australia-wide. Almost all the RAPs expressed strong connections to the archaeological sites which occur throughout the Project Area (and the wider region in general) even though some were highly critical of archaeologists and archaeological practices through time. It is not uncommon for archaeologists to be criticised for their role in Aboriginal cultural heritage management. Often, archaeologists are viewed as the facilitators of cultural destruction by Aboriginal people and have been criticized for many years for having too much 'power' in the assessment of Aboriginal cultural heritage (c.f. Fourmile, 1989). Extensive consultation with Aboriginal communities about their 'cultural values' alongside robust archaeological assessment is a way of attempting to overcome this perception, as well as limiting the archaeological assessment to questions of scientific values rather than cultural values.

Discussions around the proposed relocation of the Ravensworth homestead complex elicited a range of mixed responses from the RAP's. Many of the RAP's present commented that they considered the former Ravensworth Estate to be significant to Wonnarua people as it was the location of both co-existence and conflict between Wonnarua people and the early settlers of the Hunter Valley. Many of the RAP's also commented that Wonnarua people would have lived and worked on Ravensworth estate, however there were no direct familial or traditional cultural links expressed by any of the RAP's.

Any destruction of landscapes, including the physical, spiritual, and natural values imbued in it are seldom condoned by Aboriginal people. One theme often repeated in Aboriginal communities is the concern that contemporary Aboriginal communities have for the opinion of future generations and the overwhelming fear that people in the future will think the people of today stood by and watched their 'country' being 'destroyed' without defending it (i.e. sense of guilt).

Collated responses from the workshop questionnaires are included in Appendix B.1.18.

6.9.1 Limitations

There have been few limitations to the effective completion of this ACHAR.

Notably, the resources below have been incorporated into this report:

- Information from the WNAC, Hickey Family, PCWP and Community RAPs workshops is included in this report where permission to disclose was provided.
- A Section 10 application under the ATSIHP Act 1984 was lodged by the PCWP during the production of the
 original ACHAR and was subsequently withdrawn in early September 2019. This is discussed further in Section
 1.5.1. This combined with the time in receiving the final PCWP cultural values report caused significant delays
 (i.e. almost 2 years)
- A new section 9 and 10 Application was lodged by the PCWP on 7 July 2020 seeking protection of a Specified Area, which includes the Project Area.

Consolidated recommendations based on all the workshops and discussions with RAP's and the PCWP Values report are presented in Section 8.

6.10 Consolidated Cultural Values

To the extent possible, given the paucity of information provided by the RAPs, other than the PCWP), ACHM have constructed the following table of cultural values. These tables also include written, oral and written information gathered by ACHM through the workshop(s) and site visits with the Project RAPs.

A list of cultural values for the proposed Project Area is consolidated in Table 6-1 below.

Value / Theme	Hickey's Cultural Values Workshops	Community RAPs	WNAC Cultural Values Workshops	PCWP Cultural Values Report
Ancestral Connections to Places	Expressed Verbally	Expressed Verbally	Strongly Expressed	Strongly expressed in the written report, particularly the Glennies Creek area
Contemporary Connection to Country	Expressed Verbally	Expressed Verbally	Strongly Expressed	Strongly expressed in the written report
Attachment / Connection to the Ravensworth Estate	None Expressed	None Expressed	Strongly Expressed	Not expressed in the PCWP report but strongly expressed in the Draper report
'Cultural Values' over the Proposed Project Area	None Expressed	None Expressed	Generic values but not specific to Project Area	A range of 'cultural values' expressed
Connection to Archaeological sites	Expressed Verbally	Expressed Verbally	Expressed	Expressed in the written report
Song lines	None identified in the Project Area	None identified in the Project Area	None identified in the Project Area	Expressed in the written report, but outside the Project Area
Traditional Knowledge	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	Some values expressed in the written report for the GCOP Project Area
'Special' or Named Places	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report
'Dreaming Tracks'	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report
Creation Myths	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report
Mythological Associations	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report
Lore Grounds	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report
Resource Procurement / Extraction and Use Sites (i.e. Stone Quarry)	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report
Resource Procurement / Extraction and Use Sites- (i.e. Flora and Fauna)	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report
Massacre Sites	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report
Contact History	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report
Mission Period	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None identified in the GCOP Project Area	None specifically identified in the GCOP Project Area in the PCWP report

Table 6-1: Consolidated Cultural Values

P18-0089

6.11 Cultural Significance

The assessment of cultural significance presented in this section relates primarily to the Project Area, but also includes commentary on the cultural significance of the wider region.

It is noted that the numerous Aboriginal stakeholders who participated in this cultural values assessment process hold values which relate to the wider Hunter Valley region generally, but less directly to the Project Area specifically.

There was very little information presented in any of the workshops, site visits or written material which relate specifically to the Project Area, and no additional material and/or values were discussed or provided beyond those recorded during the Mount Owen Continued Operations ACHAR (2013) process.

The PCWP Values Report strongly expresses a broader connection to the entire Hunter Valley, including reference to dreaming tracks, Bora, rock art and other important cultural places. However, the PCWP report places these values and places (apart from the historic associations with the colonial period of Ravensworth Estate) outside the Project Area.

A common theme in many Aboriginal cultural heritage assessments is the proprietary interest members of the relevant Aboriginal communities hold regarding the wider cultural landscape including archaeological sites or places within any given area. This Project is no exception in this regard. Within the context of the current assessment, there are strong on-going connections to places created and used by ancestors alongside demonstrably strong interests in the way those places are managed or harmed because of this Project. These sentiments are not unique and must certainly be considered in the overall assessment of the significance of the places in question. The connection to these places is noted as often being relatively unspecific and generally do not appear to relate to any surviving traditional knowledge or customary cultural practices.

The cultural values expressed by the participants in this assessment have been consistent in voicing an overarching concern for the wider landscape and criticism of the negative impact of mining on that landscape. Consistent in the material collected is a sense of 'loss' or 'outrage' and grief at the treatment of Aboriginal people since First Settlement (dispossession and genocide are mentioned repeatedly) through to more contemporary experiences (i.e. the Stolen Generation).

There is also a consistent theme of the 'powerlessness' Aboriginal people often feel when confronted by situations where they feel disempowered or unable to exercise influence on decision makers. There is a sense of loss and lament for what once was, but with a very strong expression of 'corporate' ownership of the wider region by the Wonnarua people (regardless of the variety of ways in which those groups represent their own interests). There is also an element of celebrating the survival of those who are now 'speaking for country'. While the entire estate of the Wonnarua people is significant to those concerned, there is little direct evidence (anecdotal or otherwise) of any particular or specific places or values of significance within the Project Area.

For many of the informants, the contemporary attachment to place appears based on the linkage to archaeological places which were created by 'the ancestors' and thereby constituting a connecting thread to a cultural world from another time. In a similar sense, there was some attachment to the Ravensworth Homestead expressed during the site visits. This attachment was based largely on the premise that Wonnarua people had most likely lived and worked on the estate through time, rather than any specific historical associations.

This general lack of direct or specific cultural knowledge in no way diminishes the strength of connection to the places within the Project Area. However, the attachment to place is one which is predominantly of contemporary association rather than traditional knowledge, custom, lore or practice.

It is noted that the surrounding area is held to be of higher significance to many members of the Wonnarua community, however the sites and/or places within the Project area held no higher significance or value(s) than any other.

Significantly, many of the comments during the workshops highlighted the benefits of this ACHAR process to the RAPs. Participants describe the process as having empowered the groups concerned by having provided the opportunity for the groups to get together to discuss the cultural values assessments and discuss how this process has benefited the group(s) as a whole.

6.11.1 Summary Opinion

Material presented or discussions with the participants in the ACHAR process often evoked the trauma of early European settlement and the lasting effects of frontier violence, dispossession, and the importance of Wonnarua cultural survival through time. These effects are seen within the context of contemporary Aboriginal society, and the attempts by Aboriginal communities today to preserve remnants of cultural landscapes, places, lore, culture and belonging. This is in no way denying the *bona fides* of the individuals involved or their life experiences but is

a comment on the events of the shared history of the Hunter Valley which has seen much of that rich past destroyed.

The material collected during the ACHAR process for this Project clearly communicates a deep contemporary attachment to place, although in common with most of the more urbanised regions of Australia, the understanding of 'place' and the cultural lore and traditions associated with it only exist in a fragmentary state.

There has been some discussion of connections to apical ancestors who originate from within Wonnarua country. Members of the different knowledge holder groups claim connection to some (or all) of these apical ancestors (e.g. *Sarah Madoo*). There is, however, scant evidence of any continuing traditional practices or observances of ritual or ceremony within the Project Area. This can be directly attributed to the post-European settlement disruption and dislocation of traditional Aboriginal culture throughout the Hunter Valley. Contemporary knowledge of some of these cultural practices and places does still exist.

Much of the discussion surrounding the Project Area from the RAP's is descriptive and relates to generalised Aboriginal lifeways at the time of first settlement, and the historical impact of white settlement on Aboriginal people and is common to many Aboriginal groups throughout Australia, and does not relate to any direct knowledge of, or connection with, the Project Area.

6.11.2 Draper Report (2020)

The Draper (2020) report is a piece of work specifically commissioned by and for the PCWP.

In this report, Draper (2020) essentially argues that the only set of valid Aboriginal cultural values in this part of the Hunter Valley are exclusively those of the PCWP people and that the conclusions of the original ACHAR apply only to the (other) 'non-Wonnarua people' (2020: 26) who constituted 31 of the 32 RAP's registering for the Project. It is unclear how Associate Professor Draper reaches this conclusion, given that he did not canvas 97% of the RAP's for the Project. His conclusion in his report that the PCWP are the only 'true' Wonnarua dismisses all other Aboriginal people who have been party to this Project, and appears to have been written as an attempt to assert a position to the Native Title Tribunal, rather than undertaking an objective and unbiased cultural values assessment of the project RAP's.

It is also noted that at the time of completing this ACHAR, the previous PCWP Native Title Claim has been withdrawn.

Further, the report is written in such a manner that historical sources and other project reports are used selectively and repeatedly to add emphasis so as to create an elevated sense of local historical and archaeological significance at Ravensworth Estate that the relevant data taken in its entirety does not support. Similarly the assertion that this ACHAR and the other EIS heritage reports (Dunn, Casey and Lowe and the Ozark AAIA) are somehow lacking, and did not follow or observe the industry accepted standards of the ICOMOS and Burra Charter principles (2020:26) is both incorrect and unfounded.

The Burra Charter practice note on Indigenous Cultural Heritage Management provides that '[p]ractitioners should seek to gather information from a wide range of knowledge-holders, taking account of all kinds of connections, whether 'ancestral', 'traditional' or 'historical'. (Australia ICOMOS, 2013:3). The same practice note urges that practitioners 'should listen carefully to the views of Indigenous people and seek to capture those views in the assessment of significance without bias' (Australia ICOMOS, 2013:3). The assertion in Draper's (2020) report that 97% of the RAP's for this project are not Wonnarua people, and therefore not relevant, is inconsistent with these requirements and could not reasonably be claimed as unbiased.

Draper (2020) is also unfairly critical of this ACHAR for not coming 'to grips' with the historical context of the project area (at least from the PCWP perspective). Given that the version of the ACHAR Draper (2020: 15) was commenting on was completed prior to the PCWP values report becoming available, it is unsurprising that the final version of the ACHAR was going to be revised to include the PCWP cultural values if they were made available. Rather than failing to come to grips with the material, there was, at the time (of the first draft of this ACHAR) nothing to come to grips with.

Given the conclusions in the Draper (2020) report are based on interviews with 2 or 3 people, and that Draper (2020) was critical of many of the constituent parts of this ACHAR, ACHM contacted OzArk and Dr Mark Dunn to provide their comments on the Draper report.

These comments on the Draper report are included below.

6.11.3 OzArk Response to Draper Report



OzArk Environment & Heritage

Dubbo Queanbeyan Newcastle T: 02 6882 0118 enquiry@ozarkehm.com.au www.ozarkehm.com.au 145 Wingewarra St PO Box 2069 DUBBO NSW 2830

ABN 59 104 582 354

28 May 2020

Dr Shaun Canning Australian Cultural Heritage Management

RESPONSE TO DRAPER 2020 ARCHAEOLOGICAL VALUES

Dear Shaun,

I have had the opportunity to review the Neale Draper & Associates' report: Anthropology Report on PCWP Cultural Values for the Glencore Glendell Continued Operations Coal Project, Aboriginal Cultural Heritage Assessment by Assoc. Prof. Neale Draper (Draper 2020).

As the title suggests, this report focuses on the cultural values of the Plains Clans of the Wonnarua People (PCWP). However, there appears to be little, or no interrogation, of the claims put forward by the PCWP and many of the issues raised in Draper 2020 are issues that have been raised previously by the PCWP.

I will concentrate on responding to those areas in Draper 2020 that pertain directly to the archaeological values of the Glendell Continued Operations Project (GCOP) Project Area.

Statement of Scientific Significance

In the Executive Summary (Draper 2020: vi), the scientific significance of the Ravensworth Estate is stated as:

Ravensworth estate and homestead has very high scientific significance because of its potential to yield additional archaeological information about early colonial conflict events in the form of archaeological sites or conflict burials, as well as the focus for additional ethnographic (oral history) and historical research concerning the colonial conflict period around that location.

This statement fails to recognise the substantial archaeological effort that has already been expended in and around the Ravensworth Homestead. As set out in the Aboriginal Archaeology Impact Assessment (AAIA) (presented as part of the Aboriginal Cultural Heritage Assessment Report [ACHAR] in Appendix 22 of the Environmental Impact Statement [EIS]) and the Historic Archaeological Test Excavation Report and Impact Statement for the Core Estate Lands (Casey & Lowe) (EIS: Appendix 23c), considerable effort both through survey and archaeological excavation has already taken place. In the case of the Ravensworth Homestead, this included subsurface investigations both within the homestead perimeter and immediately outside of the perimeter. The result of this investigation was that no evidence of an Aboriginal presence was detected (i.e. no stone artefacts were recorded in any of the excavations in and around the homestead), let alone evidence of early contact/conflict and/or burials.

This previous work should be acknowledged, and in our professional opinion, there is <u>little</u> potential 'to yield additional archaeological information about early colonial conflict events in the form of archaeological sites or conflict burials' in and adjacent to the homestead.

Comment on OzArk methodology

Draper (2020: 27) states:

A salient feature of this (OzArk) assessment is that the stand-alone archaeological assessment is devoid of any appreciation of the Aboriginal oral history and cultural knowledge related to the local area, which provides a substantial ethnoarchaeological context for interpreting and understanding that remnant archaeological record. Such compartmentalisation diminishes the accuracy and value of Aboriginal cultural heritage assessments.

The ACHAR documents that the Aboriginal cultural heritage consultation requirements for proponents has been followed in full for the project and these guidelines are designed to provide opportunity for Registered Aboriginal Parties (RAPs), of whom the PCWP are one, to provide the sort of information that Draper alludes to. The PCWP were invited to provide their values, however at the time of ACHAR preparation, they had not provided them.

While the PCWP never provided any information to the archaeological investigation to assist with the development of its methodology, OzArk were, nonetheless, aware of the views of the PCWP and their belief that the Ravensworth Homestead was a focus of colonial conflict. Therefore, care was taken in both the survey and the test excavation program to be aware of any evidence that could be tied to early colonial contact/conflict. Yet, despite intensive investigation, none was recorded.

Further, none of the other RAPs, many of whom have a long period of experience in the archaeology of the upper Hunter Valley, ever voiced an opinion that the archaeological methodology was lacking or had failed to consider all available information.

Draper's statement can be paraphrased as 'if OzArk had known what to look for, they would have found it'. However, as professional archaeologists, OzArk would never go into the field looking to find evidence for a particular theory. At all times OzArk keeps an open mind and allows the data to speak for itself. If no evidence was recorded to support a theory that the PCWP may have, it is not that OzArk didn't know what to look for, but rather that such evidence is lacking.

Further, the PCWP had representatives present during all stages of the survey and test excavation: both for Aboriginal heritage values and the excavations associated with the historic heritage values of the Ravensworth Homestead. At no time did these representatives ever suggest that a different strategy should be employed or that they considered the survey/excavation effort to be lacking.

Discussion of scientific values

Draper 2020: 55 states:

While neither Casey and Lowe (2018) or OzArch (sic) (2018 [sic]) discovered such archaeological evidence in their limited investigations on the subject land, Oz Ark (sic) (2019: 44) refer to previous archaeological discoveries of historic Aboriginal artefacts (e.g., flaked glass tools) locally. Scott Franks referred to the discovery of Ancestral skeletal remains at Mt. Arthur mine that were identified forensically as resulting from being run down by a horse (Section 4.3.1 above), which demonstrates that further archaeological and burial discoveries relating to the historical conflict may be made in future. In fact, it is a matter of great concern to Wonnarua people that conflict burials of their ancestors ("shallow graves") and their restless spirits

OzArk response to Draper 2020

Page 2

would be disturbed through expansion of coal mining into the Glendell expansion area around Rayensworth homestead.

In OzArk's professional opinion, the OzArk work, as well as that of Casey & Lowe, was not 'limited'.

That evidence to support the PCWP thesis that the former Ravensworth Estate contains ample evidence of early colonial contact/conflict including burials is not because the investigations were 'limited', but rather that such evidence is considered rare or non-existent.

In addition, the GCOP investigation is just the latest in a long list of investigations going back to the late 1970s that have taken place at the Mt Owen Glendell Operations (MGO). The extent of this past survey effort is shown on **Figure 1**. It should also be borne in mind that this figure could be supplemented by showing further long-running archaeological investigations at the Liddell Coal mine to the north, at Ravensworth Operations to the west, at Ashton Coal to the south and at Integra Underground Mine/Rix's Creek Coal mine to the southeast. These investigations have been undertaken by a who's who of Australian consulting archaeology over the past 40 years. It must be concluded that this portion of the upper Hunter Valley has had the most intensive archaeological investigation of anywhere in the state (including the Sydney Basin), if not Australia.

The result of this intensive investigation, as Draper notes, has provided evidence of early contact in the form of knapped glass objects, but, to the best of OzArk's knowledge, no evidence of burials or of early colonial conflict within the immediate region of the MGO.

Again, it is stressed that this is not because of 'limited' investigations, or because the archaeologists were non-cognisant of cultural knowledge, but because such evidence is either extremely rare or non-existent.

Burials in the upper Hunter Valley

Draper (2020) makes many references to the possibility of there being burials still remaining undiscovered in the GCOP Additional Disturbance Area. For, example Draper (2020: 56) recommends that 'PCWP Wonnarua traditional owners' be present during topsoil stripping to monitor for the presence of Aboriginal burials.

The presence of burials at MGO is always investigated fully, whether they are suspected to be colonial or Aboriginal burials. For example, during the environmental assessment for the Mt Owen Continued Operations project, a pile of stones looking suspiciously like a grave was noted associated with the ruins of an early farmhouse near Main Creek (identified as 'Former House Site' in the Mt Owen Historic Heritage Management Plan [XMO SD PLN 0064]). This burial was first investigated by archaeologists from Umwelt (Australia) Pty Ltd in a careful, staged approach in full consultation with the Aboriginal community. While the investigation was taken over by a forensic police unit that concluded that it was not, in fact, a grave site, this investigation shows that such site types are treated very seriously by MGO.

In addition, the MGO Aboriginal Cultural Heritage Management Plan (ACHMP) outlines procedures for the unanticipated discovery of skeletal material (Section 6.1). Should such material be discovered, either within the GCOP Project Area or elsewhere at the MGO, these procedures would be followed, and the find would be robustly studied in full consultation with the Aboriginal community.

Further, in studies such as that by ERM (*Upper Hunter Valley Aboriginal Heritage Baseline Study*, October 2004) the likelihood of recording burials is concluded as being very low.

OzArk response to Draper 2020

Page 3

ERM 2004: 74-75 notes:

Very few burial sites have been recorded in the study area (refer to [ERM 2004] Table 3.4). In the Central Lowlands AHIMS indicates that four sites have been recorded: AHIMS # 37-6-0150, AHIMS # 37-6-0257, AHIMS # 37-6-0281, AHIMS # 37-2-0135. The first record refers to skeletal material found about 500 m north of the Hunter River near Singleton. The second record refers to the place that this material was reburied. The third record is a duplicate of the second. The fourth record refers to a story from an unspecified source (i.e. no archaeological material was found). In 2001 excavations at Mount Arthur North revealed another burial site (Donlon and Kuskie 2003).

It is not known if this 2001 burial at Mt Arthur is the one referred to by Draper (2020: 55), however, ERM (2004: 75–76) note that:

The burial at Mt Arthur North was excavated from duplex soils (it was not associated with alluvial deposits, a rock shelter or cave). Together with the burials described in (ERM 2004) Table 3.5 this site suggests that if conditions are favourable for preservation of bone, many different landscape elements may have the potential to contain Aboriginal burials.

In examining why burials are so infrequently recorded in the lowlands of the Hunter Valley, ERM (2004: 124) note ethnographic evidence that traditional burials were not interred in the ground and that Wonnarua peoples did not bury their dead until much later in the mid nineteenth to early 20th century with the advent of Christian missions:

...the Wonnarua tribe... occupied the Hunter and all its tributaries from within ten miles of Maitland to the apex of the Liverpool Ranges, an area which he sets down at two thousand square miles...The dead were interred in a sitting posture, the grave being covered with logs to prevent wild dogs getting at the corpse.

ERM conclude by noting:

Although this is out of the study area, there are very scanty documents relating to burials and what does exists suggests that bodies were either cremated or interred rather than buried in graves.

The ERM report is certainly not an exhaustive examination of Wonnarua burial practices but it serves to illustrate that it is very unlikely that 'shallow graves' (Draper 2020: 55) exist in the Project Area.

It must also be noted that Draper's observation that these graves are 'shallow' also means that they would have been disturbed in the past due to the often-observed erosion and soil loss that has occurred in the duplex soils of the Project Area. As all portions of the Additional Disturbance Area have been subjected to long-term agricultural land use, it is likely that any shallow burials, had they ever existed, have become exposed and dispersed over time.

Conclusion

OzArk believes that the investigation carried out for the GCOP was robust and revealed an archaeological signature that has been observed elsewhere at the MGO and the broader Hunter Valley; that is:

OzArk response to Draper 2020

Page 4

Page 5

- Most sites recorded are low density artefact sites with low scientific values
- The evidence of landform disturbance during the agricultural phase of land use is manifest with erosion and soil loss being widespread
- Most sites with a surface manifestation have a very low-density subsurface component suggesting that sites are disturbed and are surface manifestations only
- Archaeological investigations show that leached A-Horizon soils are rarely deeper than 20 centimetres before the B-Horizon clays are reached. There are no sandy deposits usually associated with burials in the Project Area. There are alluvial soils adjacent to Bowmans Creek, but these are noted as poor preservers of archaeological deposits due to agricultural practices and disturbance from flooding and channel migration (ERM 2004: 75)
- Evidence of certain site types such as burials is absent from the archaeological record
- Other site types such as scarred trees, quarries and ceremonial areas are similarly very rare.

The archaeological work conducted by OzArk and others over the years at MGO can neither prove nor disprove the ethnographic accounts of early colonial conflict at the former Ravensworth Estate. While any evidence supporting these accounts has not been recorded despite 40 years of investigation, this does not mean that these events did not occur, just that they did not leave a tangible archaeological signature.

Therefore, the recommendation in Draper 2020 to monitor proposed works in the hope of discovering such evidence should be discounted as such an occurrence would be extremely rare and any chance discoveries will be managed under an approved ACHMP. Further, any assertion that the landforms of the Project Area have especial significance as they hold evidence of early conflict in the form of graves should recognise that despite extensive investigation, no such evidence has been obtained to date.

While this does not discount the intangible associations the PCWP may have with the former Ravensworth Estate, it can be demonstrated that tangible archaeological evidence associated with early colonial conflict is considered rare or non-existent.

Yours sincerely,

Ben Churcher

Principal Archaeologist ben@ozarkehm.com.au

OzArk response to Draper 2020

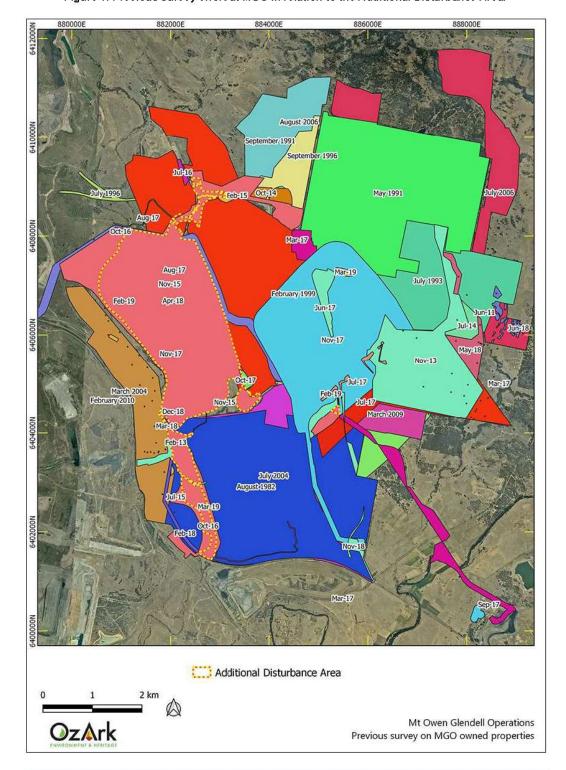


Figure 1: Previous survey effort at MGO in relation to the Additional Disturbance Area.

OzArk response to Draper 2020

Page 6

Mark Dunn Historian

Response to Neale Draper & Associates: Glencore Glendell Continued Operations Coal Project, Aboriginal Cultural Heritage Assessment—Anthropology Report on PCWP Cultural Values 12 June 2020

In June 2020 Neale Draper & Associates (ND&A) produced an Anthropology Report on the Cultural Values of the Plains Clans of the Wonnarua People regarding the Glencore Glendell Continued Operations coal project in the Hunter Valley, New South Wales. As part of the report, Draper (2020) included a section titled Cultural Heritage Values on Record (Section 3). This contact history was largely drawn from work that I have completed in the past as part of my PhD thesis (2015) and more recently in consulting reports for Umwelt Environmental and Social Consultants for the Glencore Glendell Continued Operations Coal Project (2019). The following short response addresses several issues and inconsistencies with the ND&A report in relation to the recorded history of the area and events that were known to have occurred.

Location of the existing Ravensworth Homestead in relation to recorded frontier violence events

The house known as Ravensworth that stands on the Glencore operations site was constructed by James Bowman for his overseer James White in c1832, replacing an earlier house located further to the west. James White managed the Ravensworth estate for Bowman from 1829 to 1839. Between 1825 and 1827, when much of the violence that was recorded as having taken place in the upper Hunter occurred, the earlier, first house on the property was the dwelling house at Ravensworth. This was located approximately 850m to the west of the current house site and is shown on a survey completed by Robert Dixon in 1833 (refer Figure 1). There is no documented evidence of any of the known events having happened at or in the surrounding paddocks related to the current house on site.

A single incident has a potential connection to the original house site. During the violence, an Aboriginal man was reportedly hung from a tree one mile from the original house site by the mounted police (see below). Other incidents reported as being at Ravensworth refer to the broader, 10,000-acre estate of Ravensworth rather than the house site with no specific location given within that area. References to the actual location of shepherds and convict huts and places where fencing work was being undertaken that were targeted on the estate are not known.



Figure .1:Part of Dixon's road plan showing buildings on Ravensworth including 'House', 'New house' and 'Barns' (Source: R.5.830, Crown Plan)Error! No document variable supplied.

Location of mounted police and existence of a garrison

Reference is made (pg41 of ND&A report) to Garrison Diaries that record further details on the massacre of prisoners. It is unclear what Garrison Diaries are being referred to as no referencing is provided. There were no garrison of soldiers or mounted police stationed at Ravensworth during the 1820s. Soldiers of the 3rd East Kent Regiment, known as the Buffs were stationed at Newcastle from 1824 until 1827 and detachments of those men were sent to the upper Hunter in June 1826 by the Commandant in Newcastle, Francis Allman. Records show that only six soldiers and one Corporal were deployed in response to the death of a settler, Robert Greig in November 1825. These men were briefly stationed at the farm of James Glennie in June 1826, to the east of the Ravensworth estate before being recalled.

A second detachment of five mounted police was sent to the area under the command of Captain Foley in June 1826. The mounted police were a military force stationed at Newcastle and Wallis Plains, now Maitland. Foley initially went out with twenty men but was soon forced to return to Newcastle due to provisioning issues. He left seven men to protect the area, with the small detachment spread between Ravensworth, Mr Glennie's and Mr Chilcott's farm both on Glennies Creek. Another five men also stationed at William Ogilvies estate Merton near Denman, five more at Thomas Potter McQueen's Segenhoe near Scone, with a further two men stationed at Captain Pikes Pickering farm between Denman and Muswellbrook. This was a total of 19 mounted police spread between Denman and Glennies farm. ¹

Bowman's presence at Ravensworth during this period where known

While the estate was granted to James Bowman, Bowman himself did not live on the estate as a permanent resident. Bowman was assistant surgeon at Sydney Hospital between 1819 and 1823 where he lived with his wife Mary.

Bowman continued to live at the Sydney Hospital until 1828 when he relocated to Macquarie Place in Sydney and worked as Inspector of Hospitals. He lived here until 1834 when he relocated to his new house, Lyndhurst, on his estate at Glebe in Sydney. He spent most of his time in Sydney until 1839 when he divided his time between Lyndhurst and Ravensworth. During the period 1824-1839 the estate was managed by overseers on site including John Alexander from c1824-1829, and James White who took up this position in 1829 and stayed until 1839.² The stone house at Ravensworth that is currently on site was built for White to live in.

Ravensworth as one of a number of places that were subject to violence

While there is no doubt that Ravensworth was the scene of a number of attacks by Aboriginal warriors and retaliatory incidents by settlers, Ravensworth was only one of a collection of farms and estates that were caught up in the violence on the wider Hunter Valley frontier during the period 1825-1828. The large estates of Merton, Edinglassie and Invermein were also targeted, as were travellers on the roads between these estates. Bowman's neighbours, Robert Lethbridge, Richard Alcorn and James Chilcott (located approximately 8km to the east on Glennies Creek) were all targeted during this period. Attacks and raids also occurred around the modern town of Singleton in the year after the events at Ravensworth. These are outlined in detail in Dunn (2020) Ravensworth Contact History, Report prepared for Umwelt Environmental & Social Consultants (and appended to the Aboriginal Cultural Heritage Assessment Report prepared by ACHM, which is Appendix 22 of the Project EIS) that Draper uses as a reference throughout the Anthropology Report. Taken in the wider context of the ongoing conflict, while Ravensworth was targeted, it was only one of a variety of sites rather than the central focus as Draper claims (pg25).

Accounts of the same event are repeated

Section 3 Cultural Heritage Values on Record of the Draper report relies heavily on the PhD thesis of Mark Dunn (2015) and the Ravensworth Contact History also written by Dunn (2020) for Umwelt Environmental & Social Consultants. A result of this reliance is that the same event is repeated from both sources in a number of places, giving the appearance of multiple episodes. For example, on page 19 an attack on two stockman at Ravensworth is repeated as a reference from Dunn (2020) and in the following paragraph from Watson and Chapman, editors

P18-0089 Page | **61**

.

¹ Colonial Secretary's letters received 1826: 4/1894, 26-3815 Francis Allman to Alexander McLeay Colonial Secretary 26 June 1826, State Archives NSW; Log of events in Governors Despatches Re: Aboriginal Outrages 1826: Captain Foley to Condamine, 26 September 1826 pp372-384, Governors Despatches Vol 8, A1197, SLNSW.

² Ravensworth Homestead and Farm Complex Structural and Material Condition Report: Homestead Historical Text, prepared by Cynthia Hunter for EJE Architecture/ Glendell Coal Joint Venture August 1997, p.6

of the Historical Records of Australia, Series I, Vol.XII (1914). Again, on page 20 and page 21 the same incident of a man hanged at Ravensworth is recounted using Dunn (2015) and Dunn (2020).

Twice more on page 24 two incidents already reported on page 21 and page 23 are again repeated, in some cases being word-for-word repetition. While there is no dispute on the accuracy of the accounts, the repeated use of the same incident through the report at different stages gives the false impression of a much larger series of incidents than was the case. Similarly, some of the events ascribed as having occurred at Ravensworth or that are implied via the text are not identified as such in the original documents. An example is the account of a skull of an Aboriginal man being displayed on a table in a settler's house, as reported in the Australian newspaper on 17 February 1827. While no doubt a shocking revelation as to the brutality of the frontier, the account gives no indication of where that was witnessed by the correspondent and cannot be assumed to be Ravensworth on the weight of evidence provided from the original source as suggested in the Draper report (pg 41).

200 warriors at Merton

On page 22 the Draper report discusses an incident at Merton while also questioning the idea of 200 warriors being present as is stated in Dunn (2020). The Draper report appears to have mentioned only one of two different events at Merton. According to Mary Bundock, the granddaughter of William Ogilvie, two boys known as Tolou and Mirroul were arrested at Merton by bush constables for the killing of some cattle. A man named Jerry had been seized approximately a week later at Merton for the death of a stockman at George Forbes' Edinglassie estate. This appears to be the incident referred to by Draper. Mary Ogilvie intervened on this occasion and Jerry was released.

Two days later Jerry returned with approximately 200 men. Mary Bundock described the hill behind the house 'covered in men painted and armed for a fight'. ³ Peter Cunningham, a neighbour who wrote an account of his time in the Hunter related the event, as did the magistrate Robert Scott in his report to the Colonial Secretary as copied in the HRA edition Draper refers to in his report. Alan Wood, in his book Dawn in the Valley puts the number of men at Merton as being 200.⁴ Although the Draper report refers to the appearance of 200 warriors at Merton as unaccountable, it is through the use of multiple primary and secondary sources in the original research that these conclusions have been reached.

Conclusion

There is no argument that the large Ravensworth Estate was the scene of violent encounters between the British settlers, convicts and local Aboriginal people in the second half of the 1820s. Those events that happened at or around the Ravensworth estate have been outlined in detail in the Contact History Report prepared for Umwelt Environmental and Social Consultants for the Glencore Glendell Continued Operations Coal Project (2020).

However, it is important to note that Ravensworth was only one of the estates and farm sites at which violent events occurred. In the period between 1825 and 1828, multiple attacks and raids were recorded across the entire length of the Hunter Valley from Maitland and Gostwyck in the lower valley, around Singleton and all the way to Denman and Scone.

There was no central place of conflict but rather a series of clashes across the region.

Settlers such as James Bowman have been linked to these events through the fact that the estates were granted in their names. The reality of the time though was that the estate owners were more likely to be absent from their properties and pursuing their business interests in Sydney. As absentee owners, the day-to-day management was left to trusted overseers like John Alexander or James White such as happened at Ravensworth. The history of frontier violence is often confronting and traumatic. It is through a careful reading of the primary documents available and the credible secondary sources that have since been published that the conclusions of the report have been drawn.



³ Mary Bundock Memoir CY2227 A6939 Item 30000

⁴ Cunningham, P., Two Years in New South Wales, Henry Colburn, London 1827, Volume II, p199; Historical Records of Australia Series I, Vol. XII, 1914, p.612; Wood, A.W., Dawn in the Valley, Wentworth Books, Sydney, 1972, p123.

6.12 Conclusions

The results of the assessment in this ACHAR broadly concur with the Mount Owen Continued Operations ACHAR (which also assessed the Project area). This ACHAR has ascertained that 97% of the RAP's hold no traditional cultural values associated with the Project Area (directly and specifically). By 'traditional' cultural values, we refer to these in the Native Title sense as an inherited and cohesive body of 'traditional' knowledge, laws and customs that are still observed and maintained by a group. However, in common with many urbanised communities, strong contemporary cultural values exist in almost universal claims of 'connection' to the land in question, and a sense of anguish and/or anger at having been 'disconnected' from the land in question by historical circumstances.

This ACHAR is based on the views and opinions of all 32 RAP's who have been involved and does not prioritise or favour the bona fides, position, or views of one group or individual above any other.

The majority of RAP's did not express any attachment to the Ravensworth Estate or the homestead. However, the Draper report (2020) ascribes the PCWP's broader attachment to other places in the region (such as Glennies Creek and its tributaries) directly to the Ravensworth Estate, when in fact much of this same area was assessed by the PCWP people during the Mt Owen ACHAR (2013) process with no significant cultural values arising in their reporting at that time. It is unclear what has changed in the intervening years to make Ravensworth Estate a focus of attention compared to several years ago when it was not.

Draper (2020: 57) largely bases his assessment of high scientific and historic significance in Section 5 of his report on (a) the centrality of Ravensworth Estate to the 'bloody' (2020:57) historical events of the early colonial period and (b) the potential for Aboriginal burials to be discovered in the project area (2020:55). However, as noted in the comments by Dunn and Churcher (above) both key tenets of the Draper report are not so clear cut. The evidence provided by Dunn (2015, 2020) clearly notes the importance of Ravensworth Estate during the early colonial period, but equally notes that focusing on Ravensworth Estate and the homestead as 'the' foci of the entire frontier is also misleading.

Churcher (Section 6.11.3, above) also discounts the notion on scientific grounds that there is a high potential to discover significant cultural materials, and in particular human burials, relating to the frontier conflict period at Ravensworth (and indeed any other period). The results of almost 40 years of archaeological research and survey at Ravensworth have revealed a pattern of Aboriginal archaeological site distribution entirely consistent with the archaeological signature of the remainder of the Hunter Valley. While there was some interesting contact period archaeology discovered and recorded by OzArk (2019) the likelihood of significant Aboriginal archaeological sites remaining undiscovered at Ravensworth is low. Likewise, the presence of undiscovered colonial era Aboriginal burials is considered to be extremely low.

Notwithstanding the critique of the Draper report, the key question is whether there are cultural values associated with the Project Area by the PCWP? The few PCWP people consulted by Draper (2020) do consider that they hold certain spiritual, traditional, historical and contemporary cultural values over the Ravensworth Estate (2020: 53) despite the entire area not featuring highly in their cultural practices over the past 50 years compared to Glennies Creek and other areas further afield (2020:51-53). These values have been included in the consolidated table of cultural values (see Section 6.10, above).

The Project Area has undergone considerable modification since European settlement.

Traditional Aboriginal lifeways and customs began to disappear in the early days of contact with Europeans and had largely disappeared before the turn of the 19th Century. Much of the natural landscape no longer exists in any cohesive manner, as the long history of agriculture in the area has irreversibly altered the landscape. Combining the historical disconnection of people from place with the extensive landscape modification since settlement means that the Project Area has a relatively low cultural significance when compared to other places within the wider region. This is also consistent with the archaeological assessment, which has determined that most of the archaeological sites are of low scientific significance.

7 Avoidance of harm

7.1 Project Rationale

The OEH (2011) guidelines state that an ACHA report must include 'Justification for any likely harm, including a discussion of any alternatives considered for the proposal. This must demonstrate how all feasible options to avoid or minimise harm were considered'.

In developing the footprint and the design of the proposed impacts for the Project, Glencore has considered mining options, layouts, overburden emplacements and infrastructure arrangements to optimise the Project's final design in conjunction with constraints and attempting to reduce the impacts to cultural heritage.

7.2 Opportunities to avoid impact

Throughout the design phase of the Project, efforts have been made to reduce the total amount of disturbance to the land. The completed design has been optimised and incorporates:

- a. Avoidance of Bowman's Creek by a minimum of 200 metres, and
- b. Avoidance of Significant Aboriginal sites

These efforts during the design phase of the Project have reduced the potential harm to Aboriginal cultural heritage within the Project area.

7.3 Sustainable Development Principles

This ACHAR has considered the impact of the proposed Project on the known Aboriginal objects of the Project Area and places external to it, and the range of cultural significance values associated with the Project Area.

Impact assessment has included consideration of the proposed activity and direct impacts, indirect impacts and cumulative impacts to archaeological and /or cultural places and ecologically sustainable development (ESD) principles. OEH (2011) requires that proposed development activities be discussed in the context of ESD, in particular the principles of precautionary approach and intergenerational equity.

As stated by OEH (2011):

- 1. The precautionary principle states that where 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
- 2. 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.

The Project's RAPs have been involved in a formal and structured program of consultation and participation via site visits, workshops and producing their own reports.

The RAPs undertook inception briefings and task inductions prior to any archaeological or cultural survey, focusing on providing a clear understanding of the Project and its description, the Project Area, and the area proposed to be disturbed for the Project. The briefings described the types of activities proposed and their potential impacts, being the extension of the mining area, and the area required for the construction of associated infrastructure.

The following opportunities for consultation and site access were provided by the Project:

- Site visits (which were well attended). Site visits were available at any time throughout the Project.
- A series of RAP workshops were held in August and September 2018
- Archaeological survey results were sent by letter to all RAPs (including those who participated in the fieldwork).
- Archaeological sub-surface testing results were presented during the September 2018 workshops.
- Feedback was provided to all RAPs in order to understand the direct impacts, and the RAPs were given formal opportunities to comment on and provide feedback on indirect and cumulative harm.

The Project's proposed management measures including conservation, care and control and intergenerational equity were derived from the input and suggestions of the RAPs.

8 Recommendations

8.1 Introduction

As discussed in detail in Section 4, there are 91 archaeological sites located within the Proposed Disturbance Footprint that will be impacted by the Project. The Aboriginal Archaeological Impact Assessment has determined the following:

- 52 of the 69 newly recorded sites are within or in very close proximity to the Additional Disturbance Area; and
- 40 previously recorded sites are within the Additional Disturbance Area.

In total, 91 sites are located within the Additional Disturbance Area and will be impacted should the Project be approved. 55 of these sites are artefact scatters (15 of which have PAD) and 36 are isolated finds (one of which has PAD). In general, the artefact scatters have a low artefact density with most sites recording less than 10 artefacts.

The Project will also result in indirect impacts to Aboriginal cultural heritage values within the Project Area and the wider region and would also add to the cumulative loss of cultural heritage in the Hunter Valley.

The Project consulted with the RAPs (excluding PCWP) to seek input and then feedback into the development of management options and recommendations should the Project be approved or not approved.

For the Project, all Aboriginal registrants were afforded opportunities to identify mitigation and management, care and control considerations and intergenerational equity options to inform the consolidated management options presented in this ACHAR.

8.2 Management Measures

Management measures presented here are consistent with those developed for other recent Glencore projects in the Hunter Valley.

There are two types of management measures developed, namely:

- 1. On-Site Management Measures, and
- 2. Off-Site Management Measures

On-site management measures may include actions such as archaeological salvage, protective fencing, artefact analysis, curation arrangements, induction programmes and the development or updating of an ACHMP.

Off-site management measures may include actions such as community development programmes, scholarships, educational activities or elder's camps.

In these projects, management measures have aligned to the Strengthening Aboriginal Community Wellbeing Toolkit and criterion from OEH, in particular the elements that focus on 'Culture'. For the Project, of the 8 key principles of the toolkit, the following three are the basis of the management measures proposed:

- Sense of Community;
- · Education and learning, and
- Cultural identity.

Some of the principles of the Toolkit (such as Infrastructure and services, economic strength and development, and community health and safety) are more closely aligned with the existing and ongoing Glencore Australia corporate activities.

The proposed management measures have been developed for the Project based on the assessment outcomes including recommendations from the workshops and other submissions. Whilst a range of different views and recommendations were provided some common themes were presented which strongly aligned with 'Sense of Community', 'Education' and 'Learning and Cultural Identity' principles.

This led the Project to propose funding projects in:

• Caring for Land – This was a common theme raised by the community. The program proposed focuses on Education and Learning from the Wellbeing Toolkit.

- Bringing People Together There were a range of management measures raised that involved bringing people together for community and/or Cultural purposes and activities. The program proposed focuses on the Sense of Community and Cultural Identity aspects of the Wellbeing Toolkit, and.
- Cultural Awareness/Education There were a range of management measures raised that involved Cultural
 Awareness/Education/Training, especially for younger people (both for Aboriginal and non-Aboriginal youth).
 The program focuses on Education and Learning with potential flow on effects to the Cultural Identity and
 Sense of Community aspects of the Wellbeing Toolkit.

The proposed management measures will also include:

- Alignment to the principles of the Aboriginal Community Wellbeing Toolkit (OEH 2012) that the project focuses on;
- b. Alignment with findings from this ACHA and the Archaeological assessment;
- c. the need for management options to be achievable for practical implementation;
- d. Provision of sustainable outcomes to promote intergenerational equity;
- e. Able to show value for money.

Table 8-5 contains the proposed management and mitigation measures which will be implemented should the Project be approved.

8.2.1 Aboriginal Cultural Heritage Management Plan

The Project existing Mount Owen Complex Aboriginal Cultural Heritage Management Plan will be revised to reflect the results of the archaeological assessment undertaken for the Project and this ACHAR.

8.2.2 The proposed management measures from the Knowledge Holder Groups and RAPs

The following care and control, conservation and intergenerational equity management measures have been compiled from verbal and written material collected from the RAPs during the site visits and workshops throughout 2018.

These measures are described in the following tables and have been summarised by themes and 'areas of commonality'. This has allowed the Project to formulate a set of common recommendations to mitigate or offset harm

Table 8-1: Community RAP recommendations.

Rec No.	Community RAPs Recommendation
RAP01	Ensure equal participation in all cultural heritage work for all RAPs
RAP02	Return all cultural materials held by archaeological consultants to the GCOP Project Area immediately, with materials to be stored on-site by Glencore until a suitable place for repatriation can be determined.
RAP03	Provide opportunities for training and education to Wonnarua people
RAP04	Glencore facilitate training and employment of young people in the mine other than through engagement in cultural heritage work
RAP05	Glencore to facilitate access to areas set aside as cultural heritage offsets
RAP06	Any materials repatriated from the archaeological salvage should be relocated as close to the point of origin as possible.

Table 8-2: Recommendations made by the Wanaruah Local Aboriginal Land Council.

Rec. No.	Nanaruah LALC Recommendations					
WLALC01	ocal Historical Research to fill in gaps or confirm existing knowledge					
WLALC02	Creation of an Aboriginal controlled cultural education unit					
WLALC03	Apprenticeships for 3-5 Wanaruah people					
WLALC04	Support for Business Start-Ups					

Table 8-3: Recommendations made by the Wonnarua Nation Aboriginal Corporation.

Rec No.	Wonnarua Nation Aboriginal Corporation					
WNAC01	WNAC seek funding to augment an existing community-based health fund					
WNAC02	WNAC seek funding for regular community gatherings to allow members to reconnect with people and country					
WNAC03	WNAC seek funding for an arts fund					
WNAC04	WNAC seek funding for education opportunities including options such as Clontarf / Polly Farmer / Scholarships / Apprenticeships					
WNAC05	WNAC seeking funding for small business opportunities and capacity development					
WNAC06	Request access to land to ensure continued cultural connection					

Table 8-4: Recommendations made by the Plains Clan of the Wonnarua People

Rec. No.	PCWP Recommendations					
PCWP01	PCWP seeking economic participation in mining and mining related activities					
PCWP02	The Draper report (2020) suggests archaeological monitoring of all topsoil striping within the GCOP area					

8.2.3 Notes on RAP Recommendations

While certain specific items have been recommended by the RAP's (as outlined in the preceding tables) there are also a wide range of general themes that have emerged from our work with the same RAP's over the last 6 years. Sometimes however, individuals have difficulty articulating what they would like to see as outcomes from a specific project. The general themes are recurring and focus on (a) equity in heritage management field work (b) land access (c) business opportunities (d) education opportunities (e) heritage preservation / land management and (e) employment opportunities.

There are also circumstances where individuals and/or groups may not want to have their specific recommendations publicly disclosed as there may be existing commercial sensitivities or negotiations already underway.

Table 8-5 (below) builds on the specific recommendations provided by the RAPs in Tables 8-1 to Table 8-3.

Table 8-5: This table is a consolidated management recommendations and options table based on management recommendations from the WLALC, WNAC, PCWP and Community RAPs for this and other ACHAR's.

Action Area Theme		WNAC	WLALC	Community RAP	Hickey's	PCWP	
ACHMP	A1	Cultural Awareness Induction / Training					
ACTIVIT	A2	Cultural Signage and Education					
ACHAR	А3	Recognition of Stakeholders in ACHAR					
	A4	Cultural Heritage Equity	Χ		Х	Х	
Survey, Collection and Analysis	A5	Archaeological Methodology and protocols					Х
	A6	Archaeological Interpretation					
	A7	Establish Artefact Storage facility / Keeping Place					
	A8	Learning and Land Access	Х		Х		
Care and Control	A9	3D Scan / Modelling of Project Area					
	A10	Final landform and revegetation involvement	Х				
	A11	Mine site land management contracts	Х				
	A12	Wonnarua Cultural Mapping and recording			Х		
B	A13	Museum Collections					
Research and Additional Assessment	A14	Cultural Heritage Research			Х		
	A15	Flora and Fauna Research					
	A16	Cultural Heritage training					
	A17	Employment and Business Opportunities	Х		Х		Х
	A18	Regular Community Meetings / Meeting Place	Х				
	A19	Research on Wonnarua horticulture	Х				
Intergenerational Equity	A20	Wonnarua lore and custom training					
	A21	Wonnarua Educational Funding Scholarships / Apprenticeships / School Based	Х		Х		
	A22	Horticultural & Revegetation Training					
	A23	Rehabilitation / Land Management & Training	Х		Х		

8.2.4 Proposed Management Measures

Table 8-6 and Table 8-7 contain the Cultural Heritage Management and Conservation Measures which were developed from the management and conservation measures proposed by RAPs and Knowledge Holder groups during the Aboriginal Cultural Heritage Assessment undertaken for the Project. These have been derived by assessing each RAPs management and mitigation suggestions.

By providing common themes to the RAPs management and mitigation suggestions, the Project is better able to review and respond to the RAPs care and control, conservation, and intergeneration equity recommendations.

The Project proposes management measures which address specific RAP derived issues. The Project have drawn out the consistent themes from the RAPs and have developed measures to be undertaken in the event of approval, which address these key themes.

Table 8-6: Proposed On-Site Management Measures from the Project

Element	Action No	Action Item	Project Management Measure		
	R01	Update ACHMP	The existing Mt Owen Complex ACHMP will be reviewed and update to include the Project within 12 months of Project Approval to outline all Aboriginal heritage management measures for the Project, responsibilities of all parties and the timeframe for required heritage works.		
			The ACHMP will include a staged approach to the required research and salvage works to ensure that areas required for earliest disturbance are completed as a priority.		
	R02	Cultural Awareness Package for Glencore Staff, Operators	To assist in providing our workforce a broader understanding of the cultural values identified in the ACHAR in relation to the Project area we propose the following cultural awareness package.		
Aboriginal Cultural Heritage Management Plan (ACHMP)		and Contractors	Glendell would develop a cultural heritage awareness package for staff, operators and contractors working on clearing works associated with Project and the Ravensworth Homestead relocation. This would include technical archaeological input, as well as a video discussing the Cultural Heritage Values of the area as told by local Aboriginal people.		
			As part of this project, RAPs and Knowledge Holders would be given the opportunity to submit videos for the awareness package. Glendell would fund a third-party videographer and editor to assist the community in the development of their contribution to the package. RAPs and Knowledge Holders that would prefer their values to not to be disclosed to other parties (other than those involved in the works above) would have this option available, should they wish. The videos could also contribute to the history project in the Off-site measures (R17) below.		
	R03	ACHMP Dispute Resolution process	The revised ACHMP will include specific provisions regarding ongoing engagement with the RAPs and would include mechanisms for dispute resolution and communications protocols.		
	R04	Survey, collection and Analysis	Salvage (excavation, analysis and collection) as per the recommendations of the OzArk Aboriginal Archaeology Impact Assessment Report for the salvage of the archaeological sites to be harmed within the Additional Disturbance Area.		
Survey, collection and	R05	Discovery of previously unknown cultural heritage items	The Project agrees to follow all relevant NSW Government guidelines regarding the location of human skeletal remains. The Project will apply the precautionary principle to the development of management measures for the Additional Disturbance Area.		
analysis			This approach will include the development of culturally appropriate management measures for the management of human remains, should this occur during the Project life. Protocols and approach will be developed in consultation with RAPs and updated in the revised ACHMP		
	R06	Recording of Archaeological Sites	The ACHMP will be revised to include the new sites identified in the Aboriginal Archaeology Impact Assessment Report completed for the Project		
Care and Control	R07	Care and Control Measures regarding Aboriginal Objects	Care and control management measures will be developed and included in the ACHMP for Aboriginal objects recovered through the Archaeological research and salvage program implemented for the Project and for long term storage of artefacts recovered from previous research and salvage programs. The care and control management measures will have regard to cultural considerations. Glencore propose to store artefacts from the salvage program at the soon to be constructed Wollombi Brook Regional Keeping Place.		
	R08	Repatriation of artefacts from Project Area	Glencore propose to store artefacts from the salvage program at the soon to be constructed Wollombi Brook Regional Keeping Place. GCO Project will consider the repatriation of artefacts across rehabilitation areas as part of a closure planning process at the cessation of mining.		

Element	Action No	Action Item	Project Management Measure
	R09	Sites not to Be Impacted	Glencore will implement the Aboriginal archaeological management measures program for sites in the Project Area that will not be impacted by the Project as recommended in the Aboriginal Archaeology Impact Assessment report for the Project. These measures will be further outlined in the updated ACHMP.

Table 8-7: Proposed Off-Site Management Measures. The following are indicative off-site management measures and more detailed measures are being developed as the ACHAR process continues.

	Action No	Action Item	Project Proposed Management Measure
			Currently Glencore Coal Assets Australia (GCAA) through its voluntary Community Investment Program has included: The Galuwa Aboriginal School scholarship program which currently supports 30 scholarships for Aboriginal students from the Upper Hunter in years 6, 7
			and 8 to support their academic progress, cultural identity and career aspirations.
			Singleton Clontarf Academy supporting 80 Aboriginal boys and 4 staff at Singleton High School to support the personal development and education of these boys.
	R10	Cultural Awareness and Education	GCAA's approach to supporting Aboriginal education is to work closely with NSW Department of Education to provide meaningful and needed Aboriginal education support that compliments and does not duplicate existing initiatives within NSW Education and other providers who support Aboriginal Education.
			Other initiatives and programs that will be considered for support as part of the GCO Project include:
			 Young Mob (a World Vision program) which aims to increase the cultural identity and connection to country of Indigenous youth through youth camps. A strong identity and connection to country have been identified as being vital to the health, social and emotional wellbeing of Indigenous youth.
			• The Girls Academy which develops and empowers Aboriginal girls through leadership training, mentoring, sport and extra-curricular programs with the goal of creating an environment within schools where Aboriginal girls receive the support and programs needed to help them realise their full potential.
			Knowledge holders and RAPs raised a range of issues and potential mitigation strategies with regards to cultural loss, these included:
		Bringing people together	A desire for community (or groups) to come together outside of development application/disturbance processes, and
Intergenerational Equity	R11		A desire for a range of cultural experiences (such as cultural camps, Elders Camps, teaching to younger generations)
			The GCO Project would consider supporting a program or activities to assist in promoting cultural awareness and education for young people.
	R12	Employment	Through the ACHAR and SIA processes for a number of recent programs, and ongoing consultation with local Aboriginal parties, Glencore has heard the recommendations for a work experience program for local Aboriginal people in the Hunter Valley. Separate to the GCO Project, Glencore are currently planning for the roll out of a Program in 2020.
	R13	Land Management	As part of the GCO Project, Glendell proposes to fund a traineeship or a work experience position in the area of cultural heritage management, biodiversity or land management, ecology, rehabilitation or other appropriately related field, through a third-party provider. Glendell will first approach the National Parks and Wildlife Service (NPWS) who offer a 2 year field officer traineeship in land management. In the event that this cannot be secured, Glendell would seek an alternate provider.
			As part of the ACHMP development a process and criteria for the application for this support would be developed.
	R14	Land Management	During the ACHAR preparation and in on-going consultation, RAPs and Knowledge Holders expressed values regarding a desire to be involved in the healing of land and land management activities. Ongoing consultation has also raised feedback associated with the development of Aboriginal land management businesses.
	11.1.7	Zana management	Glendell would provide opportunities for local Aboriginal businesses to tender for revegetation and land management works at the Mt Owen Complex.
	R15	Land Management	Yorks Creek realignment to receive appropriate riparian vegetation treatment post earthworks.

	R16	Cultural Awareness and Education	Through the consultation process, a range of values have been expressed regarding the early settlement history of the local area. Glendell offer to assist to develop interactive and interpretive materials documenting the early history between Aboriginal people and European settlers in the local area. Materials to be developed could include timelines, maps, oral recordings and re-enactments, and could be provided to schools and libraries for use as an educational/general interest resource. Alternatively, these could be kept as community resources. This could link with the process to develop the cultural awareness package discussed in R02 above.
	R17	Cultural Awareness and Education	During the ACHAR preparation, RAPs and Knowledge Holders raised values regarding a number of culturally sensitive places and sites in the region. Glendell would provide support to local Aboriginal groups seeking to undertake conservation projects at these places and sites in the region, in consultation with the applicable Government bodies and landholders. Funding for these conservation projects would be assessed on a case by case basis with the ACHMP update to include details on the application process and assessment criteria.
Timing and Support for the Research, Caring for Land, Bringing People Together and Cultural Awareness and Education Programs			The support for these programs would be available for applications from the local Aboriginal community for a period of 3 years from the commencement of the Project. As part of the ACHMP development a process and criteria for the application for this support would be developed. A total budget of \$600,000 will be allocated for these programs, subject to approval of the Project.

8.3 Management Measures - No Project Approval Scenario

Should the proposed Project not be approved the potential impacts would not occur, and there would be no risk to the cultural values and archaeological sites identified in this ACHAR.

In this scenario, the Project would not need to update the existing approved ACHMP and would continue to monitor and manage the identified Aboriginal archaeological and cultural heritage values related to the existing approved mining area through that management plan.

9 Bibliography

Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cmth).

Aborigines. Replies to a Circular Letter, addressed to the Clergy, of all Denominations, By Order of the Select Committee on the Condition of the Aborigines. Ordered, By the Council, 31st October 1846. Sydney: Printed by W.W. Davies, At the Government Printing Office.

Australia ICOMOS 1999, The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance Australia ICOMOS Incorporated Burwood

Australia ICOMOS. 2000. The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 1999, with associated Guidelines and Code on the Ethics of co-existence.

Australian ICOMOS 2013 Practice Note: The Burra Charter and Indigenous Cultural Heritage Management. Australia ICOMOS Incorporated Burwood.

Australia ICOMOS 2013 Draft Practice Note: Understanding and Assessing Cultural Significance Australia ICOMOS Incorporated Burwood

Australian Heritage Commission (AHC), 2001. Significance Assessment of Heritage Places. Australian Heritage Commission, Canberra.

Australian Museum, 2010, Morrison Collection: boomerangs from the Hunter Valley region, viewed 26 June 2013, http://australianmuseum.net.au/Morrison-Collection-Boomerangs-from-the-Hunter-Valley-Region>

Biodiversity Conservation Act 2016, New South Wales.

Blyton, G, D. Heitmeyer and J. Maynard. 2004. A history of Aboriginal and European contact in Muswellbrook and the Upper Hunter Valley. Umulliko Centre for Indigenous Higher Education, The University of Newcastle. A Project of the Muswellbrook Shire Council Aboriginal Reconciliation Committee.

BOM 2018 Bureau of Meteorology. 2016. Summary statistics SCONE SCS. http://www.bom.gov.au/climate/averages/tables/cw_061089.shtml Accessed 03/07/18.

Brayshaw, H. 1987. Aborigines of the Hunter Valley. A study of Colonial Records. Scone and Upper Hunter Historical Society, Scone, NSW.

Breton, W. H. 1833. Excursions in NSW, WA & Van Diemans Land (1830-33). London.

Corporations (Aboriginal and Torres Strait Islander) Act 2006 (Cmth).

Cunningham, P. 1825. Two years in New South Wales. London.

Daly, M & Brown, J 1964. The Hunter Valley Region NSW Hunter Valley Research Foundation, Newcastle.

Dangar, H 1824 Field Book 220 2/4860 and Field Book 221 2/4861 in Brayshaw, H 1987 Aborigines of the Hunter Valley: a study of colonial records, Scone and Upper Hunter Historical Society, Scone.

Dean-Jones, P. and Mitchell, P. 1993. New South Wales Department of the Environment and Conservation. Hunter Valley Aboriginal Sites Assessment Project: Environmental Modelling for Archaeological Site Potential in the Central Lowlands of the Hunter Valley. Report to NSW National Parks and Wildlife Service.

Department of Environment and Conservation (DEC) 2005 Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation. Sydney.

Department of Environment Climate Change and Water (DECCW) NSW 2010 Aboriginal cultural heritage consultation requirements for proponents 2010: Part 6 National Parks and Wildlife Act 1974. Sydney.

Draper, N. 2020 Glencore Glendell Continued Operations Coal Project, Aboriginal Cultural Heritage Assessment. Anthropology Report on PCWP Cultural Values. Report by ND&A for Tocomwall Pty Ltd.

Draper, N. 2020(a) Glencore Glendell Continued Operations Coal Project, Hunter Valley, NSW. Comments on Revised Aboriginal Cultural Heritage Assessment. Report by ND&A for Tocomwall Pty Ltd.

Dunn, M (2020) An unpublished report on the Contact History of Ravensworth Estate. A report to Glencore Coal Australia.

Dunn, M (2020) The Convict Valley: The Bloody Struggle on Australia's Early Frontier. Allen & Unwin, Sydney.

Dunne, A. 2012. From Brook to Broke: A History of Broke, *Fordwich*.

Ebsworth. H T 1826 A letter book, kept at Sydney and Port Stephens ML MS B852 in Brayshaw, H 1987 Aborigines of the Hunter Valley: a study of colonial records, Scone and Upper Hunter Historical Society, Scone.

EMM Consulting Pty Limited. 2017. Appendix 8 Aboriginal due diligence site inspection results. Report to GCOP Coal Operations Pty Limited.

Environment Planning and Assessment Act 1979 (NSW).

Environment Protection and Biodiversity Conservation Act 1999 (Cmth).

Fawcett, J W, 1898 'Notes on the customs and dialect of the Wonnah-Ruah', Science, August 22, pp/ 152-154 and 180-181 http://www.newcastle.edu.au/resources/divisions/academic/library/cultural%20Collections/pdf/fawcett1898.pdf

Fourmille, H (1989) Who Owns the Past? Aborigines as Captives of the Archives [online]. Aboriginal History, Vol. 13, 1989: 1-8.

Gray, A 2010 St Clair Mission, viewed 26 June 2013 http://australianmuseum.net.au/St-Clair-Mission

Heritage Act 1977 (NSW).

Heritage Office and Department of Urban Affairs and Planning (DUAP), 1996. Regional Histories. Department of Urban Affairs and Planning and Heritage Council of New South Wales.

Horton, D (ed.) 1994, The encyclopaedia of Aboriginal Australia, Aboriginal Studies Press for the Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra.

Howe, J 1819 Windsor Papers ML MS 106 in Brayshaw, H 1987 Aborigines of the Hunter Valley: a study of colonial records, Scone and Upper Hunter Historical Society, Scone.

Journal of the Royal Australian Historical Society 1953.

Koettig, M 1990 Regional Study of Heritage Significance Central Lowlands Hunter Valley', Electricity Commission Holdings, July 1990, Vol 3: Assessment of Aboriginal Sites

Kovac, M. and Lawrie J.W., 1991. Soil Landscapes of the Singleton 1:250,000 Sheet. Soil Conservation Service of New South Wales, Sydney.

Lucas, Stapleton and Partners Pty Ltd 2013. Hunter Estates: A Comparative Study of pre-1850s Homestead Complexes in the Hunter Region. Volume 1: Historical Context and Survey of Sites.

Macquarie University 2009, Australian Aboriginal tribes, viewed 26 June 2013, <www.libmq.edu.au/all/journeys/related/tribes.ht ml>.

McDonald. 1878. cited in Australian Languages and Traditions. Journal of the Anthropological Institute of Great Briton and Ireland. 7: 255-258.

Miller J 1985, Koori: A will to win, viewed 26 June 2013,

http://www.wonnarua.org.au/images/about%2 0the%20wonnarua%202.pdf>.

Mitchell 2002 Mitchell, P. 2002. Description for NSW (Mitchell) Landscapes Version 2. Department of Environment and Climate Change NSW.

National Parks & Wildlife Act 1974 (NSW).

Native Title Act 1993 (Cmth).

Needham, B 1981 Burragurra: where the spirit walked – Aboriginal sites in the Cessnock-Wollombi region of the Hunter Valley, NSW, Cessnock.

Nolan, R 2012 "We want to do what they did' History at St Clair', BA (Hons), University of Sydney, Sydney

Office of Environment and Heritage (OEH) 2010 Guide to Investigating, assessing, and reporting on Aboriginal Cultural Heritage in New South Wales.

Office of Environment and Heritage (OEH) 2012 Strengthening Aboriginal Community Wellbeing Toolkit.

OzArk Environmental & Heritage Management Pty Ltd. 2018. Aboriginal Archaeology Impact Assessment. GCOP Coal Continued Operations Project. GCOP Coal Mine, Wybong, NSW.

Protection of Movable Cultural Heritage Act 1986 (Cmth).

OzArk Environmental & Heritage Management Pty Ltd. 2018. Aboriginal Archaeology Impact Assessment. GCOP Coal Continued Operations Project. GCOP Coal Mine, Wybong, NSW.

Tindale, N B 1940 'Map showing the distribution of the Aboriginal tribes of Australia' [cartographic], in Digital Collections Maps, National Library of Australia, viewed 3 July 2012, >http://www.nla.gov.au/apps/cdview/?pi=nla.mapgmod91-e>.

Tindale, N. B. 1974 Aboriginal tribes of Australia: their terrain, environmental controls, distribution, limits, and proper names. Australian National University Press. Canberra.

Umwelt 2017. Aboriginal Archaeological and Ecological Due Diligence Assessment of Proposed Borehole Locations, GCOP NSW. Report to GCOP Coal Operations Pty Limited.

Wood, W. Allan. 1972. Dawn in the Valley. Wentworth Books, Sydney.

10 Glossary

Absolute Dating: Is the process of determining a specific date for an archaeological or paleontological site or artefact. Some archaeologists prefer the terms chronometric or calendar dating, as use of the word "absolute" implies a certainty and precision that is rarely possible in archaeology. See also relative dating.

Adze: A stone tool made on flakes with steep flaking along the lateral margins and hafted for use as a wood working tool.

Alluvial Terrace: A terraced embankment of loose material adjacent to the sides of a river valley.

Amorphous: Showing no definite crystalline structure.

Angle of Applied Force: The angle at which the force of flaking is applied to a core.

Angular fragment: A piece of stone that is blocky or angular.

Anisotropic: Having some physical properties which vary in different directions.

Anvil: A portable stone, used as a base for working stone tools. Anvils most frequently have a small circular depression in the centre which is the impact damage from where cores were held while being struck by a hammer stone. An anvil may be a multifunctional tool also used as a grindstone and hammer stone.

Archaeological Context: The situation or circumstances in which a particular item or group of items is found.

Archaeological site types: The archaeological site types encountered in Australia can be divided into three main groups:

Historical archaeological site: An archaeological site formed since the European settlement containing physical evidence of past human activity (for example a structure, landscape or artefact scatter).

Aboriginal contact site: A site with a historical context such as an Aboriginal mission station or provisioning point, or a site that shows evidence of Aboriginal use of non-traditional Aboriginal materials and technologies (e.g. metal or ceramic artefacts).

Aboriginal prehistoric archaeological site: A site that contains physical evidence of past Aboriginal activity, formed or used by Aboriginal people before European settlement.

These sites may be:

Artefact scatters Scarred Trees
Isolated artefacts Mounds
Rock shelters Rock art
Burial Structures Hearths
Shell middens Quarries

Ethnographic Items Grinding Patches

Archaeology: The study of the past through the systematic recovery and analysis of material culture. Archaeology relies heavily upon science and cognate disciplines to provide interpretations of the past life ways of the peoples under investigation.

Artefact: any movable object that has been utilised modified or manufactured by humans.

Artefact scatter: A surface scatter of cultural material. Aboriginal artefact scatters are often defined as being the occurrence of five or more items of cultural material within an area of about 10m x 10m.

Australian Height Datum: The datum used to determine elevations in Australia. The AHD is based on the mean coastal sea level being zero metres AHD.

Australian Small Tool Tradition: Stone tool assemblages found across Australia, with the exception of Tasmania, dating between 8000 BP to European contact. The tool types include hafted implements (e.g. Bondi points), bifacial and unifacial points, geometric microliths, and blades. The assemblage is named for its distinct lack of larger 'core tools' which characterised earlier assemblages.

Axe: A stone-headed axe or hatchet or the stone head alone, characteristically containing two ground surfaces which meet at a bevel.

Backed Artefact: Backed artefacts are flakes retouched until they have one or more steep and relatively thick surfaces that are covered with negative scars. Since the backing retouch was accomplished with a bipolar and/or anvil-rested knapping technique, these retouched surfaces typically show negative scars originating from two directions, a pattern that is sometimes described as "double backing". Backed pieces are a feature of the 'Australian small tool tradition', dating from about 8000 BP in southern Australia.

Bearing: An angle measured clockwise from a north line of 0° to a given surveyed line.

Bevelled Edge: An edge which has had its angle altered.

Biface: A flaked stone artefact which has flake scars on both ventral and dorsal surfaces.

Bipolar: Technique of knapping where a core is rested on an anvil and force applied to the core at an angle close to 900 in the direction of the core's contact with the anvil.

Blade: A flake at least twice as long as it is wide.

Blaze: A mark carved in a tree trunk at about breast height. This type of mark was traditionally used by explorers or surveyors to indicate a route of passage in a certain direction, or a particular camp location.

Bulb of Percussion: Is a convex protuberance located at the proximal end of the ventral surface of a flake, immediately below the ring crack.

Bulbar Scar: The negative scar on a core that results from the bulb of percussion on the extracted flake.

Burial site: Usually a sub-surface pit containing human remains and sometimes associated artefacts. Human burials can also occur above the ground surface within rock shelters or on tree platform burials.

Burin: A stone implement roughly rectangular in shape with a corner flaked to act as a point for piercing holes.

Cadastral: From the Latin, a cadastre is a comprehensive register of the real property of a country, and commonly includes details of the ownership, the tenure, the precise location (some can include GPS coordinates), the dimensions (and area), the cultivations if rural and the value of individual parcels of land.

Chert: Is a fine-grained silica-rich microcrystalline, cryptocrystalline or microfibrous sedimentary rock that may contain small fossils. It varies greatly in colour (from white to black), but most often manifests as gray, brown, greyish brown and light green to rusty red. Its colour is an expression of trace elements present in the rock, and both red and green are most often related to traces of iron (in its oxidized and reduced forms respectively).

Cleavage Plane: A plane of weakness or preferred fracture in a rock.

Composite: An artefact made up of two or more parts joined together.

Conchoidal Fracture: describes the way that brittle materials break when they do not follow any natural planes of separation. Materials that break in this way include flint and other fine-grained minerals, as well as most amorphous solids, such as obsidian and other types of glass. Conchoidal fractures often result in a curved breakage surface that resembles the rippling, gradual curves of a mussel shell; the word "conchoid" is derived from the word for this animal. A swelling appears at the point of impact called the bulb of percussion. Shock waves emanating outwards from this point leave their mark on the stone as ripples. Other conchoidal features include small fissures emanating from the bulb of percussion.

Conjoin: A physical link between artefacts broken in antiquity. A conjoin set refers to a number of artefacts which can be been refitted together.

Contours: Lines joining points of equal height on a topographic map. Contour lines that are relatively close together depict an area of steep terrain on the earth's surface; whereas lines depicted a distance apart represent flat areas on the earth's surface.

Core: An artefact from which flakes have been detached using a hammer stone. Core types include single platform, multi-platform, and bipolar forms.

Cortex: Weathered outer surface of rock, usually chemically altered.

Crazing: Production of visible surface cracks by uncontrolled heating of rock.

Crown land: Technically belonging to the reigning sovereign, is a class of public land, provided for the enjoyment and benefit of the people.

Crushing: Abrasion, small fracturing and the formation of ring cracks, usually along an artefacts edge.

Cryptocrystalline: Rock in which the crystal structure is too fine for clear resolution with an optical microscope.

Cultural significance: Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations (Australia ICOMOS Burra Charter 1999, Article 1.2).

Cultural Materials: The products of human behaviour, such as stone artefacts or food debris.

Datum: In surveying and geodesy, a datum is a reference point or surface against which position measurements are made, and an associated model of the shape of the earth for computing positions. Horizontal datum's are used for describing a point on the earth's surface, in latitude and longitude or another coordinate system. Vertical datum's are used to measure elevations or underwater depths. The previous datum used in Australia was known as the Australian Geodetic Datum (AGD). However, this was restricted because it was defined to best fit the shape of the earth in the Australian region only. The change in datum's had a major consequence to all coordinates. Both latitudes/longitudes eastings/northings were shifted by approximately 200 metres in a north-easterly direction.

Debitage: The term debitage refers to the totality of waste material produced during lithic reduction and the production of chipped stone tools. This assemblage includes, but is not limited to, different kinds of lithic flakes, shatter, and production errors and rejects.

Decortication: Removal of cortex from a stone artefact

Dendrochronology: Is the method of scientific dating based on the analysis of tree-ring growth patterns.

Denticulated: Describes a stone tool which has one edge worked into a series of notches giving a toothed or serrated cutting edge.

Discard: The movement of an object from its systemic context to an archaeological context.

Distal: The end of a flake opposite the bulb; the area of a flake containing its termination.

Direct Freehand Knapping: A method of holding the material to be flaked in the unsupported hand and directing the hammer stone with the other hand.

Dorsal Surface: The face of a flake which was the core surface prior to flake removal and may therefore retain negative flake scars or cortex.

Edge ground implement: A tool, such as an axe or adze which has been flaked to a rough shape and then ground against another stone to produce a sharp edge.

Edge modification: Irregular small flake scarring along one or more margins of a flake, flaked piece or core, which is the result of utilisation/retouch or natural edge damage. Edge damage refers to the removal of small flakes from the edge of an artefact.

Elevation: The height above mean sea level.

Eraillure Flake: A flake formed between the bulb of force and the bulbar scar. Sometimes the eraillure flake adheres to the core in the bulbar scar. The eraillure flake leaves no scar on the core, but always leaves a scar on the ventral surface of the flake. The eraillure flake is convex / concave (like a meniscus lens), has no distinct features on the "dorsal face", but may contain compression rings on the bulbar face.

Ethno-archaeology: The study of human behaviour and of the material culture of living societies in order to learn how items enter the archaeological record, thus allowing the formation of hypotheses as to how items of material culture entered the archaeological record in pre-history.

Ethnographic Site: Often overlooked in cultural heritage management, an ethnographic site is one which has particular spiritual or ritual significance to a particular group of people. They are more commonly referred to as 'dreaming sites' in Australia, and most appropriately recorded by someone with anthropological qualifications.

Excavation: The systematic recovery of archaeological data through the exposure of buried sites and artefacts. Excavation is a destructive process, and hence it is accompanied by comprehensive recording of every aspect.

Excavation Report: Once an excavation has finished, a report outlining the reasons, aims, methods used and findings from the excavation as well as some conclusions drawn from interpreting the artefacts.

Faceted Platform: A platform which is created by the removal of a number of flake scars.

Feather Termination: A termination of the fracture plane that occurs gradually (i.e. there are no sharp bends in the plane), producing a thin, low angled distal margin.

Feature: In excavations, a feature is something that a human made in the past that has not been or cannot be moved. Examples of this would be a house floor or a hearth (fire pit). When archaeologists are excavating, they often come across features.

Flake: A piece of stone removed from a core during the process of knapping by the application of external force, which characteristically shows traces of the processes of removal: concentric fracture ripples and a bulb of percussion. Flakes with a length: breadth ratio of 2:1 or more are usually referred to as blades. In some cases flakes are the result of shaping a block of stone into a tool of some kind. When removed from a prepared core, however, they were usually used as blanks for making tools. Primary flakes (also called decortication flakes) are large, thick flakes struck off a core when removing the cortex and preparing it for working. Secondary flakes (also called reduction flakes) are large flakes struck off a piece to reduce its size or thickness. Tertiary flakes are small flakes struck off when shaping the detail of a piece to make a specific tool. Retouching flakes are tiny, extremely thin flakes pinched or pushed off a piece to finish it, to fineshape part of the surface, sharpen it, or resharpen it. Notching flakes are produced when putting hafting notches in stone tools.

Force: The quantity of energy exerted by a moving body; power exerted; energy exerted to move another body from a state of inertia.

Formal tool: an artefact that has been shaped by flaking, including retouch, or grinding to a predetermined form for use as a tool. Formal tools include scrapers, backed pieces, adzes and axes.

Fracture: Irregular surface produced by breaking a mineral across rather than along cleavage planes.

GDA94: Geocentric Datum of Australia. A spatial reference system which is universally implemented across Australia. The Geocentric Datum of Australia (GDA) is a coordinate reference system that best fits the shape of the earth as a whole. It has an origin that coincides with the centre of mass of the earth, hence the term 'geocentric'

Geodesy: The science and mathematical calculations of the shape and size of the Earth.

Geographic coordinates: a geographic coordinate system enables every location on the earth to be specified, using mainly a spherical coordinate system. There are three coordinates: latitude, longitude and geodesic height.

Geographic Information Systems: Is any system for capturing, storing, analysing, managing and presenting data and associated attributes which are spatially referenced to Earth. GIS is a system or tool or computer based methodology to collect, store, manipulate, retrieve and analyse spatially (georeferenced) data.

Geometric microlith: A small tool that has been fashioned from breaking apart a microblade. The piece is then retouched or backed and a small tool formed.

Gilgai soils: Soils with an undulating surface, presenting as a pattern of mounds and depressions. Gilgai soils contain swelling clays, which shrink and swell with alternate drying and wetting cycles. They display strong cracks when dry. Elements of the soil circulate and move during the shrink-swell process.

Global Positioning System: GPS is a satellite based navigation system originally developed by the United State's Department of Defence. A GPS receiver calculates a position by measuring distances to four or more satellites of a possible 24. These orbit the Earth at all times.

Grain: A description of the size of particles or crystals in rocks or sand. Coarse grained rocks have particles or crystals which are large (1mm or more), and fine grained rocks have particles which are small (0.1mm or less).

Greywacke: Hard fine-grained rock of variable composition containing some quartz and feldspar but mostly very fine particles of rock fragments.

Graticule: A network of crossing lines on a map representing parallels of latitude and meridians of longitude as defined by the projection.

Grid: The division of an archaeological site into small squares that denote different areas of excavation, making it easier to measure and document the site.

Grid coordinates: A point on a map given as an easting and northing reading. The values are given in metres.

Grindstone: The abrasive stone used to abrade another artefact or to processes food. Upper and lower grind stones used to grind plants for food and medicine and/or ochre for painting. A hammer stone sometimes doubles as a hammer stone and/or anvil.

Hammer stone: a piece of stone, often a creek/river pebble/cobble, which has been used to detach flakes from a core by percussion. During flaking, the edges of the hammer stone become 'bruised' or crushed by impact with the core. Hammer stones may also be used in the manufacture of petroglyphs.

Hand-Held: Description of the method used to immobilize the rock during knapping, it which it is held in one hand and struck by a hammer stone held in the other hand.

Hardness: Resistance of material to permanent deformation.

Hearth: Usually a sub-surface feature found eroding from a river or creek bank or a sand dune — it indicates a place where Aboriginal people cooked food. The remains of hearth are usually identifiable by the presence of charcoal and sometimes clay balls (like brick fragments) and hearth stones. Remains of burnt bone or shell are sometimes preserved with a hearth

Heat treatment: The thermal alteration of stone (including silcrete) by stone workers to improve its flaking qualities.

Heritage: The word 'heritage' is commonly used to refer to our cultural inheritance from the past that is the evidence of human activity from Aboriginal peoples through successive periods of later migration, up to the present day. Heritage can be used to cover natural environment as well, for example the Natural Heritage Charter. Cultural heritage can be defined as those things and places associated with human activity. The definition is very broad, and includes Indigenous and historic values, places and objects, and associated values, traditions, knowledge and cultures.

Heritage Place: A place that has aesthetic, historic, scientific or social values for past, present or future generations — 'this definition encompasses all cultural places with any potential present or future value as defined above'. Heritage place can be subdivided into Aboriginal place and historical place, for the purposes of this document.

Hinge Termination: A fracture plane that turns sharply toward the free surface of the core immediately prior to the termination of the fracture. The bend of the ventral surface is rounded and should not be confused with a step termination.

Historic place: A place that has some significance or noted association in history.

Homogeneous: Uniform structure and property throughout the material.

Hunter-gatherer: A member of a society who gains their subsistence in the wild on food obtained by hunting and foraging.

Hydrology: Is the study of the movement, distribution, and quality of water throughout the Earth.

ICOMOS (International Council on Monuments and Sites): ICOMOS is a nongovernment professional organisation closely linked to UNESCO, with national committees in some 100 countries with the headquarters in France. ICOMOS promotes expertise in the conservation of cultural heritage. It was formed in 1965, and has a responsibility to advise UNESCO in the assessment of sites proposed for the World Heritage List. Australia ICOMOS was formed in 1976. Its fifteen member executive committee is responsible for carrying out national programmes and participating in decisions of ICOMOS.

Incipient Crack: A crack or line of weakness in the rock

Inclusion: An impurity or foreign body in the stone that reduces the homogeneity of the rock.

Indirect Percussion: Punch technique.

Interpretation: The process of explaining the meaning or use of an artefact.

Inward Force: Force applied to the platform, and directed into the body of the core.

Isolated artefact: The occurrence of less than five items of cultural material within an area of about 100 sq. metres. It/they can be evidence of a short-lived (or one-off) activity location, the result of an artefact being lost or discarded during travel, or evidence of an artefact scatter that is otherwise obscured by poor ground visibility.

Knapper: A person who creates stone artefacts by striking rocks and causing them to fracture.

Knapping Floor: The debris left on one spot and resulting from the reduction of one block of raw material. A knapping location is a site comprised of one or more knapping floors.

Koori: Koori is an Aboriginal term used to describe Indigenous people from Victoria and southern New South Wales.

Lateral Margins: The margins of a flake either side of the percussion axis.

Latitude: The angular distance along a meridian measured from the Equator, either north or south.

Layer: The layer is the level in which archaeologists dig. All excavation sites have different numbers of layers. Archaeologists try to work out when they are moving to a new layer by cultural or man-made clues like floors, but sometimes they will go by changes in soil colour or soil type.

Longitude: The angular distance measured from a reference meridian, Greenwich, either east or west.

Longitudinal Cross Section: The cross-section of a flake along its percussion axis.

Magnetic north: The direction from a point on the earth's surface to the north magnetic pole. The difference between magnetic north and true north is referred to as magnetic declination.

Maintenance: The process of keeping an artefact in a particular state or condition. An edge which is being used is maintained by flaking off blunted portions. A core is maintained by keeping its characteristics within the limits required for certain types of flaking.

Manufacture: The process of making an artefact.

Manuport: Foreign fragment, chunk or lump of stone that shows no clear sings of flaking but is out of geological context and must have been transported to the site by people.

Map scale: The relationship between a distance on a map and the corresponding distance on the earth's surface.

Margin: Edge between the ventral and dorsal surfaces of a flake.

Material culture: A term that refers to the physical objects created by a culture. This could include the buildings, tools and other artefacts created by the members of a society.

Mercator projection: A conformal cylindrical projection tangential to the Equator. Rhumb lines on this projection are represented as straight lines.

Meridian: A straight line connecting the North and South Poles and traversing points of equal longitude.

MGA94: The Universal Transverse Mercator coordinates of eastings, northings, and zones generated from GDA94 are called Map Grid of Australia 1994 coordinates.

Microblade: A very small narrow blade.

Microcrystalline: Rocks in which the crystals are very small but visible in an optical microscope.

Microwear: Microscopic use-wear.

Moiety: A moiety is a half. Tribes were composed of two moieties (halves) and each clan belonged to one of the moieties.

Mound: These sites, often appearing as raised areas of darker soil, are found most commonly in the volcanic plains of western Victoria or on higher ground near bodies of water. The majority were probably formed by a slow buildup of debris resulting from earth-oven cooking: although some may have been formed by the collapse of sod or turf structures. It has also been suggested some were deliberately constructed as hut foundations.

Morphology: The topographical characteristics of the exterior of an artefact.

Mosaic: A number of continuous aerial photographs overlapped and joined together by way of 'best fit' to form a single non-rectified image.

Negative Bulb of Force: The concave surface left after a flake has been removed. See Bulbar Scar.

Notched: Serration or series of alternating noses and concavities.

Obtrusiveness: How visible a site is within a particular landscape. Some site types are more conspicuous than others. A surface stone artefact scatter is generally not obtrusive, but a scarred tree will be.

Overhang: The lip on a core or retouched flake, caused by the platform being undercut by the bulb on the flake removed.

Overhang Removal: The act of brushing or tapping the platform edge in order to remove the overhang in a series of small flakes.

Overlays: The Victorian Planning Provisions establish a number of different Overlays to show the type of use and development allowed in a municipality. Heritage Overlays will list places of defensible cultural heritage significance.

Patina: An alteration of rock surfaces by molecular or chemical change (but not by attrition, hence not to be confused with sand blasting).

Pebble/cobble: Natural stone fragments of any shape. Pebbles are 2-60 mm in size and cobbles are 60-200 mm in size.

Percussion: The act of hitting a core with a hammer stone to strike off flakes.

Percussion Flaking: The process of detaching flakes by striking with a percussor.

Percussion Length: The distance along the ventral surface from the ring crack to the flake termination.

Place: Place means a site, area, land, landscape, building or other works, group of buildings or other works, and may include components, contents, spaces and views. (Australia ICOMOS Burra Charter 1999, Article 1.1)

Plane of Fracture: The fracture path which produces the ventral surface of a flake.

Planning scheme: The legal instrument that sets out the provisions for land use, development, and protection in Victoria. Every municipality in Victoria has a planning scheme.

Platform: Any surface to which a fabricator is applied when knapping.

Platform Angle: 1. The angle between the platform and core face on a core. 2. The angle between the platform and dorsal surface on a flake. 3. The angle between the platform and flaked surface on a retouched flake.

Platform Preparation: Alteration of the portion of the platform which receives the fabricator by grinding, polishing or flaking. Removal of small flake scars on the dorsal edge of a flake, opposite the bulb of percussion. These overhang removal scars are produced to prevent a platform from shattering.

Platform removal flake: A flake which contains a platform on the dorsal surface.

Point of force application: The area of the platform in contact with the indenter during knapping. Also known as point of contact.

Positive Bulb of Force: Bulb of force.

Post-depositional processes: The natural or cultural processes which may differentially impact upon archaeological sediments after they deposited.

Potlids: A concave-convex or plano-convex fragment of stone. Potlids never have a ringcrack or any other feature relating to the input of external force. They often have a central protuberance which indicates an internal initiation to the fracture. Potlids are the result of differential expansion of heated rock.

Pre-contact: Before contact with non-Aboriginal people.

Post-contact: After contact with non-Aboriginal people.

Pressure Flaking: The process of detaching flakes by a pressing force. Also Static Loading.

Primary decortication: The first removal of cortex from a core, creating a primary decortication flake. The flake will have a dorsal surface covered entirely by cortex.

Procurement: Obtaining raw materials.

Provenance: The location of an artefact or feature both vertically and horizontally in the site. Archaeologists record the provenance of artefacts and features in their field books and on the artefact bag. Provenance is important because it gives archaeologists the history and context of an object, i.e., exactly where it was found on the site.

Punch: An object which is placed on a core or retouched flake and receives the blow from the percussor.

Quarry: A place where humans obtained stone or ochre for artefact manufacture. A place where stone or ochre is exposed and has been extracted by Aboriginal people. The rock types most commonly quarried for artefact manufacture in Victoria include silcrete, quartz, quartzite, chert and fine-grained volcanics such as greenstone.

Quartz: A form of silica.

Quartzite: Sandstone in which the quartz sand grains are completely cemented together by secondary quartz deposited from solution.

Radiocarbon Dating: Also called carbon dating and C-14 dating. It is used to work out the approximate age of an artefact by measuring the amount of carbon 14 it contains. This dating technique is not perfect. It can only be used on organic remains (typically wood or charcoal). Also radiocarbon is only accurate to ±50 years, and cannot accurately date objects more than 50,000 years old.

Redirecting Flake: A flake which uses an old platform as a dorsal ridge to direct the fracture plane.

Redirection: Rotation of a core and initiation of flaking from a new platform situated at right angles to a previous platform. It produces a redirecting flake.

Reduction: Process of breaking down stone by either flaking or grinding.

Reduction Sequence: A description of the order in which reduction occurs within one block of stone.

Rejuvenate: The process of flaking in such a way that further reduction is possible or is easier. This usually involves removing unwanted features, such as step terminations, or making unsuitable characteristics more favourable, for example changing the platform angle. A Rejuvenation flake is a flake that has been knapped from a core solely for the purpose of preparing a new platform and making it easier to get flakes off a core, as it reduces that angle between platform and core surface.

Relative Dating: A general method of dating objects, which uses their relation to other objects. For example, artefacts found in lower layer are typically older than artefacts in higher layer.

Relic: Deposit, object or material evidence of human past.

Replica: A copy of a prehistoric artefact made by a modern investigator for research purposes.

Replicative Systems Analysis: A method of analysing prehistoric artefacts by creating exact replicas of all the manufacturing debris.

Reserves: The word 'reserve' derives from the land being reserved for a particular public use. Crown land retained in public ownership, but not reserved is termed unreserved Crown land.

Resharpening: The process of making a blunt edge sharper by grinding or flaking.

Retouched Flake: A flake that has subsequently been re-flaked. A flake, flaked piece or core with intentional secondary flaking along one or more edges.

Retouching: The act of knapping a flake into a retouched flake.

Ridge: The intersection of two surfaces, often at the junction of two negative scars.

Ring Crack: A circular pattern of micro-fissures penetrating into the artefact around the Point of Force Application and initiating the fracture. It appears on the ventral surface usually as a semicircular protuberance on the edge of the platform.

Rock art: Paintings, engravings and shallow relief work on natural rock surfaces. Paintings were often produced by mineral pigments, such as ochre, combined with clay and usually mixed with water to form a paste or liquid that was applied to an unprepared rock surface.

Run: A large area of land in which squatters could pasture their stock without a lot of fencing necessary. Employed shepherds looked after various areas of the runs. Runs became consolidated pastoral holdings. Many of the runs were about 25 sq miles in area and later became parishes.

Sand: Quartz grains with only a small content of other materials. Grain size 2.00 mm to 0.05 mm.

Sandstone: A sedimentary rock composed of sand, and with only a small amount of other material, which has been consolidated by argillaceous or calcareous bonding of grains.

Sahul: This is the name given to the continent when Australia and New Guinea were a single landmass during the Pleistocene era. During this period, sea levels were approximately 150 metres lower than present levels.

Scar: The feature left on an artefact by the removal of a flake. Includes negative bulb, negative ring crack and negative termination.

Scarred tree: Scars on trees may be the result of removal of strips of bark by Aborigines e.g. for the manufacture of utensils, canoes or for shelter; or resulting from small notches chopped into the bark to provide hand and toe holds for hunting possums and koalas. Some scars may be the result of non-Aboriginal activity, such as surveyors' marks.

Scraper: A flake, flaked piece or core with systematic retouch on one or more margins.

Screen: A screen is used by an archaeologist to sift excavated soil in search of small artefacts like nails, ceramic fragments, and organic material like seeds, shell, and bone. Can be either manual (hand held) or mechanical.

Secondary Decortication: The removal of cortex from a core after the primary decortication flake. A secondary decortication flake is one that has both cortex and flake scars on the dorsal surface.

Selection: Runs were subdivided into selections for farming, agriculture and grazing homesteads. After a period of yearly rental payments, the selector could often obtain freehold ownership.

Shell midden: A surface scatter and/or deposit comprised mainly of shell, sometimes containing stone artefacts, charcoal, bone and manuports. These site types are normally found in association with coastlines, rivers, creeks and swamps – wherever coastal, riverine or estuarine shellfish resources were accessed and exploited.

Sieve: See Screen.

Significance: Significance is a term used to describe an item's heritage value. Values might include natural, Indigenous, aesthetic, historic, scientific or social importance.

Silica: Silicon dioxide.

Silcrete: A silicified sediment.

Siliceous: Having high silica content.

Site: An area designated for archaeological exploration by excavation and/or survey usually due to the presence of a concentration of cultural material.

Step Termination: A fracture plane that turns sharply towards the free surface of the core immediately prior to the termination of the fracture. The bend of the ventral surface is sharp, often a right angle.

Stratification: Over time, debris and soil accumulate in layers (strata). Colour, texture, and contents may change with each layer. Archaeologists try to explain how each layer was added--if it occurred naturally, deliberately (garbage), or from the collapse of structures-and they record it in detailed drawings so others can follow. Stratigraphy refers to the interpretation of the layers in archaeological deposits. Usually, the artefacts found on top are the youngest (most recent), while those on the bottom are the oldest.

Structures (Aboriginal): Can refer to a number of different site types, grouped here only because of their relative rarity and their status as built structures. Most structures tend to be made of locally available rock, such as rock arrangements (ceremonial and domestic), fish traps, dams and cairns, or of earth, such as mounds or some fish traps.

Surface Site: A site where artefacts are found on the ground surface.

Taphonomy: The study of the depositional and preservation processes which produce archaeological or paleontological material.

Termination: The point at which the fracture plain reaches the surface of a core and detaches a flake.

Tertiary Flake: A flake without cortex.

Theodolite: Instrument used by a surveyor for measuring horizontal and vertical angles.

Thermal Treatment: Alteration of siliceous materials by controlled exposure to heat.

Thickness: Measurement of the distance between the dorsal and ventral surfaces of a flake.

Thumbnail scraper: A convex edged scraper that is small, generally the size of a thumbnail.

Tool: Any object that is used.

Topographic map: A detailed representation of cultural, hydrographic relief and vegetation features. These are depicted on a map on a designated projection and at a designated scale.

Transverse Cross Section: The cross section of a flake at 90° to the length.

Transverse Mercator projection: A projection similar to the Mercator projection, but has the cylinder tangent at a particular meridian rather than at the equator.

True north: The direction to the Earth's geographic North Pole.

Tula: A flake with a prominent bulb, large platform and platform/ventral surface angle of about 1300, which is retouched at the distal end. Not to be confused with a Tula Adze.

Tula Adze: A composite tool observed ethnographically, consisting of a stone artefact (often a Tula), a wooden handle and resin.

Unidirectional Core: Core from which flakes were removed from one platform surface and in only one direction.

Unifacial: Artefact flaked on only one side.

Unit: Archaeologists lay out a grid over a site to divide it into units, which may vary in size, and then figure out which units will be dug. Archaeologists dig one unit at a time. Keeping track of specific measurements between artefacts and features gives archaeologists the ability to draw an overall map looking down on the site (called a floor plan), to get the bigger picture of the site.

Use-wear: Damage to the edges or working surfaces of tools sustained in use.

Ventral Surface: The surface of a flake created when it is removed and identified mainly by the presence of a ring crack.

Visibility: The degree to which the surface of the ground can be seen. This may be influenced by natural processes such as wind erosion or the character of the native vegetation, and by land-use practices, such as ploughing or grading. Visibility is generally expressed in terms of the percentage of the ground surface visible for a project area.

Appendix A Table of all Consultation Activities

Table A–1: Consultation Activities

Date	Stage	Consultation Type	OEH Requirement	Description	To/From Who
24-Nov-17	1	Letters to Agencies	Section 4.1.2	Letter requesting RAP contacts	Hunter Local Land Services (HLLS)
24-Nov-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Office of Environment and Heritage (OEH)
24-Nov-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Native Title Services Corporation (NTSC)
24-Nov-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Muswellbrook Shire Council (MSC)
24-Nov-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Singleton Council
24-Nov-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Office of the Registrar of Aboriginal Land Rights Act
24-Nov-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	National Native Title Tribunal (NNTT)
24-Nov-17	1	Letters to Agencies	4.1.2	Letter requesting RAP contacts	Wanaruah Local Aboriginal Land Council (WLALC)
24-Nov-17	1	Letter to PCWP		Letter requesting RAP contacts	Plains Clan of Wonnaruah People (PCWP)
27-Nov-17	1	Letters to Agencies		Receiving information regarding RAPs	WLALC
28-Nov-17	1	Letters to Agencies		Receiving information regarding RAPs	Office of the Registrar
28-Nov-17	1	Letters to Agencies		Receiving information regarding RAPs	NNTT
04-Dec-17	1	Letters to Agencies		Receiving information regarding RAPs	OEH
04-Dec-17	1	Letter to PCWP		Letter issued to PCWP regarding the Aboriginal Cultural Heritage Values Report	PCWP (Scott Franks)
20-Dec-17	1	Public Notices RAPs	4.1.3, 4.1.4	Public Notice in Newspaper	Singleton Argus
22-Dec-17	1	Public Notices RAPs	4.1.3, 4.1.4	Public Notice in Newspaper	Muswellbrook Chronicle
20-Dec-17 to 22-Dec- 17	1	Letter sent to known parties	4.1.3, 4.1.4, 4.1.5, 4.2	Invitation to register as a Glendell Continued Operations Project RAP	102 contacts
22-Dec-17 to 31-Jan-18	1	Letters of registration from RAPs		RAP Registration	24 registrations received
19-Feb-18	2	Send Draft Archeological Survey Methodology to RAPs for Comment	4.2, 4.3.1, 4.3.2	Draft Archeological Survey Methodology, mailed out to Registered RAPS for comment (28- day comment period)	25 Registered contacts (RAPs) as listed in RAP database
19-Feb-18	2	Send Draft Archeological Survey Methodology to RAPs for Comment	4.2, 4.3.1, 4.3.2	Draft Archeological Survey Methodology, emailed out for comment (28-day comment period) to all registered RAPs with an email address	All RAP emails on Registered RAP list
20-Feb-18		Archaeological Survey Methodology – RAP comment		Archaeological Survey Methodology – RAP comment	Culturally Aware (Tracey Skene)
21-Feb-18		Send follow-up email to all contacts who have not responded to EOI for RAP registration		Email sent to all contacts who had not responded to EOI for RAP registration offering them to still register as a RAP for the Project	All contacts who had not responded to EOI
21-Feb-18		Phone call to all contacts who have not responded to EOI for RAP registration		Phone call sent to all contacts who had not responded to EOI for RAP registration offering them to still register as a RAP for the Project	All contacts who had not responded to EOI
27-Feb-18		Archaeological Survey Methodology – RAP comment		Archaeological Survey Methodology – RAP comment	Lower Hunter Aboriginal Incorporated (David Ahoy)
28-Feb-18	1	Copy of EOI Letters, Registered RAPs List and Public Notices	4.1.6	Email submission as per Section 4.1.6	OEH - Steven Cox and Nicole Davis

28-Feb-18	1	Copy of EOI Letters,	4.1.6	Email submission as per Section	Response from Nicole Davis as
		Registered RAPs List and Public Notices		4.1.6	acknowledgement of receipt
6-Mar-18		Archaeological Survey Methodology – RAP comment		Archaeological Survey Methodology – RAP comment	Nyanga Walang (Kevin Duncan)
16-Mar-18	2	Letter of Engagement - Seek Cultural Information from RAPs (General)	3.4, 4.3.3	Provision of field work details/expectations/Registration of Engagement Form/Field Worker Application Form	28 Registered contacts (RAPs) as listed in RAP database
16-Mar-18	2	Letter of Engagement - Seek Cultural Information from RAPs (PCWP)	3.4, 4.3.3	Provision of field work details/expectations/Umbrella Agreement	Scott Franks (PCWP)
16-Mar-18	2	Letter of Engagement - Seek Cultural Information from RAPs (HVAC)	3.4, 4.3.3	Provision of field work details/expectations/Umbrella Agreement	Ross Pahuru (HVAC)
16-Mar-18	2	Letter of Engagement - Seek Cultural Information from RAPs (WNAC)	3.4, 4.3.3	Provision of field work details/expectations/Umbrella Agreement	Laurie Perry (WNAC)
29-Mar-19		Archaeological Survey Methodology – RAP comment		Archaeological Survey Methodology – RAP comment	PCWP (Scott Franks)
9-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
10-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
11-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
12-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
13-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
16-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
17-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
18-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
19-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
20-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 4 RAPs	
30-Apr-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 2 RAPs	
1-May-18	2	Archeological Survey of the Project Area	4.3.3	Conducted by OzArk. 2 teams consisting of 2 Archaeologists + 2 RAPs	
4-Jun-18		Aboriginal Cultural Heritage Values Methodology		Issue Aboriginal Cultural Heritage Values Methodology to all contacts in RAP database	29 contacts as listed in RAP database
6-Jun-18		Aboriginal Cultural Heritage Values Methodology – RAP reply		Aboriginal Cultural Heritage Values Methodology – RAP comments	Murra Bidgee Mullangari Aboriginal Corporation (Ryan Johnson)

19-Jul-18	2	Test Excavation Methodology - RAP comment request	4.2, 4.3.1, 4.3.2	Draft Test Excavation Methodology mailout to all Registered RAPS for comment (28-day comment period)	All contacts in RAP database without an email address provided
19-Jul-18	2	Test Excavation Methodology - RAP comment request)	4.2, 4.3.1, 4.3.2	Draft Test Excavation Methodology emailed for comment (28-day comment period)	29 contacts as listed in RAP database
19-Jul-18	2	Test Excavation Methodology - RAP Reply	4.3.3	Test Excavation Methodology - RAP Comments	Murra Bidgee Mullangari Aboriginal Corporation (Ryan Johnson)
19-Jul-18	2	Test Excavation Methodology - RAP Reply	4.3.3	Test Excavation Methodology - RAP Comments	Muragadi Heritage Indigenous Corporation (Jesse Carroll-Johnson)
19-Jul-18	2	Test Excavation Methodology - RAP Reply	4.3.3	Test Excavation Methodology - RAP Comments	WNAC (Laurie Perry)
20-Jul-18	3	Invitation to Cultural Values Workshops/Site tour	4.3.3	Mailout Cultural Values Workshop invite	Un-aligned RAPs (23 RAP groups)
20-Jul-18	3	Invitation to Cultural Values Workshops/Site tour	4.3.3	Mailout Cultural Values Workshop invite	Hickeys (3 RAP groups)
20-Jul-18	3	Invitation to Cultural Values Workshops/Site tour	4.3.3	Mailout Cultural Values Workshop invite	WNAC (3 RAP groups)
20-Jul-18	3	Invitation and schedule regarding Values Workshops (email)	4.3.3	Email Cultural Values Workshop invite to those RAPs with an email address	Un-aligned RAPs (23 RAP groups)
20-Jul-18	3	Invitation and schedule regarding Values Workshops (email)	4.3.3	Email Cultural Values Workshop invite to those RAPs with an email address	Hickeys (3 RAP groups)
20-Jul-18	3	Invitation and schedule regarding Values Workshops (email)	4.3.3	Email Cultural Values Workshop invite to those RAPs with an email address	WNAC (3 RAP groups)
23-Jul-18	2	Test Excavation Methodology - RAP Reply	4.3.3	Test Excavation Methodology - RAP Comments	Nyanga Walang (Kevin Duncan)
31-July-18		Cultural Values Workshop and Site Tour	4.3.3	Workshops held at Glendell Mine Training Room and included a bus tour of the Project area	WNAC (12 RAPs) and Unaligned (7 RAPs)
1-Aug-18		Cultural Values Workshop and Site Tour	4.3.3	Workshops held at Glendell Mine Training Room and included a bus tour of the Project area	Hickey's (2 RAPs) and Unaligned (4 RAPs)
13-Aug-2018	2	Test Excavation Notification to OEH	Requirement 15c of the Code of Practice	Notification to OEH re: Test Excavation date (14 days prior to activity)	Sent to regional mail address (rog.hcc@environment.nsw.gov.au) which is the standard address for all Project queries and notifications
16-Aug-18	2	Test Excavation Fieldwork – invitations		Invitations issued to RAPs to participate in the Test Excavation Fieldwork	26 contacts
3-Sep-18		Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite emailed to those RAPs with an email address	Hickeys (3 RAP groups)
3-Sep-18		Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite emailed to those RAPs with an email address	Unaligned (22 RAP groups)
3-Sep-18		Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite emailed to those RAPs with an email address	WNAC (5 RAP groups)
3-Sep-18		Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite mailout to RAPs who do not have an email address provided	Hickeys (3 RAP groups)
3-Sep-18		Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite mailout to RAPs who do not have an email address provided	Unaligned (22 RAP groups)
3-Sep-18		Invitation to Cultural Values Workshop #2	4.3.3	Cultural Values Workshop #2 invite mailout to RAPs who do not have an email address provided	WNAC (5 RAP groups)
3-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	

4-Sep-18	3	Test Excavation (12	4.3.3	Test excavation of 12 sites that	
		sites)		included 2 archeologists and 6 RAPs	
5-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
6-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
7-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
10-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
11-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
12-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
13-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
14-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
17-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
18-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
18-Sep-18	3	Cultural Values Workshop #2	4.3.3 - 4.3.7	Cultural Values Workshop #2 (Day 1) held in Singleton for WNAC (5 RAPs and 15 Elders)	
19-Sep-18	3	Test Excavation (12 sites)	4.3.3	Test excavation of 12 sites that included 2 archeologists and 6 RAPs	
19-Sep-18	3	Cultural Values Workshop #2	4.3.3 - 4.3.7	Cultural Values Workshop #2 (Day 2) held in Singleton for WNAC (5 RAPs and 15 Elders)	
20-Sep-18	3	Cultural Values Workshop #2	4.3.3 - 4.3.7	Cultural Values Workshop #2 held in Muswellbrook for Hickeys (2 RAPs)	
21-Sep-18	3	Cultural Values Workshop #2	4.3.3 - 4.3.7	Cultural Values Workshop #2 held in Muswellbrook for Unaligned (11 RAPs)	
04-Mar-19		Letter to PCWP		Letter issued to PCWP regarding PCWP input into the ACHAR and seeking input	
March-Sep 19		Ongoing correspondence		Correspondence regarding PCWP input into the ACHAR and seeking input	
13-Sep-19		Email correspondence		PCWP Cultural Values Report proposal received	
Sep-Dec 19		Correspondence		Correspondence seeking clarification of PCWP Cultural Values Report proposal	
24-Dec-19		Email correspondence		Email from PCWP stating intent to notify DPIE that the ACHAR is not compliant and is not acceptable to the PCWP.	
Dec 19 -Feb 20		Email correspondence		Correspondence regarding PCWP fieldwork timing and logistics	
17-21 Feb 20		PCWP Fieldwork		PCWP completed fieldwork associated with their Cultural Values Report	
March – April 20		Ongoing correspondence		Ongoing correspondence regarding the status of PCWP report	
27 April 2020		PCWP Cultural Values Report – Neil Draper Report		Anthropological section of the Cultural Values Report for Glendell prepared by Neil Draper received	
25 June 2020		PCWP Cultural Values Report		PCWP Cultural Values Report received	
July 2020		Revised ACHAR		Revised ACHAR issued for 28-day RAP review	

A.1 List of RAPs for the Project

- 1. Adam Sampson
- 2. Aliera French
- 3. Allen Paget
- 4. Arthur Fletcher
- 5. Ashley Sampson
- 6. Darleen Johnson-Carroll
- 7. David Horton
- 8. Derrick Vale Sr
- 9. Des Hickey
- 10. Donna Sampson
- 11. George Sampson
- 12. Georgina Berry
- 13. Gordon Griffiths
- 14. Gregory Sampson
- 15. Irene Ardler
- 16. Jeffery Matthews
- 17. Jenny-Lee Chambers
- 18. Jesse Carroll Johnson
- 19. John Matthews
- 20. Kathleen Steward Kinchela
- 21. Kevin Duncan
- 22. Laurie Perry
- 23. Les Ahoy
- 24. Lilly Carrol
- 25. Luke Hickey
- 26. Maree Waugh
- 27. Margaret Matthews
- 28. Noel Downs
- 29. Paul Boyd
- 30. Rhoda Perry
- 31. Rhonda Griffiths
- 32. Rhonda Ward
- 33. Ryan Carroll Johnson
- 34. Scott Franks
- 35. Thomas Miller
- 36. Tim Smith
- 37. Tracey Skene

Appendix B Consultation Documentation

B.1.1 Example Letter seeking Registrations



21 December 2017



The Mount Owen Complex, operated by Glencore, includes approved open cut coal mining operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Consent) and the Barrett Pit, approved under the Glendell Consent. The Glendell Continued Operations Project (Project) seeks to extend the life of the Glendell mine to 2040, with an overall increase in extraction rate up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa.

The Project study area includes an additional approximately 1060 hectares of land outside of currently approved mining disturbance areas and is located approximately 16 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook in the Upper Hunter Valley (see attached **Figure 1**). The Project is located to the east of Bowmans Creek and the New England Highway.

Umwelt (Australia) Pty Ltd have been engaged by Glencore to manage and prepare the *Environmental Impact Statement* for the Project. To support the assessment of Aboriginal cultural heritage values within the Project Study Area, Glencore is undertaking Aboriginal community consultation as per the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.

Accordingly, Glencore is seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Singleton/Muswellbrook area to form a group of Registered Aboriginal Parties (RAPs). The RAPs will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and assist Glencore to understand the cultural values of the Project study area.

If you hold knowledge relevant to determining the cultural significance of the Project area, please register your interest to be a RAP by post: PO Box 320, Singleton NSW 2330, email: Bradly.Snedden@glencore.com.au, or by phoning Bradly Snedden at Glencore between 8.00am and 4.00pm week days on 02 6520 2684. The closing date for Expressions of Interest is by **COB 31 January 2018** or sooner if possible.

If you wish to register to be regarded as a RAP, it should be noted that as per the OEH guidelines Glencore is required to provide your details to the OEH unless advised you do not wish your details to be released.

Once relevant groups and individuals have been identified, they will form part of the formal consultation process for the project.

Kind regards,

Bradly Snedden Glendell Continued Operations Project

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298

Expression of Interest Cultural Heritage Management

Glendell Tenements Pty. Limited, a subsidiary of Glencore Coal Pty Limited (Glencore), seeks registration of Aboriginal groups or individuals interested being who are in Aboriginal regarding Heritage an Cultural proposed Glendell Assessment tor the Continued Operations Project (Project). Project seeks to extend the life of the Glendell located between Muswellbrook Singleton in the Upper Hunter Valley, NSW.

This consultation will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and understand the Aboriginal cultural values of the Project area.

If you hold cultural knowledge relevant to determining the cultural significance of the Glendell mine area, please register your interest by post: PO Box 320, Singleton NSW 2330,

email: Bradly.Snedden@glencore.com.au or by phoning Glendell between 8.00am and 4.00pm week days on 02 6520 2684.

All submissions should be received no later than **4pm on 31 January 2018**.

Figure 10-1: Public Notice in the Muswellbrook Chronicle

Expression of Interest Cultural Heritage Management

Glendell Tenements Pty. Limited, a subsidiary of Glencore Coal Pty Limited (Glencore), seeks registration of Aboriginal groups or individuals who are interested in being consulted reaardina an Aboriginal Cultural Heritage proposed Glendell Assessment tor the Operations Project (Project). Continued Project seeks to extend the life of the Glendell located between Muswellbrook and Singleton in the Upper Hunter Valley, NSW.

This consultation will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and understand the Aboriginal cultural values of the Project area.

If you hold cultural knowledge relevant to determining the cultural significance of the Glendell mine area, please register your interest by post: PO Box 320, Singleton NSW 2330,

email: Bradly.Snedden@glencore.com.au or by phoning Glendell between 8.00am and 4.00pm week days on 02 6520 2684.

All submissions should be received no later than **4pm on 31 January 2018**.

Figure 10-2: Public Notice in the Singleton Argus.

24 November 2017

Hunter Local Land Services 98 John St SINGLETON 2330

Dear Sir.

Aboriginal Cultural Heritage Assessment Glendell Continued Operations Project

The Mount Owen Complex (operated by Glencore) includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Consent) and the Barrett Pit, approved under the Glendell Consent. The Glendell Continued Operations Project (the Project) seeks to extend the life of the Glendell mine to approximately 2045, with an overall increase in extraction rate up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa.

The Project Study Area includes an additional approximately 1060 hectares of land outside of currently approved mining disturbance areas and is located approximately 16 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook in the Upper Hunter Valley (Figure 1). The Project is located to the east of Bowmans Creek and the New England Highway.

Umwelt (Australia) Pty Ltd have been engaged by Glencore to manage and prepare the *Environmental Impact Statement* for the Project. To support the assessment of Aboriginal cultural heritage values within the Project Study Area, Glencore is undertaking Aboriginal community consultation as per the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. Accordingly, Glencore is seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Singleton/Muswellbrook area to form a group of Registered Aboriginal Parties (RAPs). The RAPs will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and assist Glencore to understand the cultural values of the Project Study Area.

If your organisation can recommend and provide contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas), we can then enquire whether they wish to be consulted regarding the Project.

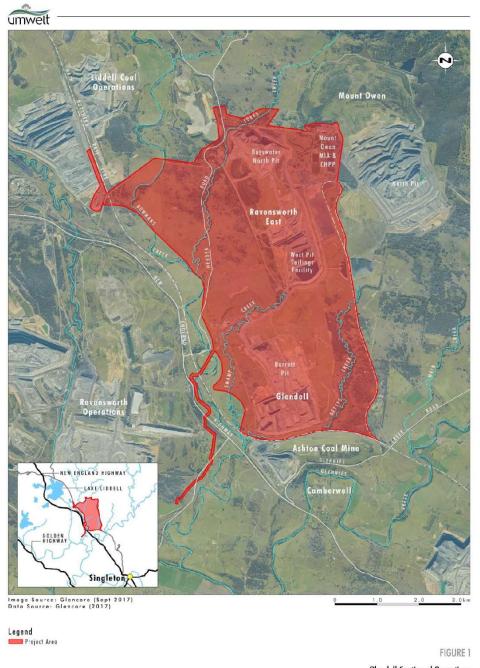
We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups or individuals by COB Monday 14 December 2017 or sooner if possible.

Yours Sincerely,

Brad Snedden Project Approvals Manager

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



Glendell Continued Operations Project Area

File Name (A4): 4166_004.dgn 20171123 16 41

Page 2 of 2

24 November 2017

General Manager Muswellbrook Shire Council PO Box 122 MUSWELLBROOK 2333

Dear Sir,

Aboriginal Cultural Heritage Assessment Glendell Continued Operations Project

The Mount Owen Complex (operated by Glencore) includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Consent) and the Barrett Pit, approved under the Glendell Consent. The Glendell Continued Operations Project (the Project) seeks to extend the life of the Glendell mine to approximately 2045, with an overall increase in extraction rate up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa.

The Project Study Area includes an additional approximately 1060 hectares of land outside of currently approved mining disturbance areas and is located approximately 16 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook in the Upper Hunter Valley (**Figure 1**). The Project is located to the east of Bowmans Creek and the New England Highway.

Umwelt (Australia) Pty Ltd have been engaged by Glencore to manage and prepare the *Environmental Impact Statement* for the Project. To support the assessment of Aboriginal cultural heritage values within the Project Study Area, Glencore is undertaking Aboriginal community consultation as per the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.* Accordingly, Glencore is seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Singleton/Muswellbrook area to form a group of Registered Aboriginal Parties (RAPs). The RAPs will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and assist Glencore to understand the cultural values of the Project Study Area.

If your organisation can recommend and provide contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas), we can then enquire whether they wish to be consulted regarding the Project.

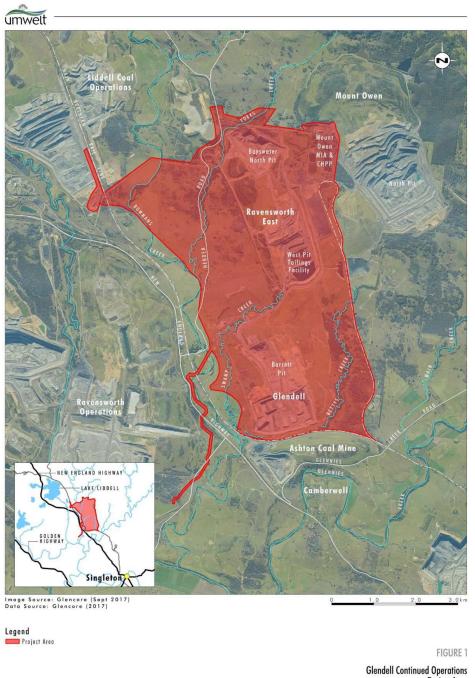
We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups or individuals by COB Monday 14 December 2017 or sooner if possible.

Yours Sincerely,

Brad Snedden Project Approvals Manager

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



Glendell Continued Operations Project Area

File Name (A4): 4166_004.dgn 20171123 16.41

Page 2 of 2



24 November 2017

The National Native Title Tribunal GPO Box 9973 SYDNEY 2001

Dear Sir/Madam,

Aboriginal Cultural Heritage Assessment Glendell Continued Operations Project

The Mount Owen Complex (operated by Glencore) includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Consent) and the Barrett Pit, approved under the Glendell Consent. The Glendell Continued Operations Project (the Project) seeks to extend the life of the Glendell mine to approximately 2045, with an overall increase in extraction rate up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa.

The Project Study Area includes an additional approximately 1060 hectares of land outside of currently approved mining disturbance areas and is located approximately 16 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook in the Upper Hunter Valley (**Figure 1**). The Project is located to the east of Bowmans Creek and the New England Highway.

Umwelt (Australia) Pty Ltd have been engaged by Glencore to manage and prepare the *Environmental Impact Statement* for the Project. To support the assessment of Aboriginal cultural heritage values within the Project Study Area, Glencore is undertaking Aboriginal community consultation as per the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.* Accordingly, Glencore is seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Singleton/Muswellbrook area to form a group of Registered Aboriginal Parties (RAPs). The RAPs will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and assist Glencore to understand the cultural values of the Project Study Area.

If your organisation can recommend and provide contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas), we can then enquire whether they wish to be consulted regarding the Project.

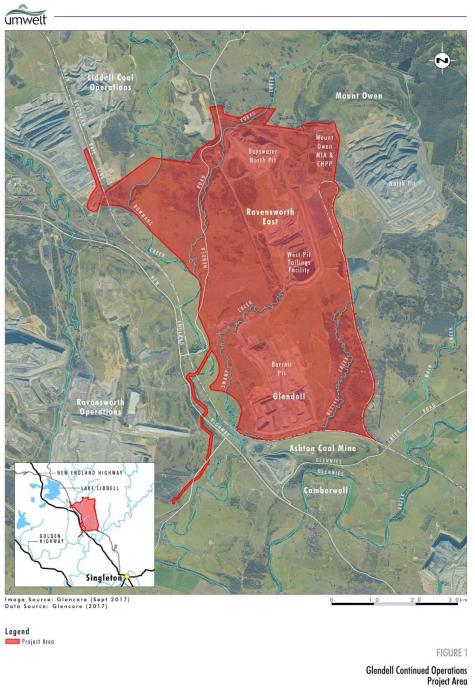
We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups or individuals by COB Monday 14 December 2017 or sooner if possible.

Yours Sincerely,

Brad Snedden Project Approvals Manager

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



File Name (A4): 4166_004.dgn 20171123 16.41

Page 2 of 2

24 November 2017

NTSCORP PO Box 2105 STRAWBERRY HILLS 2012

Dear Sir/Madam,

Aboriginal Cultural Heritage Assessment Glendell Continued Operations Project

The Mount Owen Complex (operated by Glencore) includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Consent) and the Barrett Pit, approved under the Glendell Consent. The Glendell Continued Operations Project (the Project) seeks to extend the life of the Glendell mine to approximately 2045, with an overall increase in extraction rate up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa.

The Project Study Area includes an additional approximately 1060 hectares of land outside of currently approved mining disturbance areas and is located approximately 16 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook in the Upper Hunter Valley (**Figure 1**). The Project is located to the east of Bowmans Creek and the New England Highway.

Umwelt (Australia) Pty Ltd have been engaged by Glencore to manage and prepare the *Environmental Impact Statement* for the Project. To support the assessment of Aboriginal cultural heritage values within the Project Study Area, Glencore is undertaking Aboriginal community consultation as per the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. Accordingly, Glencore is seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Singleton/Muswellbrook area to form a group of Registered Aboriginal Parties (RAPs). The RAPs will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and assist Glencore to understand the cultural values of the Project Study Area.

If your organisation can recommend and provide contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas), we can then enquire whether they wish to be consulted regarding the Project.

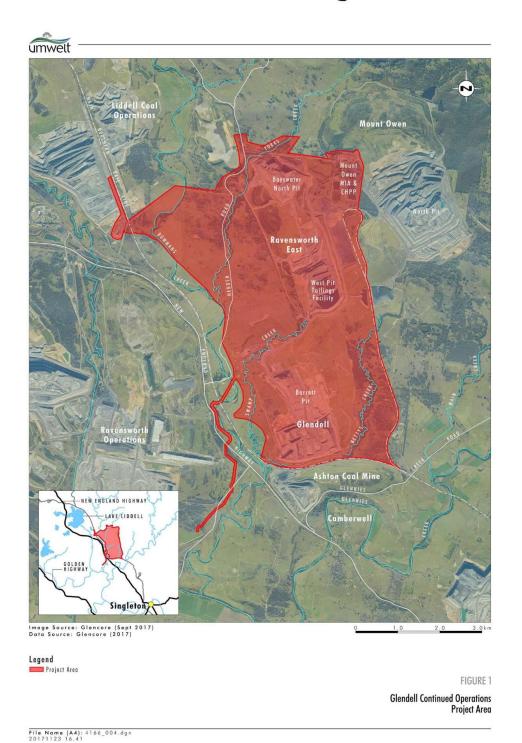
We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups or individuals by COB Monday 14 December 2017 or sooner if possible.

Yours Sincerely,

Brad Snedden Project Approvals Manager

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



Page 2 of 2

24 November 2017

OEH regional office (Newcastle) 117 Bull Street NEWCASTLE WEST 2302

Dear Sir/Madam,

Aboriginal Cultural Heritage Assessment Glendell Continued Operations Project

The Mount Owen Complex (operated by Glencore) includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Consent) and the Barrett Pit, approved under the Glendell Consent. The Glendell Continued Operations Project (the Project) seeks to extend the life of the Glendell mine to approximately 2045, with an overall increase in extraction rate up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa.

The Project Study Area includes an additional approximately 1060 hectares of land outside of currently approved mining disturbance areas and is located approximately 16 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook in the Upper Hunter Valley (**Figure 1**). The Project is located to the east of Bowmans Creek and the New England Highway.

Umwelt (Australia) Pty Ltd have been engaged by Glencore to manage and prepare the *Environmental Impact Statement* for the Project. To support the assessment of Aboriginal cultural heritage values within the Project Study Area, Glencore is undertaking Aboriginal community consultation as per the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.* Accordingly, Glencore is seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Singleton/Muswellbrook area to form a group of Registered Aboriginal Parties (RAPs). The RAPs will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and assist Glencore to understand the cultural values of the Project Study Area.

If your organisation can recommend and provide contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas), we can then enquire whether they wish to be consulted regarding the Project.

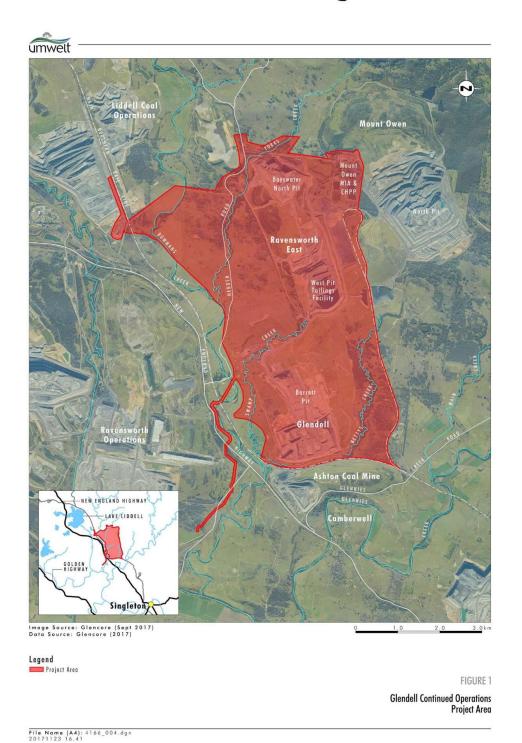
We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups or individuals by COB Monday 14 December 2017 or sooner if possible.

Yours Sincerely,

Brad Snedden Project Approvals Manager

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



Page 2 of 2

24 November 2017

The Registrar
Office of The Registrar, Aboriginal Land Rights Act 1983
PO Box 5068
PARRAMATTA 2124

Dear Nicole,

Aboriginal Cultural Heritage Assessment Glendell Continued Operations Project

The Mount Owen Complex (operated by Glencore) includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Consent) and the Barrett Pit, approved under the Glendell Consent. The Glendell Continued Operations Project (the Project) seeks to extend the life of the Glendell mine to approximately 2045, with an overall increase in extraction rate up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa.

The Project Study Area includes an additional approximately 1060 hectares of land outside of currently approved mining disturbance areas and is located approximately 16 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook in the Upper Hunter Valley (**Figure 1**). The Project is located to the east of Bowmans Creek and the New England Highway.

Umwelt (Australia) Pty Ltd have been engaged by Glencore to manage and prepare the *Environmental Impact Statement* for the Project. To support the assessment of Aboriginal cultural heritage values within the Project Study Area, Glencore is undertaking Aboriginal community consultation as per the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.* Accordingly, Glencore is seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Singleton/Muswellbrook area to form a group of Registered Aboriginal Parties (RAPs). The RAPs will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and assist Glencore to understand the cultural values of the Project Study Area.

If your organisation can recommend and provide contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas), we can then enquire whether they wish to be consulted regarding the Project.

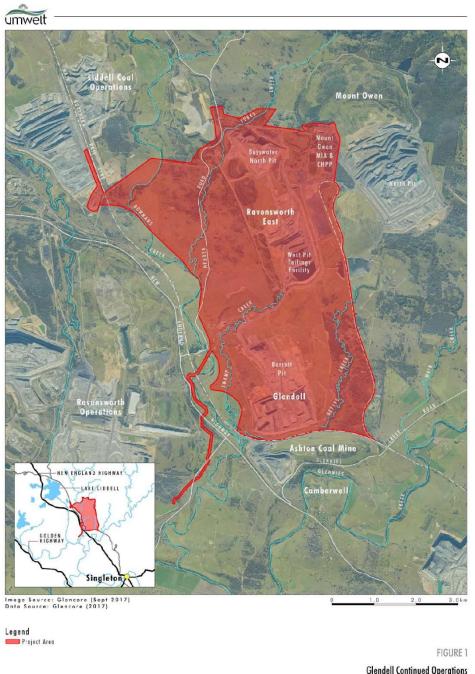
We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups or individuals by COB Monday 14 December 2017 or sooner if possible.

Yours Sincerely,

Brad Snedden Project Approvals Manager

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



Glendell Continued Operations Project Area

File Name (A4): 4166_004.dgn 20171123 16 41

Page 2 of 2

24 November 2017

General Manager Singleton Council PO Box 314 SINGLETON 2330

Dear Sir,

Aboriginal Cultural Heritage Assessment Glendell Continued Operations Project

The Mount Owen Complex (operated by Glencore) includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Consent) and the Barrett Pit, approved under the Glendell Consent. The Glendell Continued Operations Project (the Project) seeks to extend the life of the Glendell mine to approximately 2045, with an overall increase in extraction rate up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa.

The Project Study Area includes an additional approximately 1060 hectares of land outside of currently approved mining disturbance areas and is located approximately 16 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook in the Upper Hunter Valley (**Figure 1**). The Project is located to the east of Bowmans Creek and the New England Highway.

Umwelt (Australia) Pty Ltd have been engaged by Glencore to manage and prepare the *Environmental Impact Statement* for the Project. To support the assessment of Aboriginal cultural heritage values within the Project Study Area, Glencore is undertaking Aboriginal community consultation as per the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.* Accordingly, Glencore is seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Singleton/Muswellbrook area to form a group of Registered Aboriginal Parties (RAPs). The RAPs will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and assist Glencore to understand the cultural values of the Project Study Area.

If your organisation can recommend and provide contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas), we can then enquire whether they wish to be consulted regarding the Project.

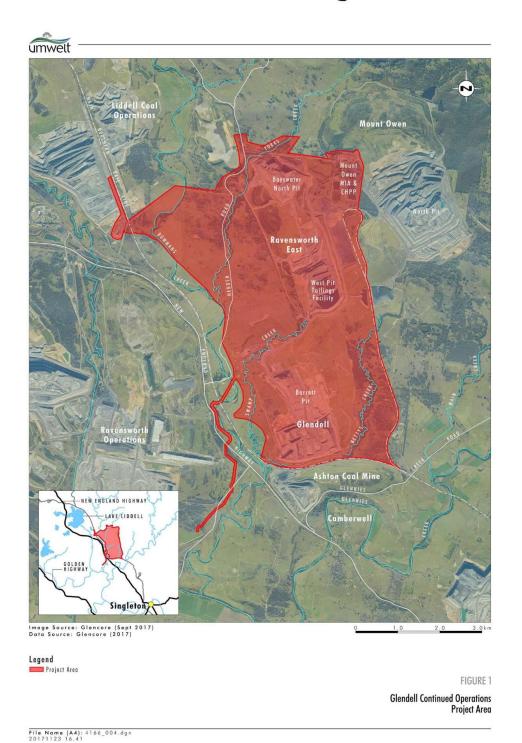
We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups or individuals by COB Monday 14 December 2017 or sooner if possible.

Yours Sincerely,

Brad Snedden Project Approvals Manager

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



1125 10.41

Page 2 of 2

24 November 2017

Noel Downs Wanaruah Local Aboriginal Land Council 19 Maitland Street MUSWELLBROOK 2333

Dear Noel,

Aboriginal Cultural Heritage Assessment Glendell Continued Operations Project

The Mount Owen Complex (operated by Glencore) includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Consent) and the Barrett Pit, approved under the Glendell Consent. The Glendell Continued Operations Project (the Project) seeks to extend the life of the Glendell mine to approximately 2045, with an overall increase in extraction rate up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa.

The Project Study Area includes an additional approximately 1060 hectares of land outside of currently approved mining disturbance areas and is located approximately 16 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook in the Upper Hunter Valley (**Figure 1**). The Project is located to the east of Bowmans Creek and the New England Highway.

Umwelt (Australia) Pty Ltd have been engaged by Glencore to manage and prepare the *Environmental Impact Statement* for the Project. To support the assessment of Aboriginal cultural heritage values within the Project Study Area, Glencore is undertaking Aboriginal community consultation as per the Office of Environment and Heritage's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.* Accordingly, Glencore is seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Singleton/Muswellbrook area to form a group of Registered Aboriginal Parties (RAPs). The RAPs will assist Glencore to develop an Aboriginal Cultural Heritage Assessment and assist Glencore to understand the cultural values of the Project Study Area.

If your organisation can recommend and provide contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas), we can then enquire whether they wish to be consulted regarding the Project.

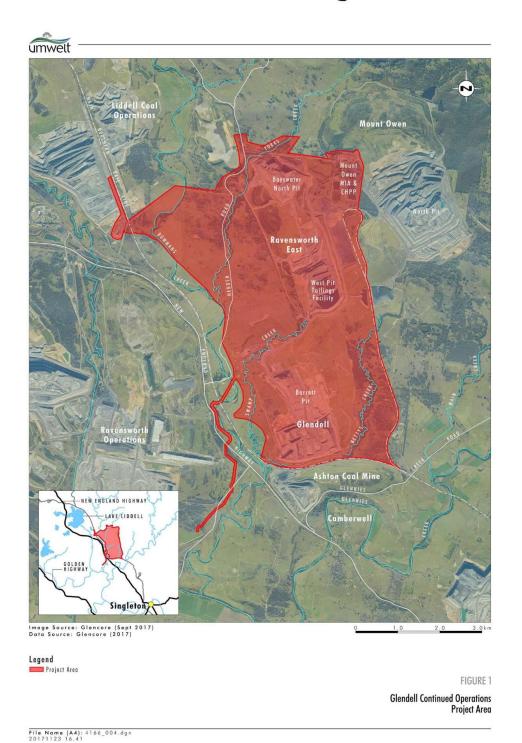
We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups or individuals by COB Monday 14 December 2017 or sooner if possible.

Yours Sincerely,

Brad Snedden Project Approvals Manager

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



0.0.41

Page 2 of 2

27 November 2017



Brad Snedden Glencore Private Mail Bag 8 SINGLETON NSW 2330

Dear Brad

Re: Request - Search for Registered Aboriginal Owners

I refer to your email dated 24 November 2017 regarding an Aboriginal Cultural Heritage Assessment located within the area of Bowmans Creek, NSW.

I have searched the Register of Aboriginal Owners and the project area described does not have Registered Aboriginal Owners pursuant to Division 3 of the Aboriginal Land Rights Act 1983 (ALRA).

I suggest that you contact the Wanaruah Local Aboriginal Land Council on 02 6543 1288. They may be able to assist you in identifying other Aboriginal stakeholders for this project.

Yours sincerely

Jodie Rikiti Administration Officer

Office of the Registrar, ALRA

Address: Level 3, 2 – 10 Wentworth Street, PARRAMATTA NSW 2150
Post: P.O Box 5068, PARRAMATTA NSW 2124
Phone: 02 8633 1266

From:wanarua@bigpond.net.auSent:Monday, 27 November 2017 11:30To:Bradly.Snedden@glencore.com.au

Subject: Re: Aboriginal Cultural Heritage Assessment for the Glendell Continued Operations

Project

Attachments: Registered Aboriginal Parties.xlsx

Follow Up Flag: Follow up Flag Status: Flagged

Good morning Brad,

Please find attached our RAP's list.

Regards Renee

Renee MacDonald Administration

Wanaruah Local Aboriginal Land Council

PO Box 127

MUSWELLBROOK NSW 2333 Ph: 02 6543 1288

I acknowledge the Traditional Owners of the land I work upon, the Wanaruah People and pay my respects to Elders past, present and future.

On 27/11/2017 10:10 AM, Bradly.Snedden@glencore.com.au wrote:

Hi Noel,

It was a pleasure to meet you last week. Further to that meeting please find attached the initial letter seeking contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas), as discussed.

Please don't hesitate to contact me at any stage.

Regards Brad

Brad Snedden Coal Assets Australia, Glencore

M: 04 2846 6820 T: 02 6520 2684

E: Bradly.Snedden@glencore.com.au

www.glencore.com

LEGAL DISCLAIMER. The contents of this electronic communication and any attached documents are strictly confidential and they may not be used or disclosed by someone who is not a named recipient.

If you have received this electronic communication in error please notify the sender by replying to this electronic communication inserting the word "misdirected" as the subject and delete this communication from your system.

1



DOC17/585796-1 ACH Glendell Contuined Operations

> Mr Brad Seddon Coal Assets Australia, Glencore Bradley.Snedden@glencore.com.au

Dear Brad.

Aboriginal Cultural Heritage Assessment - Glendell Continued Operations Project

In response to your request under Section 4.1.2(a) of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010), please find attached a list of known Aboriginal parties that have self-nominated for Singleton and Muswellbrook Council Local Government Area (LGA). Please note the following information with respect to Aboriginal consultation for your project.

Aboriginal stakeholder lists maintained by OEH are comprised of self-nominated individuals and organisations

Please note that the attached list is comprised only of self-nominated individuals and Aboriginal organisations who could have an interest in your project. The list is not vetted by OEH. As the list comprises only of self-nominated individuals and Aboriginal organisations, it is not necessarily an exhaustive list of all Aboriginal parties who may hold an interest in the project. Further consultation in accordance with step 4.1.2 of the Aboriginal cultural heritage consultation requirements for proponents (DECCW 2010) is required to identify Aboriginal people who may hold either cultural or historical knowledge relevant to determining the significance of Aboriginal objects or places within your proposed project area.

Ensure you document the consultation process

Please ensure all consultation undertaken in accordance with the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010) is documented within an Aboriginal Cultural Heritage Assessment Report (ACHAR). This must include copies of all correspondence sent to or received from all Registered Aboriginal Parties (RAPs) throughout the entire consultation process. Omission of these records in the final ACHAR may cause delays in the assessment of an Aboriginal Heritage Impact Permit (AHIP) application or a major project Aboriginal cultural heritage assessment, and could require parts of the consultation process to be repeated if the evidence provided to OEH does not demonstrate that the consultation process has been conducted in accordance with our consultation requirements.

Demonstrate that reasonable consultation attempts have been made

Please ensure you provide evidence to demonstrate that reasonable attempts have been made to contact the relevant parties identified through step 4.1.2 of the *Aboriginal cultural heritage consultation*

Locked Bag 1002 Dangar NSW 2309 Level 4, 26 Honeysuckle Drive Newcastle NSW 2300 ABN 30 841 387 271 www.environment.nsw.gov.au

requirements for proponents (DECCW 2010). If this evidence is not provided, OEH may deem that the consultation process has not complied with the consultation requirements. Similarly, the proponent is required to record all feedback received from RAPs, along with the proponent's response to the feedback. Where concerns or contentious issues are raised by RAPs during the consultation process, OEH expects that reasonable attempts are made to address and resolve these matters, however OEH acknowledges that in some cases, this may not be achievable. In the case where conflict cannot be resolved, it is the responsibility of the proponent to record these differences and provide the necessary information in their ACHAR with their AHIP application or major project ACHAR.

Consultation should not be confused with employment

As outlined in Section 3.4 of the Aboriginal cultural heritage consultation requirements for proponents (DECCW 2010), the consultation process involves getting the views of, and information from, Aboriginal people and reporting on these. It is not to be confused with other field assessment processes involved in preparing a proposal and an application. OEH does not have any role with respect to commercial engagement. Where RAPs are engaged commercially to provide field services as part of an assessment process, that is a matter for the proponent to manage as they see fit. However, if a proponent is proposing to undertake consultation processes or elicit cultural information from RAPs during the course of conducting a field survey, OEH considers this to form part of the consultation process, and expects that all RAPs would be afforded the opportunity to be involved in the process.

Contacting our office

To ensure we can respond to enquiries promptly, please direct future correspondence to our central mailbox: rog.hcc@environment.nsw.gov.au.

Should you require any further information, please do not hesitate to contact us.

Yours sincerely

STEVEN COX Senior Team Leader Planning Hunter Central Coast Branch Regional Operations Division



Attachment A

Hunter Central Coast Branch - Aboriginal Stakeholder Register for Singleton City Council LGA

Please note that this list is valid at the time of sending only, and should not be used for subsequent projects.

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Aboriginal Native Title Elders Consultants	John and Margare t	Matthews	4 Calgaroo Avenue	MUSWELLBROOK	NSW	2333			
AGA Services	Ashley, Gregory & Adam	Sampson	22 Ibis Parade	WOODBERRY	NSW	2322	Donna Sampson 0403 765 019	Ashley Sampson 0401 958 051	aga.services@hotmail.com
Aliera French Trading	Aliera	French	23B Gommera St	BLACKSMITHS	NSW	2281		0421 299 963	Aliera.french.trading@hotmail.com
Awabakal Traditional Owners Aboriginal Corporation	Kerrie	Brauer	PO Box 122	RUTHERFORD	NSW	2320	-	0412 866 357	Kerrie@awabakal.com.au
Cacatua Culture Consultants	Donna & George	Sampson	22 Ibis Parade	WOODBERRY	NSW	2322		0434 877 016	cacatua4service@tpg.com.au
Crimson-Rosie	Jeffery	Matthews	6 Eucalypt Avenue	MUSWELLBROOK	NSW	2333	02 6543 4791		

Page 4

	First					Post			
Organisation	name	Surname	Address 1	City	State	code	Landline	Mobile	Email
Culturally Aware	Tracey	Skene	7 Crawford Place	MILFIELD	NSW	2325		0474 106 537	traceyamorrung-pa.com.au
D F T V Enterprises	Derrick	Vale Snr	5 Mountbatte n Close	RUTHERFORD	NSW	2320		0438 812 197	deckavale@hotmail.com
Deslee Talbott Consultants	Deslee	Matthews	Unit 2 / 19 South Street	GUNNEDAH	NSW	2380		0431 205 336	m-desley@hotmail.com
Divine Diggers Aboriginal Cultural Consultants	Deidre	Perkins	6 Ashleigh Street	HEDDON GRETA	NSW	2321	02 4937 4573		dedemaree3@hotmail.com
Gidawaa Walang & Barkuma Neighbourhood Centre Inc.	Ann Hickey	Debbie Dacey- Sullivan	76 Lang Street	KURRI KURRI	NSW	2327	02 4937 1094		gidawaa.walang@hotmail.com
Guringai Tribal Link Aboriginal Corporation	Tracey	Howie	PO Box 4061	WYONGAH	NSW	2259	02 4396 8743		tracey@guringai.com.au
Hunter Traditional Owner	Paulette	Ryan	165 Susan Street	SCONE	NSW	2337		0431 109 001	hto.paulette@gmail.com
Hunter Valley Aboriginal Corporation	Rhonda	Griffiths	182 Bridge St	MUSWELLBROOK	NSW	2333	02 6543 1180		h973809@bigpond.net.au
Hunters & Collectors	Tania	Matthews	U211 Walowa St	NARRABRI	NSW	2390		0409 193 612	Tamatthews10@hotmail.com
Jarban & Mugrebea	Les	Atkinson	11 Nelson Street	CESSNOCK	NSW	2325		0466 316 069	Les.atkinson@hotmail.com
Jumbunna Traffic Management Group Pty Ltd	Norm	Archibald	17 Flobern Ave	WAUCHOPE	NSW	2325		0413 718 149	jtmanagement@live.com.au

	Firm					D			
Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Kauma Pondee Inc.	Jill	Green	Unit 6/1 Central Street	LAMBTON	NSW	2305		0434 210 190	kaumapondee@live.com.au
Kawul Cultural Services	Vicky	Slater	33 Gardner Circuit	SINGLETON	NSW	2330		0421 077 521	Vicki.slater@hotmail.com
Kawul Pty Ltd trading as Wonn1 Sites	Arthur	Fletcher	619 Main Road	GLENDALE	NSW	2285	02 4954 7751	02 4954 7751	Wonn1sites@gmail.com
Lower Hunter Aboriginal Incorporated	David	Ahoy	5 Killara Drive	CARDIFF SOUTH	NSW	2285		0421 329 520	lowerhunterai@gmail.com
Lower Hunter Wonnarua Cultural Services	Lea- Anne Ball and Uncle Tommy Miller		51 Bowden Street	HEDDON GRETA	NSW	2321	02 4937 2694	02 4937 2694	tn.miller@southernphone.com.au
Lower Wonnaruah Tribal Consultancy Pty Ltd	Barry	Anderson	156 The Inlet Road	BULGA	NSW	2330	02 6574 5303		-
Murra Bidgee Mullangari Aboriginal Corporation Myland Cultural & Heritage Group	Ryan Johnson Warren	& Darleen Johnson- Carroll Schillings	PO Box 246 30 Taurus Street	SEVEN HILLS ELERMORE VALE	NSW NSW	2147 2287		0497 983 332 0431 392 554	murrabidgeemullangari@yahoo.com.a u warren@yarnteen.com.au

Page 6

	First			-100		Post			
Organisation	name	Surname	Address 1	City	State	code	Landline	Mobile	Email
Roger Matthews Consultancy	Roger	Matthews	15 Parkinson Avenue	MUSWELLBROOK	NSW	2333		0455 671 288	
Ungooroo Aboriginal Corporation	Alan	Paget	PO Box 3095	SINGLETON	NSW	2330	02 6571 5111		admin@ungooroo.com.au
Wallagan Cultural Services	Maree	Waugh	PO Box 40	CESSNOCK	NSW	2325		0439 813 078	Mareewaugh30@hotmail.com
Wattaka Wonnarua CC Service	Des	Hickey	4 Kennedy Street	SINGLETON	NSW	2330		0432 977 178	deshickey@bigpond.com
Widescope Indigenous Group	Steven	Hickey	73 Russell Street	EMU PLAINS	NSW	2750		0425 232 056 or 0425 230 693	Widescope.group@live.com
Wonnarua Culture Heritage	Gordon	Griffiths	19 O'Donnell Crescent	METFORD	NSW	2323	02 4934 6437	0401 028 807	
Wonnarua Elders Council	Richard	Edwards	PO Box 844	CESSNOCK	NSW	2325			
Wonnarua Nation Aboriginal Corporation	Laurie	Perry	254 John St	SINGLETON	NSW	2330		0412 593 020	I.perry@optusnet.com.au
Yarrawalk (A division of Tocomwall Pty Ltd), Tocomwall	Scott	Franks	PO Box 76	CARRINGBAH	NSW	1495		0404 171 544	scott@tocomwall.com.au

Organisation	First name	Surname	Address 1	City	State	Post code	Landline	Mobile	Email
Pty Ltd on behalf									
of Scott Franks									
and Anor on									
behalf of the									
Plains Clans of									
the Wonnaru									
People									
NSD1680/2013									
Yinarr Cultural	Kathleen	Steward	Lot 5	MERRIWA	NSW	2329		0475 436	yinarculturalservices@bigpond.com
Services		Kinchela	Westwood					589	dontminemeay@gmail.com
			Estate						
	Carol	Ridgeway	33 Ullora	NELSONS BAY	NSW	2315	02 4984	02 4984	
		-Bissett	Road				3113	3113	
	Steve	Talbott	73 Kiah Road	GILLIESTON	NSW	2321		0429 662	gomeroi.namoi@outlook.com
				HEIGHTS				911	-
Didge Ngunawal	Paul	& Lilly	7 Siskin St	QUAKERS HILL	NSW	2763		0426 823	didgengunawalclan@yahoo.com.au
Clan	Boyd	Carroll						944	

From: Enquiries@nntt.gov.au

Sent:Tuesday, 28 November 2017 14:30To:Bradly.Snedden@glencore.com.au

Subject: RE: SR3428 Aboriginal Cultural Heritage Assessment for the Glendell Continued

Operations Project - SR3428

Attachments: 20171128_SR3428_NSW_Muswellbrook_Shire_Council_LGA_Overlap_Report.xlsx;

20171128_SR3428_NSW_Singleton_Shire_Council_LGA_Overlap_Report.xlsx

Follow Up Flag: Follow up Flag Status: Flagged

UNCLASSIFIED

Native title search – NSW - Singleton Shire Council and Muswellbrook Shire Council LGA Your ref: - Our ref: SR3428

Dear Brad Snedden,

Thank you for your search request received on 27 November 2017 in relation to the above area, please find your results attached.

Please note: Where the area identified to be searched is indistinct, generalised, or is for a freehold parcel, the results provided may relate to the Local Government Area (LGA) or Local Aboriginal Land Council (ALC).

Search Results

The results provided are based on the information you supplied and are derived from a search of the following Tribunal databases:

- Schedule of Native Title Determination Applications
- Register of Native Title Claims
- Native Title Determinations
- Register of Indigenous Land Use Agreements
- Notified Indigenous Land Use Agreements

For more information about the Tribunal's registers or to search the registers yourself and obtain copies of relevant register extracts, please visit our <u>website</u>.

Please note: There may be a delay between a native title determination application being lodged in the Federal Court and its transfer to the Tribunal. As a result, some native title determination applications recently filed with the Federal Court may not appear on the Tribunal's databases.

The search results are based on analysis against external boundaries of applications only. Native title applications commonly contain exclusions clauses which remove areas from within the external boundary. To determine

1

whether the areas described are in fact subject to claim, you need to refer to the "Area covered by claim" section of the relevant Register Extract or Schedule Extract and any maps attached.

Search results and the existence of native title

Please note that the enclosed information from the Register of Native Title Claims and/or the Schedule of Applications is **not** confirmation of the existence of native title in this area. This cannot be confirmed until the Federal Court makes a determination that native title does or does not exist in relation to the area. Such determinations are registered on the National Native Title Register.

The Tribunal accepts no liability for reliance placed on enclosed information

The enclosed information has been provided in good faith. Use of this information is at your sole risk. The National Native Title Tribunal makes no representation, either express or implied, as to the accuracy or suitability of the information enclosed for any particular purpose and accepts no liability for use of the information or reliance placed on it

If you have any further queries, please do not hesitate to contact us on the free call number 1800 640 501.

Regards,

Enquiries

Public enquiry hours are 8.30am to 4.30pm

National Native Title Tribunal | Perth

Facsimile (08) 9425 1193 | Email enquiries@nntt.gov.au

Freecall 1800 640 501 | www.nntt.gov.au

Shared Country Shared Future

Celebrating 25 Years of Native Title Recognition www.nativetitle25.gov.au

From: Bradly.Snedden@glencore.com.au [mailto:Bradly.Snedden@glencore.com.au]

Sent: Monday, 27 November 2017 7:27 AM **To:** Enquiries < <u>Enquiries@nntt.gov.au</u>>

Subject: SR3428 Aboriginal Cultural Heritage Assessment for the Glendell Continued Operations Project

To whom it may concern,

With reference to Glencore's newly proposed Glendell Continued Operations Project, which seeks to extend the life of the existing Glendell mine to approximately 2045, please find attached the initial letter seeking contact details for any Aboriginal groups or individuals with a cultural interest in the Upper Hunter Valley area (Singleton and Muswellbrook Local Government Areas).

Please don't hesitate to contact me at any stage.

Regards

Brad

Brad Snedden Coal Assets Australia, Glencore

M: 04 2846 6820 T: 02 6520 2684

E: Bradly.Snedden@glencore.com.au

www.glencore.com

LEGAL DISCLAIMER. The contents of this electronic communication and any attached documents are strictly confidential and they may not be used or disclosed by someone who is not a named recipient.



04 June 2018

Ryan Carroll Johnson & Darleen Johnson Carroll Murra Bidgee Mullangari Aboriginal Corporation PO Box 246 Seven Hills NSW 2147

Glendell Continued Operations Project Aboriginal Cultural Heritage Values - Methodology

Dear Ryan and Darleen,

Thank you for your involvement as a Registered Aboriginal Party regarding consultation for the Aboriginal Cultural Heritage Assessment (ACHA) for Glencore's Glendell Continued Operations Project (Project). The Project has completed the initial archaeological field work survey component to contribute scientific values to the ACHA and will shortly commence the collation of Aboriginal cultural heritage values as a component of the ACHA, as outlined in our previous letter dated 21 February 2018.

Methodology

The collation and reporting of cultural heritage values will be undertaken by Dr Shaun Canning from ACHM Pty Ltd and the methodology will consist of a series of cultural values workshops focussed on the project area. Key processes to be undertaken at the workshops include the following:

- Review of background cultural heritage information including the cultural heritage information collected and reported previously for the adjacent Mount Owen Continued Operations (MOCO) project ACHA in 2014 - also completed by Dr Shaun Canning.
- Review the outcomes of the initial archaeological field work survey completed in April 2018 by OzArk and RAPs.
- Opportunities to provide historical and cultural values associated with the Project through cultural values workshops and further site visits if required.
- Discussion of potential impacts and the recommended mitigation measures to reduce or manage unavoidable impacts.
- Consideration of other on-site management measures for cultural features that are not to be impacted by the Project.
- Recommended measures to address intergenerational equity in the event that the Project receives approval to proceed.

Workshops will be available for members of the WNAC, the WLALC and all other RAPs. Field visits will also be available if required by RAPs who may not have visited site recently. Following the workshops, draft Cultural Values reports will be circulated to RAPs for 28 days for comment, and final reports will be included as appendices in support of the Aboriginal Cultural Heritage Assessment for Project EIS. The final reports will also be provided to participating RAPs.

In addition, the Registered Native Title Claimants (PCWP) will be providing their advice on Aboriginal cultural heritage values for the Project Area.

Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298

This work will be undertaken in accordance with the Office of Environment and Heritage's (OEH) "Aboriginal Cultural Heritage Consultation Requirements for Proponents" (DECCW 2010), and with regard to the OEH guideline "Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW" (OEH 2011). Arrangements will also be made for confidential or sensitive information to be recorded separately in accordance with guidelines, if requested.

If you wish to comment on the ACHA methodology, your comments must be received by 6 July 2018 via the following:

- By post: PO Box 320, Singleton NSW 2330 or
- via email: Bradly.Snedden@glencore.com.au.

We will be in contact with you again with further details about the cultural values workshops.

If you have any questions, please contact me via the details below.

Regards,

Bradly Snedden Approvals Manager Glendell Continued Operations Project 02 6520 2684

Page 2 of 2

B.1.6 Archaeological Survey Methodology and Example Letter



21 February 2018



Glendell Continued Operations Project Aboriginal Cultural Heritage Assessment - Survey Methodology

Dear ,

Thank you for your registration as a Registered Aboriginal Party regarding consultation for the Aboriginal Cultural Heritage Assessment for Glencore's Glendell Continued Operations Project (Project). The Project seeks to extend the life of the Glendell Mine located between Muswellbrook and Singleton in the Upper Hunter Valley, NSW.

Please refer to the attached Methodology prepared by OzArk Environmental & Heritage Management Pty Limited (OzArk) for further details of the Project Area. It is anticipated that the survey will be conducted in late March to April 2018 and will inform the scientific values component of the Aboriginal Cultural Heritage Assessment Report to be prepared for the Project. An opportunity to provide cultural heritage values will also be facilitated through upcoming Values Workshops to be held in 2018.

In accordance with the Office of Environment and Heritage's Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010, your comments regarding the Methodology must be received by 19 March 2018 via post: PO Box 320, Singleton NSW 2330 or via email: Bradly.Snedden@glencore.com.au.

I will be in contact with you again in March 2018 with further details associated with the survey program, participation and induction requirements along with information associated with upcoming cultural values workshops.

As a separate matter, the Social Impact Assessment and community engagement team from Umwelt (Australia) Pty Limited is currently undertaking the Social Impact Assessment for the Project. As a community member and Project stakeholder you will shortly be contacted by a member of the Social Impact Assessment team, inviting you to a meeting where you can ask questions and share your thoughts on social issues and opportunities associated with the proposed Project. You can contribute your ideas and thoughts in a face-to-face meeting, by phone or by email depending on your preference. For more information, or to schedule a meeting with the Social Impact Assessment team, please contact Kate Davies at Umwelt on 0488 229 179 or send her an email at kadavies@umwelt.com.au.

If you would like to arrange for a site visit to assist in your review of the Methodology or if you have any questions, please contact me via the details below.

Regards,

Bradly Snedden Approval Manager Glendell Continued Operations Project 02 6520 2684

> Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298





ABORIGINAL CULTURAL HERITAGE SURVEY METHODOLOGY

GLENDELL CONTINUED OPERATIONS PROJECT Singleton LGA February 2018

Prepared by

OzArk Environmental & Heritage Management Pty Ltd

for

Umwelt Australia Pty Limited

on behalf of

Glendell Tenements Pty Ltd

OzArk EHM

145 Wingewarra St (PO Box 2069) Dubbo NSW 2830

Phone: (02) 6882 0118 Fax: (02) 6882 0630 enquiry@ozarkehm.com.au www.ozarkehm.com.au

This page has intentionally been left blank.

DOCUMENT CONTROLS

Proponent	Glendell Tenements	Pty Limited					
Client	Umwelt (Australia) F	Umwelt (Australia) Pty Limited					
Project No / Purchase Order No							
Document Description	Aboriginal Cultural F Operations Project	leritage Survey Methodology.	Glendell Continued				
	Name	Signed	Date				
Clients Reviewing Officer							
Clients Representative Man	aging this Document	OzArk Person(s) Managing t	his Document				
		Ben Churcher					
Location		OzArk Job No.					
Document Status V2.1 DRA	FT	Date 13 February 2018					
Draft V1.1 Author to Editor (V1.0 SR author 30/01/18					
(Series V1 = OzArk interna	al edits)	V1.1 BC edit 1/2/18					
Draft V2.0 Report Draft for r	elease to client	V2.0 BC incorporates client comments 10/2/18					
(Series V2 = OzArk and C	lient edits)	V 2.1 BC amends figures 13/2/18					
FINAL V3once latest versiby client	on of draft approved						
Prepared For		Prepared By					
David Holmes		Stephanie Rusden					
Principal Environmental Cor		Archaeologist					
Umwelt (Australia) Pty Limit 75 York Street	ed	OzArk Environmental & Heritage Management Pty. Limited					
Teralba, NSW 2284		145 Wingewarra Street (PO Box 2069)					
		Dubbo NSW 2830					
		P: 02 6882 0118					
		F: 02 6882 6030					
		stephanie@ozarkehm.com.au					

COPYRIGHT

© OzArk Environmental & Heritage Management Pty Ltd 2018 and © Glendell Tenements Pty Limited 2018

All intellectual property and copyright reserved.

Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission.

Enquiries should be addressed to OzArk Environmental & Heritage Management Pty Ltd.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

Acknowledgement

OzArk acknowledge the Traditional Owners of the area on which this assessment will take place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

CONTENTS

1	INTRO	NOITOUCTION	1
1.1	Pro	oject Overview	1
1.2	Pro	oject Area	6
2	ARCH	AEOLOGICAL CONTEXT	9
2.1	Int	roduction	9
2.2	An	tiquity of Aboriginal occupation	9
2.3	Pre	evious assessments within or near the Project Area	9
2	2.3.1	Glendell Mining Lease Area (Brayshaw 1982)	10
2	2.3.2	A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project (Dyall 1982)	10
2	2.3.3	Archaeological Survey of Pikes Gully Colliery Area, Liddell, NSW (Haglund 1982)	10
2	2.3.4	Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales (Resource Planning 1991)	11
2	2.3.5	Proposed Mt Owen Extension. Archaeological survey of Bettys Creek (Resource Plannin 1993)	_
2	2.3.6	Aboriginal Archaeological Assessment - Glendell Open Cut Mine (Umwelt 2004)	12
2	2.3.7	Environmental Assessment for Modification of Glendell Mine Operations (Umwelt 2007)	14
2	2.3.8	Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations (OzA 2013)	
2	2.3.9	Mount Owen Modification 2 (OzArk 2017e)	17
2	2.3.10	Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping (OzArk 2017b, c & d)	18
2	2.3.11	Mt Owen Complex Aboriginal cultural heritage due diligence site inspection results - EL6594, EL8184, ML1629 and ML1415 (EMM 2017)	19
2.4	Pre	evious salvage programs within or near the Project Area	19
2	2.4.1	Ravensworth East Archaeological Investigation (ERM 2002)	19
2	2.4.2	Glendell Project Area (Umwelt 2013)	21
2	2.4.3	Archaeological Salvage. Liddell Coal Operations Development Modification 5 (OzArk 201	5)23
2	2.4.4	Mount Owen Continued Operations Project Salvage Program (OzArk 2017)	24
2.5	Ard	chaeological context: conclusion	27
3	PRED	OCTIVE MODEL	28
3.1	Ва	ckground	28

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

ii

3.2	Settlement strategies	28
3.3	Past land use	29
3.4	Previously recorded sites	29
3.5	Landform modelling	
3.6	Predictive model for the Project Area	
	·	
3.7	Research questions	34
4 S	URVEY M ETHODOLOGY	35
4.1	Assessment approach	35
4.2	Background	35
4.2.1	Survey methodology	35
4.2.2	2 Survey zones	36
4.2.3	B Test excavation	38
REFERE	NCES	40
Figur	ES	
Figure 1	-1. Location of the Project Area	4
Figure 1	-2. Key Project features.	5
Figure 1	-3: Aerial showing the Project Area and major drainage systems.	7
Figure 1	-4. The Project Area superimposed on a 1958 aerial image.	8
Figure 2	-1. Location of sites previously salvaged in the Project Area.	25
Figure 3	-1: Location of valid AHIMS sites within the Project Area	31
Figure 4	-1: Aerial showing areas of survey priority	39
TABLE	:s	
Table 1-	1: Summary of Key Project Components	2
	1: Artefact densities at sites recorded by Resource Planning 1991	
	Sites salvaged within the Project Area under Permit SZ323	
	3. Sites within the Project Area salvaged under Consent #2267.	
	4. Details of sites within the Project Area salvaged under AHIP C0000623	
	5. Sites salvaged within the Project Area under SSD-5850	24

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

1 INTRODUCTION

OzArk Environmental & Heritage Management Pty Limited (OzArk) has been engaged by Umwelt Australia Pty Limited (Umwelt) (the Client) on behalf of Glendell Tenements Pty Limited (Glendell) (the Proponent) to prepare a survey methodology for the Glendell Continued Operations Project (the Project). This methodology is in accordance with Stage 3 of the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (ACHCRs).

1.1 PROJECT OVERVIEW

The Mount Owen Complex (MOC), which includes the Project Area, is located within the Hunter Coalfields in the upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres (km) northwest of Singleton, 24 km southeast of Muswellbrook. The MOC is situated in the Singleton Local Government Area (LGA) (Figure 1-1).

The MOC includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Project consent [SSD-5850]) and the Barrett Pit, approved under the Glendell Mine consent (DA 80/952). The MOC Coal Handling and Preparation Plant (CHPP) washes coal from all three pit areas. The water management system for the MOC is integrated, as well as being linked to the broader Glencore Greater Ravensworth Area Water and Tailings Scheme (GRAWTS). The MOC is approved to process up to 17 million tonnes per annum (Mtpa) run of mine (ROM) coal through the CHPP with production at each of the three pits approved as follows:

- Mount Owen (North Pit) up to 10 Mtpa;
- Ravensworth East (Bayswater North Pit) up to 4 Mtpa; and
- Glendell (Barrett Pit) up to 4.5 Mtpa.

The Project seeks to extend the life of Glendell Mine to 2043, with an increase in extraction rate over the life of the Project up to 10 Mtpa from the current approved 4.5 Mtpa.

Key aspects of the Project include the continuation of the Barrett Pit to the north, the realignment of Hebden Road, the diversion of Yorks Creek and relocation of Ravensworth Homestead (Figure 1-2). The major Project components are summarised in Table 1-1.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

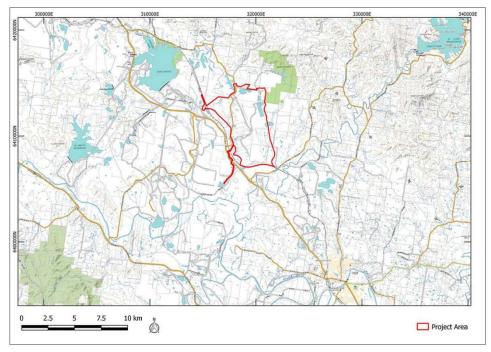
Table 1-1: Summary of Key Project Components

Project Component	Description
Extraction limit	Overall increase in extraction rate from current approved 4.5 Mtpa up to 10 Mtpa. It is noted that this will ramp up over the life of the Project as mining operations progress further to the north and as operations at Mount Owen ramp down in accordance with current approvals.
Project life	Extension of the life of Glendell Mine to 2043 – this presents an extension of 19 years based on the current approved mine life.
Additional ROM extracted	Approximately 145 Mt.
Mining areas	Continuation of open cut mining to the north of the existing Glendell Mine.
Mining method	Open cut using excavator and truck.
Interactions with other mining operations	Continued integration with MOC in relation to coal handling and transport, water and tailings management, and surface infrastructure.
Key mine infrastructure	New mine infrastructure area (MIA) to be established or use of existing Liddell MIA.
Infrastructura valantiava	Construction of a heavy vehicle access road to the new MIA or the Liddell MIA.
Infrastructure relocations	Relocation of part of Hebden Road Relocation of sections of transmission lines and other utilities as required for mine progression.
Coal handling and processing (CHPP)	Use of existing MOC CHPP infrastructure in the current location. No change to approved CHPP throughput of up to 17 Mtpa ROM coal. Size and location of ROM and product stockpile areas will remain unchanged. Given that the current Mount Owen Continued Operations Project consent authorises the use of the CHPP and associated infrastructure to 2031 (2037 subject to MOD 2 currently under assessment) this Project will need to consider and seek approval for ongoing use of this infrastructure through to 2043.
Coal Transport	No increase in train movements of up to 1636 trains per year.
Equipment fleet	Use of existing and additional mining fleet to reflect increase in production and length of mine extension.
Water management System (WMS)	Extension of existing MOC WMS to Project Area and continued integration with regional water management scheme (GRAWTS).
Overburden, coarse reject and tailings management	Emplacement of overburden in-pit with areas up to 200 metres to provide variability in the final landform.
	Out-of-pit emplacement to assist with incorporation of natural landform design elements in final landform.
	Tailings emplacement within Ravensworth East (West Pit) and regional tailings management scheme (GRAWTS).
Creek Diversions	Diversion of part of Yorks Creek
	Swamp Creek catchment diverted to Bettys Creek in final landform.
Final void	No additional void in final landform although change in size and location of final void. Final void located to the north of approved Barrett Pit void.
Rehabilitation and final landform	Final landform to be in line with current design standards (e.g. incorporation of natural landform design elements) and regulator expectations for similar recent projects such as the Mount Owen Continued Operations Project and the United Wambo Project.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

Project Component	Description
Workforce	Operational workforce expected to increase as production rate increases but will remain within the current approved employment levels associated with MOC. Some short term increases in workforce associated with key infrastructure construction periods.
Operating hours	No change, 24 hours, 7 days per week.
Mine access	From the realigned Hebden Road.
Built heritage	Dismantling and relocation of Ravensworth Homestead to enable continued mine progression.

Figure 1-1. Location of the Project Area.



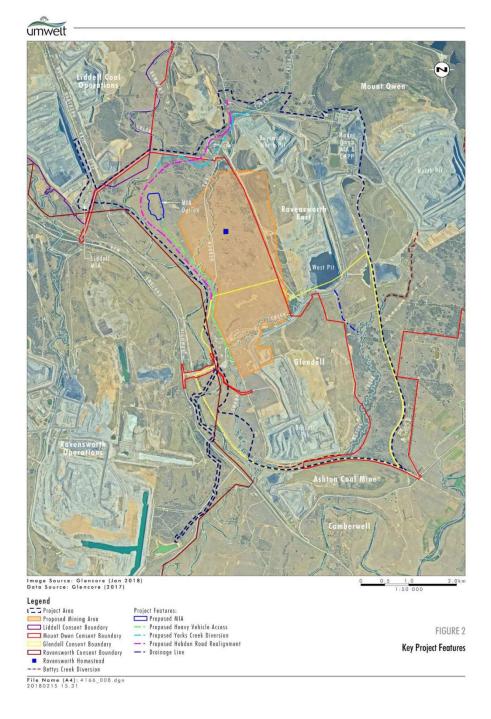


Figure 1-2. Key Project features.

6

1.2 PROJECT AREA

All proposed impacts related to construction and operation of the Project will be confined to the Project Area shown on Figure 1-3. The Project Area comprises approximately 2929 hectares (ha) the majority of which is already cleared or is approved for disturbance as part of existing approvals. A large proportion of the Project Area within MOC has been subject to salvage programs.

The topography of the Project Area is characterised by a number of low ridges with spurs and low to moderate gradient slopes. Lower topographic areas are associated with Bowmans, Swamp, Yorks and Bettys Creeks (Figure 1-3Error! Reference source not found.). The creek lines generally flow from the north to the south. Portions of Swamp, Yorks and Bettys Creek have been diverted and/or lost within the Project Area as a result approved mining activities. The Project Area also contains a number of unnamed tributaries associated with the previously listed creek lines which flow between the spurs. In the portions of the Project Area that are outside of approved mining areas, the topography is generally flat ranging between around 60 meters (m) above sea level to small rises that are around 140 m above sea level.

The Project Area has been subject to agricultural land uses, including intensive grazing and pasture improvement, as well as mine related activities. All woodland in the Project Area is regrowth and mature trees are very rare. Figure 1-4 shows the Project Area superimposed on an aerial photo dating from 1958. This shows the almost complete nature of the clearing across the Project Area and large areas of visible sheet wash erosion. Woodland regrowth tends to be thick stands of Casuarina along creek lines and open Eucalyptus woodland on slopes. Other extensive areas within the Project Area have been previously cleared and are still open grasslands currently used for cattle grazing.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

Project Area
Drainage
Bowmans Creek (in place)
Swamp Creek (in place)

Figure 1-3: Aerial showing the Project Area and major drainage systems.

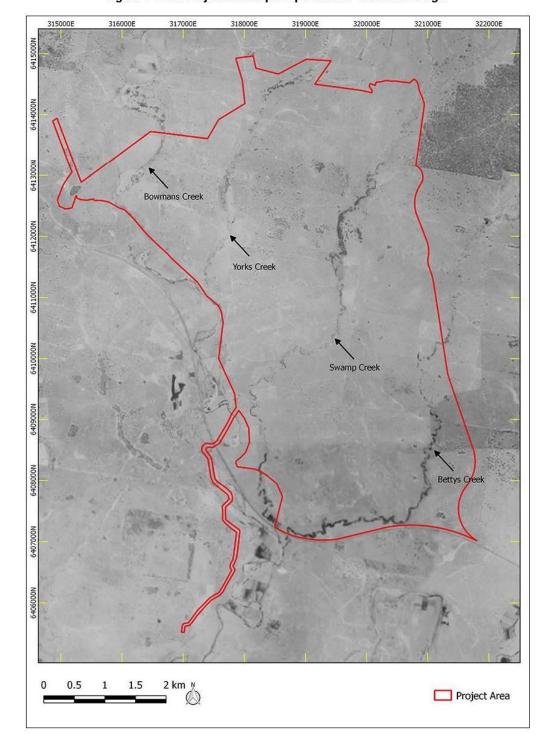


Figure 1-4. The Project Area superimposed on a 1958 aerial image.

8

2 ARCHAEOLOGICAL CONTEXT

2.1 Introduction

The Project Area is located in an area where the archaeological values are largely known due to the high amount of previous assessment either within the Project Area or in immediately adjacent landforms.

This survey methodology will limit itself to those studies that are directly applicable to the Project Area although the predictive model for site location will consider the broader archaeological context of the district.

2.2 ANTIQUITY OF ABORIGINAL OCCUPATION

The Aboriginal occupation of Australia begins prior to 40,000 BP (years before present) and possibly earlier than 50,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period, poor preservation of archaeological materials (particularly dateable organic materials) and significant coastline change over the past 18,000 years.

In 1986, Koettig undertook an archaeological survey approximately 6 km southeast of the Project Area between Glennies Creek and Singleton (cited in Umwelt 2003). Following that survey, Koettig carried out several excavations at six locations along Glennies Creek. Koettig considered artefacts found in Site SGCD 16 (about one metre deep in Unit B of on an old alluvial terrace) were 'markedly different' to artefacts recovered from the artefacts in Unit A. Her conclusion was formed on the basis of the raw material used, large number of cores, the large percentage of cortex remaining on artefacts and larger sizes of artefacts. Artefacts from Unit B were from volcanic rocks while those in Unit A were predominantly mudstone and silcrete. Later, a date of >20,200 BP was obtained from a hearth associated with the artefacts placing the site well into the Pleistocene.

2.3 PREVIOUS ASSESSMENTS WITHIN OR NEAR THE PROJECT AREA

There have been numerous archaeological investigations in the local area and a number within the Project Area itself. The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (Section 3). This section refers to archaeological investigations that were entirely or partially within the Project Area and Section 2.4 reviews the salvage programs that have taken place at the MOC.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

2.3.1 Glendell Mining Lease Area (Brayshaw 1982)

The first survey to interact with the Project Area was by Helen Brayshaw in 1982 (Brayshaw 1982). Brayshaw's survey area included areas within the southern portions of the Project Area including the southern 6 km of Bettys Creek and 5 km of Bowmans Creek. As a result of this assessment, three open sites and two isolated artefacts were recorded. The three open sites (artefact scatters) were recorded as follows:

- Site A: Artefact Scatter. 30 m west of Bettys Creek, principally on the southern bank of a tributary. 43 artefacts were recorded, occurring at an average density of 1/17 square metres (m²). Raw materials present included indurated mudstone 75%, siltstone 2.5%, quartz 2.5% and silcrete 20%;
- Site B. Artefact scatter. On the western bank of Bettys Creek, about 300 m north of the main northern railway. Four flakes were found here at an average density of 1/30 m²; and
- Site C. Artefact scatter. East of a tributary of Bettys Creek about 200 m north of the confluence. Five artefacts recorded, occurring at an average density of 1/24 m².

2.3.2 A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project (Dyall 1982)

To the northwest of the Project Area, along the northern reaches of Bowmans Creek, Len Dyall (Dyall 1982) recorded 18 artefact scatters and two grinding groove sites. The artefact scatters were small with the exception of one that contained over 150 artefacts. One grinding groove site was suggestive of a seed processing location rather than for axe grinding. Both grinding groove sites are outside of the Project Area.

2.3.3 Archaeological Survey of Pikes Gully Colliery Area, Liddell, NSW (Haglund 1982)

In the same area of Bowmans Creek and to the northwest of the Project Area, Laila Hagland (Hagland 1982) recorded two artefact scatters:

- Site 1: Aboriginal stone artefacts were noted in a number of exposures within, and along, the edge of a river terrace west of Bowmans Creek. It was noted that the artefacts recorded varied in type, size range and density between the exposures. Small thin flakes and small, well-made artefacts such as bondi points were noted only close to the southern end. Artefact density appeared greater in this part. These observations may reflect real distribution trends, but may also result from the smaller and more shallow areas of exposure further north; and
- Site 2: Aboriginal stone artefacts were noted in two exposures along the northeast bank of Bowmans Creek, northwest of its junction with Stringybark Creek, and within a minor erosion gully on the slope above.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

11

2.3.4 Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales (Resource Planning 1991)

In 1991 Resource Planning undertook a large assessment for the Mount Owen Coal Project that was focussed on Swamp and Yorks Creeks, located immediately north of the Project Area (Resource Planning 1991). This study included 25 km of drainage line (including left and right banks) along Swamp Creek and Yorks Creek. Traverses were also made across side slopes and along ridge lines. The survey area totalled 370 ha. 98 Aboriginal archaeological sites, ranging from isolated artefacts to dense concentrations of more than 100 pieces of flaked stone, were mapped and recorded. Table 2-1 presents the artefact densities recorded by Resource Planning and this shows clearly that Swamp Creek displays a lower artefact density when compared to Yorks Creek. In the case of Swamp Creek over 75% of sites were isolated finds or very low density artefact scatters while along Yorks Creek 54% of sites recorded over 50 artefacts at each site (a moderate artefact density). Resource Planning noted that the sites in the Swamp Creek catchment are regarded as an excellent representative assemblage of occupational evidence in the small tributary valleys of the Hunter River (Resource Planning 1991: 5). This report recommends, based on the survey evidence "that part of the Yorks Creek drainage line would be set aside as an archaeological conservation zone" (Resource Planning 1991: 5): a recommendation that was followed as the northern reaches of Yorks Creek are now within a permanent Voluntary Conservation Area (VCA). The Yorks Creek VCA is located outside the Project Area.

Table 2-1: Artefact densities at sites recorded by Resource Planning 1991.

Artefact Numbers	Swamp Creek (%)	Yorks Creek (%)
Isolated Artefact	27.6	9
<10 Flakes	50.0	18
10-20	14.5	18
20-50	6.6	27
50-100	1.3	18
>100		9

2.3.5 Proposed Mt Owen Extension. Archaeological survey of Bettys Creek (Resource Planning 1993)

In 1993 Matthew Barber, archaeologist with Resource Planning, surveyed areas along Bettys Creek: locations that are now within the current Mount Owen disturbance area to the northeast of the Project Area (Resource Planning 1993). The western boundary of Barber's survey area was defined by the drainage divide between Bettys Creek and Swamp Creek (now no longer extant but can be seen in historic aerial photographs (**Figure 1-4**). The southern boundary was formed by the proposed lease extension boundary. The proposed extension resulted in the disturbance of an additional 260 ha of land, including approximately 100 ha of the then Ravensworth State Forest.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

The survey recorded 39 archaeological sites, of which 34 were recorded in detail. It was found that the majority of sites were situated close to the drainage lines and that their location represented a verifiable distribution and was not a bias of survey coverage. It was, however, noted that erosion plays a vital role in the identification of sites. This is because, the report argued, the majority of sites are actually subsurface in origin.

All of the sites recorded were open artefact scatters although their content varied from one artefact to several hundred artefacts. The artefact types appear in the main to be the product of backed blade manufacture (Resource Planning 1993: 4). There were some sites, in the report's opinion, which had a high potential for further archaeological investigations due to their potential to contain subsurface deposits and the quantity of artefacts present. A number of artefacts revealed retouch, the majority of which were classed as part of the backed blade industry. As with other sites in the Swamp Creek area, and other parts of the Hunter Valley, the dominant raw material was indurated mudstone/tuff followed by silcrete.

2.3.6 Aboriginal Archaeological Assessment - Glendell Open Cut Mine (Umwelt 2004)

Umwelt conducted an Aboriginal Archaeological Assessment for the Glendell Open Cut Mine survey area involving survey during September, October and December 2001, as well as geomorphic investigations during May 2002.

The Glendell survey area incorporated sections of Bowmans Creek, Swamp Creek and Bettys Creek and included the southern portion of the Project Area. As part of the archaeological brief, a desk-top study and an in-field reconnaissance were undertaken with the aim of identifying areas within the Glendell survey area that contained Aboriginal resources. The resources sought for identification within the Glendell survey area included fresh water supplies, food and medicine plants, faunal prey species, stone suitable for implement manufacture, areas suitable for camping, areas that provided an extensive outlook, areas with major and minor creek confluences that had often been found to have Aboriginal camp sites and the terrain units that may have acted as pathways between resource locations.

The information compiled was then used to assist in the preparation of a predictive model related to the location and nature of sites within the then Glendell survey area. In addition, past land-use practices and geomorphic studies were used to determine areas where artefactual material may remain in a relatively undisturbed context. Geomorphic studies were also used to investigate a buried soil profile within the shared Bowmans Creek/Swamp Creek floodplain and to determine the likelihood of this soil profile containing artefactual material from the late Pleistocene to early Holocene periods.

As a result of the research it was concluded that the entire Glendell survey area would have supplied adequate resources for small groups of hunter-gatherers living a mobile lifestyle. Bowmans Creek was highlighted as an area that should have formed the focus of camping

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

12

activities of longer duration, possibly by larger numbers of people, due to an increased abundance and reliability of the resource base.

Other areas, such as the lower western slopes adjacent to Bettys Creek were assessed as having attracted groups of people for short-term visits to harvest abundant seasonal foods. Bowmans Creek was therefore cited as likely to have the largest sites in terms of spatial extent and numbers of artefacts.

Such sites were predicted as likely to be found on the lower slopes, terraces and floodplains along Bowmans Creek, spreading further across the Bowmans Creek/Swamp Creek floodplain. Bettys Creek and Swamp Creek were listed as likely to have evidence of more sporadic and short-term use as overnight camping locations.

A pattern of site distribution was evident from the previously recorded sites in the locale with the majority of sites located along the watercourses (58%). More of these were associated with ephemeral tributaries (30%) than major creek lines and their associated floodplains and terraces (30%). A little more than half (54%) of the sites were within 30 m of the closest watercourse and 66% within 100 m. In relation to the slopes, sites were more commonly located on the foot slopes/lower slopes (18.5%), than the crest/upper slopes (16.6%) and mid slopes (8%).

A total of 37 previously unrecorded sites were located during the 2001 fieldwork survey of the Glendell survey area. The sites consisted of 30 artefact scatters, including one small quarry site with an associated artefact scatter, one scatter in an area with a buried soil profile and seven isolated finds. The Bowmans Creek 5 quarry site was recorded as having an associated artefact scatter as the majority of the artefacts in the site were manufactured from mudstone and silcrete rather than the quartz and quartzite materials available at the site.

The artefact scatter in the area with the buried soil profile (Bowmans Creek/Swamp Creek Trench) was located on the shared floodplain between Bowmans Creek and Swamp Creek. In this area a trench approximately 300 m in length was constructed during the 1980s to divert Swamp Creek into Bowmans Creek. At the time of the 2001 survey the trench was not connected to the creeks and it currently remains unconnected. The artefact scatter eroding from the A-Horizon of the floodplain was observed to be approximately one metre above the buried soil profile. This profile was later determined through geomorphic investigation to be of early Pleistocene to Tertiary age and did not contain any artefactual material (Mitchell 2002).

Artefact analysis of the salvage assemblage recorded:

Flakes and broken flakes dominated the assemblage (78%), followed by flaked pieces (15%) and cores (3%). Within the flake category, 4% were retouched and half of the retouched flakes were backed. Heat shatter accounted for 3% of the artefacts;

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

13

- The mudstone and silcrete flakes were of similar size. Volcanic flakes were generally larger and heavier than flakes composed of other raw materials;
- Volcanic flakes had a significantly higher percentage of cortex than silcrete or mudstone, and mudstone artefacts had a higher percentage of cortex than silcrete;
- Silcrete artefacts had a higher overall rate of retouch than mudstone artefacts (8.2% and 6.3% respectively), and silcrete retouched artefacts were more likely to be backed than retouched mudstone artefacts; and
- A number of artefacts relating to post-European occupation of the area were also
 recovered, including fragments of glass and pottery. The location of this material closely
 correlated with concentrations of Aboriginal stone artefacts. Additionally, at least one
 Aboriginal artefact manufactured from glass was salvaged, suggesting that the area was
 used by Aboriginal people in the post-contact period.

2.3.7 Environmental Assessment for Modification of Glendell Mine Operations (Umwelt 2007)

In 2007 an Environmental Assessment was undertaken to modify the Glendell Mine Development Consent (DA 80/952) to enable the integration of Glendell Mine operations with the approved MOC operations and the implementation of a revised mine plan.

The assessment noted that a range of surveys of the Glendell Mine site had been undertaken to identify areas and sites of significance in relation to Aboriginal archaeology. Appendix 10 of the Environmental Assessment lists a number of sites that had been previously identified at the Glendell Mine site and have been salvaged in accordance with a permit from the then Department of Environment and Conservation. The assessment stated that the remaining sites within the Glendell Mine site will be protected and managed in accordance with an Aboriginal Heritage Management Plan developed for the site.

2.3.8 Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations (OzArk 2013)

The assessment area for the Mount Owen Continued Operations (MOCO) Project disturbance area covered approximately 500 ha with portions of the assessment area encompassing part of the southern portion of the Project Area.

Australian Cultural Heritage Management Pty Limited (ACHM) were engaged by Mount Owen to undertake Aboriginal community consultation for the MOCO Project and to author the Aboriginal Cultural Heritage Assessment Report (ACHAR) to which OzArk 2014 contributed (ACHM 2013). The ACHM report appeared as Appendix 13a (Parts 1 and 2) of the MOCO Project *Environmental Impact Statement* (EIS) (Umwelt 2015). ACHM 2013 contains the cultural, aesthetic and historic values of the area, while OzArk 2014 contains an examination of the scientific values of the area.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

2.3.8.1 Cultural values

ACHM 2013: 114 summarises the cultural values of the area in which the Project Area is located. What follows is an edited excerpt of the MOCO Project Statement of Significance (ACHM 2013: Section 5:10):

It is noted that the numerous Aboriginal stakeholders who participated in this cultural values assessment process hold values which relate to the wider Hunter Valley region generally, and less directly to the MOCO area specifically. However, one of the Knowledge Holder groups holds very strong values over the MOCO area. Other than the one group expressing strong connection to the MOCO area, there was very little other information presented in the disclosed material or values workshops which relates specifically to the MOCO area.

A common theme in many Aboriginal cultural heritage assessments is the proprietary interest members of the relevant Aboriginal communities hold in regard to the wider cultural landscape including archaeological sites or places within any given area. The project is no exception in this regard. Within the context of the current assessment, there are strong on-going connections to places created and used by ancestors alongside demonstrably strong interests in the manner in which those places are managed or harmed as a result of this project. These sentiments are not unique, and must certainly be considered in the overall assessment of the significance of the places in question. The connection to these places is noted as often being relatively unspecific and generally do not appear to relate to any surviving traditional knowledge or customary cultural practices, apart from one of the Knowledge Holder groups who express a strong connection to on-going cultural knowledge and customary lore in this location.

The cultural values expressed by the participants in this assessment have been consistent in voicing an over-arching concern for the wider landscape and criticism of the negative impact of mining on that landscape. Consistent in the material disclosed is a sense of 'outrage' and grief at the treatment of Aboriginal people since First Settlement (dispossession and genocide are mentioned repeatedly) through to more contemporary experiences (i.e. the Stolen Generation).

ACHM 2013: Section 5:10 concludes:

There is little doubt that the wider cultural landscape surrounding (and encompassing) the MOCO area is of high cultural and historical significance to Wonnarua people. The historical associations with early settlement, conflict, dispossession and survival are important, and the nature of the area as a surviving cultural landscape of significance to numerous members of the Wonnarua people

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

makes this an area of regional and national significance. The regional archaeological record is also of high regional significance. Overall, the cultural significance of the wider region is considered to be high, and requires considerable additional research to fully understand.

2.3.8.2 Scientific values

The archaeological survey for the MOCO Project took place over two weeks from 26 November 2012 to 7 December 2012. The archaeological test excavation program for the MOCO Project took place over one week from 11 March 2013 to 15 March 2013. In 2014, the proposed disturbance area for the MOCO Project was expanded slightly necessitating a further one day of survey that took place on 29 April 2014. The results of these investigations are detailed in OzArk 2014 and contained in Appendix 13b of the MOCO Project EIS (Umwelt 2015).

Results

Large portions of the MOCO Project (223 ha) had been subject to previous Aboriginal Heritage Impact Permits (AHIPs) with extensive areas having already undergone archaeological assessment and salvage. Within the disturbance area, 18 sites had already been salvaged by manual excavation and more expansive additional areas have been subject to grader scrapes to salvage subsurface artefacts. Over the years, both from within the disturbance area and from adjacent landforms, over 11,000 artefacts had already been recovered as a result of these programs.

As a result of the scientific values assessment for the MOCO Project, 39 Aboriginal sites were recorded; consisting of:

- 11 artefact scatters (37-3-1189 to 37-3-1199);
- 25 isolated finds (37-3-1170 to 37-3-1188 and 37-3-1212 to 37-3-1216); and
- Three extensions to previously recorded sites (Extension to site 37-3-0649, Extension to site 37-3-0611 and Extension to site 37-3-0600).

In addition, the disturbance area contained three previously recorded sites, 37-3-0611, 37-3-0985 (low density artefact scatters) and 37-3-0527 (isolated artefact). Thus, 42 sites were known to exist within or close to the disturbance area.

At two locations within the disturbance area, test excavations were carried out under the NSW Office of the Environment and Heritage (OEH) Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW. At one location (37-3-1191), no artefacts were recorded during the test excavations, while at the second location (37-3-1192), 114 artefacts were recorded, with over 80% coming from one discrete concentration. As a result, it was determined that 37-3-1191 is a displaced site with no associated archaeological deposits, while

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

16

37-3-1192 is a low density artefact scatter along the banks of the 'eastern drainage' line with one known concentration of artefacts.

Three sites recorded during the survey, 37-3-1194, 37-3-1197 and 37-3-1198, remain partially extant in the Project Area.

Conclusion

Those archaeological sites in the disturbance area investigated revealed relatively sparse artefact concentrations in shallow and disturbed contexts. Archaeologically, all of the places located and/or identified conform to the Australian Small Tool Tradition¹, and most likely date to no more than the last 2,000 to 3,000 years.

The majority of the disturbance area had been subjected to varying degrees of land clearing and mining since first settlement, destroying the primary context of much of the physical cultural material present, and irretrievably altering the landscape itself.

Given the nature and extent of the archaeological sites identified, there was little additional knowledge which could be added to the archaeological record from any further investigation of this material. There is little probability for the presence of undisturbed and deeply stratified archaeological sites within the disturbance area.

In general, the archaeological sites in the MOCO disturbance area offered:

- Limited research potential in regard to regional and/or localised subsistence and resource procurement activities;
- Limited research potential to address questions on stone tool technologies in the region;
- Limited potential for radiometric dating methods to be applied to the sites;
- Limited research potential to address questions about the timing of the first occupation of this region of the Hunter Valley;
- Limited research potential to address questions about the timing of the Aboriginal settlement history of the Hunter Valley; and
- Limited potential to reveal further unique spatiotemporal patterning which would add to the archaeological record.

2.3.9 Mount Owen Modification 2 (OzArk 2017e)

OzArk was engaged by Umwelt, on behalf of Mt Owen Pty Limited to complete an Aboriginal Cultural Heritage Assessment Report for the Mount Owen Continued Operations Modification 2.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

17

¹ The Australian Small Tool Tradition (also sometimes referred to as 'Bondaian') is a term applied to the Holocene period Aboriginal tool kit; distinguishing it from the earlier Australian Core Tool and Scraper Tradition generally dated to the Pleistocene period.

18

The proposed modification disturbance area consisted of two portions: a smaller northern portion on both sides of, and south of, an existing diversion of Bettys Creek (Area A; approximately 9 ha); and a larger portion to the southeast of the current North Pit (Area B; approximately 37 ha). Both areas are to the east of the Project Area.

The fieldwork component of the assessment was undertaken by an OzArk archaeologist and representatives of Registered Aboriginal Parties (RAPs) and Wonnarua Knowledge Holder Groups on 31 August 2017.

No Aboriginal sites were recorded during the assessment. Further, no landform within the proposed disturbance area was seen as having potential to contain further, subsurface archaeological deposits due to the moderate level of disturbance across the proposed disturbance area and the generally thin soils.

MOCO IF-3 (37-3-1198) was the only valid previously-recorded site within the proposed disturbance area. This site was revisited during the site inspection, however, despite good areas of exposure, the artefact was unable to be located. One previously recorded site 37-3-0687 (MC-7) is located outside but close to the proposed disturbance area. This site may be harmed by future erosion stabilisation works along Main Creek and management recommendations regarding this site are made in OzArk 2017e.

2.3.10 Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping (OzArk 2017b, c & d)

In mid to late 2017 and early 2018, OzArk completed five archaeological due diligence assessments of over 100 soil test pit and groundwater monitoring bore locations surrounding Bowmans, Swamp and Yorks Creek for alluvium and Biophysical Strategic Agricultural Land verification and mapping assessments within the Project Area (OzArk 2017b, c & d). Over the five assessments, two new Aboriginal sites (Bowmans Creek 6 and Yorks Creek 19) were recorded and the extent of one previously recorded artefact scatter was updated (#37-3-0748; York Creek 5).

Bowmans Creek 6 was located on a lower slope landform adjacent to a tributary of Bowmans Creek. A total of 12 artefacts were identified, consisting largely of unmodified flakes, with one end scraper and core also recorded. Yorks Creek 19 consists of two flakes recorded on an upper terrace landform near the confluence of Bowmans and Yorks Creeks. In addition to this, one complete flake was recorded along a grazing track in close proximity to #37-3-0748. Given its location on the same upper terrace landform, the artefact was assessed as being an extension to site #37-3-0748. An additional seven artefacts were recorded eroding from the edge of the upper terrace. Site #37-3-0748 was also initially recorded as having potential archaeological deposit (PAD), although it was considered likely to be disturbed by cultivation.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

Recorded materials across the three sites were consistent with the predominate materials of the region being mudstone and silcrete, with a volcanic flake also recorded at Yorks Creek 19.

2.3.11 Mt Owen Complex Aboriginal cultural heritage due diligence site inspection results - EL6594, EL8184, ML1629 and ML1415 (EMM 2017)

EMM Consulting Pty Limited (EMM) was engaged to prepare an Aboriginal cultural heritage due diligence assessment for the proposed exploration program across the Project Area. As part of this exploration program, a total of 20 drill holes were proposed.

A field survey of proposed drill locations was undertaken by EMM on 23 May 2017 and no artefacts were identified within the areas of proposed exploration disturbance. In addition, the proposed locations are considered to have low archaeological potential. No additional measures have therefore been recommended in relation to heritage for the proposed drilling program.

2.4 PREVIOUS SALVAGE PROGRAMS WITHIN OR NEAR THE PROJECT AREA

2.4.1 Ravensworth East Archaeological Investigation (ERM 2002)

In 2002 ERM conducted archaeological excavations and salvage grader scrapes over areas of the Ravensworth East Mine under Permit SZ323. These investigates were located in the northeastern portion of the Project Area, in areas along the former course of Swamp Creek (ERM 2002) (Figure 2-1). Table 2-2 lists the six sites salvaged within the Project Area under the 2002 ERM program.

Table 2-2. Sites salvaged within the Project Area under Permit SZ323.

AHIMS#	Site name	
37-3-0399	Ravensworth 10	
37-3-0398	Ravensworth 09	
37-3-0400	Ravensworth 11	
37-3-0401	Ravensworth 12	
37-3-0402	Ravensworth 13	
37-3-0403	Ravensworth 14	

The combined geomorphological investigations undertaken by ERM highlighted the Swamp Creek valley as the key area likely to yield archaeological evidence of Aboriginal occupation within the ERM study area. However, these studies also showed that although buried land surfaces were apparent within the valley, evidence of Pleistocene Aboriginal occupation was unlikely to be recovered. Archaeological sampling of soil from these land surfaces failed to yield any archaeological material, confirming this view. In light of this, no further pursuit of Pleistocene archaeological deposits was undertaken within the scope of the excavation program.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

The initial archaeological component of ERM's investigation, which included grader scrapes spread over three different landscapes across the valley, at varying distances from water sources, yielded little archaeological evidence. Of the three grader scrapes, three artefacts were recovered over a total area of 560 m².

A low rise adjacent to the swampy meadow channel west of Swamp Creek in the vicinity of surface sites RE 12–14, revealed substantial archaeological material with several artefact concentrations located approximately 40 m to 60 m away from the channel. Test pit excavation yielded an artefact spread up-slope of the channel from approximately 10 m from the current channel edge, extending across the rise in all directions. A total of 87 artefacts were recovered from the 11 test pits. Over a combined excavated area of 11 m², this represents an artefact density of 7.9 artefacts/m². The largest artefact concentration (44 pieces or 50.57% of the total assemblage) was excavated from Test Pit 4 located on the peak of the rise. Without the Test Pit 4 artefact concentration, artefact density would have been substantially lower, at 4.3 artefacts/m², as the majority of test pits contained five artefacts or less. 82.75% of the assemblage was mudstone and 17.25% was silcrete.

Open excavation of the site complex RE 12–14 recovered a concentrated artefact scatter across the peak of the rise within the very shallow A-Horizon soil. Open excavation on this rise was proposed by Margrit Koettig (then at the NSW Department of Environment and Climate Change) to define the apparent spread of artefacts from TP4, and to further establish the nature of this subsurface deposit, specifically to investigate whether it contained hearths and identifiable activity areas. The open area excavation of 86 m² (including TP4) was conducted in July–August 2001 by ERM. 1,168 artefacts were excavated in the open excavation and the investigations revealed a continuation of artefacts over the low rise, rather than what was originally recorded as three individual surface sites. Within this scatter, several distinct areas of artefact concentration were recorded, all with quantities of associated charcoal and burnt earth. The assemblage comprised backed artefacts and associated manufacturing debitage, mostly of mudstone.

Seven raw materials were represented in the open excavation. Mudstone was the dominant raw material observed, accounting for almost 80% of the total artefact numbers. This mirrored the initial trend set in testing phase. Silcrete was the next most common material and comprised nearly 20% of the assemblage. The remainder of the artefacts (less than 2%) was produced from six other raw material types.

Five artefact types were identified in the assemblage. The majority of artefacts were whole flakes accounting for more than 50% of the assemblage with broken flakes (almost 30%) and flaked pieces (approximately 15%) making up much of the remaining assemblage numbers. All modified artefacts, consisting of cores and retouched flakes, made up just under 2% of the assemblage.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

20

2.4.2 Glendell Project Area (Umwelt 2013)

Salvage of the Glendell project area was undertaken under National Parks and Wildlife Services (NPWS) section 90 Consent #2267 and formed Part 4 of the salvage program for the Bettys Creek valley (Figure 2-1). This archaeological salvage within the Glendell project area was conducted by Umwelt and the Aboriginal community between November 2005 and February 2006. Table 2-3 lists those sites within the Project Area that were salvaged under Consent #2267.

Table 2-3. Sites within the Project Area salvaged under Consent #2267.

AHIMS	site name	Sal vage methodology
37-3-0599	Bettys Creek 9	Surface Collection with Subsurface Investigation (manual excavation)
37-3-0601	Bettys Creek 11	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0602	Bettys Creek 12	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0604	Bettys Creek 14	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0605	Bettys Creek 15	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0606	Bettys Creek 16	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0607	Bettys Creek 17	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0608	Bettys Creek 18	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0609	Bettys Creek 19	Surface Collection
37-3-0610	Bettys Creek 20	Surface Collection
37-3-0618	Swamp Creek 1	Surface Collection
37-3-0619	Swamp Creek 2	Surface Collection
37-3-0620	Swamp Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0621	Swamp Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0622	Swamp Creek 5	Surface Collection
37-3-0623	Swamp Creek 6	Surface Collection
37-3-0624	Swamp Creek 7	Surface Collection
37-3-0026	Glennies Creek Site B / Bettys Creek - B	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0625	Swamp Creek 8	Surface Collection
37-3-0027	Glennies Creek Site C / Bettys Creek - C	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0626	Swamp Creek 12	Surface Collection
37-3-0592	Bettys Creek 1	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0627	Swamp Creek 13	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0593	Bettys Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0773	Swamp Ck 10	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0594	Bettys Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0595	Bettys Creek 5	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0596	Bettys Creek 6	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0597	Bettys Creek 7	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0598	Bettys Creek 8	Surface Collection with Subsurface Investigation (grader scrapes)

A total of 2,713 artefacts were recovered from the Glendell project area salvage including 824 (30.6%) from the surface collection, 274 (10.1%) from Excavation 1 (Bettys Creek 10), 19

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

21

(0.7%) from Excavation 2 (Bettys Creek 9), 1,414 (52.1%) from Excavation 3 (Bettys Creek 2) and 177 (6.5%) from the grader scrapes. A total of 2,604 (96%) of the artefacts were recovered from the Bettys Creek catchment, 52 (1.9%) from the Bowmans Creek catchment and 57 (2.1%) from the Swamp Creek catchment.

Observations made from the surface collection assemblage are as follows:

- The highest number of artefacts were collected from Bettys Creek 14 (26.7% of the surface collection assemblage), followed by Bettys Creek 10 (19.5% of the assemblage);
- 60.6% of the artefacts were collected from lower slopes and floodplains associated with creek lines (56.7% from Bettys Creek; 3.3% from Swamp Creek and 0.7% from Bowmans Creek);
- Sites on low but elevated spurs in tributary confluences comprised 22.2% of the assemblage; ridge crests (7.5%); sites on lower slopes on tributary channels more than 150 m from the main creek channel (7.5%); mid slope sites (1.3%) and upper slopes (0.6%);
- The dominant artefact type was broken flakes (45%); followed by flakes (26.7%); flaked pieces (10.9%); retouched flakes (10%), cores (3.7%), heat shatter (3.4%) and grindstones (0.4%);
- A total of 31 cores were recovered from the surface collection. Of these, 21 were recovered from the Bettys Creek sites (17 from areas with tributary confluences with Bettys Creek); and
- Mudstone was dominant within the assemblage making up 58.5% of the artefacts, followed by silcrete (31.9%) with the remaining raw materials making up 9.6% of the total assemblage.

Excavation was targeted at Bettys Creek 2, Bettys Creek 9 and Bettys Creek 10 indicated the following:

- Bettys Creek 10 and Bettys Creek 2 retained a level of spatial integrity reflected by knapping events and raw material distribution patterns;
- Bettys Creek 9 contained artefacts in a secondary context;
- · All three locations contained backed flakes;
- A ground oven identified at Bettys Creek 2 had an absolute date of 2188+/-39 BP;
- It was possible to obtain one radiocarbon date of 3077±40 BP (calibrated-Wk-20912) from Square K Spit 3 of Excavation 3 within the Mount Owen Extension Area. The date was relative in nature as it belonged to a large piece of burnt wood that was associated with artefacts both above and below it. Thus the artefacts above it must be dated to later than 3077±40 BP and those below it to earlier;
- Broken flakes (45.7%) dominated the artefact assemblage, followed by flakes (38.7%);

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

22

23

Page | 149

- Bettys Creek 10 and Bettys Creek 2 were dominated by mudstone while Bettys Creek
 9 was dominated by silcrete. Overall, mudstone was dominate (55.7%) over silcrete (32.3%);
- A small knapping event was evident at Bettys Creek 10, with greater amounts of knapping noted at Bettys Creek 2; and
- Core to flake ratios for Bettys Creek 10 were 1:28.7 and for Bettys Creek 2 were 1:27.4 suggesting knapping on site.

As a result of the Umwelt investigations outlined above, today's archaeological landscape, particularly along Bettys Creek, but also along Swamp Creek and Bowmans Creek in the vicinity of the Project Area, has been extensively studied.

2.4.3 Archaeological Salvage. Liddell Coal Operations Development Modification 5 (OzArk 2015)

OzArk was engaged by Liddell Coal Operations (LCO) to undertake the salvage of 15 Aboriginal archaeological sites for Development Modification 5 of DA 305-11-01 and was approved under Aboriginal Heritage Impact Permit (AHIP) #C0000623 (Figure 2-1). The salvage of the sites was undertaken on 28 January 2015 and 24 to 25 February 2015.

Artefacts were retrieved from seven of the 15 sites. A total of 46 artefacts were salvaged across all sites. The majority of the 46 artefacts recovered from the salvage were flakes (73.9%). Other artefact types included cores, flaked pieces, debitage, blades and a core fragment. Almost all artefacts were made from mudstone (56.5%) and silcrete (39.1%). Quartz and basalt artefacts were also present. Most artefacts were at a tertiary (65.2%) stage of reduction, with the rest secondary (34.8%). There were no artefacts at the primary stage of reduction.

The artefacts that were salvaged closely correspond to the regional context. The low proportion of formal tools (just one in 46) and the high percentage of flakes and debitage (76%) in the salvaged assemblage are typical of the region, but this is probably true in most sites across Australia. Mudstone has been recorded to be the most common raw material in the region, which was the case for the salvaged artefacts, and the other materials salvaged are also common.

Details of the two sites in this program that are within the Project Area are listed in Table 2-4.

Table 2-4. Details of sites within the Project Area salvaged under AHIP C0000623.

AHIMS#	Site name	Artefacts salvaged	Notes	
37-3-0419	Rav 24 East	12	This site was salvaged by surface collection and grader-scrape salvage. The ground surface visibility (GSV) of 15% is based on pre-grader-scrape visibility. The grader-scrapes added an additional 20% GSV.	
37-3-1152	LID 36	1	Rakes were used to remove wood chips from the ground and improve GSV.	

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

P18-0089

2.4.4 Mount Owen Continued Operations Project Salvage Program (OzArk 2017)

In early 2017 the MOCO salvage program took place under the authority of the 2016 Mount Owen Complex *Aboriginal Cultural Heritage Management Plan* (ACHMP) (XMO SD PLN 0060). This program was completed in the approved disturbance areas associated with the MOCO Project (SSD-5850).

This program included the collection of surface artefacts at 26 sites resulting in 163 artefacts being recorded (Figure 2-1). Included in the tally of 26 sites, were two sites where limited archaeological excavation took place resulting in a further 187 artefacts being recorded. An additional area on the east bank of Bowmans Creek proposed for impact by the new Hebden Road bridge was also subject to archaeological investigation by manual excavation but the area proved to be highly disturbed and no artefacts were recorded.

In addition, there were three sites that were unable to be salvaged, one as it was on land not owned by Mount Owen and two due to the fact that the area of the sites had previously been unintentionally impacted by mining activities². These unintentional impacts were self-reported to the OEH who issued an official caution to Mount Owen on 17 March 2016. Sites salvaged within the Project Area under SSD-5850 are listed in **Table 2-5**.

Table 2-5. Sites salvaged within the Project Area under SSD-5850.

Site ID	Site Name	Site Type	Number of Artefacts Salvaged	Salvage methodology
37-3-0611	Extension to Bettys Creek 21	Artefact Scatter	4	Surface collection only
37-3-1174	MOCO IF-5	Isolated Find	1	Surface collection only
37-3-1195	MOCO OS-7	Artefact Scatter	0	Surface collection only
37-3-1199	MOCO OS-11	Artefact Scatter	7	Surface collection only
37-3-1211	MOCO IF-18	Isolated Find	0	Surface collection only
	Bowmans Creek East Bank (Hebden Road)	PAD	0	Manual excavation.

Of all the sites investigated in the 2017 salvage program, 37-3-1192 recorded the highest artefact density with 71 surface artefacts (43.5% of all surface artefacts recorded during the salvage program) and 186 artefacts recorded in the excavation component of the program (constituting almost all of the artefacts recorded in the excavation component of the program). 37-3-1192 was located on an unnamed watercourse (termed the 'eastern drainage') approximately 2.5 km east of the Project Area. 37-3-1192 was located in area heavily affected by erosion and the investigation showed that while one concentration of artefacts remained *in situ*, the majority of the site had been displaced by the erosion.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

24

² In addition, MOCO OS-3 was unintentionally partially impacted by mining activities and the remainder of this site was salvaged during the salvage program.

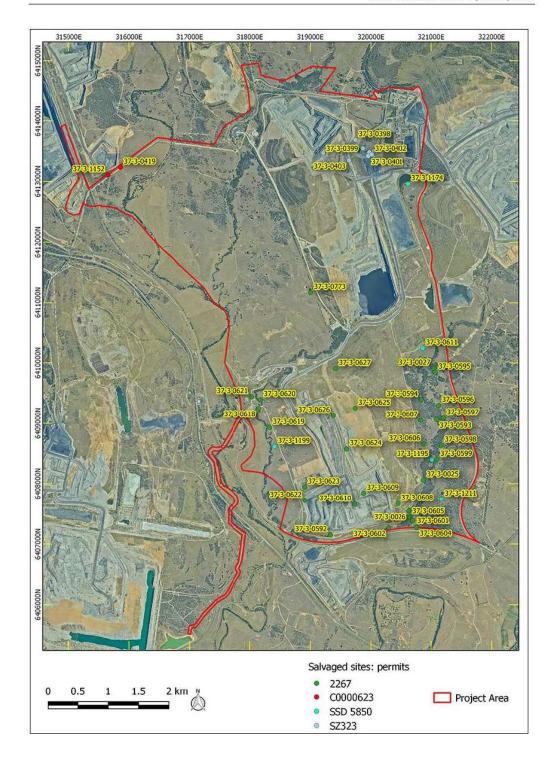
25

Other sites that recorded more than 10 artefacts during the salvage program were 37-3-1191, 37-3-1197 and 37-3-1198. 37-3-1197 and 37-3-1198 remain partially extant within the Project Area. All other sites recorded very low artefact numbers supporting the conclusion reached in OzArk 2014 that the remaining archaeological values at MOC consist of low density, often displaced, artefact scatters.

The recording of these sites affords with the general picture emerging that sites located away from permanent water are likely to have a low artefact density and low site complexity.

Figure 2-1. Location of sites previously salvaged in the Project Area.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project



2.5 ARCHAEOLOGICAL CONTEXT: CONCLUSION

The extensive and long running archaeological investigations within and in close proximity to the Project Area indicate that:

- Stone artefact sites (isolated finds and artefact scatters) are the most commonly recorded site types in the area and that other site types, such as culturally modified trees, are very rare or non-existent;
- At the current state of knowledge, only stone artefact sites will be impacted by the Project. Other site types such as grinding grooves or the Bowmans Creek engraving site (Bowmans Ck 16, 37-3-0772) are located outside of the Project Area. In addition, the Yorks Creek VCA is located outside of the Project Area;
- Artefacts tend to associated only with the A-Horizon soil layers indicating a date in the Holocene period (i.e. 10,000 BP to the present);
- The predominant raw materials used for stone artefact manufacture are locally sourced mudstone and silcrete;
- Excavations generally reveal a low artefact density but some spatial patterning has been
 observed: principally concentrations of artefacts interpreted as 'knapping areas'. Other
 archaeological features such as hearths are rare;
- Sites tend to be associated with waterways and a discernible pattern has been observed
 whereby larger sites are associated with larger waterways offering permanent water
 supplies; and
- While all waterways have been equally studied, Yorks and Bettys Creeks appear to
 have attracted past Aboriginal occupation more often than Swamp Creek. Bowmans
 Creek would have been a major focus of past occupation but much of the evidence of
 this occupation has been removed by major channel migrations or intensive historical
 land use disturbances such as cultivation.

3 PREDICTIVE MODEL

3.1 BACKGROUND

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and other resources and rock shelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport: both over short and long time scales or (b) the historical impacts associated with the introduction of European farming practices including: grazing and cropping; land degradation associated with exotic pests such as goats and rabbits and the installation of farm related infrastructure including water-storage, utilities, roads, fences, stockyards and residential quarters. Scarred trees may survive for up to several hundred years but rarely beyond.

3.2 SETTLEMENT STRATEGIES

The large number of archaeological studies undertaken within, and in the vicinity of the Project Area provides information to obtain a sound understanding of the nature and distribution of archaeological sites within the area. Although there is some conjecture about the relationship between stream order, site numbers and densities, the general pattern is that the majority of sites are present within 30 m of watercourses (Dean-Jones 1992: 26–27; AMBS 1997: 29). Although sites are present in locations at a greater distance from water, these sites are limited in terms of both number and size, constituting a lower density scatter than is found along the creek lines (Dean-Jones 1992: 24; ERM 1999: 22–23). The majority of sites are small, with larger sites typically found in association with permanent watercourses. Reduced visibility has been proffered as an explanation for the higher number of sites and artefacts present along the more heavily eroded and less vegetated minor watercourses as compared to major creeks (Umwelt 2004: 7.7; ERM 1999: 84).

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

3.3 PAST LAND USE

Crucial for the preservation of archaeological deposits is the history of past land use in a particular area. In particular, the European history of the Hunter Valley lowlands, where the Project Area is located, is a stark example of historic land mismanagement leading to wide-spread erosion as the dispersible soils were exposed to rain. On Figure 1-4, for example, the wide-spread sheet wash erosion is noticeable; particularly on the slopes that once existed in the south of the Project Area. While this portion of the Project Area contained more-sloping landforms compared to other areas, it remains indicative of the soil loss that has occurred across the Project Area.

Bowmans, Swamp, Yorks and Bettys Creek have deeply incised channels that are most likely the result of European land-use practices (especially vegetation clearance and overgrazing) in the area and previous studies of the soil profiles exposed in the banks of Swamp, Yorks and Bettys Creeks indicate that these creeks formerly had shallow channels with a chain of ponds morphology (Umwelt 2004).

The drainage depressions and second and third order drainage lines within the Project Area have all been subject to varying degrees of gully erosion. In some areas, erosion has formed gullies up to two metres deep. These destabilised areas have generally also been affected by sheet erosion. Consequently, there has been extensive downslope and downstream movement of topsoil (A-Horizon) and any archaeological deposits it may have contained. With such widespread soil movement it is also important to remember that accumulations of artefacts that may be termed a 'site' today may have, in fact, been washed into that location during the historic period and bear no relationship to past Aboriginal occupation patterns in the area.

Cultivation has impacted the floodplains and terraces of the creek lines and much of the lower slope landforms within the Project Area (see Figure 1-4). Cultivation acts to redistribute artefacts both horizontally and vertically within the soil profile and ultimately destroys the integrity of artefact assemblages within the top 50 centimetres of the soil profile.

More recently, approved coal mining activities, has been the major source of impact within the landscape. Coal mining activities have resulted in the loss of a large portion of Swamp Creek, Bettys Creek and surrounding landforms.

3.4 PREVIOUSLY RECORDED SITES

Due to the history of archaeological investigation in the vicinity of the Project Area, there have been a number of sites recorded either within the Project Area, or in close proximity. 62 sites remain extant within the Project Area (Figure 3-1).

As discussed in Section 2 and below in Section 3.4, the results of previous investigations would suggest that:

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

29

- The most common site type will be stone artefact sites; either low density artefact scatters or isolated finds;
- Culturally modified trees will be extremely rare due to the level of historical clearing and the fact that they are a regionally rare site type;
- Grinding grooves will be unlikely to occur in the Project Area as the major creek lines
 have been subject to previous assessment and it would be expected that these site
 types would have already been recorded; and
- Other site types such as burials or stone arrangements will be very rare due to the longterm agricultural disturbances that have occurred in the Project Area.

3.5 LANDFORM MODELLING

In the portions of the Project Area that are outside of approved mining areas, the topography is generally flat ranging between around 60 m above sea level to small rises that are around 140 m above sea level. As such, while there are minor variations in the topography of the Project Area, these are not pronounced enough to be mapped in a way that is meaningful for the archaeological understanding of the Project Area.

Formerly, however, in areas that have been largely mined, the topography of the Project Area was comprised of a number of low, generally north—south trending ridges (elevation from 10 to 140 m) with east—west trending spurs and long slopes with a low to moderate gradient. Numerous drainage depressions flowed between each spur, forming first, second and third order ephemeral tributaries of Bowmans, Swamp, Yorks and Bettys Creeks (Figure 1-3).

Swamp, Yorks and Bettys Creeks are all tributaries of Bowmans Creek, which would have been the most reliable water source within the Project Area. The main channels of Swamp, Yorks and Bettys Creek and any associated swamps and billabongs would have provided semi-permanent water sources (Umwelt 2004). The tributary systems of these lower order streams (e.g. first and second order streams) would have only provided an ephemeral water source.

There are many minor creek confluences within the Project Area, however, the only major creek confluence in the Project Area is the confluence of Yorks and Bowmans Creek with the major confluences of both Swamp and Bettys Creek with Bowmans Creek in very close proximity, but to the south of the Project Area. All creeks within the Project Area have some floodplain development, however, only Bowmans Creek has a well-defined terrace sequence. Up to three terrace surfaces are associated with Bowmans Creek within the Project Area.

As such there are a variety of topographic features within the Project Area that would have encouraged past Aboriginal occupation; namely:

 The ridges and spurs would have provided good views along the creek valleys and would have been used as vantage points. However, as the Project Area is now largely

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

30

- devoid of crests, this landform feature will not influence the distribution or occurrence of archaeological sites in the Project Area.
- The landforms adjacent to Bowmans, Swamp, Yorks and Bettys Creeks have the
 capability of providing elevated landforms adjacent to water: landforms recognised in the
 area as having archaeological sensitivity. There is increased archaeological sensitivity at
 the confluence of Bowmans and Yorks Creeks.

Valid sites within GCOP Area Project Area Valid Partially destroyed

Figure 3-1: Location of valid AHIMS sites within the Project Area.

3.6 PREDICTIVE MODEL FOR THE PROJECT AREA

- <u>Isolated finds</u> may be indicative of: random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or sub-surface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
 - As isolated finds can occur anywhere, particularly within disturbed contexts, it is
 predicted that this site type could be recorded within the Project Area. It is
 noted in Section 2.3 that isolated finds are commonly recorded in the vicinity of
 the Project Area.
- Open artefact scatters are here defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short or long term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools, but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

This site type is likely to be located within landforms of a gentle gradient associated with the main channels of Bowmans, Swamp, Yorks and Bettys Creeks as these are likely to have been attractive camping areas. Smaller sites containing low density and low complexity assemblages are predicted near semi-permanent watercourses (Swamp, Yorks and Bettys Creeks), while the more permanent nature of Bowmans Creek suggests that this creek may have been the focus of more intensive (longer duration) camping which would have produced larger sites with higher density and more complex assemblages. Moderate to steeply sloping landforms are unlikely to have been utilised with lower gradient ridges and spurs being more attractive for camping. The lack of water in these elevated landforms would suggest, however, that camping would have been short-term and that sites would be smaller and contain low complexity assemblages. The high degree of impact from past agricultural practices along the floodplains i.e. cultivation, in the Project Area will probably mean that surface scatters and archaeological deposits are likely to have

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

become displaced. It would be expected that most sites located would date to the late Holocene (i.e. less than 4,000 years old), the age attributed to the A-Horizon artefact bearing deposits. Although Pleistocene sites contained within B-Horizon sediments may also occur, there have been only one or two instances of Pleistocene deposits being identified in the district and this must be considered a rare eventuality. It is noted that the Project Area already has a number of artefact scatters recorded by investigations over the years. This suggests that many of the larger sites have probably been previously recorded and that the Project Area will probably not record many more large sites.

- Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed as a consequence of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting or bark removal. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any particular example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently the distinction between European and Aboriginal scarred trees may not be clear.
 - Due to the near-total clearance of trees from within the Project Area (see Figure 1-4), this site type is not predicted to occur. It is also noted that this site type is very rare at a regional level due to historical tree clearance.
- Quarry sites and stone procurement sites typically consist of exposures of stone
 material where evidence for human collection, extraction and/or preliminary
 processing has survived. Typically these involve the extraction of siliceous or fine
 grained igneous and meta-sedimentary rock types for the manufacture of artefacts.
 The presence of quarry/extraction sites is dependent on the availability of suitable
 rock formations.
 - This site type could be recorded within the Project Area should suitable rock outcroppings be available. One quarry site, Bowmans Creek 5, is located within the Project Area to the north of Swamp Creek (see Section 2.3.7).
- <u>Burials</u> are generally found in soft sediments such as aeolian sand, alluvial silts and
 rock shelter deposits. In valley floor and plains contexts, burials may occur in locally
 elevated topographies rather than poorly drained sedimentary contexts. Burials are
 also known to have occurred on rocky hilltops in some limited areas. Burials are
 generally only visible where there has been some disturbance of sub-surface
 sediments or where some erosional process has exposed them.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

Although it is possible that this site type could be found within the Project Area in the alluvial landforms, it is considered a rare site type especially given the disturbance that has occurred within the Project Area.

An examination of the landforms within the Project Area (Section 3.5) indicate that the northern portions of the Project Area is in a degrading environment where soils have been moved from the slopes towards the creek systems where aggrading landforms are evident. This would have the effect of displacing or impacting archaeological deposits had they existed in the north of the Project Area. Landforms adjacent to Bowmans Creek, in particular, are in an aggrading environment. This may mean that archaeological deposits may have become buried, or mixed with artefacts that have washed down from adjoining slopes.

3.7 RESEARCH QUESTIONS

A number of research questions can meaningfully be applied to the investigation of the Project Area. These research questions include:

- What resources were available to the Aboriginal people using the Project Area (food, stone and water)?
- How do the artefact assemblages from the sites along the slopes and ridge crests in the Project Area differ from sites that are located along Bowmans, Swamp, Bettys and Yorks Creeks?
- What tasks were Aboriginal people undertaking at the sites?
- Did the Aboriginal people use the Project Area at any particular time of the year?
- Are there hearths in the area?
- If there are hearths, do they contain remains (animal/plant) that may indicate what people were cooking/eating?
- · Are there burials in the area?
- Is there evidence to suggest that Aboriginal people were using the area earlier than the mid to late Holocene?
- Can dates be obtained for the Aboriginal use of the area?
- What resources were transported to the area and where?

The survey methodology set out in **Section 4** will be framed to help answer these questions; should sites of sufficient significance be encountered within the Project Area. However, based on the results of previous assessments and past disturbances, it not expected that the Project Area will contain sites of sufficient significance to help answer those research questions that require a robust data set.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

4 SURVEY METHODOLOGY

4.1 ASSESSMENT APPROACH

The Aboriginal cultural heritage assessment of the Project Area will follow the *Code of Practice* for the Investigation of Aboriginal Objects in New South Wales (Code of Practice; DECCW 2010). The field inspection will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011).

4.2 BACKGROUND

The following archaeological methodology is based on the understanding that portions of the Project Area have been previously surveyed and, in some areas, salvaged as a result of past archaeological assessments and works related to mining approvals. There is, therefore, significant knowledge for much of the Project Area regarding the likelihood of further unidentified Aboriginal objects or sites. In addition, data from previous reports, site cards and permits can be used to interpret the landscape if ground surface visibility is poor to ensure that the archaeological characteristics of the Project Area are understood.

In addition, sizeable portions of the Project Area have been heavily modified by approved mining activities.

All survey will be undertaken with the assistance of RAP/Wonnarua Knowledge Holder representatives. Apart from their valuable experience in recognising and recording archaeological sites, the RAP/ Wonnarua Knowledge Holder representatives will be able to acquaint themselves with the Project Area in order to inform their cultural value assessment of the Project Area. Any cultural values relating to the Project Area will be captured by the OzArk archaeologist (if such information is provided during the survey) and included in the ACHAR to be prepared as part of the EIS for the Project.

4.2.1 Survey methodology

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004).

It should be noted that the aim of any archaeological survey is not to locate each and every artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within a Project Area are known. Therefore the aims of the survey will be to:

 Reinspect the location of all 62 previously recorded sites that remain within the landscape within the Project Area so that their current condition and scientific heritage values can be assessed;

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

35

- Conduct pedestrian transects across targeted landforms in the Project Area so that their archaeological potential can be determined;
- Evaluate whether the predictive model set out in Section 3.6 is valid;
- Determine if the research questions set out in Section 3.7 can be answered;
- Determine if any portions of the Project Area require test excavation in order to understand the archaeological potential at a particular location;
- Undertake sufficient assessment in order to satisfy Sections 2.2, 2.4 (as it pertains to scientific values), 2.5, 2.6, and 2.7 in the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH 2011);
- Collecting sufficient data so that the results can be presented in an ACHAR as set out in Section 3 in the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH 2011); and
- Undertaking survey and record keeping to satisfy Requirements 1–13 of the Code of Practice.

It is envisioned that fieldwork for the survey would be completed in three weeks with two teams of surveyors consisting of two archaeologists and up to four RAP/Wonnarua Knowledge Holder representatives working concurrently for two weeks, and one team in the third week.

4.2.2 Survey zones

For the purposes of the archaeological survey, the Project Area has been divided into three zones of survey where differing levels of assessment will take place. These zones are set out in Sections 4.2.2.1 to 4.2.2.3.

Figure 4-1 shows a map displaying the various areas of survey priority ranging from areas so heavily modified that they do not require survey, areas of limited survey priority, and areas that warrant full survey. The proposed survey methodology in each area is as follows.

4.2.2.1 Area of high survey priority: 1,000 ha

This assessment area includes approximately 1,000 ha that is classified as 'high survey priority' on Figure 4-1. This constitutes approximately 34 per cent of the Project Area. In this area the major Project components such as the Barrett Pit continuation, the Hebden Road realignment, a potential new MIA, the heavy vehicle access road to the new MIA or Liddell MIA, and the diversion of Yorks Creek will be located (Section 1.1). Although a significant part of the high survey priority area has been subject to survey (over 10 years ago), much of this area is outside of land that has been systematically surveyed in the recent past.

This area includes approximately 2.5 km of Bowmans Creek, 3.5 km of Yorks Creek and 3.9 km of Swamp Creek; all drainage systems with known Aboriginal cultural heritage values. Although culturally modified trees will not be recorded (Section 3.6), this survey area includes the

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

36

riparian corridors of Bowmans, Yorks and Swamp Creek areas as disturbance is predicted to be lower in these areas.

Field survey will, wherever possible, be conducted in transects of 100 m intervals (with up to six surveyors spaced 10 m apart). If field conditions do not allow straight transects some areas may be investigated more opportunistically where exposures and/or vegetation allow. Areas of higher archaeological potential such as the banks of waterways such as Bowmans, Yorks, Swamp and Bettys Creeks will be fully inspected by pedestrian transects along both banks. This will ensure that this survey zone is systematically assessed.

If areas have significant levels of ground cover and pedestrian survey is considered by the archaeologist and RAP/Wonnarua Knowledge Holder representatives to yield no results, then assessment will be made, based in part on knowledge gained from past archaeological research in the area, of the potential of the area to have Aboriginal artefacts present.

4.2.2.2 Area of low survey priority: 208 ha

This area contains generally flat landforms surrounding Bettys Creek (Figure 4-1). This area constitutes approximately 7 per cent of the Project Area.

This area has been extensively surveyed in the recent past, including more recently for the MOCO Project. As this area has been extensively surveyed, the archaeological characteristics of this area are largely known. In addition, the Project does not propose to disturb extensive areas within this portion of the Project Area. The only planned disturbance in this area is in the northern portion of the low survey priority area and is to enable the final landform to drain into Bettys Creek (Figure 1-2).

This area will not be inspected by formal transects but will focus on areas of exposure where archaeological material may be visible. Further definition of the Project Design may also narrow the survey area within this area.

Survey in this area will use the experience of the archaeologist and RAP/Wonnarua Knowledge Holder representatives to target areas that they feel will yield the best information. Survey will also be concentrated in the area where the final landform drainage is planned.

4.2.2.3 Area of modified landforms: 1,607 ha

This area has been highly modified by approved mining activities and includes open cut pits, waste emplacements, dams, buildings and other surface infrastructure (Figure 4-1). This constitutes approximately 55 per cent of the Project Area.

Due to the highly modified nature of these landforms, they are extremely unlikely to contain archaeological sites and no survey will take place in this area.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

37

4.2.2.4 Approved disturbance areas: 110 ha

Small portions of land within the Project Area (approximately 110 ha or 4 per cent of the Project Area) are not included in any of the three zones described above as they are in areas where approval to disturb has been consented but the disturbance has not yet occurred (**Figure 4-1**). These approvals are either part of the Glendell Mine consent (DA 80/952) or the MOCO Project consent (SSD-5850). As these areas have been previously assessed and approval to disturb has already been consented, these areas will not be subject to survey.

4.2.3 Test excavation

It is possible that the survey may identify landforms where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, the test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

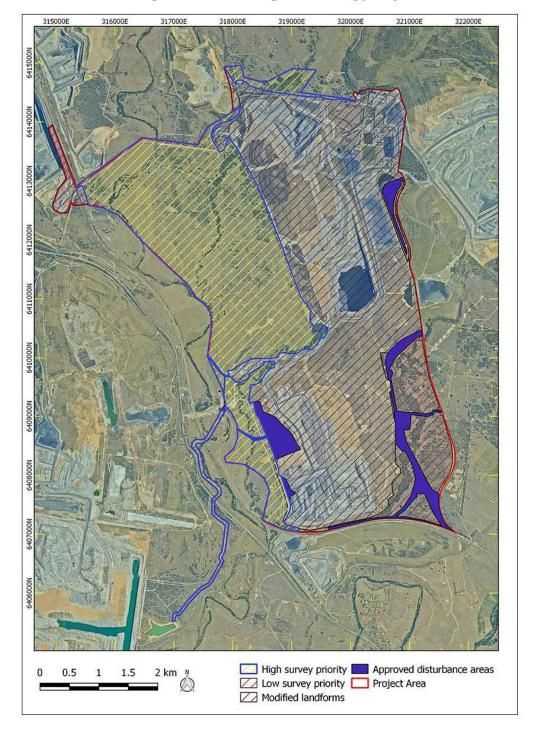


Figure 4-1: Aerial showing areas of survey priority.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

39

REFERENCES

AMBS 1997	Australian Museum Business Services. 1997. Archaeological test Excavations of Aboriginal Sites at Bettys Creek Mt Owen Mine, Hunter Valley. NSW. Vol. 1–4. Report for Mt Owen Mine, BHP Coal Australia.
Burke & Smith 2004	Burke, H. and Smith, C. 2004. <i>The Archaeologist's Field Handbook</i> , Blackwell, Oxford.
Brayshaw 1982	Brayshaw, H. 1982. Additional Archaeological Information Relating to Glendell Open Cut Coal Mine at Ravensworth. Hunter Valley. Report for Croft & Associates Pty. Limited.
Dean-Jones 1992	Dean-Jones, P (Resource Planning Pty Ltd). 1992. Archaeological Report Subsurface Analysis Swamp Creek, Mount Owen Mine Site. Report to Hunter Valley Coal Corporation Pty.
DECCW 2010	DECCW. 2010. Code of Practice for the Investigation of Aboriginal Objects in New South Wales. Department of Environment, Climate Change and Water, Sydney.
Dyall 1982	Len Dyall. 1982. A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project. Report for ELCOMM.
EMM 2017	EMM Consulting Pty Limited. 2017. Mt Owen Complex Aboriginal cultural heritage due diligence site inspection results (J17105) EL6594. EL8184, ML1629 and ML1415.
EMM 2017 ERM 1999	heritage due diligence site inspection results (J17105) EL6594. EL8184,
	heritage due diligence site inspection results (J17105) EL6594. EL8184, ML1629 and ML1415. ERM. 1999. Ravensworth East Mine Environmental Impact Statement.
ERM 1999	heritage due diligence site inspection results (J17105) EL6594. EL8184, ML1629 and ML1415. ERM. 1999. Ravensworth East Mine Environmental Impact Statement. Report for Peabody Resources Limited. ERM Pty Limited. 2002. Ravensworth East Archaeological Investigation.
ERM 1999 ERM 2002	heritage due diligence site inspection results (J17105) EL6594. EL8184, ML1629 and ML1415. ERM. 1999. Ravensworth East Mine Environmental Impact Statement. Report for Peabody Resources Limited. ERM Pty Limited. 2002. Ravensworth East Archaeological Investigation. Report to Coal and Allied Pty Limited. Hagland, L. 1982. Archaeological Survey of Pikes Gully Colliery Area,
ERM 1999 ERM 2002 Haglund 1982	heritage due diligence site inspection results (J17105) EL6594. EL8184, ML1629 and ML1415. ERM. 1999. Ravensworth East Mine Environmental Impact Statement. Report for Peabody Resources Limited. ERM Pty Limited. 2002. Ravensworth East Archaeological Investigation. Report to Coal and Allied Pty Limited. Hagland, L. 1982. Archaeological Survey of Pikes Gully Colliery Area, Liddell, N.S.W. Report for Longworth and McKenzie Pty. Limited. Mitchell, P. 2002. Aspects of the geomorphology of the Giendell Coal

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

	Operations. Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd.
OzArk 2015	OzArk Environmental & Heritage Management Pty Limited 2015. Archaeological Salvage. Liddell Coal Operations Development Modification 5. Report for Liddell Coal Operations.
OzArk 2017	OzArk Environmental & Heritage Management Pty Limited. 2017. Aboriginal Archaeological Salvage Report. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd.
OzArk 2017b	OzArk Environmental and Heritage Management. 2017. Aboriginal Due Diligence Archaeological Assessment: Mt Owen Complex: Glendell North Project. Bowmans, Swamp and Yorks Creeks: alluvium and biophysical strategic agricultural land verification and mapping. Report for Mt Owen Pty Ltd.
OzArk 2017c	OzArk Environmental and Heritage Management. 2017. Aboriginal Due Diligence Archaeological Assessment. Bowmans and Yorks Creeks Additional Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping. Report for Mt Owen Pty Ltd
OzArk 2017d	OzArk Environmental and Heritage Management. 2017. Aboriginal Desktop Due Diligence Archaeological Assessment: Bowmans and Yorks Creeks Additional Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping. Report for Mt Owen Pty Ltd.
OzArk 2017e	OzArk Environmental and Heritage Management. 2017. Aboriginal Cultural Heritage Assessment Report. Mount Owen Continued Operations Modification 2. Report for Umwelt (Australia) Pty Ltd on behalf of Mt Owen Pty Limited.
Resource Planning 1991	Resource Planning Pty Limited. 1991. Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales. Report for Hunter Valley Coal Corporation Pty Limited.
Resource Planning 1993	Resource Planning Pty Limited. 1993. Proposed Mt Owen Extension. Archaeological survey of Bettys Creek. Report for Hunter Valley Coal Corporation Pty Limited.
Umwelt 2003	Umwelt (Australia) Pty Limited. 2003. Survey and Assessment of Impact on Aboriginal Cultural Heritage and Archaeological Values, Main Creek, Hunter Valley. NSW. Prepared for Glennies Creek Coal Management.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

Umwelt 2004	Umwelt (Australia) Pty Limited. 2004. Aboriginal Archaeological Assessment - Glendell Open Cut Mine. Report to Glendell Joint Venture.
Umwelt 2007	Umwelt (Australia) Pty Limited. 2007. Environmental Assessment for Modification of Glendell Mine Operations (3 Volumes). Report for Xstrata Mt Owen Pty Limited.
Umwelt 2011	Umwelt (Australia) Pty Limited. 2011. Appedndix 6: Historic Heritage and Aboriginal Archaeological Constraints Analysis. Report for Xstrata Mount Owen.
Umwelt 2013	Umwelt (Australia) Pty Limited. 2013. Part 4 – Bettys Creek Salvage Program, Glendell Mine Surface and Subsurface Salvage under Section 90 Aboriginal Heritage Impact Permit #2267. Report for Xstrata Mount Owen.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

B.1.7 Example letter - Archaeological Survey Invitation



16 March 2018



Dear ,

Re: Glendell Continued Operations Project Aboriginal cultural heritage values assessment
– ongoing consultation and fieldwork details

Introduction

Thank you again for registering your expression of interest to be consulted in relation to the Aboriginal archaeological values impact assessment for the Glendell Continued Operations Project (the Project).

Later in the year we will be commencing the Aboriginal cultural heritage values assessment with a series of cultural values workshops that will provide opportunity for your input. This assessment provides greater insight into values, opportunity to discuss potential management measures and greater involvement in consultation. This will include an opportunity to visit the area and be presented with a summary of the fieldwork.

Ongoing consultation will continue for the duration of the Project and the offer to all Registered Aboriginal Parties (RAPs) or knowledge holders remains if you would like to visit the Project Area or provide information associated with Aboriginal objects or places of cultural value at any stage to please contact Glendell representatives to arrange a visit.

In regards to fieldwork, we would like to confirm that the Aboriginal Archaeological Assessment - field survey component is now scheduled to occur between: $9^{th} - 13^{th}$ April 2018, $16^{th} - 20^{th}$ April 2018 and 30^{th} April -4^{th} May 2018.

This provides an opportunity to participate in the field survey component of the assessment.

It is noted that in accordance with Section 3.4 of the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010, consultation should not be confused with employment. In this regard, a rostered fieldwork schedule will be developed for the field assessment and participants will be reimbursed for their time. If you would like to participate in the field survey component please complete the attached Registration of Engagement and further information.

Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298

GLENCORE

Fieldwork Details

The following information is provided for those RAPs who would like to participate in the fieldwork activities. Depending on the final number of participants, a rostered fieldwork schedule will be developed. Your service provider will contact you to confirm your allocated days.

General

Work Period 9th – 13th April 2018

16th – 20th April 2018 30th – 4th May 2018

Work Hours 8am to 4pm

<u>Meeting Location</u> Ravensworth East Offices (transport to survey site will be provided)

Access to Site All fieldwork participants are required to complete an Archaeological

Investigation - Temporary/Short Term Induction at the commencement of their

first shift

All fieldwork participants are required to sign on and off daily at the

Ravensworth East Offices

Safety Requirements

All fieldwork participants must ensure they have the following personal protective equipment and personal items:

- · Hi-Vis long sleeved shirt and trousers
- Protective eyewear/sunglasses
- Boots with ankle support
- Hard hat with wide brim attachment
- Gloves
- Sunscreen
- Rain jacket
- Drinking water (additional drinking water will be available)
- · Lunch and morning/afternoon tea (esky will be available for storage)

Site restrictions and Expectations

Mount Owen Complex is a Glencore managed site and all fieldwork participants should note:

- Smoking is not permitted anywhere on site or within the Glendell Continued Operations
 Project Area
- Mount Owen Complex is a zero alcohol site and all employees and contractors are required to complete a BAC prior to entry
- Mobile phones or other electronic devices are not permitted onsite during the survey. They will be permitted for use during the morning tea/lunch/afternoon tea breaks only.

Way forward

Page 2 of 4

GLENCORE

In order to confirm your participation in the fieldwork, please complete the attached Registration of Engagement form provided at the end of this letter. The completed Registration of Engagement should be provided to Bradly Snedden at the details below by **29 March 2018**. Please then contact your preferred Service Provider to arrange involvement in the upcoming fieldwork.

If you have any questions, please contact me via the details provide below.

Yours sincerely,

Bradly Snedden
Project Approvals Manager
Glendell Continued Operations Project

02 6520 2684

<u>Bradly.snedden@glencore.com.au</u>

Page 3 of 4



Glendell Continued Operations Project

Aboriginal Cultural Heritage
Assessment

Registration of Engagement

<u>DETAILS</u>	
Full Name:	
Address:	
Phone Number:	
Mobile Number:	
Email Address:	
Name of Organisation:	
I wish to participate in the archaeological field survey associated with Glencore's Glendell C Operations Project.	Continued Sign Initials
I am generally fit for outdoor fieldwork activities and have no medical illness or injury that would prevent my involvement	
I have read and understood the requirements to participate in the field assessment	
I agree to be engaged in cultural heritage assessment and survey through the following supplier:	
Hunter Valley Aboriginal Corporation (HVAC)	
Wonnarua Nation Aboriginal Corporation (WNAC)	
Tocomwall Pty Ltd (PCWP)	
I certify that the information provided on this form is true and correct.	
Print Name:	
Signature:Date:	

Page 4 of 4

B.1.8 Archaeological Survey Participants

	Week 1			Week 2				Week 3				
-	09/04/2018	10/ <u>04</u> /2018	11/04/2018	12/04/2018	13/04/2018	16/04/2018	17/04/2018	18/04/2018	19/04/2018	20/04/2018	30/04/2018	01/05/2018
WNAC	Maree Waugh	Georgina Berry	Tracey Skene	Georgina Berry	Georgina Berry	Maree Waugh	Georgina Berry	Georgina Berry	Maree Waugh	Tracey Skene	Tracey Skene	Tracey Skene
Tocumwal	Johnny Phillips	Johnny Phillips	Johnny Phillips	Johnny Phillips	Johnny Phillips	Johnny Phillips	Johnny Phillips	Johnny Phillips	Johnny Phillips	Johnny Phillips	Johnny Phillips	Johnny Phillips
	Mary Franks	Mary Franks	Mary Franks	Mary Franks	Mary Franks	Scott Franks	Scott Franks	Scott Franks			Mary Franks	
HVAC	John Matthews	John Matthews	John Matthews	Allen Paget	Allen Paget	George Sampson	George Sampson	George Sampson	Dave Horton	Cliff Johnson		George Sampson
	Darrell Matthews	Darrell Matthews	Darrell Matthews	Zaccariah Lakier	Zaccariah Lakier	Ashley Sampson	Gregory Sampson	Gregory Sampson	Darcy Dole	Allen Paget	Shaun Carroll	Gregory Sampson
	Colleen Stair	Colleen Stair	Colleen Stair	Paulette Ryan	Paulette Ryan	Paulette Ryan	Darcy Dole	Dave Horton	Zaccariah Lakier	Darcy Dole		
	Rhonda Ward	Rhonda Ward	Allen Paget	Katrina Cavanaugh	Katrina Cavanaugh	Chad Cowan	Chad Cowan	Zaccariah Lakier	Paulette Ryan	Rhonda Ward		
	Cliff Johnson	Cliff Johnson	Rhonda Ward	Cliff Johnson	Cliff Johnson	Shaun Carroll	Shaun Carroll	Katrina Cavanaugh	Katrina Cavanaugh	Kyle Johnson		

B.1.9 Archaeological Survey 28 Day Review Feedback from RAPs

Group/Organisation	Abbreviation	Contact Person	Agree with Methodology	Methodology Comment
Culturally Aware		Tracey Skene	Yes	No Concerns
Lower Hunter Aboriginal Incorporated	LHAI	David Ahoy	Yes	No Concerns
Kevin Duncan		Kevin Duncan	No	Objects to all mining
JLC Cultural Services		Jenny Chambers	Yes	No Concerns



25 July 2018

Laurie Perry PO Box 3066 Singleton Delivery Centre NSW 2330

Glendell Continued Operations Project Aboriginal Cultural Heritage Values Workshops

Dear Laurie.

Thank you for your involvement as a Registered Aboriginal Party (RAP) regarding consultation for the Aboriginal Cultural Heritage Assessment (ACHA) for Glencore's Glendell Continued Operations Project (Project). The initial archaeological field work survey component has been completed in collaboration with OzArk archaeologists and the RAPs for the Project. In addition to OzArk's assessment, the ACHA Report is also now being prepared by Shaun Canning from Australian Cultural Heritage Management (ACHM). **Figure 1** below outlines how the ACHA Report integrates with the overall Aboriginal cultural assessment being completed for the Project.

A significant component which provides important contribution into the ACHA Report is the undertaking of Cultural Values Workshops particularly associated with capturing the values associated with the Project Area. These Workshops have now been scheduled and this letter provides you with further information in this regard.

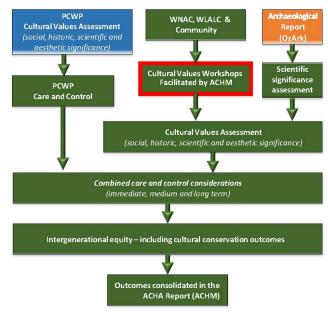


Figure 1 Integrated Aboriginal Cultural Heritage Assessment Approach

Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



Cultural Values Workshops

Cultural Values Workshops have now been scheduled for the Project. Separate workshops will be conducted to enable knowledge holders and members of the Aboriginal community the opportunity to participate in a smaller, more personalised, forum. Please see the details below providing information as to the arrangements for your workshop.

Indicative Itinerary

Cultural Values Workshop Date - Thursday 2nd August 2018

11:50pm-12pm	Meet at Ravensworth East Offices for log-on and site induction
12pm	Leaving vehicles at Ravensworth East, we will boards a bus that will take everyone to Glendell Mine.
12:15pm – 12:45pm	Survey results overview (Ben Churcher – OzArk)
12:45pm – 2:30pm	Site tour of the Project Area, in bus provided
2:30pm – 4:00pm	Workshop and discussions (afternoon tea available) at Glendell Mine Training Room.
4:00pm	Return to Ravensworth East Mine and Log-off site (required)

Participation Reimbursement

We appreciate your attendance and acknowledge the time required to participate. Accordingly, you will be reimbursed for your attendance based on a half days work plus travel expenses. Invoicing will be facilitated by your previously nominated supplier.

General Information

The following provides additional information for participants who would like to attend the Cultural Values Workshop.

Meeting Location Ravensworth East offices, Hebden Road

Access to Site All participants are required to complete an induction

All participants are required to sign on and off at the Damstra terminal at

Ravensworth East Mine

Site restrictions and Expectations

Mount Owen Complex is a Glencore managed site and all participants should note:

- Smoking is not permitted anywhere on site or within the Project Area
- Mount Owen Complex is a zero alcohol site and all employees, contractors and visitors are required to complete a blood alcohol content (BAC) test on arrival
- Mobile phones or other electronic devices are not permitted onsite during the site tour. They
 will be permitted for use during the breaks only
- Hi Vis clothing and enclosed footwear is required for the site visit

Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298

GLENCORE

Attendance Registration

To confirm your attendance at the Cultural Values Workshop please RSVP by Monday 30 July 2018 via the following:

By post: PO Box 320, Singleton NSW 2330, orvia email: Bradly.Snedden@glencore.com.au

If you have any questions, please contact me via the details below.

Kind regards,

Bradly Snedden Approvals Manager Glendell Continued Operations Project (02) 6520 2684

Page 3 of 3

B.1.11 Cultural Values Workshop One – WLALC Attendees and Minutes

Glendell Continued Operations Project Meeting record and action list

Cultural Values Workshop - WLALC

Meeting Date: 31 st July 2018 (AM)	Location: Glendell Training Room
Attendees	
Colleen Stair (CS) - Crimson Rosie	John Matthews (JM) - UHHC
Rhonda Griffiths (RG) - HVAC	Shaun Canning (SC) - ACHM
Margaret Matthews (MM) - ANTC	Ben Churcher (BC) - OzArk
David Horton (DH) – Gomeri C/C	Bradly Snedden (BS) - Glencore
George Sampson (GeS) - Cacatua	Ben Kemp (BK) - Glencore
Greg Sampson (GrS) – AGA	Bridie McWhirter (BMc) - Umwelt

ltem /	Action	When required
BC provided an overview of the archaeology assessment and the field survey completed in April and May 2018, the test excavation methodology and explained the plan ahead for the test excavation program. BC added that the Glendell Continued Operations Project site is very different in comparison to the Mangoola site, for example Mangoola has no interaction with creeks. BC added that the Glendell Continued Operations Project site is very different in comparison to the Mangoola site, for example Mangoola has no interaction with creeks. BC added that the Glendell Continued Operations Project site is very different in comparison to the Mangoola site, for example Mangoola has no interaction with creeks.		
Site tour completed to familiarise the RAPs with the landform and visit potential sites in the upcoming test excavation program		
SC gave an overview of what the ACHAR will cover and outlined it will include cultural heritage and archaeology.		
SC raised the importance of aboriginal interaction with the Ravensworth Homestead SC stated importance of finding contact sites which will be a focus for OZAVK and Casey and Lowe, however evidence of contact is difficult to find SC raised the importance of the connection with the Macarthurs. RG added that her family have a connection to the Macarthurs and will get in contact with her sister to find out more information for the next workshop.		
SC added that after the test pitting results 28 day notification period, another workshop will be held to discuss values		
SC raised the topic of massacres in the area: The topic is current as Lyndell Ryan has done work out of Newcastle Uni on massacres in the area Question over massacres on site which were existing questions from MOCO approval process No closer to understanding massacre history as no single place can be identified that they occurred and no specific information has been found. SC added that unless something comes out of this project, the results will remain the same as MOCO.		
SC raised the need to come up with recommendations to be included ACHAR SC added that high level recommendations which apply across the region or company are not achievable for the project, but need to be more locally focussed and realistic for the project to achieve SC added that he will bring together all recommendation together from the three groups into the ACHAR		

Commercial in Confidence

Page 1 of 6

Glendell Continued Operations Project

Meeting record and action list

Cultural Values Workshop - WLALC

Item	Action	When required
SC suggested that there may be scholarship opportunities similar to what was included in MOCO. Opportunity to make the scholarship wider than environmental science or archaeology, which was the MOCO criterion. R6 added that scholarships are something we should be looking at.		
SC raised that not everyone wants to go to university or is ready to go and that there is potential to bridge the gap between school and university and support other programs such as tafe courses high school program or apprenticeships. RC added that there is a need for something in the high schools for boys as there is existing girls programs for example the girls academy at Muswellbrook High School		
SC raised the idea of offsets and their difficulty in being of use or value to the aboriginal community as they are typically fragmented of land with noillmited access allowed. RG added that for the offsets to be useful, they need to be one decent parcel of land instead of a number of small fragments of land.		
SC stated that Glencore don't have an appetite for inventing programs but would rather invest and support existing programs RG mentioned that she would investigate what local existing programs need funding. RG added that there is a need to go into highschools as that is where our future is		
RG raised the issue of the keeping place and suggested that there is separation of groups. SC added that the diversity of groups being multinational companies, multiple shires and multiple aboriginal groups who would have to agree to come to a decision. RG added that there is culture and heritage that we are missing out on because we can't come together to salvage for future generations.		
RG raised issues with the Umbrella Agreement and its fairness. SC suggested that the group consult with Tim Walls in this regard as it cannot be solved in this forum and is not a part of this discussion.		

Commercial in Confidence Page 2 of 6

B.1.12 Cultural Values Workshop One – Unaligned RAP Attendees and Minutes

Glendell Continued Operations Project Meeting record and action list

Cultural Values Workshop – Unaligned RAPs

Meeting Date: 1 st August 2018 (AM)	Location: Glendell Training Room
Attendees	
Jenny Lee Chambers (JC) – JLCCS	Shaun Canning (SC) - ACHM
Allen Paget (AP) - Ungooroo	Ben Churcher (BC) - OzArk
Duane Sharpley (DS) - Muragadi	Bradly Snedden (BS) - Glencore
Jordan Ponting (JP) - Murrabidgee	Ben Kemp (BK) - Giencore
Bridie McWhirter (BMc) - Umwelt	

Iter	n	Action	When required
•	BC provided an overview of the archaeology assessment and the field survey completed in April and May 2018, the test excavation methodology and explained the plan ahead for the test excavation program.		
•	Site tour completed to familiarise the RAPs with the landform and visit potential sites in the upcoming test excavation program		
	SC gave an overview of what the ACHAR will cover and outlined it will include cultural heritage and archaeology.		
	SC raised the need to come up with recommendations to be included ACHAR SC added that high level recommendations which apply across the region or company are not achievable for the project, but need to be more locally fo		
•	SC suggested that MOCO aimed high for many recommendations which may not have been achievable and there is a need to bridge the gap from high school to university as not all will want to go to university. SC added that there is potential for programs in earlier ages, for example Clontarf. SC mentioned that Ciencore would prefer to invest in existing programs to gain instant traction and there is better value out of existing programs. SC suggested that there should be a focus on three key themes for recommendations - employment opportunities, business opportunities and education		
•	AP raised the question that if another group or RAP wanted to start up a business, do you have to let them. SC suggested it is a case by case basis and it is dependent on the individual. SC added that there is a need to bridge the gap between running a business and having the ability to do it and therefore, creating opportunities for training to bridge this gap is important		
•	SC suggested Glencore's appetite is to ensure programs around resources skills are optimised, through supporting education and upskilling instead of handing out jobs or businesses etc. SC added that its likely Glencore would prefer pay for education through courses and training so that they can gain the right skills and then potentially gain jobs from training. O AP provided the example of Ungoorco Medical centre in Singleton		
•	SC raised the issue of offsets The Hillcrest property was raised as an example where no one from aboriginal communities have had involvement in SC added that the aim is to avoid these situations		

Commercial in Confidence

Page 3 of 6

Glendell Continued Operations Project

Meeting record and action list

Cultural Values Workshop – Unaligned RAPs

Iter	n	Action	When required
٠	SC added that after the test pitting period, another workshop will be held to discuss values SC suggested that everyone go away and consider recommendations BS suggested that the previous MOCO recommendations be put up during next workshop		

Commercial in Confidence Page 4 of 6

B.1.13 Cultural Values Workshop One – Hickey Family Attendees and Minutes

Glendell Continued Operations Project Meeting record and action list

Cultural Values Workshop – Hickeys

Meeting Date: 1 st July 2018 (PM)	Location: Ravensworth East Offices
Attendees	
Luke Hickey (LH) - HVCS	Shaun Canning (SC) - ACHM
Mick Stair (MS) - HTO	Ben Churcher (BC) - OzArk
Ben Kemp (BK) - Glencore	Bradly Snedden (BS) - Glencore
Bridie McWhirter (BMc) - Umwelt	

Item		Action	When required
methodol	ded an overview of the archaeology assessment and the field survey completed in April and May 2018, the test excavation ogy and explained the plan shead for the test excavation program. questioned whether the scarred free within the Project Area is allev or dead	BC to confirm whether scarred tree is alive	TBC
10m. LH	I that the text excavation methodology is not clear enough and suggested that transects should occur at 5m intervals instead of added that if the intervals occur at every 5m then no significant sites are missed. If the significant is the sare missed. If the the will investigate if there are areas appropriate for 5m intervals.	BC to investigate whether 5m intervals are appropriate for test pitting	31/8/2018
Site tour	completed to familiarise the RAPs with the landform and visit potential sites in the upcoming test excavation program		
SC gave	an overview of what the ACHAR will cover and outlined it will include cultural heritage and archaeology.		
LH raised	t that their aim is for self-employment and indigenous wellbeing		
	I that there is not enough land on the valley floor, it is rare and endangered and so is the water source. LH added that the issue ing is coming and going and leaving it as is. LH raised the Hillcrest property as an example.		
up with a needed.	If the concern of previous projects and not getting what they were promised in previous times. SC stated that we need to come a strategy to focus on recommendations which are achievable for the project. LH stated that funding for the mens group is differ that they don't want the money, they want the opportunities.		
• SC added	d that after the test pitting period, another workshop will be held to discuss values suggested that everyone consider recommendations for the next workshop		

Commercial in Confidence Page 5 of 6

B.1.14 Cultural Values Workshop One – WNAC Attendees and Minutes

Glendell Continued Operations Project Meeting record and action list

Cultural Values Workshop – WNAC

Meeting Date: 2 ^{nα} August 2018	Location: Glendell Training Room	
Attendees		
James Wilson-Miller (JWM) - WNAC-WEC	Laurie Perry (LP) - WNAC	
Arthur Fletcher (AF) - WNAC	Georgina Berry (GB) - WNAC	
Richard Edwards - WNAC-WEC	Maree Waugh (MW) - WNAC	
Sandra Miller (SM)- WNAC	Rhoda Perry (RP) - WNAC-WEC	
Rae Reed (RR) - WNAC	Shaun Canning (SC) - ACHM	
Kerry Phillips (KP) - WNAC	Ben Churcher (BC) - OzArk	
Paul W Hinton - WNAC	Ben Kemp (BK) - Glencore	
Garry Phillips-Reilly (GPR) - WNAC	Bridie McWhirter (BMc) - Umwelt	

Ite	n	Action	When required
•	BC provided an overview of the archaeology assessment and the field survey completed in April and May 2018, the test excavation methodology and explained the plan ahead for the test excavation program. o AF stated that they want to be involved in the creek diversion from the beginning. BS suggested there could be a working bee for involvement		
ŀ	Site tour completed to familiarise the RAPs with the landform and visit potential sites in the upcoming test excavation program		
	SC gave an overview of what the ACHAR will cover and outlined it will include cultural heritage and archaeology.		
	SC raised the idea of offset areas and questioned whether they work from a cultural point of view due to their difficulty in being of use or value to the aboriginal community as they are typically fragmented of land with nollimited access allowed. AF raised that the community should have input from the beginning in regard to offset areas. SC stated that this could be a recommendation in the ACHAR. LP stated that cultural offsets do work as he has had experience with them working with Glencore previously.		
•	LP stated that they are trying to stay in the community culturally.		
	SC added that after the test pitting period, another workshop will be held to discuss values and suggested that everyone consider recommendations for the next workshop LP raised issues over funding to get together to talk about recommendations due to the widespread locations of members.		
	LP raised issues regarding the Umbrella Agreement. SC suggested LP talk to Tim Walls for this matter as it is not the right forum and cannot be solved as part of this workshop.		

Commercial in Confidence Page 6 of 6

B.1.15 Example Letter inviting RAPs to Second Cultural Values Workshop



3 September 2018



Re: Glendell Continued Operations Project – Invitation to Cultural Values Workshop #2

Introduction & Project Update

Thank you again for your ongoing involvement in relation to the Aboriginal Archaeological Values Impact Assessment for the Glendell Continued Operations Project (the Project).

As you are aware, the Aboriginal Cultural Heritage Field Survey was completed between 9 April and 1 May 2018. A test excavation program is also scheduled to take place from 3 to 21 September 2018.

Both assessments have been prepared in collaboration with OzArk Archaeologists and Registered Aboriginal Parties (RAPs) for the Project. In this regard, a draft *Aboriginal Archaeological Impact Assessment* (AAIA) report is currently being prepared by OzArk and a copy will be mailed out to you for review and comment in the coming months.

Cultural Values Workshop Session 2

In addition to the field surveys completed to date, the first of the Cultural Values Workshop sessions were held during July and August 2018 with assistance from Dr Shaun Canning from Australian Cultural Heritage Management (ACHM).

A further Cultural Values Workshop, to be held over two days, is now proposed to enable additional opportunity to participate in roundtable discussions regarding cultural knowledge or values you may wish to provide. Following recent feedback, and given that the Mangoola Coal Continued Operations Project is completing a similar assessment, this workshop will be jointly run with members of the Mangoola Coal Continued Operations Project Team to ensure clarification is provided across both projects.

Please see the details below regarding the arrangements for the Cultural Values Workshop.

Private Mail Bag 8, Singleton, NSW 2330 567 Broke Road, Singleton, NSW 2330 T + 61 2 6570 2416 F + 61 2 6570 2520 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298

GLENCORE

Meeting Date, Location and Details

Workshop Date: Tuesday 18 and Wednesday 19 September 2018

Location: Charbonnier Hunter Convention Centre - Lower Chameleon

Room

44 Maitland Road, Singleton

Time: 8:30 am to 4:00 pm

Service: Lunch and morning/afternoon tea will be provided (please indicate

any special dietary requirements)

Participation Reimbursement

We appreciate your attendance and acknowledge the time required to participate. Accordingly, you will be reimbursed by your previously nominated supplier (WNAC) for your attendance based on a full days work (\$550) plus travel expenses (\$50), totalling \$600 for each day attended.

Attendance Registration

To confirm your attendance at the Workshop, please RSVP by 10 September 2018 to:

Contact: Catherine Fenton (Approvals Officer)

Email: catherine.fenton@glencore.com.au

Phone: (02) 6520 2686

Post: PO Box 320, Singleton NSW 2330

Way Forward

If you would like to participate in the Cultural Values Workshop please provide your RSVP by 10 September 2018. We will then contact your previously nominated supplier to confirm your attendance and to permit invoicing.

If you have any questions, please feel free to contact me via the details provided below. I look forward to seeing you at the workshop.

Kind Regards,

Bradly Snedden Approvals Manager - Glendell Continued Operations Project (02) 6520 2684

Page 2 of 2

B.1.16 Cultural Values Workshop Two - Questionnaire

Cultural Values	What can projects do to make up for the loss of country?	
Cultural Values	Are the post-settlement places in the project area important to you?	
Reconciliation	What do you think projects should consider to assist the reconciliation process?	
Cumulative Impact	Can you tell us what you think the cumulative impacts of this project might be?	
Cultural Heritage Protection	Is the protection of cultural heritage places important to you?	YES 🗆
		NO 🗆
		Why?
Cultural Heritage Protection	How could cultural heritage places be mitigated if protection is not an option?	
Intergenerational Equity	What types of programs do you think are important to Wonnarua people to create intergenerational equity poportunities?	Education
Intergenerational Equity	What types of programs do you think are important to Wonnarua people to create intergenerational equity opportunities?	Education Equity
Intergenerational Equity	What types of programs do you think are important to Wonnarua people to create intergenerational equity opportunities?	Equity Capacity Building
Intergenerational Equity	What types of programs do you think are important to Wonnarua people to create intergenerational equity opportunities? What specific education programs would you like to see?	Equity Capacity Building
	create intergenerational equity opportunities?	Equity
	create intergenerational equity opportunities?	Equity
	create intergenerational equity opportunities? What specific education programs would you like to see?	Equity
	create intergenerational equity opportunities? What specific education programs would you like to see? What specific capacity building programs would you like to see?	Equity
	create intergenerational equity opportunities? What specific education programs would you like to see?	Equity
	create intergenerational equity opportunities? What specific education programs would you like to see? What specific capacity building programs would you like to see?	Equity

	What specific business opportunities would you like to see?	
	How do you think equity can be created during the project(s)?	
Other Matters	What other matters do you think should be addressed by this process as part of	
	the Glendell or Mangoola Projects?	

Aboriginal	Cultural	Values	Workshops

The purpose of this form is for you to write down any values or recommendations that you would like to see considered for incorporation in the Aboriginal Cultural Heritage Assessment Report for the project. The form is divided into several themes and topics.

The main purpose of the workshop is to define and describe the cultural values of the project area. Cultural values is the term used to describe how individuals value and are attached to a particular place. These values may cover a range of feelings, emotions and values.

Project: Mangoola Continued Operations Project

Question	Your Answer
Do you or your family have any specific cultural knowledge or values that you would like to share regarding the project area?	
Please tell us what those values are in the column to the right.	
If you answered NO, to the question above, do you know anyone who does hold knowledge or values over the project area?	
Are you satisfied that the archaeological assessment undertaken for the project is comprehensive and fit for purpose?	
What are the most important parts of the landscape to Aboriginal people?	
	Do you or your family have any specific cultural knowledge or values that you would like to share regarding the project area? Please tell us what those values are in the column to the right. If you answered NO, to the question above, do you know anyone who does hold knowledge or values over the project area? Are you satisfied that the archaeological assessment undertaken for the project is comprehensive and fit for purpose?

B.1.17 Cultural Values Workshop Two – Attendees

Glendell Continued Operations Project and Mangoola Coal Continued Operations Project Meeting record and action list

Cultural Values Workshop # 2

Wonnarua Nation Aboriginal Corporation (WNAC)				
Meeting Date: 18 th September 2018 (Day 1) Location: Charbonniere Hotel Singleton				
Attendees				
James Wilson-Miller (JWM) - WNAC-WEC	Laurie Perry (LP) - WNAC	Alice Hinton Bateup (AHB) - WNAC		
Arthur Fletcher (AF) – WNAC Elder Chair	Georgina Berry (GB) - WNAC	Lee P Perry (LPP) - WNAC		
Richard Edwards - WNAC-WEC	Maree Waugh (MW) - WNAC	Tom Miller - WNAC Elder		
Sandra Miller (SM)- WNAC	Rhoda Perry (RP) - WNAC-WEC	Tracey Skene (TS) - WNAC		
Kerry Phillips (KP) - WNAC	Lee Hinton (LH) - Chair WNAC	Kevin Hinton (KH) - WNAC elder		
Paul W Hinton - WNAC	Noeline Bell (NB) - WNAC	Patricia Burns (PB) - WNAC		
Garry Reilly (GR) - WNAC Director	Maxine Conaty (MC) - WNAC	Jason Martin (JM) - Glencore		
Bradly Snedden (BS) - Glencore	Shaun Canning (SC) - ACHM	Lori Dennen-King (LD) - Glencore		
Bridie McWhirter (BMc) - Umwelt				

Iter	n	Action	When required
•	JM provided an overview of the Mangoola Project and the outcomes of the archaeological fieldwork completed to date	Provide ecology reports to WNAC members	On hold until reports complete
•	RP raised the extent of stakeholder consultation—suggested that it's a shame anyone can put in their values. RP also questioned whether there would be a time that Glencore can inform OEH that there will only be two groups to consult with. SC added that NSW legislation doesn't allow this process and the consultation guidelines are there so that no discrimination occurs against anyone.		Complete
•	BS provided an overview of the Glendell Continued Operations Project and the outcomes of the archaeological fieldwork completed to date and a broad overview of the Ravensworth Homestead. BS also noted that the archaeological test pitting process did not find any artefacts at the Homestead.		
•	The significance of Ravensworth Homestead to indigenous people was raised. For example it is located on indigenous land, its proximity to St. Clair and the relationships with the Macarthurs. JVMM suggested that it is a sacred site of significance for indigenous men and women. JWM added that it is significant to them even though it's not indigenous heritage. RP added that they knew the people who worked there and lived there.		
•	BS suggested that if Glencore do not get approval to relocate the Homestead, a possible outcome is to mine around the Homestead. It was added that the Wambo Homesteadd hasn't been moved and mined around and was not a good outcome.		
•	The number of indigenous people in the existing workforce at Mount Owen Complex was questioned. It was added that training, development and employment opportunities for indigenous people is needed.		
•	It was stated that in 1904, people from St Clair Mission worked at the Homestead and therefore there is over 100 years of aboriginal history associated with the Homestead. RP added that they used to go to the surgery in Singleton in the 1940's which shows the connection with the Bowman's.		

Commercial in Confidence

Page 1 of 5

Page 2 of 5

Glendell Continued Operations Project and Mangoola Coal Continued Operations Project Meeting record and action list

Cultural Values Workshop # 2

Iter	n	Action	When required
•	RP stated that we need to tread carefully for future generations as what are we going to be leaving them.		
-	JM raised that 25 archaeological sites will be harmed as part of the Mangoola Project and added that a portion of the Mangoola site which has high significance of archaeological sites is being fenced off and 'offset'. It was then raised by WNAC members that offset sites should be locked up more permanently and access to the land should be provided.		
•	WNAC members suggested that they would like to read the ecology report for both Mangoola and Glendell Continued Operations Project. BS and JM stated that the ecology reports are not complete but could be provided when complete. MC sadded that they want to know the plant species which are on the land as plants have cultural values and knowledge about uses and medicinal user.		
-	LP raised the need for offsets for cultural values and land for growing bush plants and tucker. LP added that they need to own their own land to grow the plants on.		
•	SC raised the idea of scholarships and their implementation through the Mount Owen Continued Operations Project which provided three archaeological scholarships. SC added that the scholarships need to be broadened and not just available for archaeology.		
	LH suggested that health programs are needed in the community. The access for elderly is also an issue with an aging population. For example mobility scooters and sleep apnoea machines.		
•	LH raised education as an issue in the indigenous community such as keeping up to date with technology. For example, some of the older generation do not know how to research on the internet or send emails and elders need to be taught compassionately.		
	LH questioned the level of aboriginal employment in the Giencore workforce and suggested that WNAC would like to see an increase. LH added the importance of school based traineeships and school based apprenticeships as some individuals may not want to go to University, but through a school based program they could achieve a qualification before they leave school. LH suggested that school based traineeships should be a corporate based initiative with specific targets for each region.		
•	LH stated that there is an existing program called 'Career Trackers' which is a non-profit organisation which creates intern opportunities for indigenous university students. LH added that training is needed to allow for better transition and creating opportunities for employment after training.		
	LH suggested funding and support for indigenous sportspeople at the grassroots level. RP added that support is needed in sport as there are a lot of young indigenous sportspeople e.g. touch footballers.		
	It was raised that there needs to be an indigenous careers path because there is a facilitation step missing between training, education and employment.		
	It was raised that there are three different mines (United, Mangoola, Glendell) with three different scope of works. LP stated that the WNAC objectives are aligned with their membership base and use. LP added that WNAC focuses on their membership base not at a local level as some members live out of area		

Commercial in Confidence

Glendell Continued Operations Project and Mangoola Coal Continued Operations Project Meeting record and action list

Cultural Values Workshop #2

	Wonnarua Nation Aboriginal Corporation (WNAC)
Meeting Date: 19 th September 2018 (Day 2)	Location: Charbonniere Hotel Singleton	
Attendees		
James Wilson-Miller (JWM) - WNAC-WEC	Laurie Perry (LP) - WNAC	Alice Hinton Bateup (AHB) - WNAC
Arthur Fletcher (AF) - WNAC Elder Chair	Georgina Berry (GB) - WNAC	Lee P Perry (LPP) - WNAC
Richard Edwards - WNAC-WEC	Maree Waugh (MW) - WNAC	Tom Miller - WNAC Elder
Sandra Miller (SM)- WNAC	Rhoda Perry (RP) - WNAC-WEC	Tracey Skene (TS) - WNAC
Kerry Phillips (KP) - WNAC	Lee Hinton (LH) - Chair WNAC	Kevin Hinton (KH) – WNAC elder
Paul W Hinton - WNAC	Noeline Bell (NB) - WNAC	Patricia Burns (PB) - WNAC
Garry Reilly (GR) - WNAC Director	Maxine Conaty (MC) - WNAC	Jason Martin (JM) - Glencore
Bradly Snedden (BS) - Glencore	Shaun Canning (SC) - ACHM	Lori Dennen-King (LD) - Glencore
Bridie McWhirter (BMc) - Umwelt		

Ite	m	Action	When required
•	SC initiated discussion of the Ravensworth Homestead and asked WNAC members to provide any thoughts or values they hold towards the Homestead		
•	RP stated that a number of descendants worked on the farm and that they do have a connection to it. LP added that everyone is trying to save it but where will it go. LP added that it needs to be moved onto land that is never going to be mined and that the cultural significance needs to be maintained. BS stated that it will move onto land where no mineable resource lies under. JWM added that indigenous cultural heritage to the Homestead needs to be maintained as it is part of their story.		
•	It was suggested that once the Homestead is relocated, that the house could be used as a museum, a keeping place, training centre.		
•	WNAC members agreed that the preservation of the homestead is important – would rather it be moved than be destroyed by leaving it in situ for destruction by dust and vibration.		

Commercial in Confidence

Page 3 of 5

Glendell Continued Operations Project and Mangoola Coal Continued Operations Project Meeting record and action list

Cultural Values Workshop # 2

Iter		Action	When required
•	LH provided a presentation on the strategic direction of WNAC and potential opportunities for funding from Glencore to assist in WNAC's direction:	•	
	WINAC are planning on completing a membership census to determine what skills, education completed, employment situations, medical conditions exist within WNAC which will outline where the gaps are and then can determine the strategic direction to take LH stated that the education fund agreement that WNAC currently have with Centennial expires in 2020. WNAC are seeking Glencore to take over the agreement to provide support and funding to elder technology and access to equipment, replacement of outdated services, literacy and numeracy ororams		
	 The health fund agreement that WNAC currently have with Centennial expires in 2020. WNAC are seeking Glencore to take over the agreement to provide support and funding to access to high tech live saving equipment (e.g. sleep apnoea, diabetes), coordination of intergenerational workshops. 		
	 Employment options for individuals predominately less than 25 years which would then allow training for employment opportunities, potentially in mining, E.g. traineeships for 12 month period in Mining Services or Business Cervices 		
	 Small business development program including cert IV in business management, start-up capital grant including a business coach/mentor. This will allow the individual to develop a business plan and gain the knowledge and understanding whether the business will be viable – to reduce rate of unsuccessful small start-up businesses 		
	 Sporting fund – WNAC currently has an agreement with Centennial however this focusses on national and international sporting funding. Support from Glencore for tournaments such as Koori knockout, Ella 7's – more local and grassroots focussed 		

Commercial in Confidence Page 4 of 5

Glendell Continued Operations Project Meeting record and action list

Cultural Values Workshop # 2

Unaligned RAPs – Glend	dell Continued Operations Project
Meeting Date: 21st September 2018	Location: Singleton Diggers Club
Attendees	
John Matthews (JM) - UHHC	Jenny Chambers (JC) - JLCCS
Margaret Matthews (MM) - ANTC	Rhonda Ward (RW) - UCCS
Collen Stair (CS) - Crimson Rosie	Aliera French (AF) - Aliera French Trading
David Horton (DH) - Gomery C/C	Shaun Canning (SC) - ACHM
George Sampson (GeS) - Cacatua	Noel Downs (ND) - Wanaruah LALC
Greg Sampson (GrS) - AGA Services	Catherine Fenton (CF) - Glencore
Rhonda Griffiths (RG) - HVAC	Bridie McWhirter (BMc) - Umwelt

Iter	n	Act	ion		When required
٠	SC introduced the Project and gave a brief overview of the purpose of the workshop and suggested that the focus be on cultural values associated with Ravensworth Homestead as that is the main difference between the Glendell Continued Operations Project and the Mangoola Project in terms of cultural heritage. Broader values from the group were previously captured in meeting held Monday 17/9	•	Send copy information attendees	of community sheet to	5/10/18
•	ND stated that the Wanaruah Local Aboriginal Land Council placed a submission in for the Ravensworth Homestead to be relocated to Sedgefield				
•	RG stated that her great grandmother was brought up at Camden Park and that could be a contact as it was through Macarthur's daughter (Mary). RG added that it cannot be confirmed as she has not been told any stories but suggests its likely through the connection with Camden Park				
•	Agreed that the Ravensworth Homestead would be better to go somewhere that it can be used, rather than left to deteriorate. However there is no known direct lines of connection back to the homestead				
	AF asked what would be done differently if there was known aboriginal connection of the Homestead. SC stated that it adds to the complexity of the place and increases significances. SC added that it changes how it will be documented more than anything else.				
•	ND added that the archaeological area surrounding the Homestead is significant and the buildings represent what happened to aboriginal people				
•	RG stated that if the Homestead is relocated, it needs to be maintained as there is no point otherwise as you are not conserving it. RG added that it would be nice to see it restored.				
.	Issue of community access was raised – Heritage assets get locked up and become inaccessible				
•	CF mentioned that a community information sheet on the Ravensworth Homestead was previously issued but can be supplied to anyone who would like a copy				
ŀ	ND referenced and read an excerpt from a book called 'Dawn in the Valley' by W. Allan Wood which contains references to the area				

Page 5 of 5 Commercial in Confidence

B.1.18 Workshop Two Questionnaire Responses

	1	d Question		1							1											
Topic/Theme	Question	Respondent 1	Respondent 2	Respondent 3	Respondent 4	Respondent 5	Respondent 6	Respondent 7	Respondent 8	Respondent 9	Respondent 10	Respondent 11	Respondent 13	Respondent 14	Respondent 15	Respondent 16	Respondent 17	Respondent 18	Respondent 19	Respondent 20	Respondent 21	Respondent 22
Cultural Values 1	Do you or your family have any specific cultural knowledge or values that you would like to share regarding the GCOP Project Area(e.g. cultural values, historic values, scientific and/or aesthetic values)?	My family's connection to this land goes back many generations . The land is the lifeblood of all of us and flows through us.	Yes.	We do have cultural knowledg e and connectio ns to this area. Our families lived and worked on this land.	As part of my role as an Aboriginal site worker, to me cultural values are high, same with the historic values.		Only what my Mother and Grandmoth er and my other Uncle.		general. These aspects are important in disseminating	As you should know land is very important as we believe we belong to the land. Changes to the land is changes to our culture. My great great grandmother walked the land free.	around this area	The LALC hold cultural knowledge for this area. Place names. Some information about the family clan group. Whose country it was. This group was moved from the area in the 1850s to (the crossing) before being dispersed to Breza and St Clair in 1860s.		All good.			Eatens Family. Mainly song line.	Extended family knowledge passed down from elders. The edge of song line.	Extended family knowledge passed down from elders.	Have walked the land and have family associate d with the land.	Yes, family have connection to the land, by working, cultural connection s.	
Cultural Values 2	If you answered no, to the question above, do you know anyone who does hold knowledge or values over the protected area?		Jimi Miller.				Elders of Wonnarua	Yes, I do. Victor Penny, Laurie Perry James Miller.	There are many cultural knowledge holders whose knowledge of history, heritage and cultural value vary. Please be aware of these concerns.	Most of our Wonnarua people/famili es and some have more knowledge, e.g. Jimmy can speak our language in its true form, others know of sites.	Yes. Family members.	The Wedgetail Eagle was the clan totem. Milyane/Wan thala.					(Respond ent ticked this box)	(Responde nt ticked this box)	Yes.			
Cultural Values 3	Are you satisfied that the archaeological assessment undertaken for the project is comprehensive and fit for purpose?		Yes.		Mostly, but more cultural values should be understoo d, heard and respected . Hopefully this should happen as soon as possible.	Yes.	artefacts have been moved - relocated to other areas due to soil erosion and changing weather	because there is new technolo gy that exists today which can verify	Indigenous interpretatio ns are included, I see no problem.	who the archaeologist is working	Not really, still a feeling of loss.	Would like to see a lot more work done researching local historical records to fill in gaps and/or confirm existing knowledge.		Free land.		Yes survey wise but not the test pitting.	ent ticked	Yes, it is comprehen sive.	Yes.	Would like to have more impact and a say in where the excavatio n pits are dug.	No on scientific level, yes but on a cultural level it should have had a separate cultural report this would have saved us doing this questionnai re, allowed. Traditional owners to have more input from beginning of assessment allowing us to choose the archaeologi st.	

Cultural Values 4	What are the most important parts of the landscape to Aboriginal people?	For me the Hunter River, Redonberry Hill and St. Clair hold significant importance .	Being able to walk over, around, the land is a very important part of our real connection to land and our families.	All the landscape including flora and fauna, mother earth and water.	All country in important .	All found in the Hunter Valley is important to me it is part of my Aboriginal Identity.	The land itself, rehabilita tion restored back to its original landscap e.	Redbournebe rry Hill, Hunter River, St Clair, and Glennies Creek.	The whole its our land and its going to be torn up for money not for the betterment of Wonnarua families.	Water ways, sites of significance land/water ways.	All of it. Mostly those where people hunter gathered, slept, educated and entertained. Water ways and habitat for staples, e.g. possum, eels, water rush, grasses.		Waterways	Shelters.	Shelter used for weather	Rivers, creeks, shelters.	The whole land itself! Everythin g. It all tells a story of our people.	The whole landscape is important to us it holds spiritual and cultural connection s. It leaves behind our ancestors' artefacts that therefore show connection of them being on the landscape. It plays hand in hand with the associated cultural landscape that overall tell the story of the landscape.	
Cultural Values 5	What recommendati ons in relation to migration should Glencore consider in relation to the potential impacts of the Project?	To ensure future generations can appreciate the natural environme nts and their connection to it.		Resources of all descriptio ns and 24- hour access. Help for elders and families.	Mining activities destroy country. Nothing can be done - country is destroyed .	None.	All of the above.	Mitigating truthfully with local designated Indigenous community by investigating program whereby positive outcomes will benefit all concerned. Training in most areas of employment, education, training and identified Indigenous positions.	Reimbursem ent to the Wonnarua families WNAC members and it should not be a spit in the bucket	Loss/homestead re. our family ancestry.	Cultural protection areas need to be formalized. Wybong and Big flat Creek. 100-200m either side for sight at that owned by GCOP.	Nil.	Funds made available for cultural education of the immediate community of the impact the project causes.	Managem ent control.	That shelters protected, by blasting. Salvage of all artefacts.	All artefacts to be salvages in the impact area.	To listen to us more and not treat us like idiots.	If the landscape is in harm's way and all precautions have been exhausted and that there is no way of protecting it then mitigation method of having compulsory input by from beginning being part of decision making. By taking more voluntary steps to improve relations with communiti es.	Repatria tion to within project areas.
Cultural Values 6	Are post- settlement/Eur opean heritage places important to you? If so, how?	Yes, they created the built environme nt we live in today, it signifies our modern history and deserves to be respected.	Yes, most definitely. Because of family connectio ns, family environm ent and a workplace	Yes they are and always because its part of us and I acknowle dge time has changed and we have to accept and adopt.	White settlemen t is only of value where Koori participat ion in involved.	Anything to do with European takeover of Wonaarua Land situated in the Hunter Valley is not important to me.	No, not really.	culture clash buildings do have special significance with certain Indigenous groups, not all, i.e. Bowman's	Europeans don't hold our culture to any value, and they should. Only place our ancestors used e.g. Ravensworth	No not really.	As it applies to the ongoing history of Aboriginal people. Jimmy Blacksmith lived through this area.		Yes of course its still our history even though it can sometimes be painful.	N/A.	None.	No.	Yes, it has a connectio n with us.	Yes, some areas such as homestead hold importance to us as it is connected to our stories of the land, oral history, etc.	

Cumula tive Impact	Can you tell us what you think the cumulative impacts of this project might be?		Destruction of our land mass. But there is still cultural values associated with this land.	Positive: Potentiall y training and employm ent in many fields, looking after elders. Targeted employm ent for Aboriginal s and their families. Negative: Environm ental and health concerns.	Loss of country. Loss of wildlife. Loss of connectio n to country.	Just the long term affects that result in the health of Wonnarua People especially affecting our elders that are still living on this land.	Loss of identity.	All positive outcomes of this project should benefit all associated with it. Patterns of reciprocity should at all times be adhered to on equal terms.	employ	Loss/flora/fauna/lan d/rivers system.	Further destruction and impact to the cultural landscape.				Mainly environme ntal for animals and local communiti es health wise. Culturally the whole Project has significantl y destroyed a large part of the cultural landscape.		Loss of sites for educationa I purposes. Already low in this case.	Loss of sites.	Broken spiritual connectio n, sadness seeing the process happen.	Our culture is inextricably linked to the environme nt and that any impact to our cultural sites and landscape is like taking a page out of oral history stories.
Cultural Heritag e Protecti on A	Is the protection of cultural heritage places important to you?	Yes. To ensure that our future generations have access to and understand their heritage.	Yes. Keeping our C/H - Histories, storyline, and songs.	Yes. For our future generatio ns and us. To be as healthy and our value to the communit y.	Yes. Spiritual identity.	Yes. All cultural heritage to do with Wonnarua Nation on Wonnarua Land is important to me.	Yes.	Yes. There are sites which are shared sites. Glennies, Bowman's Creeks, St Clair, a relocated Bowman's Cottage.	Yes. We need them to keep our culture alive.	Yes. Keep them intact for our future generations.	Yes. Stupid question.	Yes.	Yes.	Yes.	Yes. Because it is a part of our cultural history, destroying the cultural heritage sites would be equivalent to burning history textbooks. It would be erasing our cultural history of these sites are destroyed.	Yes. Important	Yes. We have lost a significant amount over time all places are significant to my people.	Yes. All sites are important to Aboriginal people.	Yes. Because our culture should be respected a lot more than it is now.	Yes. It is our culture and connection to the land our grass roots to our ancestor's past.
e Protecti	What protection options are necessary, if any?		-	Are our voices truly being heard in a respectful way from governme nts including local, state, governme nt?	Once mining destroys it is gone.	The area of land known as 'Redbourne berry Hill/Reserve ' situated just on the outskirts of Singleton.	Ι.		Moved to WNAC land		Cultural burning is effective for hazard reduction as well as rehabilitation . Sustainability of water ways and habitat to continue the local cultural resources. 100-200m either side of creeks. Cultural management practices.				Fencing. Educating the GCOP employees about Aboriginal culture and sites, so no harm accidently occurs. Monitoring of sites to ensure ongoing protection. Signs being put up reminding GCOP employees that this specific area is protected and it is not to be disturbed.	1	That all site be protected or freed. Free to be salvaged as manageme nt of RAPS.	Fencing.	l . '.	Maybe by having a small panel of knowledge holders sitting alongside Glencore on decision making of the land they propose to mine and having the right to have report of what happens to their cultural land.
Mitigati on I	How could cultural heritage places be mitigated if protection is not an option?		guards are	rata of 2:1 of land area, the	A facility under the guidance of the Wonnaru a	Consultatio n with the Mine's People, to try and achieve the	Out the window.	Relocation of post contact heritage structures must be	to the OEH, DPE local council, State	retain cultural	Investment into Aboriginal community education. The Upper					Education . Access sites.	Relocate artefacts to area for education purposes.	Salvage, offset areas.	To record and keep all our cultural informati on.	Having the right to thoroughly retrieve all cultural information

					nominate d and identified by the people as highly significant places to be protected and mitigated forever.	elders, to preserve and display cultural artefacts uncovere d.	best outcome for my people.		considered at all costs.	Ith government ministers.		Hunter needs an Aboriginal community controlled cultural education unit.						Education for all.			from the landscape and document it on a cultural perspective .
Miti on II	What types of programs do you think are important to Wonnarua people to create intergeneration al equity opportunities?	Equity. Capacity building. Training. Site conservatio n works. Business opportuniti es. Offsets.	Education . Capacity building. Training. Site conservat ion works. Business opportuni ties. Offsets.	Education . Equity. Capacity building. Training. Site conservati on works. Business opportuni ties. Offsets. School- based scholarshi ps, culture workshop s.	Education . Equity. Capacity building. Training. Site conservati on works. Business opportuni ties. Offsets. Health.	Education . Equity. Capacity building. Training. Site conservat ion works. Business opportuni ties.	Education. Training. Business opportuniti es.	Educatio n. Capacity works. Training. Site conserva tion works.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities . Outcomes.	Education. Equity. Capacity building. Training. Site conservation works. Business opportunities . Offsets. Plus reunions, health cont., cultural identity and language revival, permanent work/ employment, youth cultural camps, Elders cultural camps, Elders cultural camps, eg. teachers, doctors, etc.	Education. Equity. Capacity buildings. Training. Site conservation works. Business operations. Offsets. To keep our people up to date with technology. Scholarships outside mining. Help us replant with Indigenous plants. Cultural and arts, visual communication.	works. Business	Educatio n. Equity. Capacity building. Training. Site conserva tion works. Offsets.	Educatio n. Equity. Capacity buildings . Training. Site conserva tion works. Offsets.	Educatio n. Equity. Capacity building. Training. Site conserva tion works. Offsets.	Education. Equity. Capacity building. Training. Site conservati on works. Business opportuniti es. Offsets. Funds for Aboriginal kids (especially boys) education focusing on different ways of learning the governmen t curriculum which our kids struggle greatly with. Funds to set up an Aboriginal health care center in Muswellbr ook. Part fund the AMS and replicate in Muswellbr ook. (This is what is most important to me).	Education . Equity. Capacity building. Training. Site conservat ion works. Business opportuni ties. Offsets.	Education. Equity. Capacity building. Training. Site conservati on works. Business opportuniti es. Offsets.	Education. Equity. Capacity building. Training. Site conservatio n works. Business opportuniti es. Offsets.	Education . Equity. Capacity building. Training. Site conservat ion works. Business opportuni ties. Offsets.	Education. Equity. Capacity building. Training. Site conservatio n works. Business opportuniti es. Offsets. Giving community to utilise their skills and work on building partnership with Glencore.
Miti on II				School programs. Language programs. Archaeolo gical site training.	Need job specific training and qualificati ons with a demand so that there in always working opportunities. Minimum 12 months employm	Care and control? Specific signed agreemen t for fund, managem ent and reporting. Integratio n Equity: Funding for research to reconnect .	Integration equity.	Care and control? Training for kids.	Care and control? Care and control, before and post of potential mining interests. Intergenerati on equity for perpetuity	Care and control? Computers, scholarships outside of mining, arts, sports, small business, exclusion within language, technology, schools.	Care and control? Elder of the nation keeping up with systems technology and training. Cultural camps. Sports at high level.	Care and control? Cultural engagement. (respondent ticked Integration Equity)				Funds towards the girls Academy program at Muswellbr ook. Funds towards PCYC programs for young Indigenous Australians	Care and control? Training.	Care and control? Access to all artefacts, all sites, important trails.	(Responden tticked care and control and integration identity).	Care and control? And conservat ion museum for artefacts.	Care amd control? Conservati on and land-horticultur e programs, manageme nt ecology, GIS program learns mapping. Integrating equity: Working with

			ent to get on their feet.													Indigenous people on cultural camps beyond program and community
What specific capacity building programs would you like to see?	Training and employme nt quotas to assist in social equity and ensuring future generations are adequately skilled to succeed.	Business - start up.	As above.	Identified sporting skills should be financially assisted.		Educatio n.	Realistic policy development s which foster and nurture realistic outcomes.	Language W/S to our children before our knowledge holders pass. Same as our Cultural Land to refurbish the fauna that has been lost with all the mining going on.	Juvenile justice, working with children programs. Cultural healing.	Cultural education unit to deliver up to Cert. 2 level. Courses to engage community \$2 million over 3-4 years.	Funding for Aboriginal housing to help local families and employme nt opportuniti es.	(Respond ent ticked this box)	Training opportuniti es, employme nt of Aboriginal people in all aspects, operations.	Develop skills training Aboriginal mentors.	Working together and building partnersh ips.	Building relationship with community on a business level. Opportunit y of John Ventures with community . Working with health, issues, mental health domestic violence, holding or being part of forums on a sponsorshi p level.
What specific training programs would you like to see?	Small business manageme nt and mentoring. Full time traineeship s and apprentices hips. University internships and graduate programs. High school work experience program.	Training in: technolog y programs, cultural workshop.	Rehab of mine sites - machine operators. Specific to needs of company.	Identify individual 's skills and interest develop work experienc e, training programs .	Anything to do with our youth in their sporting abilities and job training.		Mining related positions for apprentices and young adults, full funded from mining coffers. Indigenous projects coordinators, for mining interests.	Business. Language. Cultural camps. Scholarships. Arts. Technology. Understandi ng our fauna as the old people did. Scholarships re: HECS.	Language (Wonnarua/Gringai)	3-5 Aboriginal apprenticeshi ps each year for people who live locally and went to school here.	More apprentice ships and traineeships specifically for all Aboriginal age groups. Skill building programs for young people (15-25?) to build skills that are essential to be employed.	(Respond ent ticked this box)	Employme nt of mentors, assistance in training.	Traineeship s. Apprentices hips.	School based traineeshi ps and scholarshi ps.	School based traineeship s, apprentices hips, scholarship s, language and culture programs, learning apps - culture - land etc.
What specific opportunities would you like to see in relation to business development?	Indigenous businesses to be able to utilize a financial committee for the duration of a contract to purchase plant equipment, etc. Diploma/Ce rt IV Small Business Manageme nt to ensure the potential businesses are adequately skilled and	Set up business in arts shop. Tourism business. Youth programs.	Respect. Training and jobs. Creating opportuni ties where there is a demand.	The opportuni ty to undertak e courses in business managem ent.		Small business es, take Aborigina I trained youth workers.	Small business enterprises associated with mining concerns, i.e. truck driving, fencing, land regeneration, machine operators, surveying assistants, etc.	WNAC to be greater, re: work/employ ment WNAC to continue to be here longer than the mines. WNAC to continue our culture and language. Giving land to grow plants from Wonnarua Lands.	management skills with Wonnarua Nation members. Bail houses for Koori kids, cultural camps for	Support for startups and ongoing mentoring.		Continue in training.	Continue through, training, in contracts for fencing, horticultur es.	Fencing contracts, tree planting.	Support and training for our people, and to become self- supportiv e.	Assistance in helping community set up their business by leasing office space and paying the lease for 12 months until business builds up contracts, etc. Putting the community through business counsel and building their Governanc

	competent in all facets of business and are able to manage their business interests.													e education up, or either putting up a fund for community to tap into to.	
Other Matters	What other matters do you think should be addressed by this process as part of the Project?	Need correction al services and assistance . Work rehabilitat ion employm ent. Upskilling for the workforce .	appropria te Glencore managem ent on an agreed timefram	Educate our youth, educate our elders. Small business ment skills, safe houses for youth on being released from internme nt.	Cross cultural training for mining personnel in local history, culture and heritage of affected groups, developed, structured and delivered by local Elders or persons of knowledge. Recognizing the groups who are real Traditional Owners and supporting their interest. Tell governments that only designated owners of country are the ones we will engage with and no other.	important is renumeration to WNAC and that it is well and truly appropriate in regards to what the mines will make over the year they	together as Wonnarua families. 2. Art and cultural practice for Wonnarua families. 3. Health and wellbeing for Wonnarua children. 4. Application for language online. 5. Top up WNAC's	200m either		Getting rid of the umbrella agreement . Actions being taken to improve protection of sites.	Ongoing consultati on.	Ongoing meetings with Glencore and ongoing consultations.	Training - education . Mental health. Sprt. Cultural camps. Cultural healing. Cultural swarenes s.	p of community attends high cost conference that relates to	Repatria tion of artefacts , access to areas where artefacts are repatriat ed to, length of time it takes to access mines to visit sites.

								1			
memorial											
walking											
trails in											
conjunction											
with											
national											
park and											
wild life,											
literacy and											
numeracy											
programs,											
and cultural											
camps											
within											
upper-											
lower											
Hunter.											

B.1.19 Archaeological Test Excavation Methodology





A VIEW OF ONE OF THE PROPOSED TEST EXCAVATION LOCATIONS ADJACENT TO BOWMANS CREEK IN THE NORTH OF THE PROJECT AREA.

ARCHAEOLOGICAL TEST EXCAVATION METHODOLOGY

Glendell Continued Operations Project
August 2018

PREPARED BY

OZARK ENVIRONMENTAL AND HERITAGE MANAGEMENT PTY LTD

FOR

UMWELT AUSTRALIA PTY LIMITED

ON BEHALF OF

MT OWEN PTY LTD

OzArk EHM

145 Wingewarra St (PO Box 2069) Dubbo NSW 2830

Phone: (02) 6882 0118 Fax: (02) 6882 0630 enquiry@ozarkehm.com.au www.ozarkehm.com.au

CONTENTS

1	1 Inti		duct	tion	1
	1.	1	Prea	amble	1
	1.	2	Вас	kground to the Test Excavation Program	. 1
	1.	3	Cod	le requirements for the Test Excavation Program	. 4
	1.	4	Abo	riginal community consultation	.6
2		The	Pote	ential Additional Disturbance Area	.8
3		Archaeological Context			
	3.	1	Pre	vious archaeological studies	12
		3.1.	1	Ravensworth East Archaeological Investigation (ERM 2002)	14
		3.1.	2	Glendell Project Area (Umwelt 2013)	15
		3.1.3 (OzArk		Aboriginal Archaeological Values Assessment: Mount Owen Continued Operatio	
		3.1.4 (OzArk 2		Archaeological Salvage. Liddell Coal Operations Development Modification	
		3.1.	5	Mount Owen Continued Operations Project Salvage Program (OzArk 2017)	20
4 Proposed Methods			ose	d Methods	23
	4.	1	Pur	pose of the test excavation program	23
	4.	2	Вас	kground to the test excavation program	23
	4.	3	Rati	onale behind the test excavation methodology	28
		4.3.1		Predicative model	28
	4.3.2		2	Research questions	28
	4.	4	San	npling Strategy	29
		4.4.	1	Sampling strategy compliance with the Code: Requirement 16	36
5	Referer		eren	ces	38

Glendell Continued Operations Project: Test Excavation Program Methodology

FIGURES

Figure 1-1: Key Project features3
Figure 2-1. Aerial showing the Project Area and the Potential Additional Disturbance Area 9
Figure 2-2. The Project Area showing major hydrological features10
Figure 2-3. The Potential Additional Disturbance Area overlain on a 1967 aerial image11
Figure 3-1. Location of previously salvaged sites in the vicinity of the Potential Additional
Disturbance Area
Figure 4-1: Aerial showing sites within proximity to the Potential Additional Disturbance Area. 25
Figure 4-2. Aerial showing the type of sites within the Proposed Additional Disturbance Area. 26
Figure 4-3: Location of the proposed test excavation program32
Figure 4-4: Detailed locations for the proposed test excavation program at Area 133
Figure 4-5: Detailed locations for the proposed test excavation program at Areas 2, 11 & 1233
Figure 4-6: Detailed locations for the proposed test excavation program at Areas 3 & 434
Figure 4-7: Detailed locations for the proposed test excavation program at Area 734
Figure 4-8: Detailed locations for the proposed test excavation program at Area 835
Figure 4-9: Detailed locations for the proposed test excavation program at Areas 9 & 10 35
Figure 4-10: Example of placement for test excavation pits at Areas 5 & 6
Tables
Table 3-1. Sites salvaged within the Project Area under Permit SZ32314
Table 3-2. Sites within the Project Area salvaged under Consent #226715
Table 3-3. Details of sites within the Project Area salvaged under AHIP C000062320
Table 3-4. Sites salvaged within the Project Area under SSD-5850
Table 4-1: Proposed areas for test excavation
Table 4-2: Previously recorded sites with PADs not included in the test excavation program27
Table 4-3: Sampling methodology for text excavation program31

Glendell Continued Operations Project: Test Excavation Program Methodology

1 Introduction

1.1 PREAMBLE

OzArk Environmental & Heritage Management (OzArk) would like to acknowledge the Traditional Owners of the area—the Wonnarua peoples—and pay respect to their cultural heritage, beliefs and continuing relationship with the land.

We pay respect to the Elders, both past and present, for they hold the memories, traditions, culture and hopes of Aboriginal people in the area.

This document sets out the proposed methodology for the test excavation program associated with the Glendell Continued Operations Project (the Project). Test excavation is an archaeological tool designed to help identify archaeological deposits of conservation value and to understand the nature and extent of the subsurface component of sites. The permissible actions undertaken during the test excavation program are governed by Section 3.1 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (Code of Practice). This clearly establishes that a test excavation program should sample a given area, rather than to completely excavate it, and that the program should be designed to answer specific archaeological questions rather that other, broader questions (see Requirement 17 Section 1.3).

The test excavation methodology for the Project was written by Ben Churcher (Principal Archaeologist, OzArk).

1.2 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The Glendell Mine is an open cut coal mine located at the Mount Owen Complex (MOC), within the Hunter Coalfields in the upper Hunter Valley of New South Wales (NSW). The Project Area is located approximately 20 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook.

The Project seeks to extend the life of Glendell Mine to 2044, with an increase in extraction rate over the life of the Project up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa. The Project will extend the life of the existing operation providing for ongoing employment opportunities for the existing Glendell workforce (**Figure 1-1**).

Key aspects of the Project include the continuation of the Glendell Pit to the north, the realignment of Hebden Road, the diversion of Yorks Creek and relocation of Ravensworth Homestead.

The Project will impact on areas that have previously been impacted by mining and are approved for mining as well as up to an additional approximately 870 hectares (ha) of land that has not previously been impacted by mining (the Potential Additional Disturbance Area).

Glendell Continued Operations Project: Test Excavation Program Methodology

2

Umwelt Australia Pty Ltd (Umwelt) has been engaged by Mt Owen Pty Ltd on behalf of Glendell Tenements Pty Ltd (the proponent) to prepare an Environmental Impact Statement (EIS) for the Project which involves the development of an Aboriginal Archaeology Impact Assessment (AAIA).

As part of the AAIA, OzArk have been engaged to undertake the archaeological assessment of the areas that will be potentially impacted by the Project. The surface archaeological assessment has already been completed over the Potential Additional Disturbance Area during April and May 2018.

As a result of the surface archaeological assessment, 12 locations have been identified that require subsurface test excavation in order to determine the integrity and/or extent of sites recorded during the field assessment.

This document sets out the proposed methodology for the test excavation and follows the Code of Practice under Part 6 *National Parks and Wildlife Act 1974* (NPW Act).

Additionally, test excavations related to historic heritage at the Ravensworth Homestead may also be required. There is potential for Aboriginal artefacts to be encountered in historic test excavations. The methodology for the historic test excavations will have policies relating to the potential of encountering Aboriginal artefacts and this methodology will be circulated separately to the Registered Aboriginal Parties (RAPs) for the Project once prepared.

Glendell Continued Operations Project: Test Excavation Program Methodology

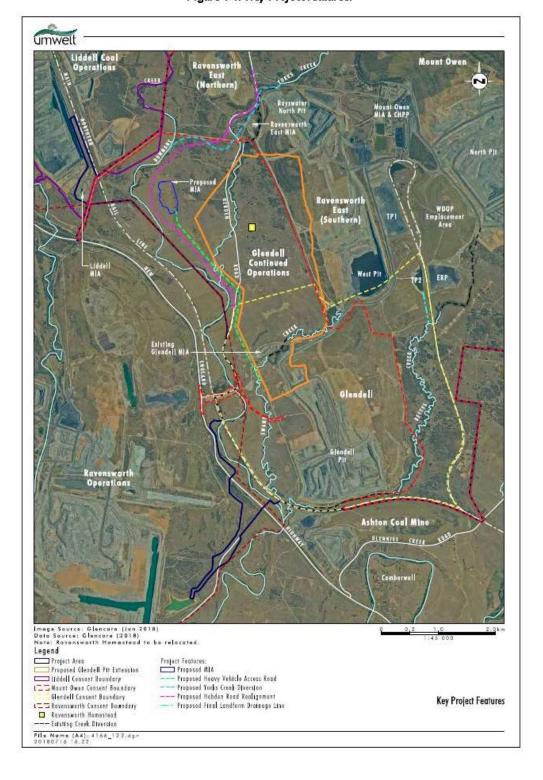


Figure 1-1: Key Project features.

1.3 CODE REQUIREMENTS FOR THE TEST EXCAVATION PROGRAM

The Code of Practice lists a number of requirements pertaining to test excavation. These requirements are enumerated below and further information pertaining to these requirements follow in subsequent sections of this document.

Requirement 14 (Test excavation which is not excluded from the definition of harm):

Sub-surface investigation will not be excluded from harm where they are carried out in the following areas:

- o in or within 50m of an area where burial sites are known or are likely to exist
- o in or within 50m of a declared Aboriginal place
- o in or within 50m of a rock shelter, shell midden or earth mound
- in areas known or suspected to be Aboriginal missions or previous Aboriginal reserves or institutes
- in areas known or suspected to be conflict or contact sites.
 - > The test excavation locations are not located within the vicinity of the items listed under Requirement 14 of the Code.
 - It is noted, however, that the entirety of the test excavation program is taking place in an area where there is the potential for conflict or contact sites due to the program's location within the former Ravensworth Estate and its proximity to the Ravensworth Homestead where early contact (and potentially conflict) between Aboriginal people and settlers may have occurred. While there are no known specific conflict or contact sites within the immediate vicinity of the test excavation areas, should such sites come to light during the test excavation works, all archaeological testing under the Code of Practice will immediately cease at that location.
 - Further, the Secretary's Environmental Assessment Requirements (SEARs) for the Project (SSD 9349; issued 7 June 2018), indicate that test excavation is a required aspect of the Aboriginal cultural heritage assessment:
 - Office of Environment and Heritage (OEH) input into SEARs, Attachment A Point 6 (in part): "The Environmental Impact Assessment (EIS) must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in the Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation."
- Requirement 15a (Consultation): As the proposed archaeological test excavation
 program is part of the Project, consultation has been ongoing with the RAPs and has been
 completed to the stage described in subclause 80C (6) of the National Parks and Wildlife
 Regulation 2009 (NPW Regulation).

Glendell Continued Operations Project: Test Excavation Program Methodology

5

Page | 205

- Requirement 15b (Test excavation sampling strategy): This document sets out the proposed sampling strategy for the test excavation program.
- Requirement 15c (Notification):
 - o the location of the proposed test excavation and the subject area.
 - > This document sets out the proposed location of the test excavation program.
 - the name and contact details of the legal entity with overall responsibility for the project.
 - Mt Owen Pty Limited, 642 Hebden Road, RAVENSWORTH NSW 2330
 - the name and contact details of the person who will be carrying out the test excavations where this is different to the legal entity with overall responsibility for the project.
 - OzArk Environmental & Heritage Management, 145 Wingewarra St, DUBBO NSW 2830
 - the proposed date of commencement, and estimated date of completion, of the test excavations.
 - Anticipated Commencement: 03/09/2018
 - > Anticipated Completion: 21/09/2018

Weather permitting, the projected period for the excavation is up to 15 days.

- the location of the temporary storage location for any Aboriginal objects uncovered during the test excavations.
 - Aboriginal objects recovered during the excavations will be temporarily housed in a locked container at 21 Agnes Ave, CRESTWOOD, NSW, 2620 (OzArk branch office) for analysis. Following analysis the artefacts will be stored in accordance with the MOC Aboriginal Cultural Heritage Management Plan (MOC ACHMP) until such time as a Care Agreement is reached between an individual or organisation and the Office of Environment and Heritage (OEH). If no analysis is required (i.e. all analysis is completed in the field), the artefacts will be stored in accordance with the MOC ACHMP. Other objects, such as faunal or charcoal samples, may be sent to third party specialists for analysis.
- Requirement 16a (Test Excavation): The test excavation program will adhere to Requirement 16a of the Code as set out in this document (see Section 4.3).
- Requirement 16b (Objects recovered during test excavations): Aboriginal objects recovered during the excavations will be analysed at 21 Agnes Ave, CRESTWOOD, NSW, 2620 (OzArk branch office). When not being analysed, the objects will be temporarily stored in a locked container at 21 Agnes Ave, CRESTWOOD, NSW, 2620. Following analysis the objects will be stored according to the MOC ACHMP. If no analysis is required (i.e. all analysis is completed in the field), the artefacts will be immediately

Glendell Continued Operations Project: Test Excavation Program Methodology

P18-0089

stored according to the MOC ACHMP until such time as a Care Agreement is reached between an individual or organisation and OEH.

- Requirement 17 (When to stop test excavations): the test excavation program will adhere to the requirements set out in the Code: Any test excavation carried out under this requirement will cease when suspected human remains area encountered; or when enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.
 - OzArk shall ensure that this Requirement is adhered to during the test excavation program. This will include ceasing work as soon as human skeletal material is noted and immediately notifying the police. If the skeletal material is determined to be Aboriginal, OEH will be immediately notified

1.4 ABORIGINAL COMMUNITY CONSULTATION

A draft of this test excavation methodology was issued to all RAPs on 19 July 2018 for a 28 day review period closing on 17 August 2018.

From 31 July to 2 August 2018, during the review period for this document, a series of on-site meetings were held with RAPs to initiate discussions regarding the cultural values of the Potential Additional Disturbance Area. As part of these meetings, Ben Churcher, OzArk Principal Archaeologist, presented a summary of the results of the archaeological survey and introduced the methodology and location of the test excavation program. In addition, these meetings involved RAPs being shown various areas within the Potential Additional Disturbance Area where test excavation was planned to take place.

As a result of these meetings, only one specific comment from Luke Hickey was received regarding the test excavation methodology. This comment revolved around the spacing of the test excavation squares which were proposed to be spaced at 10 metre (m) intervals, while Luke felt this spacing was too wide and proposed a 5 m spacing. During discussion on this issue, it was agreed that small potential archaeological deposits (PADs) would be sampled by excavation squares at 5 m intervals; while larger PADs would be sampled at 10 m intervals so that a broad representation of the landform could be sampled.

As a result of Luke's concerns, Point 3 in Section 4.4 has been added to this document.

At the end of the 28 day review period, three further responses were received from RAPs. These responses are set out below. There was no requirement to amend the test excavation methodology as a result of these responses.

Ryan Johnson (Murra Bidgee Mullangari).

I have read the project information and draft test pitting methodology and endorse the recommendations made.

Glendell Continued Operations Project: Test Excavation Program Methodology

> Jesse Carroll - Johnson (Muragadi Heritage Indigenous Corporation)

I have read the recommendations for the Glendell project and endorse the recommendations made by Ozark, if you require further details please contact.

> Kevin Duncan

Yaama Bridie, Thank you for the results of the Draft Test Pitting Methodology for the Glendell Project. I as an Aboriginal Traditional Custodian of these areas strongly disapprove of Mining in our Traditional Lands as Mining has done much damage to our natural Environment and Cultural Space. For thousands of years these lands have been important places for our people. In the result of Mining across the Valley into Jerry's Plains the Land itself will never recover and thousands of years of Cultural History wiped forever. My words I know will probably not be recognised in context to my Human Right as an Indigenous person under United Nations Charter of Indigenous Peoples Rights which Australia is Signatory. So even in my protest to protect and preserve Culture that is older than the Pyramids themselves they will ultimately will be destroyed. This is my True expression of who I am as an Aboriginal Person and of my feelings for my Ancestral Home Lands. Sincerely Kevin Duncan Gomeroi, Wonnorua Awaba, Peoples

Glendell Continued Operations Project: Test Excavation Program Methodology

8

2 THE POTENTIAL ADDITIONAL DISTURBANCE AREA

Figure 2-1 shows the Project Area and the extent of the Potential Additional Disturbance Area.

The majority of the Potential Additional Disturbance Area has been already cleared and includes flat landforms and associated lower and mid slope landforms associated with Bowmans, Yorks and Swamp Creeks (Figure 2-2). Historically the area has been intensively farmed leading to widespread vegetation loss and soil erosion (Figure 2-3).

The region surrounding the Project Area is an area that holds high cultural value for Wonnarua people and the wider landscape surrounding the Project Area has deep meaning to Wonnarua people.

Many of the Aboriginal community are also deeply concerned about the existence of 'massacre sites' within the former Ravensworth Estate which includes the Potential Additional Disturbance Area. There is very little supporting historic evidence regarding the actual location of any such sites, despite this having been expressed strongly as 'stories' and cultural knowledge held by a knowledge holder for the area. All available evidence, however, indicates that the area is outside, and a number of kilometres from, the Project Area (ACHM 2013: 66–69).

The wider cultural landscape surrounding the Project Area is of high cultural and historical significance to Wonnarua people. The historical associations with early settlement, conflict, dispossession and survival are important, and the area is seen as a significant surviving cultural landscape to numerous members of the Wonnarua people. Overall, the cultural significance of the wider region is considered to be high.

The landscape within the Potential Additional Disturbance Area is highly disturbed and fragmented, resulting in the fact that much of the natural landscape no longer exists as the history of agriculture and coal mining has irreversibly altered the landscape. With the remnant cultural landscape within the Potential Additional Disturbance Area having undergone considerable modification since European settlement, the Potential Additional Disturbance Area potentially has a lower cultural significance than the surrounding region. However, landscape features, such as creek lines, have often been cited as being of cultural importance and the Potential Additional Disturbance Area contains portions of Bowmans, Yorks and Swamp Creeks. These waterways would contribute and enhance the residual cultural landscape of the Potential Additional Disturbance Area.

Glendell Continued Operations Project: Test Excavation Program Methodology

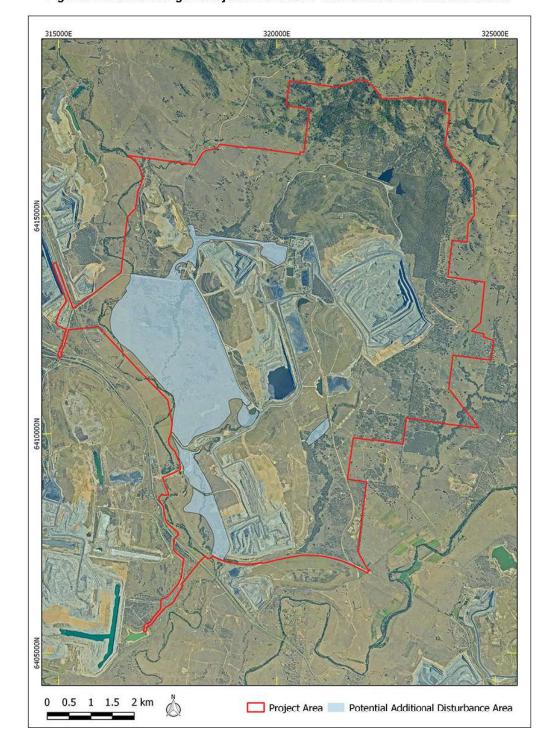


Figure 2-1. Aerial showing the Project Area and the Potential Additional Disturbance Area.

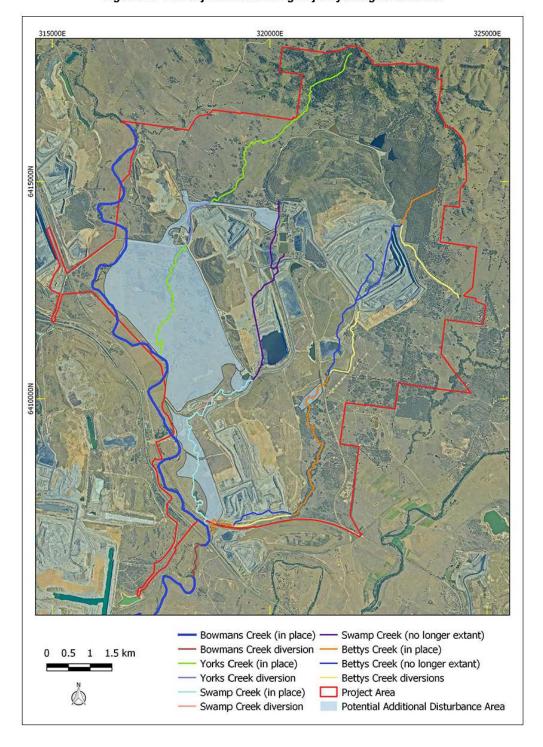


Figure 2-2. The Project Area showing major hydrological features.

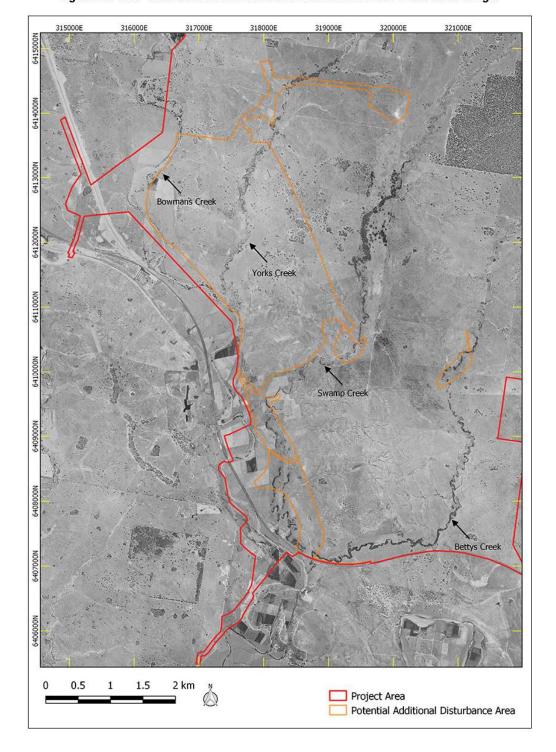


Figure 2-3. The Potential Additional Disturbance Area overlain on a 1967 aerial image.

11

3 ARCHAEOLOGICAL CONTEXT

3.1 Previous archaeological studies

The Project Area has been subject to previous Aboriginal archaeological survey and assessment in the recent past resulting in the recording of multiple Aboriginal sites.

Based on current information from the OEH managed Aboriginal Heritage Information Management System (AHIMS) database, there have been a number of sites recorded either within the Potential Additional Disturbance Area, or in close proximity.

During the course of the survey all valid and partially valid sites were revisited and the majority recorded currently visible artefacts. At those sites where there were no visible surface artefacts, possible explanations include:

- The sites have a low artefact density and it is therefore easier to understand that a low number of artefacts could be obscured whereas larger, more-dense artefact sites would retain a surface manifestation
- The high degree of water movement in some areas that has probably removed artefacts
 from their find location. This reinforces how dynamic any landscape is and how difficult it
 is to re-locate low density sites after a passage of time.

There have been numerous archaeological investigations in the local area and a number within the Potential Additional Disturbance Area itself. The results of these investigations provide an archaeological context for the assessment and were used in the preparation of a predictive model of Aboriginal site location for the pedestrian survey. These studies were summarised in the Survey Methodology. For the purpose of the test excavation program, only the studies involving subsurface test excavation or salvage are summarised here.

Glendell Continued Operations Project: Test Excavation Program Methodology

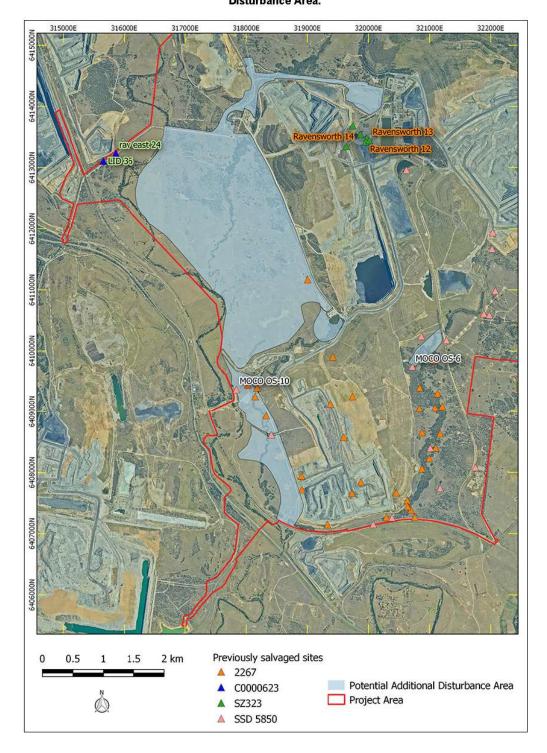


Figure 3-1. Location of previously salvaged sites in the vicinity of the Potential Additional Disturbance Area.

14

3.1.1 Ravensworth East Archaeological Investigation (ERM 2002)

In 2002 ERM conducted archaeological excavations and salvage grader scrapes over areas of the Ravensworth East Mine under Permit SZ323. These investigates were located in the central portion of the Project Area, in areas along the former course of Swamp Creek (ERM 2002). The area where this work took place is now highly modified and outside of the Potential Additional Disturbance Area. Figure 3-1 lists the six sites salvaged within the Project Area under the 2002 ERM program. The location of these sites is shown on Figure 3-1.

Table 3-1. Sites	saivaged withi	in the Project Arc	ea under Permi	SZ323.

AHIMS#	Site name
37-3-0399	Ravensworth 10
37-3-0398	Ravensworth 09
37-3-0400	Ravensworth 11
37-3-0401	Ravensworth 12
37-3-0402	Ravensworth 13
37-3-0403	Ravensworth 14

The combined geomorphological investigations undertaken by ERM highlighted the Swamp Creek valley as the key area likely to yield archaeological evidence of Aboriginal occupation within the ERM study area. However, these studies also showed that although buried land surfaces were apparent within the valley, evidence of Pleistocene Aboriginal occupation was unlikely to be recovered. Archaeological sampling of soil from these land surfaces failed to yield any archaeological material, confirming this view. In light of this, no further pursuit of Pleistocene archaeological deposits was undertaken within the scope of the excavation program.

The initial archaeological component of ERM's investigation, which included grader scrapes spread over three different landscapes across the valley, at varying distances from water sources, yielded little archaeological evidence. Of the three grader scrapes, three artefacts were recovered over a total area of 560 square metres (m²).

A low rise adjacent to the swampy meadow channel west of Swamp Creek in the vicinity of surface sites Ravensworth 12 to 14, revealed substantial archaeological material with several artefact concentrations located approximately 40 metres (m) to 60 m away from the channel. Test pit excavation yielded an artefact spread up-slope of the channel from approximately 10 m from the current channel edge, extending across the rise in all directions. A total of 87 artefacts were recovered from the 11 test pits. Over a combined excavated area of 11 m², this represents an artefact density of 7.9 artefacts/m². The largest artefact concentration (44 pieces or 50.57% of the total assemblage) was excavated from Test Pit 4 located on the peak of the rise. Without the Test Pit 4 artefact concentration, artefact density would have been substantially lower, at 4.3 artefacts/m², as the majority of test pits contained five artefacts or less. 82.75% of the assemblage was mudstone and 17.25% was silcrete.

Glendell Continued Operations Project: Test Excavation Program Methodology

Open excavation of the site complex Ravensworth 12–14 recovered a concentrated artefact scatter across the peak of the rise within the very shallow A-Horizon soil. Open excavation on this rise was proposed by Margrit Koettig (then at the NSW Department of Environment and Climate Change) to define the apparent spread of artefacts from TP4, and to further establish the nature of this subsurface deposit, specifically to investigate whether it contained hearths and identifiable activity areas. The open area excavation of 86 m² (including TP4) was conducted in July–August 2001 by ERM. 1,168 artefacts were excavated in the open excavation and the investigations revealed a continuation of artefacts over the low rise, rather than what was originally recorded as three individual surface sites. Within this scatter, several distinct areas of artefact concentration were recorded, all with quantities of associated charcoal and burnt earth. The assemblage comprised backed artefacts and associated manufacturing debitage, mostly of mudstone.

Seven raw materials were represented in the open excavation. Mudstone was the dominant raw material observed, accounting for almost 80% of the total artefact numbers. This mirrored the initial trend set in testing phase. Silcrete was the next most common material and comprised nearly 20% of the assemblage. The remainder of the artefacts (less than 2%) was produced from six other raw material types.

Five artefact types were identified in the assemblage. The majority of artefacts were whole flakes accounting for more than 50% of the assemblage with broken flakes (almost 30%) and flaked pieces (approximately 15%) making up much of the remaining assemblage numbers. All modified artefacts, consisting of cores and retouched flakes, made up just under 2% of the assemblage.

3.1.2 Glendell Project Area (Umwelt 2013)

Salvage of the Glendell project area was undertaken under National Parks and Wildlife Services (NPWS) section 90 Consent #2267 and formed Part 4 of the salvage program for the Bettys Creek valley. This archaeological salvage within the Glendell project area was conducted by Umwelt and the Aboriginal community between November 2005 and February 2006. **Table 3-2** lists those sites within the Project Area that were salvaged under Consent #2267. The location of these sites is shown on **Figure 3-1**.

Table 3-2. Sites within the Project Area salvaged under Consent #2267.

AHIMS	site name Salvage methodology	
37-3-0599	Bettys Creek 9	Surface Collection with Subsurface Investigation (manual excavation)
37-3-0601	Bettys Creek 11	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0602	Bettys Creek 12	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0604	Bettys Creek 14	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0605	Bettys Creek 15	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0606	Bettys Creek 16	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0607	Bettys Creek 17	Surface Collection with Subsurface Investigation (grader scrapes)

Glendell Continued Operations Project: Test Excavation Program Methodology

P18-0089

Page | 215

AHIMS	site name	Salvage methodology
37-3-0608	Bettys Creek 18	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0609	Bettys Creek 19	Surface Collection
37-3-0610	Bettys Creek 20	Surface Collection
37-3-0618	Swamp Creek 1	Surface Collection
37-3-0619	Swamp Creek 2	Surface Collection
37-3-0620	Swamp Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0621	Swamp Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0622	Swamp Creek 5	Surface Collection
37-3-0623	Swamp Creek 6	Surface Collection
37-3-0624	Swamp Creek 7	Surface Collection
37-3-0026	Glennies Creek Site B / Bettys Creek - B	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0625	Swamp Creek 8	Surface Collection
37-3-0027	Glennies Creek Site C / Bettys Creek - C	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0626	Swamp Creek 12	Surface Collection
37-3-0592	Bettys Creek 1	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0627	Swamp Creek 13	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0593	Bettys Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0773	Swamp Ck 10	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0594	Bettys Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0595	Bettys Creek 5	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0596	Bettys Creek 6	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0597	Bettys Creek 7	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0598	Bettys Creek 8	Surface Collection with Subsurface Investigation (grader scrapes)

A total of 2,713 artefacts were recovered from the Glendell project area salvage including 824 (30.6%) from the surface collection, 274 (10.1%) from Excavation 1 (Bettys Creek 10), 19 (0.7%) from Excavation 2 (Bettys Creek 9), 1,414 (52.1%) from Excavation 3 (Bettys Creek 2) and 177 (6.5%) from the grader scrapes. A total of 2,604 (96%) of the artefacts were recovered from the Bettys Creek catchment, 52 (1.9%) from the Bowmans Creek catchment and 57 (2.1%) from the Swamp Creek catchment.

Observations made from the surface collection assemblage were as follows:

- The highest number of artefacts were collected from Bettys Creek 14 (26.7% of the surface collection assemblage), followed by Bettys Creek 10 (19.5% of the assemblage)
- 60.6% of the artefacts were collected from lower slopes and floodplains associated with creek lines (56.7% from Bettys Creek; 3.3% from Swamp Creek and 0.7% from Bowmans Creek)
- Sites on low but elevated spurs in tributary confluences comprised 22.2% of the assemblage; ridge crests (7.5%); sites on lower slopes on tributary channels more than 150 m from the main creek channel (7.5%); mid slope sites (1.3%) and upper slopes (0.6%)

Glendell Continued Operations Project: Test Excavation Program Methodology

16

- The dominant artefact type was broken flakes (45%); followed by flakes (26.7%); flaked pieces (10.9%); retouched flakes (10%), cores (3.7%), heat shatter (3.4%) and grindstones (0.4%)
- A total of 31 cores were recovered from the surface collection. Of these, 21 were recovered from the Bettys Creek sites (17 from areas with tributary confluences with Bettys Creek)
- Mudstone was dominant within the assemblage making up 58.5% of the artefacts, followed by silcrete (31.9%) with the remaining raw materials making up 9.6% of the total assemblage.

Excavation was targeted at Bettys Creek 2, Bettys Creek 9 and Bettys Creek 10 indicated the following:

- Bettys Creek 10 and Bettys Creek 2 retained a level of spatial integrity reflected by knapping events and raw material distribution patterns
- Bettys Creek 9 contained artefacts in a secondary context
- All three locations contained backed flakes
- A ground oven identified at Bettys Creek 2 had an absolute date of 2188+/-39 BP (years before present)
- It was possible to obtain one radiocarbon date of 3077±40 BP (calibrated-Wk-20912) from Square K Spit 3 of Excavation 3 within the Mount Owen Extension Area. The date was relative in nature as it belonged to a large piece of burnt wood that was associated with artefacts both above and below it. Thus the artefacts above it must be dated to later than 3077±40 BP and those below it to earlier
- Broken flakes (45.7%) dominated the artefact assemblage, followed by flakes (38.7%)
- Bettys Creek 10 and Bettys Creek 2 were dominated by mudstone while Bettys Creek
 9 was dominated by silcrete. Overall, mudstone was dominate (55.7%) over silcrete (32.3%)
- A small knapping event was evident at Bettys Creek 10, with greater amounts of knapping noted at Bettys Creek 2
- Core to flake ratios for Bettys Creek 10 were 1:28.7 and for Bettys Creek 2 were 1:27.4 suggesting knapping on site.

As a result of the Umwelt investigations outlined above, today's archaeological landscape, particularly along Bettys Creek, but also along Swamp Creek and Bowmans Creek in the vicinity of the Project Area, has been extensively studied.

Glendell Continued Operations Project: Test Excavation Program Methodology

3.1.3 Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations (OzArk 2013)

The assessment area for the Mount Owen Continued Operations (MOCO) Project disturbance area covered approximately 500 ha with portions of the assessment area encompassing part of the southern portion of the Potential Additional Disturbance Area.

Australian Cultural Heritage Management Pty Limited (ACHM) were engaged by MOC to undertake Aboriginal community consultation for the MOCO Project and to author the Aboriginal Cultural Heritage Assessment Report (ACHAR) to which OzArk 2014 contributed (ACHM 2013). The ACHM report appeared as Appendix 13a (Parts 1 and 2) of the MOCO Project *Environmental Impact Statement* (EIS) (Umwelt 2015). ACHM 2013 contains the cultural, aesthetic and historic values of the area, while OzArk 2014 contains an examination of the scientific values of the area.

The archaeological survey for the MOCO Project took place over two weeks from 26 November 2012 to 7 December 2012. The archaeological test excavation program for the MOCO Project took place over one week from 11 March 2013 to 15 March 2013. In 2014, the proposed disturbance area for the MOCO Project was expanded slightly necessitating a further one day of survey that took place on 29 April 2014. The results of these investigations are detailed in OzArk 2014 and contained in Appendix 13b of the MOCO Project EIS (Umwelt 2015).

Results

Large portions of the MOCO Project (223 ha) had been subject to previous Aboriginal Heritage Impact Permits (AHIPs) with extensive areas having already undergone archaeological assessment and salvage. Within the MOCO disturbance area, 18 sites had already been salvaged by manual excavation and more expansive additional areas have been subject to grader scrapes to salvage subsurface artefacts. Over the years, both from within the MOCO disturbance area and from adjacent landforms, over 11,000 artefacts had already been recovered as a result of these programs.

As a result of the scientific values assessment for the MOCO Project, 39 Aboriginal sites were recorded; consisting of:

- 11 artefact scatters (37-3-1189 to 37-3-1199)
- 25 isolated finds (37-3-1170 to 37-3-1188 and 37-3-1212 to 37-3-1216)
- Three extensions to previously recorded sites (Extension to site 37-3-0649, Extension to site 37-3-0611 and Extension to site 37-3-0600).

In addition, the MOCO disturbance area contained three previously recorded sites, 37-3-0611, 37-3-0985 (low density artefact scatters) and 37-3-0527 (isolated artefact). Thus, 42 sites were known to exist within or close to the MOCO disturbance area.

Glendell Continued Operations Project: Test Excavation Program Methodology

18

At two locations within the MOCO disturbance area, test excavations were carried out under the OEH Code of Practice. At one location (37-3-1191), no artefacts were recorded during the test excavations, while at the second location (37-3-1192), 114 artefacts were recorded, with over 80% coming from one discrete concentration. As a result, it was determined that 37-3-1191 is a displaced site with no associated archaeological deposits, while 37-3-1192 is a low density artefact scatter along the banks of the 'eastern drainage' line with one known concentration of artefacts.

Two sites recorded during the survey, 37-3-1194 and 37-3-1198, remain partially extant in the Potential Additional Disturbance Area.

Conclusion

Those archaeological sites in the disturbance area investigated revealed relatively sparse artefact concentrations in shallow and disturbed contexts. Archaeologically, all of the places located and/or identified conform to the Australian Small Tool Tradition¹, and most likely date to no more than the last 2,000 to 3,000 years.

The majority of the disturbance area had been subjected to varying degrees of land clearing and mining since first settlement, destroying the primary context of much of the physical cultural material present, and irretrievably altering the landscape itself.

Given the nature and extent of the archaeological sites identified, there was little additional knowledge which could be added to the archaeological record from any further investigation of this material. There is little probability for the presence of undisturbed and deeply stratified archaeological sites within the disturbance area.

In general, the archaeological sites in the MOCO disturbance area offered:

- Limited research potential in regard to regional and/or localised subsistence and resource procurement activities
- Limited research potential to address questions on stone tool technologies in the region
- Limited potential for radiometric dating methods to be applied to the sites
- Limited research potential to address questions about the timing of the first occupation of this region of the Hunter Valley
- Limited research potential to address questions about the timing of the Aboriginal settlement history of the Hunter Valley
- Limited potential to reveal further unique spatiotemporal patterning which would add to the archaeological record.

Glendell Continued Operations Project: Test Excavation Program Methodology

19

¹ The Australian Small Tool Tradition (also sometimes referred to as 'Bondaian') is a term applied to the Holocene period Aboriginal tool kit; distinguishing it from the earlier Australian Core Tool and Scraper Tradition generally dated to the Pleistocene period.

3.1.4 Archaeological Salvage. Liddell Coal Operations Development Modification 5 (OzArk 2015)

OzArk was engaged by Liddell Coal Operations (LCO) to undertake the salvage of 15 Aboriginal archaeological sites for Development Modification 5 of DA 305-11-01 and was approved under AHIP #C0000623. The salvage of the sites was undertaken on 28 January 2015 and 24 to 25 February 2015.

Artefacts were retrieved from seven of the 15 sites. A total of 46 artefacts were salvaged across all sites. The majority of the 46 artefacts recovered from the salvage were flakes (73.9%). Other artefact types included cores, flaked pieces, debitage, blades and a core fragment. Almost all artefacts were made from mudstone (56.5%) and silcrete (39.1%). Quartz and basalt artefacts were also present. Most artefacts were at a tertiary (65.2%) stage of reduction, with the rest secondary (34.8%). There were no artefacts at the primary stage of reduction.

The artefacts that were salvaged closely correspond to the regional context. The low proportion of formal tools (just one in 46) and the high percentage of flakes and debitage (76%) in the salvaged assemblage are typical of the region, but this is probably true in most sites across Australia. Mudstone has been recorded to be the most common raw material in the region, which was the case for the salvaged artefacts, and the other materials salvaged are also common.

Details of the two sites in this program that are near the Potential Additional Disturbance Area are listed in **Table 3-3** and shown on **Figure 3-1**.

Table 3-3. Details of sites within the Project Area salvaged under AHIP C0000623.

AHIMS#	Site name	Artefacts salvaged	Notes
37-3-0419	Rav 24 East	12	This site was salvaged by surface collection and grader-scrape salvage. The ground surface visibility (GSV) of 15% is based on pre-grader-scrape visibility. The grader-scrapes added an additional 20% GSV.
37-3-1152	LID 36	1	Rakes were used to remove wood chips from the ground and improve GSV.

3.1.5 Mount Owen Continued Operations Project Salvage Program (OzArk 2017)

In early 2017 the MOCO salvage program took place under the authority of the 2016 MOC ACHMP (XMO SD PLN 0060). This program was completed in the approved disturbance areas associated with the MOCO Project (SSD-5850).

This program included the collection of surface artefacts at 26 sites resulting in 163 artefacts being recorded. Included in the tally of 26 sites, were two sites where limited archaeological excavation took place resulting in a further 187 artefacts being recorded. An additional area on the east bank of Bowmans Creek proposed for impact by the new Hebden Road Bridge was also subject to archaeological investigation by manual excavation but the area proved to be highly disturbed and no artefacts were recorded.

Glendell Continued Operations Project: Test Excavation Program Methodology

In addition, there were three sites that were unable to be salvaged, one as it was on land not owned by Mount Owen (37-3-0527) and two due to the fact that the area of the sites had previously been unintentionally impacted by mining activities (37-3-1171 and 37-3-1189)². These unintentional impacts were self-reported to the OEH who issued an official caution to MOC on 17 March 2016. Sites salvaged within the Project Area under SSD-5850 are listed in **Table 3-4** and shown on **Figure 3-1**.

Table 3-4. Sites salvaged within the Project Area under SSD-5850.

Site ID	Site Name	Site Type	Number of Artefacts Salvaged	Salvage methodology
37-3-0527	Ashton EWA 17	Artefact scatter	N/A	Not salvaged (access)
37-3-0611	Bettys Creek 21	Artefact scatter	2	Surface collection and excavation
37-3-1170	MOCO IF-1	Isolated find	0	Surface collection
37-3-1171	MOCO IF-2	Isolated find	N/A	Not salvaged (previously destroyed)
37-3-1174	MOCO IF-5	Isolated find	1	Surface collection
37-3-1176	MOCO IF-7	Isolated find	0	Surface collection
37-3-1177	MOCO IF-8	Isolated find	0	Surface collection
37-3-1178	MOCO IF-9	Isolated find	1	Surface collection
37-3-1179	MOCO IF-10	Isolated find	0	Surface collection
37-3-1180	MOCO IF-11	Isolated find	2	Surface collection
37-3-1181	MOCO IF-12	Isolated find	1	Surface collection
37-3-1182	MOCO IF-13	Isolated find	2	Surface collection
37-3-1183	MOCO IF-14	Isolated find	3	Surface collection
37-3-1184	MOCO IF-15	Isolated find	2	Surface collection
37-3-1189	MOCO OS-1	Artefact scatter	N/A	Not salvaged (previously destroyed)
37-3-1190	MOCO OS-2	Artefact scatter	2	Surface collection
37-3-1191	MOCO OS-3	Artefact scatter	24	Surface collection
37-3-1192	MOCO OS-4	Artefact scatter	257	Surface collection and excavation
37-3-1193	MOCO OS-5	Artefact scatter	2	Surface collection
37-3-1194	MOCO OS-6	Artefact scatter	5	Surface collection
37-3-1195	MOCO OS-7	Artefact scatter	0	Surface collection
37-3-1196	MOCO OS-8	Artefact scatter	3	Surface collection
37-3-1197	MOCO OS-9	Artefact scatter	36	Surface collection
37-3-1198	MOCO OS-10	Artefact scatter	10	Surface collection
37-3-1199	MOCO OS-11	Artefact scatter	7	Surface collection
37-3-1211	MOCO IF-18	Isolated find	0	Surface collection
37-3-1212	MOCO IF-21	Isolated find	2	Surface collection
37-3-1213	MOCO IF-22	Isolated find	2	Surface collection

² In addition, MOCO OS-3 was unintentionally partially impacted by mining activities and the remainder of this site was salvaged during the salvage program.

Glendell Continued Operations Project: Test Excavation Program Methodology

21

22

Site ID	Site Name	Site Type	Number of Artefacts Salvaged	Salvage methodology
	Bowmans Creek East Bank (Hebden Road)	Potential archaeological deposit (PAD)	0	Manual excavation.

Of all the sites investigated in the 2017 salvage program, 37-3-1192 (MOCO OS-4 located on an unnamed watercourse termed the 'eastern drainage') recorded the highest artefact density with 71 surface artefacts (43.5% of all surface artefacts recorded during the salvage program) and 186 artefacts recorded in the test excavation component of the program (constituting almost all of the artefacts recorded in the test excavation component of the program). 37-3-1192 was located in area heavily affected by erosion and the investigation showed that while one concentration of artefacts remained *in situ*, the majority of the site had been displaced by the erosion.

Other sites that recorded more than 10 artefacts during the salvage program were 37-3-1191, 37-3-1197 and 37-3-1198. 37-3-1194 and 37-3-1198 remain partially extant within the Potential Additional Disturbance Area. All other sites recorded very low artefact numbers supporting the conclusion reached in OzArk 2014 that the remaining archaeological values at MOC consist of low density, often displaced, artefact scatters.

The recording of these sites affords with the general picture emerging that sites located away from permanent water are likely to have a low artefact density and low site complexity.

Glendell Continued Operations Project: Test Excavation Program Methodology

4 Proposed Methods

4.1 Purpose of the test excavation program

The purpose of the test excavation program is to understand more completely the nature of the sub-surface material within the Potential Additional Disturbance Area. Data obtained from the test excavation program will inform the mitigation and management options in the forthcoming AAIA.

The aims are therefore to:

- 1. Establish the extent and nature the of sub-surface archaeological deposits at a site or landform with archaeological potential
- Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the Potential Additional Disturbance Area
- 3. Develop, in consultation with the RAPs, an informed management strategy for the site to assist in mitigating the proposed impacts.

As a result, locations initially considered for the test excavation program are limited to:

- · Areas identified during the pedestrian survey as having archaeological potential
- Landforms which are relatively intact (i.e. not within disturbed contexts)
- Previously recorded sites which were potential archaeological deposits (PADs) or had PADs associated with them.

Excavations undertaken as per the Code do not require an AHIP under the NPW Act.

4.2 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The test excavation program follows an extensive program of surface survey that focused on the Potential Additional Disturbance Area rather than the Project Area as a whole. The Aboriginal heritage surface survey was undertaken by two teams on 9 to 20 April 2018, and by one team on 30 April to 1 May 2018 with each team consisting of two archaeologists and up to four RAPs. The assessment consisted of full pedestrian assessment of the Potential Additional Disturbance Area.

The results of the Aboriginal heritage assessment will be contained in the forthcoming AAIA that will provide full details of all sites recorded. As an overview, the pedestrian survey recorded 59 additional sites consisting of:

- 33 artefact scatters
- 24 isolated finds
- One PAD
- One scarred tree.

Glendell Continued Operations Project: Test Excavation Program Methodology

23

24

15 of these sites are outside of the Potential Additional Disturbance Area, however, some are closely adjacent to the boundary of the Potential Additional Disturbance Area and will require further management.

In addition, there are 43 previously recorded sites within or partially within the Potential Additional Disturbance Area. Of these, one site can no longer be reasonably located in the landscape. As such there are 42 known Aboriginal sites that have been previously recorded in the Potential Additional Disturbance Area.

Figure 4-1 illustrates the locations of all sites within proximity to the Potential Additional Disturbance Area and Figure 4-2 shows the site types recorded during the survey.

When previously and recently recorded sites are considered, there are 86 sites within the Potential Additional Disturbance Area. Three additional sites are technically outside of the Potential Additional Disturbance Area but are so closely adjacent that they should be treated as if they are inside of the Potential Additional Disturbance Area. However, one of these sites can no longer be reasonably located in the landscape and so there are an additional two known sites that may be harmed by the Project, As such, should the Project be approved in its current form, 88 known sites will be harmed.

The survey identified 12 areas where test excavation would provide a clearer picture of the subsurface archaeological potential. These areas, and the reasons why they have been selected are outlined in **Table 4-1**. The location of these 12 areas are shown on **Figure 4-3**.

There a number of previously recorded sites in the Potential Additional Disturbance Area where PADs are mentioned on the site card. However, not all of these sites will be investigated during the test excavation program and the reasons for their exclusion are outlined in **Table 4-2**.

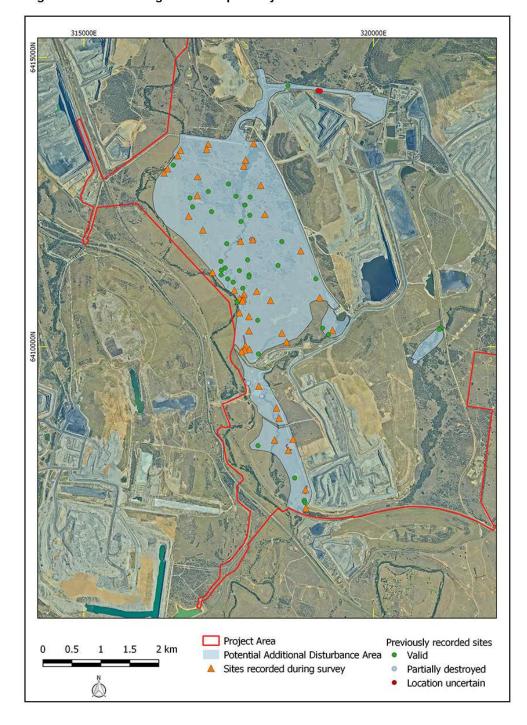


Figure 4-1: Aerial showing sites within proximity to the Potential Additional Disturbance Area.

20

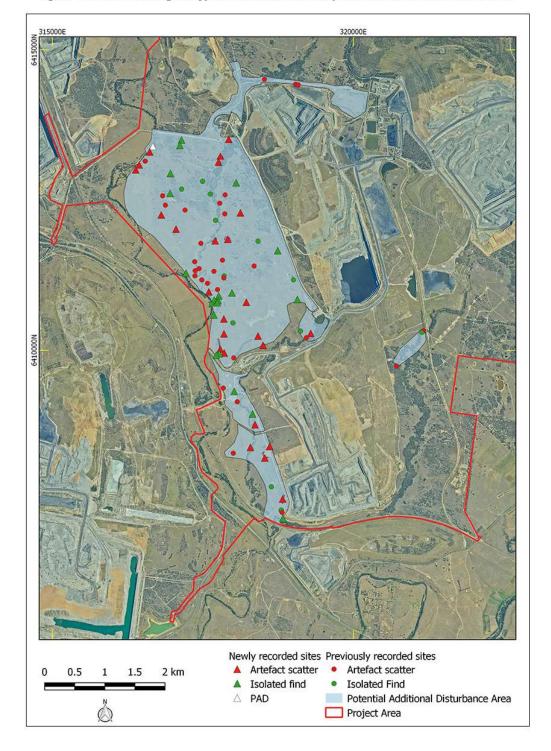


Figure 4-2. Aerial showing the type of sites within the Proposed Additional Disturbance Area.

Table 4-1: Proposed areas for test excavation.

Area	Landform	Reason for test excavation
Area 1	A broad elevated spur running parallel to Bowmans Creek.	A number of artefact scatters are located within the landform.
Area 2	A large level area that is elevated above Yorks Creek on its eastern bank.	Area also occupied by Ravensworth Homestead, often an indicator of a prime occupational location.
Areas 3 & 4	Landforms on western bank of Yorks Creek close to its confluence with Bowmans Creek.	Appeared to have high archaeological potential during the survey.
Areas 5 & 6	Elevated landforms on the eastern bank of Yorks Creek close to its confluence with Bowmans Creek.	Appeared to have high archaeological potential during the survey.
Area 7	Terrace overlooking the floodplain for Bowmans Creek.	A number of surface artefacts were visible during the survey.
Area 8	Elevated landform between Swamp Creek and what appears to be an old channel for Swamp Creek.	Allows landforms in this portion of Swamp Creek to be tested.
Areas 9 & 10	Two locations on either side of Swamp Creek.	Chosen at random in order to test the nature of deposits along this portion of Swamp Creek.
Areas 11 & 12	Centred on previously recorded sites where original recorders suggested PAD may be present.	Allows the banks on either side of Yorks Creek to be tested. Includes AHIMS #37-3-0754 and #37-3-0761.

Table 4-2: Previously recorded sites with PADs not included in the test excavation program.

Site ID	Site name	GDA East	GDA North	Reason for not including in test excavation
37-3-0753	York Creek 10	317865	6412266	Disturbed location. No potential noted during survey.
37-3-0752	York Creek 9	317685	6411312	Disturbed location. No potential seen during survey.
37-3-0748	York Creek 5	317365	6411471	Low-medium archaeological significance. Better location being tested to south (Area 3).
37-3-0617	Bowmans Creek 5	318015	6409874	Disturbed location. No potential seen during survey.
37-3-0612	Bettys Creek 22	321138	6410296	Within what was once a swamp/pond? Low archaeological potential.
37-3-0469	Bowmans/Swamp Creek Trench 1	318072	6409137	Highly disturbed and partially destroyed.
37-3-0766	Bowmans Ck 10	316833	6412566	Low archaeological values. Potential not visible at time of survey.
37-3-0764	Bowmans Ck 8	317205	6412329	Disturbance from buried pipeline. Will test nearby Bowmans Ck 7 (Area 1).
37-3-0762	Bowmans Ck 6	317645	6410765	Disturbed by cultivation. Other testing sites nearby.
37-3-0760	York Creek 17	317555	6411497	Disturbed location. No potential noted during survey.
37-3-0759	York Creek 16	317827	6411497	Disturbed location. No potential seen during survey.

4.3 RATIONALE BEHIND THE TEST EXCAVATION METHODOLOGY

4.3.1 Predicative model

The 2018 OzArk assessment of the Project Area has reached the following preliminary conclusions at this stage of the archaeological investigations:

- Stone artefact sites (isolated finds and artefact scatters) are the most commonly recorded site types in the area and that other site types, such as culturally modified trees, are very rare or non-existent
- Artefacts tend to associated only with the A-Horizon soil layers indicating a date in the Holocene period (i.e. 12,000 BP to the present)
- The predominant raw materials used for stone artefact manufacture are locally sourced mudstone and silcrete
- Excavations generally reveal a low artefact density but some spatial patterning has been
 observed: principally concentrations of artefacts interpreted as 'knapping areas'. Other
 archaeological features such as hearths are rare
- Sites tend to be associated with waterways and a discernible pattern has been observed whereby larger sites are associated with larger waterways offering permanent water supplies
- While all waterways have been equally studied, Yorks and Bettys Creeks appear to have attracted past Aboriginal occupation more often than Swamp Creek. Bowmans Creek would have been a major focus of past occupation but much of the evidence of this occupation has been removed by major channel migrations or intensive historical land use disturbances such as cultivation.

4.3.2 Research questions

While any test excavation program is limited in the level of research objectives it can achieve due to the restricted nature of the excavations, the test excavations for the Project will attempt to shed light on:

- Do the results support previous findings that occupation appears denser along Yorks Creek when compared to Swamp Creek?
- Do elevated landforms associated with Bowmans Creek preserve subsurface archaeological deposits?
- Are additional archaeological features, such as hearths, present in the Potential Additional Disturbance Area?
- How do the findings in terms of raw material use compare to other investigations in the vicinity of the Potential Additional Disturbance Area?

Glendell Continued Operations Project: Test Excavation Program Methodology

28

4.4 SAMPLING STRATEGY

The excavation program will be undertaken by archaeologists and representatives of RAPs and will include the following aspects:

- Twelve areas will be investigated by the test excavation program. Ten of these areas relate
 to newly identified PADs noted by OzArk during the pedestrian survey, and two are situated
 at previously recorded sites (AHIMS #37-3-0754 and #37-3-0761).
- 2. The location for the proposed test excavation program is shown on Figure 4-3 and detailed locations of transects on Figure 4-4 to Figure 4-9.
- 3 Excavation squares will generally be spaced with a 10 m interval so that a broad representation of the landform will be obtained. However, should the PAD under investigation be small in size, the excavation squares will be excavated at a 5 m interval.
- 4. Prior to any excavation, the site will be recorded via digital photography.
- 5. A minimum of six 0.5 m x 0.5 m excavation squares in a straight 50 m transect will be excavated, although the methodology allows for additional squares to be excavated should the results indicate that this is warranted. The excavation squares will be positioned so as a valid sample of the impact area is obtained so that the archaeological values of the area can be characterised. Depending on the size of the investigation area, there may be only one transect or more. For specific methodology relating to each area, see Table 4-3.
- 6. Initial excavation squares will be excavated in 5 cm spits to determine whether archaeological stratigraphy is present. If not, spit size will be increased to 10 cm. If archaeological stratigraphy is present, this will be used rather than spits.
- 7. The excavated material from all pits will be sieved on site using dry sieving through nested sieves of 6–8 millimetre (mm) and 2.5–3.5 mm mesh (which is considered to satisfy the 5 mm aperture wire-mesh sieve requirement).
- 8. Each excavator (by hand) will be responsible for sieving the deposit from their excavation square, retrieving the artefacts and, in conjunction with the supervising archaeologist, correctly recording their provenance. There could be some room for assistance with the sieving but a self-contained approach is preferable. Deposits will be sieved on to tarpaulins and the spoil used to backfill the excavation square.
- 9. A standard excavation recording form will be used for each excavation square. Details will include; date, site recorder, spit number and depth, description of finds, description of soil, sketch plan of excavation (if relevant to show structure), end of spit levels, soil pH (when necessary or appropriate) and a bucket tally.

Glendell Continued Operations Project: Test Excavation Program Methodology

- 10. It is envisioned that the excavation crew will consist of an Excavation Director, two assistant archaeologists, and at least six cultural heritage field workers. The excavator of each excavation square, in conjunction with the supervising archaeologist, will be responsible for ensuring all forms are correctly completed. It will be the archaeologists' responsibility to perform all photographic tasks, undertake any planning and section drawing if required and to ensure that a correct location of each excavation square is maintained.
- 11. Given that the work will be reasonably physical, all persons participating on the test excavation program should be aware of this and be 'fit for work'.
- 12. If intact archaeological deposits or archaeological features are encountered, then additional archaeological excavation squares may be excavated to ensure documentation of any features and/or retrieval of artefacts and other relevant archaeological material. A feature would include a high density of artefacts within a square (such as in excess of 60 artefacts greater than 15 mm in size per m²), or a square containing rare or unusual artefacts (such as artefacts constructed from a stone type rarely represented in the area or less-common tool forms such as ground edge axes, hammerstones, etc.), or other signs of human occupation i.e. ground ovens/hearths or charcoal concentrations. Any expansion must adhere to Requirement 16 (5). Any expansion would only occur with the consent of the Excavation Director who will determine if an expansion is required to gain the appropriate scientific information.
- 13 Rather than expanding around an individual square as set out in Point 12, it is more likely that any expansion will involve setting out an additional transect at 90 degrees to a transect that has demonstrated significant and intact archaeological deposits. The perpendicular transect will be used to assist in determining the spatial spread of the subsurface deposits.
- 14. If appropriate (i.e. intact archaeological stratigraphy is recorded) section drawings will be completed for the appropriate excavation square(s). If no archaeological stratigraphy is recorded then digital photographs shall be taken of a representative section of each excavation square and a suitably representative drawing made of the excavation square section to show the soil profile.
- 15. Analysis of all excavated lithics will be made in order to determine the site's characteristics and to enable the site to be compared with other sites in the region. Analysis will also assist in determining what type of activities the Aboriginal people carried out at the site and their relationship with local resources (fauna, flora, water and stone). All artefacts will be analysed and selectively photographed. If charcoal from a secure stratigraphic context is obtained, it may be sent to a laboratory for Carbon 14 dating (subject to proponent's agreement).

- 16. Select faunal remains, if recovered, will be analysed by a fauna specialist. Remnant shell and bone fragments may assist in determining what foods Aboriginal people may have eaten at the specific site and may elucidate possible foraging strategies. In conjunction with in situ stone tools, bone/shell fragments may also provide evidence of specific usage of stone tools for food processing.
- 17. Artefacts will remain in the care of OzArk until such time as the analysis is complete. Every effort will be made to analyse artefacts on-site to ensure that the artefacts do not have to leave the Project Area. However, in the case of large artefact numbers or artefacts requiring further research, it may be necessary to take artefacts off-site. If taken off-site, the artefacts would be the responsibility of OzArk and every effort would be made to return all artefacts to the MOC as quickly as is possible. At the completion of analysis (whether on-site or off-site) artefacts will be returned to the MOC where they will be kept as per the MOC ACHMP until Point 19 below is enacted.
- 18. The results of the test excavation program will inform the forthcoming AAIA. Excavation results will be used to advise further courses of action in relation to the management and mitigation options for the Project Area.
- 19. Once all salvage activities for the Project Area are complete (should the Project be approved), artefacts will be amalgamated and managed as per the MOC ACHMP.

Table 4-3: Sampling methodology for text excavation program.

Area	Test excavation methodology
Area 1	5 x 50 m transects, with each 50 m transect separated by 50 m. Transects will be positioned running along the spur, parallel to Bowmans Creek. Area 1 includes an area of PAD recorded during the survey. Decisions on the suitability of expansion will depend on the results of the first five transects.
Area 2	4 x 50 m transects will be initially excavated to examine areas closet to Yorks Creek and a tributary to Yorks Creek located to the south of the PAD area. Decisions on whether to expand excavation will depend on results of the initial four transects.
Area 3	2 x 50 m transects will be excavated so entire PAD area is investigated.
Area 4	5 x 50 m transects will be excavated to investigate areas closest to Yorks Creek and Bowmans Creek, as well as landforms near the confluence of the two creeks.
Areas 5 & 6	These PADs are too small for an entire transect. Instead two sets of two conjoined 0.5 m \times 0.5 m pits will initially investigate these areas (see Figure 4-10).
Area 7	2 x 50 m transects will be excavated running along the length of the terrace.
Area 8, 9, 10, 11 & 12	1 x 50 m transect excavated initially at each location.

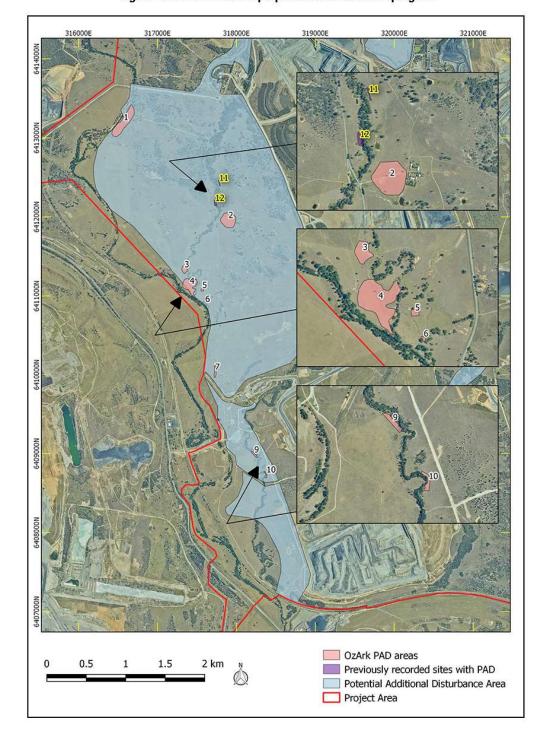


Figure 4-3: Location of the proposed test excavation program.

32

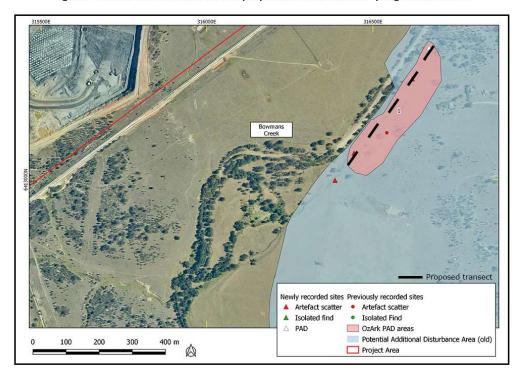
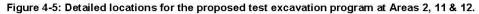
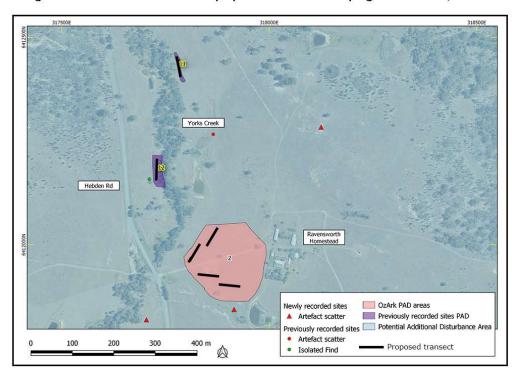


Figure 4-4: Detailed locations for the proposed test excavation program at Area 1.





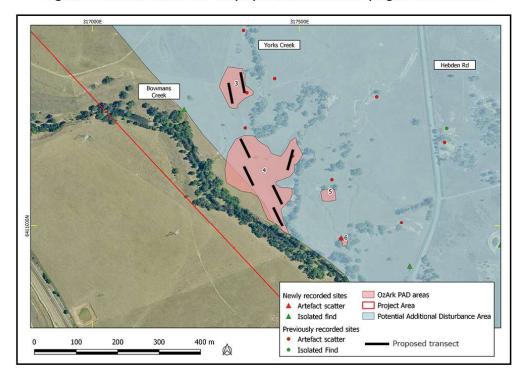
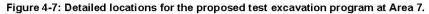
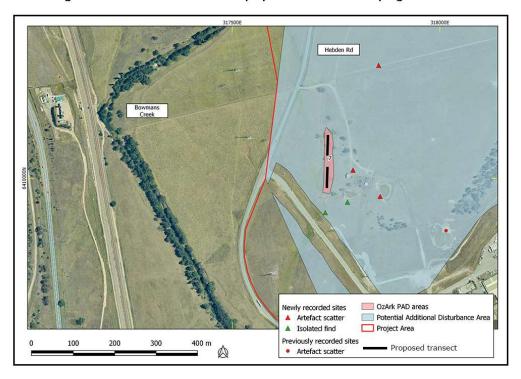


Figure 4-6: Detailed locations for the proposed test excavation program at Areas 3 & 4.





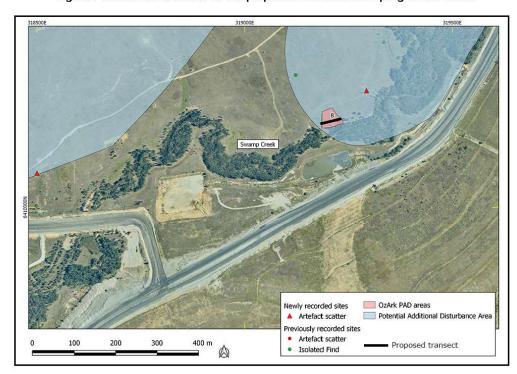
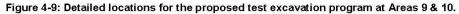


Figure 4-8: Detailed locations for the proposed test excavation program at Area 8.



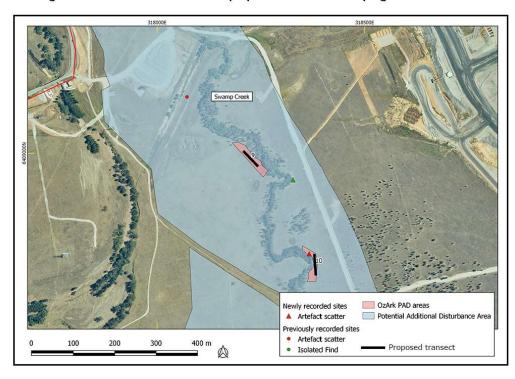
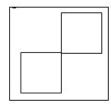


Figure 4-10: Example of placement for test excavation pits at Areas 5 & 6.



4.4.1 Sampling strategy compliance with the Code: Requirement 16

- 1 Test excavation units must be placed on a systematic grid appropriate to the scale of the area—either PAD or site—being investigated e.g. 10 m intervals, 20 m intervals, or other justifiable and regular spacing.
 - The sampling strategy outlined in Section 4.4 complies with this requirement. As the Code
 of Practice allows excavation units to be grouped depending on a site's characteristics,
 the excavation strategy at Areas 6 and 7 complies with the Code of Practice so long as
 no more than 0.5% of the site is excavated.
- 2 Any test excavation point must be separated by at least 5 m.
 - The sampling strategy outlined in **Section 4.4** complies with this requirement. It should be noted that while the initial transect will have 10 m intervals, the Code allows expansion around pits displaying notable concentrations of artefacts (i.e. more than 60 artefacts larger than 15 mm per m²) or archaeological features. These 'expansions' are limited to a maximum area of 3 m². It is also noted in **Section 4.4** Point 3 that when PADs are small in area that a 5 m interval for the test excavation squares will be adapted.
- 3 Test excavations units must be excavated using hand tools only.
 - The sampling strategy outlined in Section 4.4 complies with this requirement.
- 4 Test excavations must be excavated in 0.5 m x 0.5 m units.
 - The sampling strategy outlined in Section 4.4 complies with this requirement.
- Test excavations units may be combined and excavated as necessary to understand the site characteristics, however:
- the maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3 m²;
 - The sampling strategy outlined in Section 4.4 complies with this requirement.
- ii) the maximum surface area of all test excavation units must be no greater than 0.5% of the area—either PAD or site—being investigated.
 - The number and size of test excavations undertaken as part of this program will be managed to ensure that this requirements is satisfied.

Glendell Continued Operations Project: Test Excavation Program Methodology

36

37

- Where the $0.5 \text{ m} \times 0.5 \text{ m}$ excavation unit is greater than 0.5% of the area then point 5 (ii) (above) does not apply.
 - Not applicable. As the potential archaeological deposits are spatially large, less than 0.5% of the known potential archaeological deposits dimensions will be investigated.
- 7 The first excavation unit must be excavated and documented in 5 cm spits at each area —either PAD or site—being investigated. Based on the evidence of the first excavation unit, 10 cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.
 - Complies. See in Section 4.4 Point 6.
- 8 All material excavated from the test excavation units must be sieved using a 5 mm aperture wire-mesh sieve.
 - Complies. See in Section 4.4 Point 7.
- 9 Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.
 - This requirement will be fulfilled in the field and all excavation squares will be excavated
 to the B-Horizon basal clays. To ensure that, as suspected, these basal clays are culturally
 sterile, several deeper probes at each excavation area will be excavated into these clays
 to ensure that they are, in fact, culturally sterile. The decision as to where these deeper
 probes are placed will rest with the Excavation Director.
- 11 Photographic and scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects must be made for each single excavation point.
 - Complies. See in Section 4.4 Points 9, 10, 14, 15 and 16.
- 12 Test excavations units must be backfilled as soon as practicable.
 - Complies. See in Section 4.4 Point 8.
- 13 Following test excavation, an Aboriginal Site Impact Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each AHIMS site that has been the subject of test excavation in accordance with the requirements of the Code.
 - It will be the responsibility of OzArk to ensure that this requirement is met.

Glendell Continued Operations Project: Test Excavation Program Methodology

5 REFERENCES

ACHM 2013	Australian Cultural Heritage Management Pty Limited. <i>Mount Owen Continued Operations Project. Aboriginal Cultural Heritage Assessment Report.</i> Report to Mt Owen Pty Limited.
ERM 2002	ERM Pty Limited. 2002. Ravensworth East Archaeological Investigation. Report to Coal and Allied Pty Limited.
OEH 2011	Office of Environment and Heritage. 2011. Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales. Department of Environment, Climate Change and Water, Sydney.
OzArk 2013	OzArk Environmental & Heritage Management Pty Limited. 2013. Aboriginal Archaeological Values Assessment. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd.
OzArk 2015	OzArk Environmental & Heritage Management Pty Limited. 2015. Archaeological Salvage. Liddell Coal Operations Development Modification 5. Report for Liddell Coal Operations.
OzArk 2017	OzArk Environmental & Heritage Management Pty Limited. 2017. Aboriginal Archaeological Salvage Report. Mount Owen Continued Operations Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd.
Umwelt 2013	Umwelt (Australia) Pty Limited. 2013. Part 4 – Bettys Creek Salvage Program, Glendell Mine Surface and Subsurface Salvage under Section 90 Aboriginal Heritage Impact Permit #2267. Report for Xstrata Mount Owen.

Glendell Continued Operations Project: Test Excavation Program Methodology

B.1.20 Archaeological Test Excavation 28 Day Review Feedback from RAPs

Group/Organisation	Contact Person	Methodology Comments Received	Agree with Methodology
Culturally Aware	Tracey Skene	Email received from Tracey Skene 20/2:	Yes
		Good evening Bridie,	
		I have viewed methodology and familiar with the Survey location, at this point of time I have no concerns in regard to the proposed methodology.	
		Please keep me updated on the progress of the upcoming fieldwork and look forward to the next step of this Assessment.	
		Thanks Tracey Skene	
Lower Hunter	Les Ahoy	Hi	Yes
Aboriginal Incorporated		On behalf of LHAI I endorse the Glendell ACHA survey methodology with no further comments to add.	
		Thank You	
		David Ahoy	
Nyanga Walang	Kevin Duncan	Hi Bridie,	No
		Thank you for your invitation to be a party to the Glendell Operations project. As a Traditional stakeholder to our tribal lands throughout this region and our people having a long continuous connection these lands are always have been very special and sacred to our peoples' adamant in my decision to not support any Mining projects on our lands it goes against everything that our Cultural moral ,spiritual beliefs in the preservation and protection of our lands.	
		I cannot allow or be a party to such destructive practices as it goes against everything we are as Aboriginal people. In saying this I will like my comments to be noted as a registered stakeholder for this project and hope my comments are taken seriously and respectively in this decision.	
		Thank you	
		Kevin Duncan	
Tocomwall Pty Ltd	Scott Franks	Scott Franks responded via email 29/3/18	No
		Sorry for the delay in responding to the comments I raised with you regarding the Ozark Methodology, in short, the proposed methodology simply has know (sic) value or worth in understanding my people's heritage. after reading the draft it was clear to me that know (sic) real background research has be done or any understanding of the cultural land scape or any of the more recent assessments that have been completed on adjoining mining operations owned by Glencore coal.	
		The draft provides an isolated attempt to box in our heritage to a single location using a mining EL boundary, this type of assessment falls short of really giving our heritage a fair and real voice in any assessment process. I cannot support the approach as by its own design is it a science-based assessment and clearly know (sic) real cultural assessment attached to it, this process fall very short of the current required approvals under the NPSW Acts (sic) for OEH.	
Murra Bidgee Mullangari Aboriginal Corporation	Ryan & Darleen Johnson- Carroll	Hi Bridie, I have read the project information and draft test pitting methodology and endorse the recommendations made. Kind regards	Yes

P18-0089

		Ryan Johnson	
Muragadi Heritage Indigenous Corporation	Jesse Carroll-Johnson	To whom it may concern, I have read the recommendations for the Glendell project and endorse the recommendations made by Ozark, if you require further details please contact. Kind regards Jesse	Yes
Wonnarua Nation Aboriginal Corporation	Laurie Perry	Hi Bridie Thank YouI will have a look and get back to you cheers	
Nyanga Walang	Kevin Duncan	Yaama Bridie, Thank you for the results of the Draft Test Pitting Methodology for the Glendell Project. I as an Aboriginal Traditional Custodian of these areas strongly disapprove of Mining in our Traditional Lands as Mining has done much damage to our natural Environment and Cultural Space. Or thousands of years these lands have been important places for our people. In the result of Mining across the Valley into Jerry's Plains the Land itself will never recover and thousands of years of Cultural History wiped forever. My words I know will probably not be recognised in context to my Human Right as an Indigenous person under United Nations Charter of Indigenous Peoples Rights which Australia is Signatory. So even in my protest to protect and preserve Culture that is older than the Pyramids themselves they will ultimately be destroyed. This is my True expression of who I am as an Aboriginal Person and of my feelings for my Ancestral Homelands. Sincerely Kevin Duncan Gomeroi, Wonnorua Awaba, People	No

P18-0089

Appendix C ACHAR 28-Day Review Feedback



18 September 2019

Dear Registered Stakeholder,

Glendell Continued Operations Project Draft Aboriginal Cultural Heritage Assessment Report – Invitation for Comment

Glencore is continuing to progress environmental assessments and stakeholder consultation associated with the preparation of the Glendell Continued Operations Project (the Project) Environmental Impact Statement. In this regard, please find in the email a link to a copy of the draft Aboriginal Cultural Heritage Assessment Report prepared by Australian Cultural Heritage Management (ACHM) with significant contributions from the Registered Aboriginal Parties, Knowledge Holders and OzArk Environmental and Heritage Management (OzArk). For security reasons, access is available through to 18 October 2019 to download the file after which time the link will expire. Please follow the directions provided in the email to download the report.

We invite all Registered Aboriginal Parties to provide, in writing, comments on the draft *Aboriginal Cultural Heritage Assessment Report* (ACHM 2019) by **Friday 18 October 2019**. To assist, attached to this correspondence is an associated response form to enable you to provide your feedback.

For correspondence including the provision of comments, additional information or to request additional copies of the report please contact me on the details provided below.

We have also included a copy of the community information sheet in the link provided, which provides an overview of the Project, a summary of the Project impacts and key findings of the environmental and social studies that have been undertaken.

Thank you again for your ongoing involvement in relation to the Aboriginal Cultural Heritage Assessment for the Glendell Continued Operations Project and we look forward to your response.

Kind regards,

Bradly Snedden

Project Approvals Manager

Email: bradly.snedden@glencore.com.au

Phone: 0428 466 820

P.O. Box 320, Singleton, NSW 2330 158 Hebden Road, Ravensworth, NSW 2330 T+61 2 6520 2600 F+61 2 6520 2700 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



Glendell Continued Operations Project

Draft Aboriginal Cultural Heritage Assessment Report Comments

Comments are required to be provided in writing or via oral communication by Friday, 18 October 2019.

Your comments can be submitted by either email or post using the details listed below.

Attention Bradly Snedden (Project Approvals Manager)

Phone:

Email:

Mail:

0428 466 820

bradly.snedden@glencore.com.au

c/o Mount Owen Complex Private Mail Bag 8, Singleton, NSW 2330		
Do you agree with the draft Aboriginal Cultural Heritage Assessment Report (ACHM 2019)?	Y J S	NO
Do you have any comments on the draft Aboriginal Cultural Heritage Assessment Report (AC	CHM 201	9)?
(List here or on a separate sheet):		
Thanks for the opportunity to respond to this report. We hope all is well with you guys. Yes we support it . Ps Keel Regards Kauwul - Arthur.	o up the go	ood work.

P.O. Box 320, Singleton, NSW 2330 158 Hebden Road, Ravensworth, NSW 2330 T+61 2 6520 2600 F+61 2 6520 2700 www.glencore.com

Glencore Coal Assets Australia Pty Limited ACN 163 821 298



30 October 2019

Ms B McWhirter
Environmental Scientist
Umwelt (Australia) Pty Ltd
Email: bmcwhirter@umwelt.com.au

Dear Bridie

RE: ACHAR REVIEW COMMENTS – GLENDELL CONTINUED OPERATIONS PROJECT

This letter from the Wanaruah LALC does not express the views of any other Aboriginal stakeholder groups (whether their representatives are members of the LALC or not) or individuals who have chosen to speak in their own right. The comments provided are considered appropriate under Clause No. 42(4) (a) and (b) of the Aboriginal Land Rights Act (1983) (and its amendments) in relation to the role of the LALC in the protection and the promotion of awareness in the community, of culture and heritage for Aboriginal people within its boundary.

We have reviewed the above document and although we are generally in agreement with the draft report and its recommendations for the ongoing protection of artefacts and sites (on site management recommendations), we wish to make the following comments on the cultural aspects and the off site management recommendations:

- 1. In Section 6.8 (Dominant Themes) and in regard to the destruction of landscapes and their cultural values, it is stated that there is an "... overwhelming fear that people in the future will think the people of today stood by and watched their 'country' being 'destroyed' without defending it (i.e. sense of guilt)...". There seems to be nothing that today's Aboriginal people can do to stop big business and the Australian governments (state or federal), from ignoring its First Nation peoples, while they strive to 'milk' everything they can get out of our Country for financial profit regardless of the effects it has on our unique natural environment and the people who have looked after it for thousands of years. It is NOT 'guilt', it is 'frustration', 'anger', helplessness' and 'sadness'. We have nothing to feel guilty about, we have and continue to (futile that it may seem), survive in this Country and try to keep our heads high and proud and to keep speaking out, while we continue to protect what we believe is culturally significant and sacred to us our heritage and our families.
- 2. In Section 8 (Recommendations): Table 8.2 (Recommendations made by the Wanaruah Local Aboriginal Land Council), these recommendations [(WLALC01) Local historical research to fill in gaps or confirm existing knowledge; (WLALC02) Creation of an Aboriginal controlled cultural

education unit; (WLALC03) Apprenticeships for 3-5 Wonnarua (sic.) people; and (WLALC04) Support for business start-up] have not been reflected in 8.2.3 (Notes on RAP Recommendations) and Table 8.4 (Consolidated management recommendations). However, we presume they have been included (or need to be included) in Table 8.6 (Proposed off site Management Measures). These issues need to be addressed and seriously considered.

Thank you for this opportunity to review the draft report.

Kind regards,

Suzie Worth

Indigenous Archaeologist for the

Wanaruah LALC

Wanaruah Local Aboriginal Land Council

2

From: Will Moon < william@tocomwall.com.au> Sent: Wednesday, 13 November 2019 8:38 AM

To: Scott, Shane (Newcastle - AU) <Shane.Scott@glencore.com.au>

Cc: Scott Franks <scott@tocomwall.com.au>
Subject: ACHAR Glendell Project Area

Hi Shane

Thanks for your message yesterday regarding feedback for the ACHAR. After reviewing the report we concluded that it really did not offer any new knowledge for how the Aboriginal people used this part of the Hunter landscape. We were surprised that a study of this scale and duration offered nothing new. It seemed to just offer up the same conclusions of so many other reports for the area in terms of an increase in artefact numbers and density approaching water sources and the typical trends for raw materials for the area. Nothing else. The degree of reduction evident for many of the artefacts suggested that groups using the area were very mobile however there was no further analysis of this that might have provided some new insight or knowledge about the mobility of people in the area, or the reasons for what appears to be a high percentage of artefacts subjected to tertiary reduction. Generally a disappointing outcome from the perspective of learning something new for the area.

Regards

Will Moon

Senior Archaeologist

Tocomwall Pty Ltd m: 0419399230 e: william@tocomwall.com.au www.tocomwall.com.au



Breach of Confidentiality

This email and any files transmitted with it are confidential and intended solely for the use of the individual to whom they are addressed. If you have received this email in error please notify the sender. This message contains confidential information and is intended only for the individual named. If you are not the named addressee you

1

should not disseminate, distribute or copy this e-mail. Please notify the sender immediately by e-mail if you have received this e-mail by mistake and delete this e-mail from your system. If you are not the intended recipient you are notified that disclosing, copying, distributing or taking any action in reliance on the contents of this information is strictly prohibited. Although the company has taken reasonable precautions to ensure no viruses are present in this email, the company cannot accept $responsibility \ for \ any \ loss \ or \ damage \ arising \ from \ the \ use \ of \ this \ email \ or \ attachments.$ LEGAL DISCLAIMER. The contents of this electronic communication and any attached documents are strictly confidential and they may not be used or disclosed by someone who is not a named recipient. If you have received this electronic communication in error please notify the sender by replying to this electronic communication inserting the word "misdirected" as the subject and delete this communication from your system. 2

Appendix D Aboriginal Archaeology Impact Assessment (AAIA) Report





A heavily worked mudstone core from Glendell North OS32 located on the bank of Bowmans Creek.

ABORIGINAL ARCHAEOLOGY IMPACT ASSESSMENT

GLENDELL CONTINUED OPERATIONS PROJECT

GLENDELL MINE, RAVENSWORTH, NSW NOVEMBER 2019

Report Prepared by

OzArk Environment & Heritage

for Umwelt Environmental & Social Consultants

on behalf of

Glendell Tenements Pty Ltd

OzArk Environment & Heritage

145 Wingewarra St

(PO Box 2069)
Dubbo NSW 2830
Phone: (02) 6882 0118
Fax: (02) 6882 0630
enquiry@ozarkehm.com.au
www.ozarkehm.com.au



DOCUMENT CONTROLS

Proponent	Glendell Tenements	Pty Ltd		
Client	Umwelt Environmental & Social Consultants			
Project No / Purchase Order No				
Document Description	Aboriginal Archaeolo Operations Project	ngy Impact Assessment. Glend	ell Continued	
	Name	Signed	Date	
Clients Reviewing Officer				
Client's representative mana	aging this document	OzArk person(s) managing th	nis document	
Bridie McWhirter		Ben Churcher		
Location		OzArk Job No.		
►OzArk EHM Data ►Client ►Glendell GCOP 2018 ►R		1885		
Document Status V3.0 FINA	\L	Date 22 November 2019		
Draft V1.1 Author to editor C (Series V1 = OzArk interna		V1.0–1.3: TD and SR prepare preliminary sections V1.4–V1.6. BC edits and revi		
Draft V2.0 Report draft for re (Series V2 = OzArk and C		V2.0: to Umwelt 14/12/18 V2.1–V2.3 OzArk amendmer V2.4 BC amends for new PA V2.5–V2.6 BC amendments 2 2019 V2.7: BC includes RAP comr 22/11/19	DA 6/8/19 August–September	
FINAL V3once latest versi by client	on of draft approved	V3.0 BC finalises 22/11/19		
Prepared for		Prepared by		
Bridie McWhirter		Ben Churcher		
Environmental Scientist		Principal Archaeologist		
Umwelt Environmental & So	cial Consultants	OzArk Environment & Heritaç		
75 York Street		145 Wingewarra Street (PO Box 2069)		
Teralba, NSW 2284		Dubbo NSW 2830		
		P: 02 6882 0118		
		ben@ozarkehm.com.au		

COPYRIGHT

© OzArk Environment & Heritage 2019 and © Glendell Tenements Pty Ltd 2019

All intellectual property and copyright reserved.

Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission.

Enquiries should be addressed to OzArk Environment & Heritage.

Acknowledgement

OzArk acknowledge the Wonnarua Traditional Owners of the area on which this assessment took place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

OzArk would like to thank all RAP representatives who participated in the survey and test excavation program. As this involved many people it is impossible to thank everyone individually although OzArk acknowledges that your hard work, and the dedication you showed towards the understanding and protection of your cultural heritage, contributed to the success of this assessment program.

ABBREVIATIONS

The following abbreviations are used in this report.

AAIA Aboriginal Archaeology Impact Assessment

ACHAR Aboriginal Cultural Heritage Assessment Report

ACHM Australian Cultural Heritage Management Pty Ltd. (authors of the ACHAR)

ACHMP Aboriginal Cultural Heritage Management Plan

AHIMS Aboriginal Heritage Information Management System

AHIP Aboriginal Heritage Impact Permit

ASIRF Aboriginal Site Impact Recording Form

BCE Before the Common Era (an alternative for using BC in dates)

BCD Biodiversity and Conservation Division (formerly OEH)

BP Before Present

DECC Former New South Wales Department of the Environment and Climate

Change (now BCD)

DPIE Department of Planning, Industry and Environment

EIS Environmental Impact Statement

EP&A Act Environmental Planning and Assessment Act 1979

GCO Glendell Continued Operations

GIS Geographical Information System

Glendell Mine; the proponent

GPS Global Positioning System

LALC Local Aboriginal Land Council

LCO Liddell Coal Operations

LGA Local Government Area

NPW Act National Parks and Wildlife Act 1974

NSW New South Wales

NSW NPWS New South Wales National Parks and Wildlife Service

MOC Mount Owen Complex. Includes the Mount Owen, Ravensworth East and

Glendell mines.

OEH Former New South Wales Office of the Environment and Heritage, now BCD

OzArk Environment & Heritage

PA Project Approval

PAD Potential archaeological deposit

PCWP Plains Clans of the Wonnarua People, Native Title Claimant Group

Project Glendell Continued Operations Project

RAP Registered Aboriginal Party

SBB Sydney Basin Bioregion

SEARs Secretary's Environmental Assessment Requirements

SSD State significant development

Umwelt (Australia) Environmental & Social Consultants

GLOSSARY

Assemblage: Refers to all artefacts recorded at a particular location. In this report, assemblage

refers to stone artefacts as this was the only artefact class recorded.

Bondaian: A chronological period where bondi points become more frequent in artefact

assemblages. Post-3000 BP, although earlier at some sites.

Capertian: Chronological phase preceding the Bondaian Phase. Pre-3000 BP, although

earlier at some sites.

Code of Practice Code of Practice for Archaeological Investigation of Aboriginal Objects in New

South Wales under Part 6 NPW Act. Issued by DECCW in 2010, the Code of Practice is a set of guidelines that allows limited test excavation without the need to apply for an AHIP. The test excavation program for this assessment was

conducted under the Code of Practice.

Debitage: The term debitage refers to all the waste material produced during lithic reduction

and the production of stone tools. Therefore, technically, all artefacts other than reworked tools are debitage. However, in this report debitage is used in its other common meaning being the small flakes and chips produced purely as a byproduct of knapping. This distinguishes these small flakes from the larger flakes that were removed (while technically 'debitage', a non-retouched flake can be

used as a tool and therefore could have been the intended end point for a

Holocene: Is the geological epoch which lasted from around 12,000 years ago to the present

(10,000 BCE). This period is generally warmer and wetter than the preceding

Pleistocene period.

knapping event).

Pleistocene: Is the geological epoch which lasted from about 2.5 million years ago to

10,000 BCE. This period spans the world's recent period of repeated glaciations.

Aboriginal occupation of Australia occurs during the upper Pleistocene.

Taphonomy: The study of how artefacts can be moved in archaeological deposits due to

natural occurrences such as animals burrowing or treadage into the ground.

EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged by Umwelt (Australia) Environmental & Social Consultants (Umwelt) on behalf of Glendell Tenements Pty Limited (the proponent) to complete an Aboriginal Archaeology Impact Assessment (AAIA) for the Glendell Continued Operations Project (the Project). The purpose of the assessment is to form part of an Environmental Impact Statement (EIS) being prepared by Umwelt to accompany an application for development consent under Division 4.1 and 4.7 of Part 4 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act) for the Project.

Australian Cultural Heritage Management Pty Limited (ACHM) will prepare the *Aboriginal Cultural Heritage Assessment Report* (ACHAR). This AAIA will be an appendix to the ACHAR.

The Project seeks to extend the life of Glendell Mine to 2044 with an increase in the current approved extraction rate of 4.5 million tonnes per annum (Mtpa) to up to 10 Mtpa over the life of the Project.

Key aspects of the Project include the continuation of the Glendell Pit to the north (Glendell Pit Extension), the realignment of a section of Hebden Road, the realignment of a section of Yorks Creek, construction of a new mine infrastructure area (MIA), and relocation of Ravensworth Homestead.

The fieldwork component of this assessment consisting of survey and test excavation was undertaken by OzArk, Registered Aboriginal Parties (RAPs) and Wonnarua Knowledge Holders over the course of several weeks in April, May and September 2018. The field survey (discussed in **Section 5**) and the test excavation (discussed in **Section 6**) was broken into five weeks and involved 25 field days in total. OzArk and RAPs also participated in the historic heritage test excavation program completed over 15 days between October and November 2018.

69 new sites were recorded during the survey consisting of: 39 artefact scatters; 29 isolated finds; and one scarred tree.

Of the artefact scatters, 32 sites recorded less than 10 artefacts and no site contained more than 70 artefacts. At nine locations it was assessed that there are subsurface deposits. One of these sites was determined to have a moderate artefact density (Glendell North OS6), however, none of the recorded sites was remarkable in its manifestation; either in terms of the types of artefacts recorded, the raw material the artefacts were manufactured from or the density and nature of the surface artefact manifestation. The recorded sites are also very representative of artefact sites in the upper Hunter Valley both in terms of the types of artefacts recorded and the raw materials from which the artefacts were manufactured.

The test excavation program involved excavation of 152 0.5 m by 0.5 m excavation squares at 12 separate localities: a total of 38 square metres. From this area of excavation, 180 artefacts were recovered; an average of 4.7 artefacts per square metre or 1.18 artefacts per excavation square.

This density of artefacts is extremely low and only two excavation squares recorded more than 15 artefacts.

Most of the excavation squares did not have overt evidence of disturbance, apart from Areas 2 and 12 where historic items were recorded in some of the excavation squares. However, as most of the squares had what can be described as a very truncated A1-Horizon and a leached A2-Horizon, the implication is that the landscape has been subject to the stripping of the A1-Horizon and the exposure of the A2-Horizon. The implicit conclusion is, therefore, that the landscape has undergone a high general disturbance from soil loss that has compromised the archaeological deposits across the Additional Disturbance Area. As such, the general condition of the archaeological landscape within the Additional Disturbance Area is assessed to be poor.

No evidence of colonial conflict or skeletal remains was identified during the survey or test excavation programs. As such, nothing in the current archaeological assessment was able to corroborate or extend the scant information the written sources provide regarding colonial conflict.

Undertaking an assessment of scientific significance for all sites within the Additional Disturbance Area shows that 84.6% of sites (n=77) have a low scientific significance as they are either isolated finds or low-density artefact scatters (**Section 8.2**). Nine sites have low-moderate scientific significance, five sites have moderate scientific significance, and no sites have been assessed as having high scientific significance.

An assessment of potential impacts to the archaeological values in the Additional Disturbance Area shows that 52 of the 69 newly recorded sites are within or in very close proximity to the Additional Disturbance Area and 39 previously recorded sites are within the Additional Disturbance Area (**Section 8.3**).

In total, 91 sites are located within the Additional Disturbance Area and will be impacted should the Project be approved. 55 of these sites are artefact scatters (15 of which have PAD) and 36 are isolated finds (one of which has PAD). In general, the artefact scatters have a low artefact density with most sites recording less than 10 artefacts.

Management recommendations are made in **Section 9** to mitigate this loss of archaeological value. These recommendations include:

- Conserving all sites outside of the Additional Disturbance Area by extending the current site
 monitoring and verification protocols contained in the MOC ACHMP (Section 9.4.8);
- Undertaking a collection and recording of all surface artefacts at all sites within the Additional Disturbance Area where there is a surface manifestation of artefacts (**Section 9.5.1**); and
- To undertake limited manual archaeological excavation at four locations to confirm the nature of the archaeological deposits (**Section 9.5.2**).

Further recommendations regarding Aboriginal cultural heritage are made in the ACHAR that this AAIA accompanies.

CONTENTS

Abbre	viatio	ons	iii
Gloss	ary		v
Execu	itive S	Summary	vi
1 In	trodu	uction	1
1.1	Pro	oject overview	1
1.2	Th	e Project Area	4
1.3	Th	e Additional Disturbance Area	7
1.4	Th	e survey area	7
2 Tł	he Ar	chaeological Assessment	10
2.1	Re	elevant legislation	10
2.	1.1	Commonwealth legislation	10
2.	1.2	State legislation	10
2.	1.3	Applicability to the Project	12
2.2	As	sessment approach	12
2.3	Pu	rpose and objectives	12
2.	3.1	Aboriginal archaeological assessment objectives	13
2.4	Da	te of archaeological assessment	13
2.5	Ab	original community involvement	14
2.6	Oz	Ark involvement	14
2.	6.1	Field assessment	14
2.	6.2	Reporting	14
3 La	andso	cape Context	15
3.1	То	pography	15
3.2	Ge	eology and soils	19
3.3	Ну	drology	20
3.4	Ve	getation	22
3.5	Cli	mate	23
3.6	La	nd use history and existing levels of disturbance	24
3.	6.1	Land use conclusion	25

	3.7	Environ	mental context conclusion	2	28
4	Ab	original A	Archaeology Background	3	30
	4.1	Ethno-h	istoric sources of regional Aboriginal culture	3	30
	4.2	Colonia	l occupation	3	30
	4.3	Regiona	al archaeological context	3	31
	4.3	.1 Pre	evious archaeological studies in the region	3	32
	4	1.3.1.1	Antiquity	3	32
	4	1.3.1.2	Archaeological characteristics	3	32
		1.3.1.3	Previous studies	3	33
	4.3	.2 The	e Place	3	35
	4.4	Local a	rchaeological context	3	38
	4.4	.1 De:	sktop database searches conducted	3	38
	4.4	.2 Pre	evious archaeological investigations within or overlapping	the Addition	al
	Dis	turbance	Area	4	ļ1
	4	1.4.2.1	Archaeological survey		11
		1.4.2.2	Archaeological salvage		19
	4	4.4.2.3	Archaeological context: Conclusion	5	56
	4.4	.3 Pre	eviously recorded sites within the Additional Disturbance Area	5	56
	4.5	Predicti	ve model for site location	6	30
	4.5	.1 Set	ttlement strategies	6	30
	4.5	.2 Pas	st land use	6	32
	4.5	.3 Pre	eviously recorded sites	6	34
	4.5	.4 Lar	ndform modelling	6	34
	4.5	.5 Pre	evious studies	6	36
	4.5	.6 Coi	nclusion	6	37
5	Re	sults of A	Aboriginal Archaeological Assessment	7	71
	5.1	Samplin	ng strategy and field methods	7	⁷ 1
	5.2	Project	constraints	7	⁷ 4
	5.3	Effective	e survey coverage	7	⁷ 4
	5.4	Aborigir	nal sites recorded	7	7
	5.4	.1 Arto	efact scatters		33
	Gle	ndell Nor	rth OS1	8	33

Glendell North OS2	85
Glendell North OS3	87
Glendell North OS4	89
Glendell North OS5	90
Glendell North OS6	92
Glendell North OS7	94
Glendell North OS8	95
Glendell North OS9	97
Glendell North OS10	99
Glendell North OS11	101
Glendell North OS12	103
Glendell North OS13	105
Glendell North OS14	108
Glendell North OS15	109
Glendell North OS16	112
Glendell North OS17	114
Glendell North OS18	115
Glendell North OS19	118
Glendell North OS20	121
Glendell North OS21	122
Glendell North OS22	124
Glendell North OS23	126
Glendell North OS24	128
Glendell North OS25	130
Glendell North OS26	132
Glendell North OS27	134
Glendell North OS28	136
Glendell North OS29	137
Glendell North OS30	139
Glendell North OS31	141

Glendell North OS32	143
Glendell North OS33	145
Glendell North OS34	148
Glendell North OS35 (formerly Glendell North PAD2)	150
Glendell North OS36 (formerly Glendell North PAD1)	150
Glendell North OS37	152
Glendell North OS38	154
Glendell North OS39	156
5.4.2 Isolated finds	158
Glendell North IF1	159
Glendell North IF2	160
Glendell North IF3	162
Glendell North IF4	163
Glendell North IF5	164
Glendell North IF6	166
Glendell North IF7	168
Glendell North IF8	169
Glendell North IF9	171
Glendell North IF10	172
Glendell North IF11	174
Glendell North IF12	175
Glendell North IF13	177
Glendell North IF14	177
Glendell North IF15	178
Glendell North IF16	180
Glendell North IF17	181
Glendell North IF18	183
Glendell North IF19	183
Glendell North IF20	185
Glendell North IF21	186

	Glendel	North IF22	188
	Glendel	North IF23	189
	Glendel	North IF24	191
	Glendel	l North IF25	192
	Glendel	North IF26 (formerly Glendell North PAD3)	194
		l North IF27	
		North IF28	
	Glendel	l North IF29	197
	5.4.3	Scarred tree	199
	Glendel	North ST1 (37-3-1561)	199
	5.5 Pre	viously recorded aboriginal sites located	201
6	Aborigi	nal Archaeological Test Excavation Program	231
	6.1 Bad	kground to the test excavation program	231
	6.2 Me	thodology	233
	6.2.1	Purpose of the test excavation program	233
	6.2.2	Rationale behind the test excavation methodology	
	6.2.3	Sampling methodology for text excavation program	
		e artefact catalogue	
	6.3.1	Analysis terminology	234
	6.3.2	Research considerations	241
	6.3.2	.1 Statistically useful sample sizes	242
	6.3.2		
	6.3.2	Ç	
	6.4 Tes	st excavation results	243
	6.4.1	Preamble	243
	6.4.2	Description of excavation areas	247
	6.4.2	.1 Stratigraphy	267
	6.4.2	.2 Artefact distribution	287
	6.4.2	.3 Artefact types	288
	6.4.2	.4 Raw materials	289
	6.4.2	.5 Artefact size	290
	6.4.2	.6 Reduction Stage	291

	6.4.2	.7 Integrity	291
	6.4.2	.8 Artefact Assemblage: Area by Area	292
	6.4.3	Conclusion	304
	6.4.3	.1 Area 1	304
	6.4.3	.2 Area 2	308
	6.4.3	.3 Area 3	308
	6.4.3	.4 Area 4	309
	6.4.3	.5 Area 5	313
	6.4.3		
	6.4.3		
	6.4.3		
	6.4.3 6.4.3		
	6.4.3		
		.12 Area 12	
		toric heritage archaeological test excavation program	
7		sion	
_		cussion of survey results	
		·	
	7.1.1	Surface survey summary	
	7.1.2	Discussion	322
	7.2 Dis	cussion of test excavation results	330
	7.2.1	Research questions	330
	7.2.2	Research considerations	332
	7.3 RA	P comments on the draft AAIA	333
8	Assess	ment of Significance	336
	8.1.1	Introduction	336
	8.1.2	Background to the assessment of scientific significance	336
	8.2 Ass	sessed significance of the recorded sites	338
	8.2.1	Newly recorded sites	338
	8.2.2	Previously recorded sites	344
	8.3 Like	ely impacts to Aboriginal heritage from the Project	
	8.3.1	Ecologically sustainable development principles	
	8.3.1		
		· · · · · · · · · · · · · · · · · · ·	

9	Mar	nage	ment and Mitigation: Aboriginal Heritage	.355
ç	9.1	Gen	eral principles for the management of Aboriginal sites	.355
ç	9.2	Exis	ting archaeological management at the MOC	.355
	9.2.	1	Background	.355
	9.2.	2	Aboriginal Party Consultation	.356
	9	.2.2.	1 Aboriginal Cultural Heritage Working Group	.356
	9.2.	3	Protection measures for cultural heritage sites	.357
	9.2.	4	Discovery of new Aboriginal sites	.357
	9	.2.4.	1 Management of newly discovered sites within currently approved operations.	.357
	-).2.4.: pera	2 Management of newly discovered sites outside of the currently approved tions	.358
).2.4.:		
ç	9.3	Man	agement Options	.359
	9.3.	1	Option A: Do Nothing	.359
	9.3.	2	Option B: Modify project design to avoid harm	.359
	9.3.	3	Option C: No design change and mitigate archaeological impacts	.360
ç	9.4	Man	agement and Mitigation of Recorded Aboriginal Sites	.361
	9.4.	1	Archaeological salvage	.361
	9.4.	2	Sites requiring specific management to prevent harm	.369
	9.4.	3	Sites located on LCO owned land west of Bowmans Creek	.371
	9.4.	4	Management of Bowmans Creek 16 (37-3-0772)	.372
	9.4.	5	Management of Glendell North ST1 (37-3-1561)	.374
	9.4.	6	Protocols related to the discovery of new sites	.374
	9.4.	7	Protocols related to the discovery of human skeletal material	.374
	9.4.	8	Protocols for the conversation of sites outside the Additional Disturbance Area	.375
	9.4.	9	Care of salvaged artefacts	.375
ç	9.5	Man	agement process	.375
	9.5.	1	Archaeological salvage: surface artefact collection	.375
	9.5.	2	Archaeological salvage: limited manual excavation	.376
10	c	Conc	lusion	.380
R۵	feren	200		383

Appendix 1: Survey methodology	388		
Appendix 2: AHIMS search result Appendix 3: Salvage Report Appendix 4: Supplementary site location and artefact photos Appendix 5: Test excavation methodology			
		Appendix 6: Test Excavation Catalogue	475
		Figures	
		Figure 1-1: Regional context of the Project Area	2
Figure 1-2. Key Project features: Conceptual Project Layout.	3		
Figure 1-3: Aerial showing the Project Area.	5		
Figure 1-4. The Project Area superimposed on a 1958 aerial image	6		
Figure 1-5. Aerial showing the Additional Disturbance Area and the Project Area	8		
Figure 1-6. Aerial showing the survey area in relation to the Additional Disturbance Area	9		
Figure 3-1: Aerial showing the major topographic zones within the Additional Disturbance A	\rea17		
Figure 3-2: Examples of the topography of each survey unit.	18		
Figure 3-3: Aerial of the Project Area showing the major waterways.	21		
Figure 3-4: Examples of the hydrology within the Additional Disturbance Area	22		
Figure 3-5: Examples of vegetation types within the Additional Disturbance Area	23		
Figure 3-6: A 1958 aerial image showing historic disturbances.	26		
Figure 3-7: Examples of disturbances within the survey area	27		
Figure 3-8: Environmental zones conducive to Aboriginal occupation.	29		
Figure 4-1: AHIMS sites located within The Place	37		
Figure 4-2: Previously recorded AHIMS sites near the Additional Disturbance Area	39		
Figure 4-3. Location of sites previously salvaged in the Project Area	55		
Figure 4-4. Previously recorded sites within the Additional Disturbance Area	59		
Figure 4-5: Aerial showing the correlation between site recordings and drainage lines	61		
Figure 4-6: A 1958 aerial image with previously recorded valid sites	63		
Figure 4-7: Previously recorded valid sites and major landform types	65		
Figure 5-1: Survey transects undertaken during the assessment of the survey area	73		
Figure 5-2: Examples of GSE/GSV within the survey area	76		
Figure 5-3: Aerial showing newly recorded sites.	80		
Figure 5-4: Aerial showing newly recorded artefact scatters	81		
Figure 5-5: Aerial showing newly recorded isolated finds and the scarred tree	82		
Figure 5-6: Aerial showing location and extent of Glendell North OS1.	84		

Figure 5-7: Photographs showing an overview and details of Glendell North OS1	84
Figure 5-8: Aerial showing location and extent of Glendell North OS2	86
Figure 5-9: Photographs showing an overview and details of Glendell North OS2	86
Figure 5-10: Aerial showing location and extent of Glendell North OS3 and OS4	88
Figure 5-11: Photographs showing an overview and details of Glendell North OS3.	88
Figure 5-12: Photographs showing an overview and details of Glendell North OS4.	90
Figure 5-13: Aerial showing location and extent of Glendell North OS5 to OS7	91
Figure 5-14: Photographs showing an overview and details of Glendell North OS5.	92
Figure 5-15: Photographs showing an overview and details of Glendell North OS6.	93
Figure 5-16: Photographs showing an overview and details of Glendell North OS7.	95
Figure 5-17: Aerial showing location and extent of Glendell North OS8	96
Figure 5-18: Photographs showing an overview and details of Glendell North OS8.	97
Figure 5-19: Aerial showing location and extent of Glendell North OS9	98
Figure 5-20: Photographs showing an overview and details of Glendell North OS9.	99
Figure 5-21: Aerial showing location and extent of Glendell North OS10	100
Figure 5-22: Photographs showing an overview and details of Glendell North OS10)101
Figure 5-23: Aerial showing location and extent of Glendell North OS11	102
Figure 5-24: Photographs showing an overview and details of Glendell North OS1	1103
Figure 5-25: Aerial showing location and extent of Glendell North OS12	104
Figure 5-26: Photographs showing an overview and details of Glendell North OS12	2105
Figure 5-27: Aerial showing location and extent of Glendell North OS13	106
Figure 5-28: Photographs showing an overview and details of Glendell North OS13	3107
Figure 5-29: Aerial showing location and extent of Glendell North OS14	108
Figure 5-30: Photographs showing an overview and details of Glendell North OS14	1109
Figure 5-31: Aerial showing location and extent of Glendell North OS15	110
Figure 5-32: Photographs showing an overview and details of Glendell North OS15	5111
Figure 5-33: Aerial showing location and extent of Glendell North OS16	112
Figure 5-34: Photographs showing an overview and details of Glendell North OS16	3113
Figure 5-35: Aerial showing location and extent of Glendell North OS17	114
Figure 5-36: Photographs showing an overview and details of Glendell North OS17	7115
Figure 5-37: Aerial showing location and extent of Glendell North OS18	116
Figure 5-38: Photographs showing an overview and details of Glendell North OS18	3117
Figure 5-39: Aerial showing location and extent of Glendell North OS19 and OS20	119
Figure 5-40: Photographs showing an overview and details of Glendell North OS19	9119
Figure 5-41: Photographs showing an overview and details of Glendell North OS20)121
Figure 5-42: Aerial showing location and extent of Glendell North OS21	123
Figure 5-43: Photographs showing an overview and details of Glendell North OS2	l123
Figure 5-44: Aerial showing location and extent of Glendell North OS22	125

Figure	5-45:	Photographs showing an overview and details of Glendell North OS22.	125
Figure	5-46:	Aerial showing location and extent of Glendell North OS23	127
Figure	5-47:	Photographs showing an overview and details of Glendell North OS23.	127
Figure	5-48:	Aerial showing location and extent of Glendell North OS24	129
Figure	5-49:	Photographs showing an overview and details of Glendell North OS24.	129
Figure	5-50:	Aerial showing location and extent of Glendell North OS25	131
Figure	5-51:	Photographs showing an overview and details of Glendell North OS25.	131
Figure	5-52:	Aerial showing location and extent of Glendell North OS26	133
Figure	5-53:	Photographs showing an overview and details of Glendell North OS26.	133
_		Aerial showing locations and extents of Glendell North OS27 and Glendell North OS	
		Dhata manha ahanin na an anamian and dataila af Clandall Narth CC27	
		Photographs showing an overview and details of Glendell North OS27.	
Ū		Photographs showing an overview and details of Glendell North OS28.	
		Aerial showing location and extent of Glendell North OS29	
_		Photographs showing an overview and details of Glendell North OS29.	
		Aerial showing location and extent of Glendell North OS30	
		Photographs showing an overview and details of Glendell North OS30.	
_		Aerial showing location and extent of Glendell North OS31	
		Photographs showing an overview and details of Glendell North OS31.	
		Aerial showing location and extent of Glendell North OS32	
		Photographs showing an overview and details of Glendell North OS32.	
		Aerial showing location and extent of Glendell North OS33	
_		Photographs showing an overview and details of Glendell North OS33	
		Aerial showing location and extent of Glendell North OS34 and OS35	
_		Photographs showing an overview and details of Glendell North OS34	
		Aerial showing location and extent of Glendell North OS36	
_		Photographs showing an overview and details of Glendell North OS36	
Figure	5-71:	Aerial showing location and extent of Glendell North OS37	153
Figure	5-72:	Photographs showing an overview and details of Glendell North OS37	153
Figure	5-73:	Aerial showing location and extent of Glendell North OS38	155
Figure	5-74:	Photographs showing an overview and details of Glendell North OS38	155
Figure	5-75:	Aerial showing location and extent of Glendell North OS39	157
Figure	5-76:	Photographs showing an overview and details of Glendell North OS39.	157
Figure	5-77:	Aerial showing location and extent of Glendell North IF1.	160
Figure	5-78:	Photographs showing an overview and details of Glendell North IF1	160
Figure	5-79:	Aerial showing locations and extents of Glendell North IF2 and Glendell North IF3.	161
Figure	5-80:	Photographs showing an overview and details of Glendell North IF2.	162
Figure	5-81:	Photographs showing an overview and details of Glendell North IF3	163

Figure 5-82: Aerial showing location and extent of Glendell North IF4.	164
Figure 5-83: Photographs showing an overview and details of Glendell North IF4	164
Figure 5-84: Aerial showing location and extent of Glendell North IF5.	165
Figure 5-85: Photographs showing an overview and details of Glendell North IF5	166
Figure 5-86: Aerial showing location and extent of Glendell North IF6.	167
Figure 5-87: Photographs showing an overview and details of Glendell North IF6	167
Figure 5-88: Aerial showing location and extent of Glendell North IF7.	168
Figure 5-89: Photographs showing an overview and details of Glendell North IF7	169
Figure 5-90: Aerial showing location and extent of Glendell North IF8.	170
Figure 5-91: Photographs showing an overview and details of Glendell North IF8	170
Figure 5-92: Aerial showing location and extent of Glendell North IF9.	171
Figure 5-93: Photographs showing an overview and details of Glendell North IF9	172
Figure 5-94: Aerial showing location and extent of Glendell North IF10	173
Figure 5-95: Photographs showing an overview and details of Glendell North IF10	173
Figure 5-96: Aerial showing location and extent of Glendell North IF11.	174
Figure 5-97: Photographs showing an overview and details of Glendell North IF11	175
Figure 5-98: Aerial showing locations and extents of Glendell North IF12 to Glendell	
Figure 5-99: Photographs showing an overview and details of Glendell North IF12	
Figure 5-100: Photographs showing an overview and details of Glendell North IF13	
Figure 5-101: Photographs showing an overview and details of Glendell North IF14	
Figure 5-102: Aerial showing location and extent of Glendell North IF15	
Figure 5-103: Photographs showing an overview and details of Glendell North IF15	
Figure 5-104: Aerial showing location and extent of Glendell North IF16	
Figure 5-105: Photographs showing an overview and details of Glendell North IF16	
Figure 5-106: Aerial showing locations and extents of Glendell North IF17 and Glendell	
	182
Figure 5-107: Photographs showing an overview and details of Glendell North IF17	
Figure 5-108: Photographs showing an overview and details of Glendell North IF18	183
Figure 5-109: Aerial showing location and extent of Glendell North IF19	184
Figure 5-110: Photographs showing an overview and details of Glendell North IF19	184
Figure 5-111: Aerial showing location and extent of Glendell North IF20	185
Figure 5-112: Photographs showing an overview and details of Glendell North IF20	
Figure 5-113: Aerial showing location and extent of Glendell North IF21	187
Figure 5-114: Photographs showing an overview and details of Glendell North IF21	
Figure 5-115: Aerial showing location and extent of Glendell North IF22	
Figure 5-116: Photographs showing an overview and details of Glendell North IF22	
Figure 5-117: Aerial showing location and extent of Glendell North IF23	190

Figure 5-118: Photographs showing an overview and details of Glendell North IF23	190
Figure 5-119: Aerial showing location and extent of Glendell North IF24	191
Figure 5-120: Photographs showing an overview and details of Glendell North IF24	192
Figure 5-121: Aerial showing location and extent of Glendell North IF25	193
Figure 5-122: Photographs showing an overview and details of Glendell North IF25	193
Figure 5-123: Aerial showing location and extent of Glendell North IF26	194
Figure 5-124: Aerial showing location and extent of Glendell North IF27 and Glendell	North IF28.
	195
Figure 5-125: Photographs showing an overview and details of Glendell North IF27	196
Figure 5-126: Photographs showing an overview and details of Glendell North IF28	197
Figure 5-127: Aerial showing location and extent of Glendell North IF29	198
Figure 5-128: Photographs showing an overview and details of Glendell North IF29	198
Figure 5-129: Aerial showing location and extent of Glendell North ST1	199
Figure 5-130: Photographs showing an overview and details of Glendell North ST1	200
Figure 5-131: Aerial showing the location of all previously recorded and registered site	es in or near
the survey area	204
Figure 6-1: Location of the test excavation program areas.	232
Figure 6-2. Examples of raw material types from the Additional Disturbance Area	237
Figure 6-3. Location of transects within Area 1 showing total artefact numbers from e	ach square.
	248
Figure 6-4. Area 1. View of transects.	248
Figure 6-5. Location of transects within Area 2 showing total artefact numbers from e	ach square.
	250
Figure 6-6. Area 2. View of transects.	250
Figure 6-7. Location of transects within Area 3 showing total artefact numbers from e	ach square.
	252
Figure 6-8. Area 3. View of transects.	252
Figure 6-9. Location of transects within Area 4 showing total artefact numbers from e	ach square.
	254
Figure 6-10. Area 4. View of transects.	254
Figure 6-11. Location of transect within Area 5 showing total artefact numbers from 6	ach square.
	256
Figure 6-12. Area 5. View of transect.	256
Figure 6-13. Location of transects within Area 6 showing total artefact numbers from 6	each square.
	257
Figure 6-14. Area 6. View of transects.	258
Figure 6-15. Location of transects within Area 7 showing total artefact numbers from 6	each square.
	259

Figure 6-16	. Area 7. View of transects.	259
Figure 6-17	. Location of transects within Area 8 showing total artefact numbers from ea	ach square.
		260
Figure 6-18	. Area 8. View of transects.	261
Figure 6-19	. Location of transects within Area 9 showing total artefact numbers from ea	ach square.
		262
Figure 6-20	. Area 9. View of transects.	262
Figure 6-21	. Location of transects within Area 10 showing total artefact numbers from ea	ach square.
		263
Figure 6-22	. Area 10. View of transects.	264
-	. Location of transects within Area 11 showing total artefact numbers from ea	•
	. Area 11. View of transects.	
•	. Location of transects within Area 12 showing total artefact numbers from ea	
_		
	. Area 12. View of transects.	
•	. Test excavation Area 1. Stratigraphy	
•	. Test excavation Area 1. Vertical artefact distribution	
-	. Test excavation Area 2. Stratigraphy	
-	. Test excavation Area 3. Stratigraphy	
•	. Test excavation Area 4. Stratigraphy	
	. Test excavation Area 4. Vertical artefact distribution	
•	. Test excavation Area 5. Stratigraphy	
•	. Test excavation Area 6. Stratigraphy	
	. Test excavation Area 7. Stratigraphy	
•	. Test excavation Area 8. Stratigraphy	
-	. Test excavation Area 9. Stratigraphy	
-	. Test excavation Area 10. Stratigraphy	
-	. Test excavation Area 11. Stratigraphy	
•	. Test excavation Area 12. Stratigraphy	
Figure 6-41	. Test excavation. Vertical distribution of artefacts	288
Figure 6-42	. Test excavation. Artefact type	289
Figure 6-43	. Test excavation. Artefact raw materials	290
-	. Test excavation. Artefact size	
•	. Test excavation. Artefact reduction stage	
•	. Test excavation. Artefact integrity	
-	. Test excavation. Area 1 artefact types	
Figure 6-48	. Test excavation. Area 1 Artefact raw material.	293

Figure 6-49. Test Excavation. Area 1 artefacts	294
Figure 6-50. Test excavation. Area 3 artefacts.	296
Figure 6-51. Test excavation. Area 4 artefact raw material.	297
Figure 6-52. Test excavation. Area 4 artefact types.	298
Figure 6-53. Test excavation. Area 4 artefacts.	298
Figure 6-54. Test Excavation. Area 6 artefacts	300
Figure 6-55. Test excavation. Area 7 artefacts.	301
Figure 6-56. Test Excavation. Area 8 artefact.	301
Figure 6-57. Test Excavation. Area 9 artefact.	302
Figure 6-58. Test Excavation. Area 10 artefacts	302
Figure 6-59. Test excavation Area 11 artefacts.	303
Figure 6-60. Test excavation Area 12 artefacts.	303
Figure 6-61. Area of subsurface deposit at Glendell North OS5.	305
Figure 6-62. Area of subsurface deposit at Glendell North OS6.	306
Figure 6-63. Area of subsurface deposit at Glendell North OS36.	307
Figure 6-64. Area of subsurface deposit at Bowmans Ck 7	308
Figure 6-65. Area of subsurface deposit at York Creek 4.	309
Figure 6-66. Area of subsurface deposit at Glendell North OS34.	310
Figure 6-67. Area of subsurface deposit at Glendell North OS35.	311
Figure 6-68. Area of subsurface deposit at York Creek 7.	312
Figure 6-69. Area of subsurface deposit at Yorks Creek 19.	313
Figure 6-70. Area of subsurface deposit at Glendell North OS16.	314
Figure 6-71. Area of subsurface deposit at Glendell North OS19.	315
Figure 6-72. Area of subsurface deposit at G11 Glendell.	316
Figure 6-73. Area of subsurface deposit at Glendell North IF26.	317
Figure 6-74. Area of subsurface deposit at Glendell North OS25.	318
Figure 6-75. Area of subsurface deposit at York Creek 11	319
Figure 6-76. Area of subsurface deposit at York Creek 18.	320
Figure 6-77. Location of historic heritage test excavation areas	321
Figure 7-1. Aerial showing the relationship of newly recorded sites to waterway buffers	324
Figure 7-2. Aerial showing the relationship of newly recorded sites to historic disturbances	326
Figure 7-3. Aerial showing the relationship of newly recorded sites to landform	327
Figure 8-1: Potentially impacted sites in the northern portion of the Additional Disturbance	e Area.
Figure 8-2: Potentially impacted sites in the southern portion of the Additional Disturbance	
Figure 8-3: Potentially impacted sites in the eastern portion of the Additional Disturbance Are	
Figure 9-1: Aerial showing the location of Glendell North OS1	

Figure 9-2: Aerial showing the location of Glendell North IF23.	370
Figure 9-3: Aerial showing the location of 37-3-0343 (Mt Owen (1996) 1; MTO1;)	371
Figure 9-4: Aerial showing the location of sites located to the west of Bowmans Creek	372
Figure 9-5: Photographs showing Bowmans Creek 16 in 2019.	373
Figure 9-6: Aerial showing the location of Bowmans Creek 16	374
Tables	
Table 2-1: Concordance between the BCD input to the SEARs and this AAIA	12
Table 4-1: Artefact densities at sites recorded by Resource Planning 1991	34
Table 4-2: Aboriginal heritage: desktop-database search results	38
Table 4-3: Previously recorded AHIMS sites near the Additional Disturbance Area: site ty	pes and
frequencies.	40
Table 4-4. Sites salvaged within the Project Area under Permit SZ323	49
Table 4-5. Sites within the Project Area salvaged under Consent #2267	50
Table 4-6. Details of sites within the Project Area salvaged under AHIP C0000623	53
Table 4-7. Sites salvaged within the Project Area under SSD-5850.	54
Table 4-8. Site types of valid, previously recorded sites within the Additional Disturbance A	rea56
Table 4-9: Previously recorded sites within the Additional Disturbance Area	57
Table 5-1: Survey coverage data for the survey area	75
Table 5-2: Landform summary and recorded sites within the survey area	75
Table 5-3: Newly recorded sites noted during the survey.	77
Table 5-4: Glendell North OS1. Artefact attributes.	85
Table 5-5: Glendell North OS2. Artefact attributes.	87
Table 5-6: Glendell North OS3. Artefact attributes.	89
Table 5-7: Glendell North OS4. Artefact attributes.	90
Table 5-8: Glendell North OS5. Surface artefact attributes	92
Table 5-9: Glendell North OS6. Surface artefact attributes	94
Table 5-10: Glendell North OS7. Artefact attributes.	95
Table 5-11: Glendell North OS8. Artefact attributes.	97
Table 5-12: Glendell North OS9. Artefact attributes.	99
Table 5-13: Glendell North OS10. Artefact attributes	101
Table 5-14: Glendell North OS11. Artefact attributes	103
Table 5-15: Glendell North OS12. Artefact attributes	105
Table 5-16: Glendell North OS13. Artefact attributes	107
Table 5-17: Glendell North OS14. Artefact attributes	109
Table 5-18: Glendell North OS15. Artefact attributes	111
Table 5-19: Glendell North OS16. Surface artefact attributes	113

Table 5-20: Glendell North OS17. Artefact attributes	115
Table 5-21: Glendell North OS18. Artefact attributes	116
Table 5-22: Glendell North OS19. Surface artefact attributes	118
Table 5-23: Glendell North OS20. Artefact attributes	121
Table 5-24: Glendell North OS21. Artefact attributes	124
Table 5-25: Glendell North OS22. Artefact attributes	126
Table 5-26: Glendell North OS23. Artefact attributes	128
Table 5-27: Glendell North OS24. Artefact attributes	130
Table 5-28: Glendell North OS25. Surface artefact attributes.	132
Table 5-29: Glendell North OS26. Artefact attributes	134
Table 5-30: Glendell North OS27. Artefact attributes	136
Table 5-31: Glendell North OS28. Artefact attributes	137
Table 5-32: Glendell North OS30. Artefact attributes	139
Table 5-33: Glendell North OS30. Artefact attributes	139
Table 5-34: Glendell North OS31. Artefact attributes	143
Table 5-35: Glendell North OS32. Artefact attributes	145
Table 5-36: Glendell North OS33. Artefact attributes	148
Table 5-37: Glendell North OS34. Surface artefact attributes	149
Table 5-38: Glendell North OS37. Artefact attributes	154
Table 5-39: Glendell North OS38. Artefact attributes	156
Table 5-40: Glendell North OS39. Artefact attributes	158
Table 5-41: Recorded isolated finds artefact attributes and coordinates	158
Table 5-42: Attributes of Glendell North ST1	200
Table 5-43: All previously recorded and registered sites in or near the survey area	201
Table 5-44: Results of inspection of previously recorded, registered, sites in or near the survey	y area.
	205
Table 6-1: Reasons why certain areas were chosen for test excavation	231
Table 6-2: Previously recorded sites with PADs not included in the test excavation program	233
Table 6-3: Sampling methodology for the text excavation program.	234
Table 6-4. Terminology used in the artefact catalogue	235
Table 6-5. Summary of results from each excavation square	243
Table 6-6. Area 1: Excavation log.	268
Table 6-7. Area 2: Excavation log.	271
Table 6-8. Area 3: Excavation log.	274
Table 6-9. Area 4: Excavation log	275
Table 6-10. Area 5: Excavation log	278
Table 6-11. Area 6: Excavation log	279
Table 6-12. Area 7: Excavation log.	280

Table 6-13. Area 8: Excavation log	282
Table 6-14. Area 9: Excavation log	283
Table 6-15. Area 10: Excavation log	284
Table 6-16. Area 11: Excavation log	285
Table 6-17. Area 12: Excavation log	286
Table 8-1: Scientific significance of newly recorded sites	339
Table 8-2: Significance assessment of previously recorded sites.	344
Table 8-3: All known sites within the Additional Disturbance Area	347
Table 9-1: Management recommendations for sites within the Additional Disturbance Area	362
Table 9-2: Sites requiring specific management to ensure conservation.	369
Table 9-3: Sites located on LCO owned land to the west of Bowmans Creek	371

1 Introduction

OzArk Environment & Heritage (OzArk) has been engaged by Umwelt Environmental & Social Consultants (Umwelt) on behalf of Glendell Tenements Pty Limited (the proponent) to complete an Aboriginal Archaeology Impact Assessment (AAIA) for the proposed Glendell Continued Operations Project (the Project). The purpose of the assessment is to form part of an Environmental Impact Statement (EIS) being prepared by Umwelt to accompany an application for development consent under Division 4.1 and 4.7 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Project.

Australian Cultural Heritage Management Pty Limited (ACHM) will prepare the *Aboriginal Cultural Heritage Assessment Report* (ACHAR). This AAIA will be an appendix to the ACHAR.

1.1 PROJECT OVERVIEW

The Mount Owen Complex (MOC), which includes the Project Area, is located within the Hunter Coalfields in the upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres (km) northwest of Singleton, 24 km southeast of Muswellbrook. The MOC is situated in the Singleton Local Government Area (LGA) (**Figure 1-1**).

The MOC includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Project consent (SSD-5850 as modified) and the Glendell Pit, approved under the Glendell Mine consent (DA 80/952 as modified). The Coal Handling and Preparation Plant (CHPP) washes coal from all three pit areas. The water management system for the MOC is integrated, as well as being linked to Glencore's Greater Ravensworth Area Water and Tailings Scheme (GRAWTS). The MOC is approved to process up to 17 million tonnes per annum (Mtpa) run of mine (ROM) coal through the CHPP with production at each of the three pits approved as follows:

- North Pit up to 10 Mtpa;
- Bayswater North Pit up to 4 Mtpa; and
- Glendell Pit up to 4.5 Mtpa.

The Project seeks to extend the life of Glendell Mine to 2044 with an increase in the current approved extraction rate of 4.5 Mtpa to 10 Mtpa over the life of the Project. Key aspects of the Project include the continuation of the Glendell Pit to the north (Glendell Pit Extension), the realignment of a section of Hebden Road, the realignment of a section of Yorks Creek, construction of a new mine infrastructure area (MIA), and relocation of Ravensworth Homestead (**Figure 1-2**).

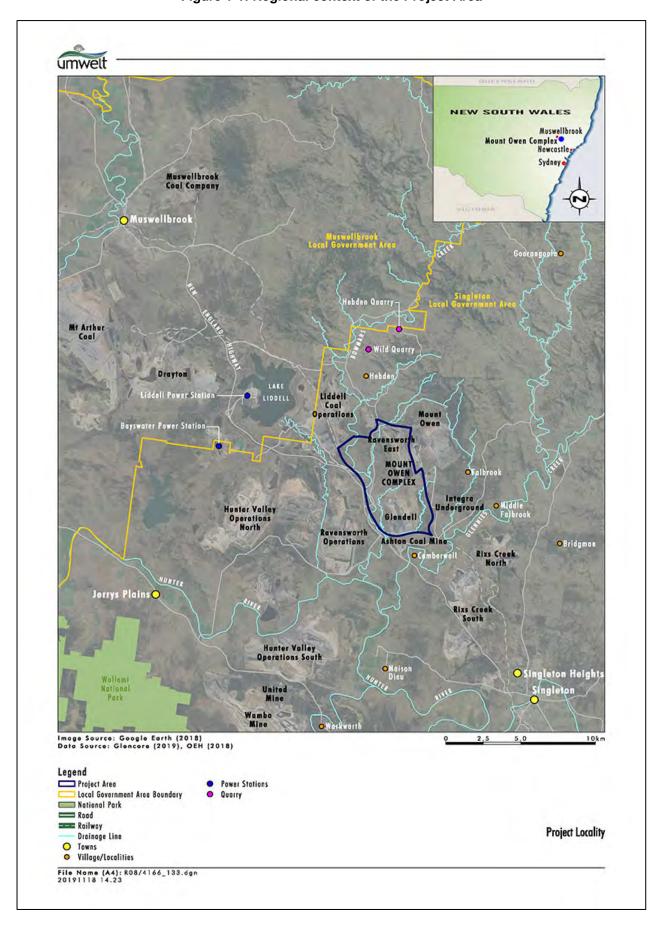


Figure 1-1: Regional context of the Project Area

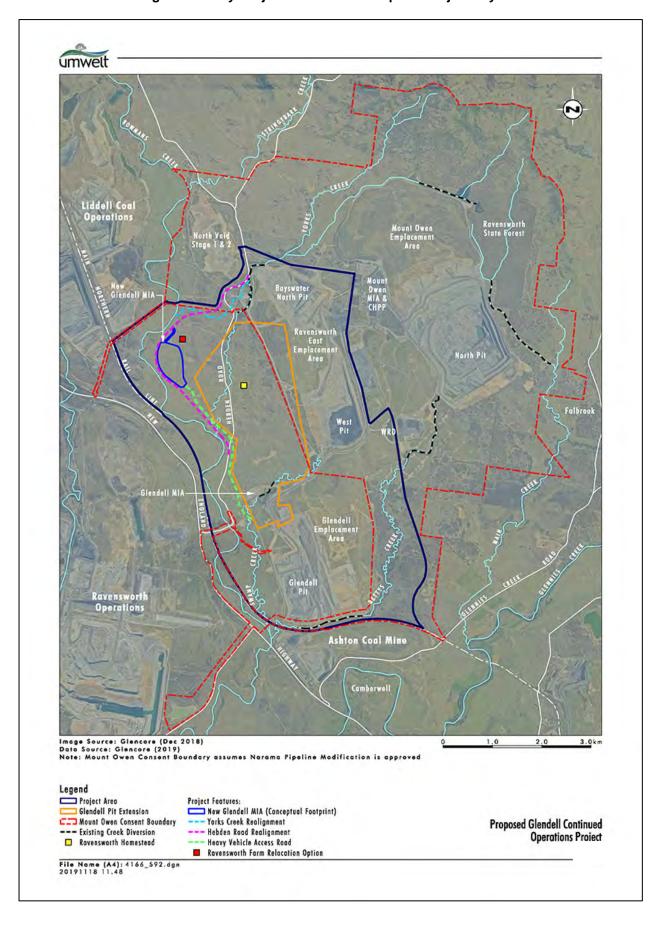


Figure 1-2. Key Project features: Conceptual Project Layout.

1.2 THE PROJECT AREA

All proposed impacts related to construction and operation of the Project will be confined to the Project Area shown on **Figure 1-3**. The Project Area comprises approximately 2,900 hectares (ha); the majority of which is already cleared or is approved for disturbance as part of existing approvals. A large proportion of the Project Area within the MOC has been subject to salvage programs.

The topography of the Project Area is characterised by several low ridges with spurs and low to moderate gradient slopes. Lower topographic areas are associated with Bowmans, Swamp, Yorks and Bettys Creeks (**Figure 1-3**). The creek lines generally flow from the north to the south. Portions of Swamp, Yorks and Bettys Creek have been diverted within the Project Area as a result approved mining activity. The Project Area also contains several unnamed tributaries associated with the previously listed creek lines which flow between the spurs. In the portions of the Project Area that are outside of approved mining areas, the topography is generally flat ranging between around 60 meters (m) above sea level to small rises that are around 140 m above sea level.

The Project Area has been subject to agricultural land uses, including intensive grazing and pasture improvement, as well as mine related activities. All woodland in the Project Area is regrowth and mature trees are very rare. **Figure 1-4** shows the Project Area superimposed on an aerial photo dating from 1958. This shows the almost complete nature of the clearing across the Project Area and large areas of visible sheet wash erosion. Woodland regrowth tends to be thick stands of Casuarina along creek lines and open Eucalyptus woodland on slopes. Other extensive areas within the Project Area have been previously cleared and are still open grasslands currently used for cattle grazing.

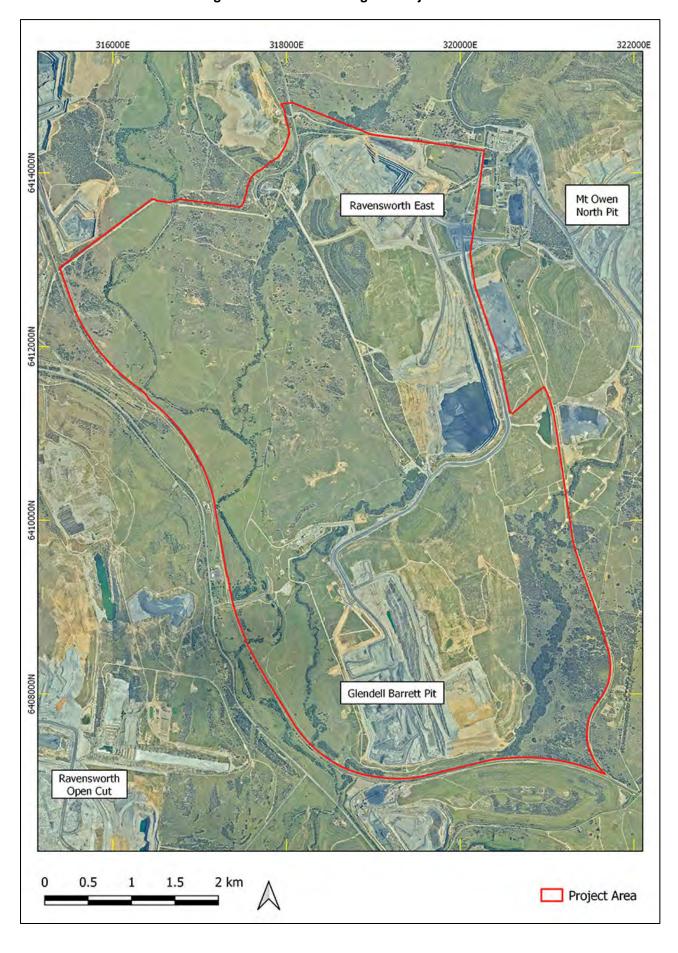


Figure 1-3: Aerial showing the Project Area.

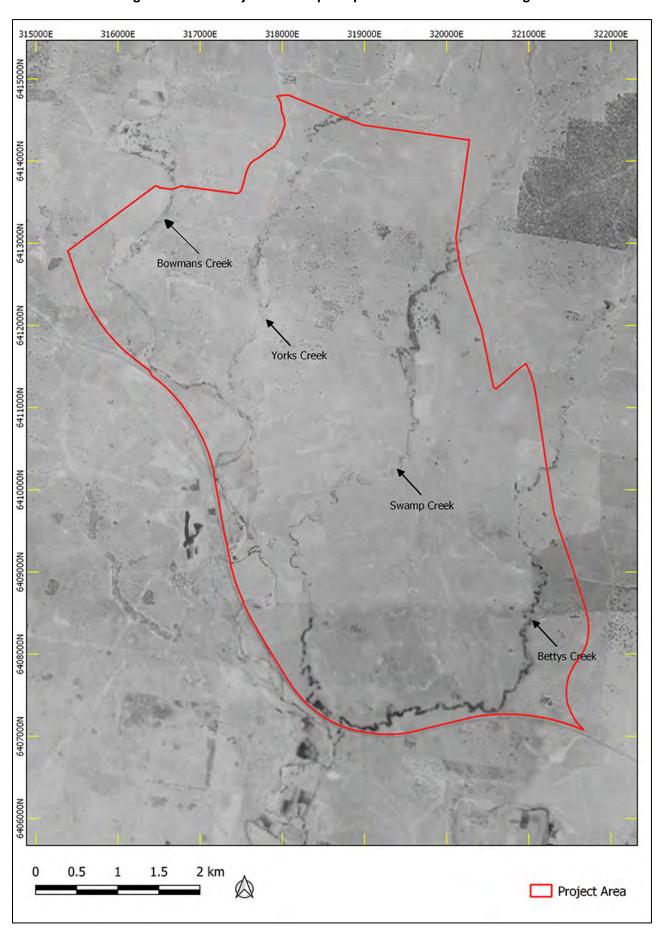


Figure 1-4. The Project Area superimposed on a 1958 aerial image.

1.3 THE ADDITIONAL DISTURBANCE AREA

The Additional Disturbance Area is the area in which all Project impacts currently outside of approved disturbance areas will be located (**Figure 1-5**). The Additional Disturbance Area occupies approximately 750 ha.

The Additional Disturbance Area consists of a large contiguous block to the east of Bowmans Creek. There are also smaller portions to the north of the Ravensworth East mine, as well as a small area in the east on either side of Bettys Creek.

The principal area of the Additional Disturbance Area consists of flat landforms associated with Bowmans Creek and the gentle gradient slopes to the east. While there are some prominent but low hills within the Additional Disturbance Area to the north of the access road to the Glendell Mine, generally the Additional Disturbance Area has a low gradient. As such, the entirety of the Additional Disturbance Area has been subject to cultivation (in areas adjacent to Bowmans Creek) or grazing (in areas away from the Bowmans Creek). Most of the area remains cleared and large portions continue to be used for cattle grazing.

1.4 THE SURVEY AREA

As the Project progressed during 2018, the Additional Disturbance Area has been reduced in size. As such, when the field survey for this assessment was undertaken in April/May 2018, it assessed an area larger than the current Additional Disturbance Area. The area included in the survey for the Project will be termed the 'survey area'. As shown on **Figure 1-6**, the principal areas included in the survey which are no longer part of the Additional Disturbance Area are:

- A large area to the west of Bowmans Creek in the northwest of the Project Area;
- Areas to the north of the Project Area adjacent to Yorks Creek;
- An area to the southwest of the Project Area on either side of Bowmans Creek; and
- A reduced area in the east of the Project Area near Bettys Creek.

The survey area covered approximately 1,010 ha. All areas included in the current Additional Disturbance Area were included in the survey area and have been assessed.

This AAIA will note recordings made within the survey area but any discussion of Project impacts will be limited to the Additional Disturbance Area.

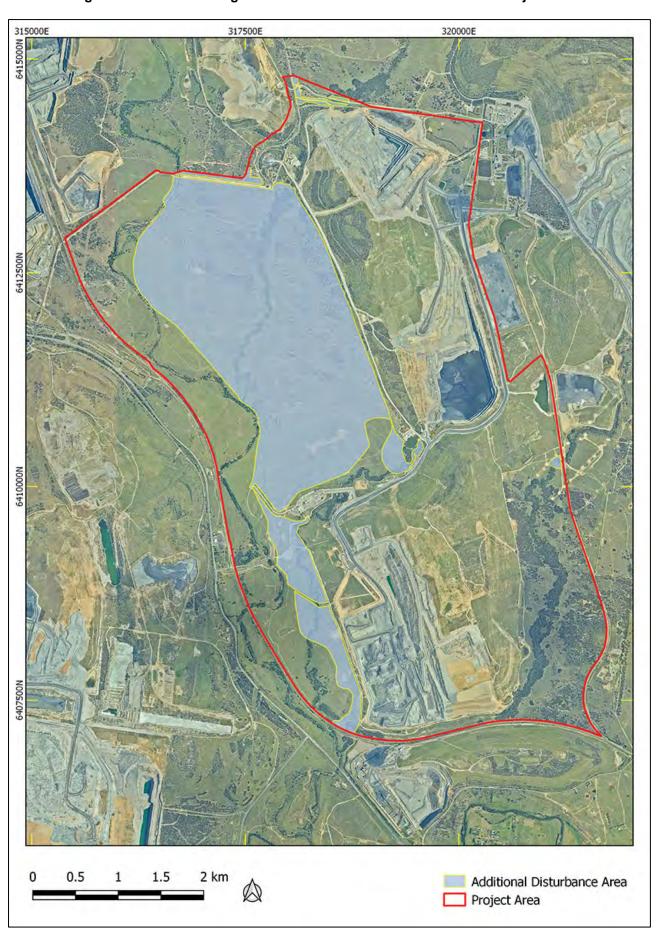


Figure 1-5. Aerial showing the Additional Disturbance Area and the Project Area.

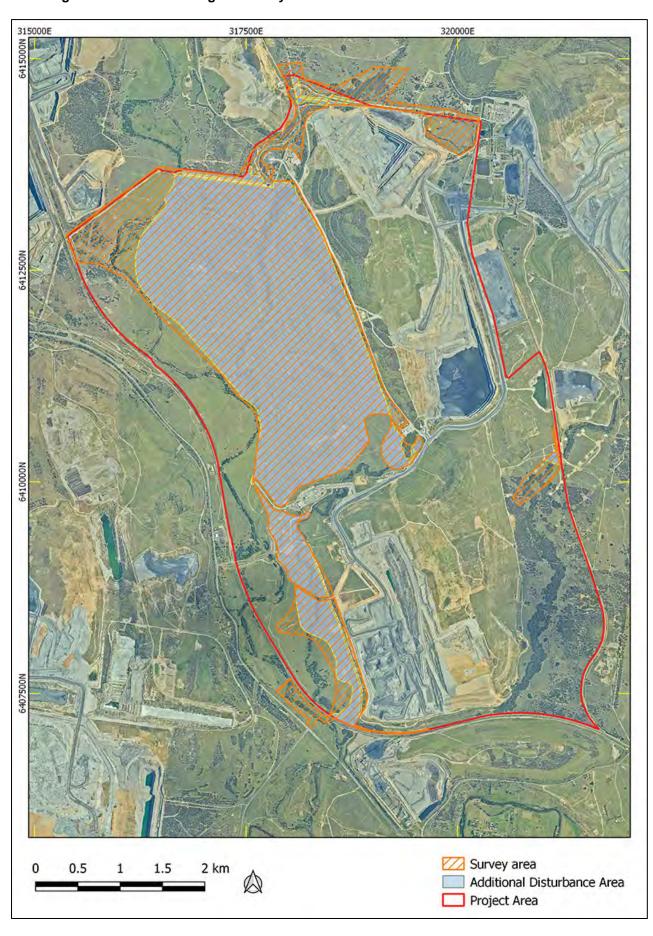


Figure 1-6. Aerial showing the survey area in relation to the Additional Disturbance Area.

2 THE ARCHAEOLOGICAL ASSESSMENT

2.1 RELEVANT LEGISLATION

Cultural heritage is managed by a number of state and national Acts. Baseline principles for the conservation of heritage places and relics can be found in the *Burra Charter* (Australia ICOMOS 2013). The *Burra Charter* has become the standard of best practice in the conservation of heritage places in Australia, and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The *Burra Charter* generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a state level.

Several Acts of parliament provide for the protection of heritage at various levels of government.

2.1.1 Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Matters of National Environmental Significance listed under the EPBC Act include the National Heritage List and the Commonwealth Heritage List, both administered by the Commonwealth Department of the Environment and Energy. Ministerial approval is required under the EPBC Act for proposals involving significant impacts to National/Commonwealth heritage places.

Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 is aimed at the protection from injury and desecration of areas and objects that are of significance to Aboriginal Australians. This legislation has usually been invoked in emergency and conflicted situations.

2.1.2 State legislation

Environmental Planning and Assessment Act 1979 (EP&A Act)

This Act, amended by the *Environmental Planning and Assessment Amendment Act 2017,* establishes requirements relating to land use and planning. The framework governing environmental and heritage assessment in NSW is contained within the following parts of the EP&A Act:

- Part 4: Local government development assessments, including heritage. May include schedules of heritage items;
 - o **Division 4.7:** Approvals process for state significant development.

As the Project is a State Significant Development (SSD), Section 4.41 of the EP&A Act (formerly Section 89J) applies and certain authorisations, such as an Aboriginal Heritage Impact Permit (AHIP), are not required for the Project. This section also provides a defence for any investigative

or other activities that are required to be carried out for the purpose of complying with any environmental assessment requirements (i.e. SEARs: see below).

National Parks and Wildlife Act 1974 (NPW Act)

Amended during 2010, the NPW Act provides for the protection of Aboriginal objects (sites, objects and cultural material) and Aboriginal places. Under the Act (Part 6), an Aboriginal object is defined as: any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises NSW, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains.

An Aboriginal place is defined under the NPW Act as an area which has been declared by the Minister administering the Act as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.

As of 1 October 2010, it is an offence under Section 86 of the NPW Act to 'harm or desecrate an object the person knows is an Aboriginal object'. It is also a strict liability offence to 'harm an Aboriginal object' or to 'harm or desecrate an Aboriginal place', whether knowingly or unknowingly. As the Project is a SSD, if approved, Section 4.41 of the EP&A Act will apply and an AHIP under section 90 of the NPW Act to harm Aboriginal objects is not required. Instead, all management related to Aboriginal cultural heritage within the Additional Disturbance Area will be governed by the policies within an approved Aboriginal Cultural Heritage Management Plan (ACHMP).

Under Section 89A of the Act, it is a requirement to notify the Chief Executive of the Biodiversity and Conservation Division (BCD, formerly OEH) of the location of an Aboriginal object. This is normally done by submitting a site card to the Aboriginal Heritage Information Management System (AHIMS) that is administered by the Department of Premier and Cabinet.

Secretary's Environmental Assessment Requirements

Secretary's Environmental Assessment Requirements (SEARs) were issued for the Project (SSD 9349) on 7 June 2018.

The SEARs recognise heritage as a key issue to be examined in the EIS and state (in part):

an assessment (will be undertaken) of the potential impacts of the development on Aboriginal heritage (cultural and archaeological), including consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage

To inform the SEARs, the BCD (formerly OEH) provided input regarding Aboriginal cultural heritage. The BCD input is set out in **Table 2-1** along with a concordance of where the BCD requirements are addressed in this AAIA.

2.1.3 Applicability to the Project

The Project will be assessed under Divisions 4.1 and 4.7 of the EP&A Act.

Any Aboriginal sites within the Additional Disturbance Area are afforded legislative protection under the NPW Act. It is noted, however, that Section 4.41 of the EP&A Act removes the requirement for SSD projects to apply for an AHIP to harm Aboriginal objects.

It is noted there are no Commonwealth or National heritage listed places within the Additional Disturbance Area and as such, the heritage provisions of the EPBC Act do not apply.

Further, a submission made under Part 2, Division 1 Section 10 of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* seeking to protect an area that included the Project Area as an Aboriginal Place was withdrawn by the Applicant in September 2019.

The BCD requirements set out in the SEARs are listed in **Table 2-1**, along with a concordance of where this requirement, if applicable, is addressed in this AAIA.

Table 2-1: Concordance between the BCD input to the SEARs and this AAIA.

BCD requirement	Where addressed in the AAIA
The Environmental Impact Assessment (EIS) must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in the Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the <i>Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW</i> (DECCW, 2011) and consultation with OEH regional branch officers.	This AAIA contains the results of the Aboriginal archaeological survey and test excavation program undertaken for the Project. It also assesses the scientific, or archaeological, values present within the Additional Disturbance Area. This report is part of the ACHAR that will examine the cultural, aesthetic and historic values of the Additional Disturbance Area.
Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.	This requirement has been followed by the Project and is documented in the ACHAR.
Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH.	Impacts to the scientific values within the Additional Disturbance Area are discussed in Section 8.3 . Management considerations ranging from a 'do nothing' scenario through to an 'unavoidable impact' scenario is discussed in Section 9.2

2.2 ASSESSMENT APPROACH

The current assessment follows the Code of Practice for the Investigation of Aboriginal Objects in New South Wales (Code of Practice; DECCW 2010).

Field assessment and reporting followed the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011).

2.3 Purpose and objectives

The purpose of the AAIA is to identify and assess heritage constraints relevant to the Project.

2.3.1 Aboriginal archaeological assessment objectives

The AAIA will apply the Code of Practice, in the completion of an Aboriginal archaeological assessment, to meet the following objectives:

Objective One: Undertake background research on the region to formulate a predicative

model for Aboriginal site location within the Additional Disturbance Area

Objective Two: Identify and record objects or sites of scientific or archaeological significance

within the Additional Disturbance Area, as well as any landforms likely to

contain further archaeological deposits

Objective Three: Assess the likely impacts of the Project to Aboriginal archaeological sites

and/or deposits and provide management recommendations.

2.4 DATE OF ARCHAEOLOGICAL ASSESSMENT

The fieldwork component of this assessment was undertaken by OzArk, Registered Aboriginal Parties (RAPs) and Wonnarua Knowledge Holders over the course of several weeks in April, September, October and November 2018. The survey and test excavation during this time was broken in nine weeks and involved 40 field days in total, namely:

- Week 1: 9-12 April (5 days; survey);
- Week 2: 16-13 April (5 days; survey);
- Week 3: 30 April and 1 May (2 days; survey);
- Week 4: 3-7 September (5 days; Aboriginal test excavation);
- Week 5: 10-14 September (5 days; Aboriginal test excavation);
- Week 6: 17-19 September (3 days; Aboriginal test excavation);
- Week 7: 29 October to 2 November (5 days; historic test excavation);
- Week 8: 5-9 November (5 days; historic test excavation); and
- Week 9: 12-16 November (5 days; historic test excavation).

The historic test excavations were directed by Casey & Lowe and are reported in the Statement of Heritage Impact appended to the EIS. However, an OzArk archaeologist and up to two RAP representatives (including a representative from the Plains Clans of the Wonnarua People (PCWP) were present during the historic test excavations to manage any Aboriginal cultural heritage finds.

2.5 ABORIGINAL COMMUNITY INVOLVEMENT

The Project has followed the Aboriginal Cultural Heritage *Consultation Requirements for Proponents* including the identification of RAPs and the provision of both survey and test excavation methodologies for RAP review and comment (**Appendix 1**; **Appendix 5**).

RAPs, or their representatives, accompanied the field survey and test excavation programs (both the Aboriginal and historic heritage programs). As up to eight members of the Aboriginal community were present for the field survey days highlighted above, and up to six were present during the test excavation program, 186-person days of Aboriginal community involvement has been included in the assessment.

Full details of the consultation undertaken is provided in the ACHAR that this AAIA supports.

2.6 OZARK INVOLVEMENT

2.6.1 Field assessment

The fieldwork component for the AAIA was undertaken by:

- Fieldwork director: Ben Churcher (OzArk Principal Archaeologist, BA [Hons], University of Queensland; Dip Ed, University of Sydney);
- Fieldwork director: Dr Jodie Benton (OzArk Director and Principal Archaeologist, PhD University of Sydney);
- Archaeologist: Stephanie Rusden (OzArk Project Archaeologist, BSc, University of Wollongong, BA, University of New England);
- Archaeologist: Dr Alyce Cameron (OzArk Project Archaeologist, BA [Hons] and PhD [Archaeology & palaeoanthropology] Australian National University);
- Archaeologist: Philippa Sokol (OzArk Project Archaeologist, BA and DipScience, University of New England); and
- Archaeologist: Tom Dooley (OzArk Project Archaeologist BA [Hons]).

2.6.2 Reporting

The reporting component of the AAIA was undertaken by:

- · Report Author: Ben Churcher;
- Major contributor: Stephanie Rusden;
- Contributor: Tom Dooley; and
- Reviewer: Dr Jodie Benton.

3 LANDSCAPE CONTEXT

An understanding of the environmental contexts of a project area is requisite in any Aboriginal archaeological investigation (DECCW 2010). It is a particularly important consideration in the development and implementation of survey strategies for the detection of archaeological sites. In addition, natural geomorphic processes of erosion and/or deposition, as well as humanly activated landscape processes, influence the degree to which these material culture remains are retained in the landscape as archaeological sites; and the degree to which they are preserved, revealed and/or conserved in present environmental settings.

The Additional Disturbance Area is located wholly within the Hunter Subregion of the Sydney Basin Bioregion (SBB). The Hunter subregion is situated at the far north of the SBB and contains the townships of Scone, Muswellbrook, Singleton, Cessnock, Maitland and the city of Newcastle. The Hunter subregion is predominantly comprised of rolling hills, wide valleys and the meandering system of the Hunter River on a wide floodplain. A wide range of environments are present within the greater subregion including coastal, dune, estuarine, rainforest, plateau, lowland, riparian and swamp ecosystems; not all of which are represented in the Additional Disturbance Area. The Hunter subregion encompasses the catchments of Goulburn, Hunter, and Paterson Rivers (NSW NPWS 2016).

3.1 TOPOGRAPHY

The Additional Disturbance Area falls within the southern portion of the Gloucester foothills topographic zone of the Hunter central lowlands. This greater landscape is characterised by gently undulating lowlands developed on easily eroded Permian sedimentary rock above the alluvial belt of the Hunter River, gradually transitioning into rounded to steep hills with rock outcropping in excess of 300 m AHD (Australian Height Datum) (NSW EPA 2013; Umwelt 2007). The topography of the Additional Disturbance Area is characterised by a number of low ridges with spurs and low to moderate gradient slopes. Elevation is at its greatest (up to 140 m AHD) on the steep conglomerate ridge in the centre of the area (**Figure 3-1**), abruptly transitioning into undulating hills and gentle slopes. These gentle landforms represent the greatest portion of the landscape, together forming a series of minor valleys sloping towards Bowmans Creek, Yorks Creek, and Swamp Creek respectively before levelling out into flats and floodplains (**Figure 3-1**).

For the purposes of this assessment, this landscape can be divided into three survey units based on topographic zones which inform an archaeological characterisation of its landforms. These contiguous areas can be briefly characterised as follows:

• Flats and floodplains: Approximately 414 ha or 55 per cent of the Additional Disturbance Area consists of flat terrain or gentle toe slopes. This terrain contains the named waterways of the Additional Disturbance Area as well as sections of their unnamed tributaries. These areas include substantial sections of floodplain and creek terraces, especially adjacent

Bowmans, Yorks and Swamp Creeks. Most of this landscape zone is currently cleared and either consists of grass paddocks or small stands of regenerating woodland. Soil depths are variable, and it is only in the southwest of the Additional Disturbance Area adjacent to Bowmans Creek where aggrading conditions have allowed soil depth to accumulate.

- Slopes: Approximately 299 ha or 40 per cent of the Additional Disturbance Area consists mostly of elevated sloping landforms (lower to upper slopes). This zone is predominantly located in the south-east and central northern portions of the Additional Disturbance Area. This topography contains steep gradients in places but is more generally characterised by moderate slopes. These landforms primarily represent open grassland paddocks, yet also currently support select areas of open woodland of regenerated trees with very few mature trees. Rock outcrops are frequent in the central portion and, to a lesser extent, the northern portion of the Additional Disturbance Area. Soils tend to be very thin due to soil loss when this area was historically cleared of vegetation.
- Ridges: Approximately 37 ha or five per cent Additional Disturbance Area consists of raised areas with a confined summit. This zone includes two discrete ridge lines; the first a north-south trending ridge line in the north west of the Additional Disturbance Area; and the second a generally east-west trending ridge in the central portion of the Additional Disturbance Area. These landforms currently support areas of open woodland of regenerated trees with very few mature trees, as well as cleared, grassed paddocks. Outcropping rock is present across the ridges and consists on conglomerate, the underlying bedrock of the area. Soils tend to be very thin due to soil loss due to the naturally eroding nature of the landform type.

Figure 3-1 maps the major topographic zones of the Additional Disturbance Area and **Figure 3-2** shows a representative view of each of these topographic zones.

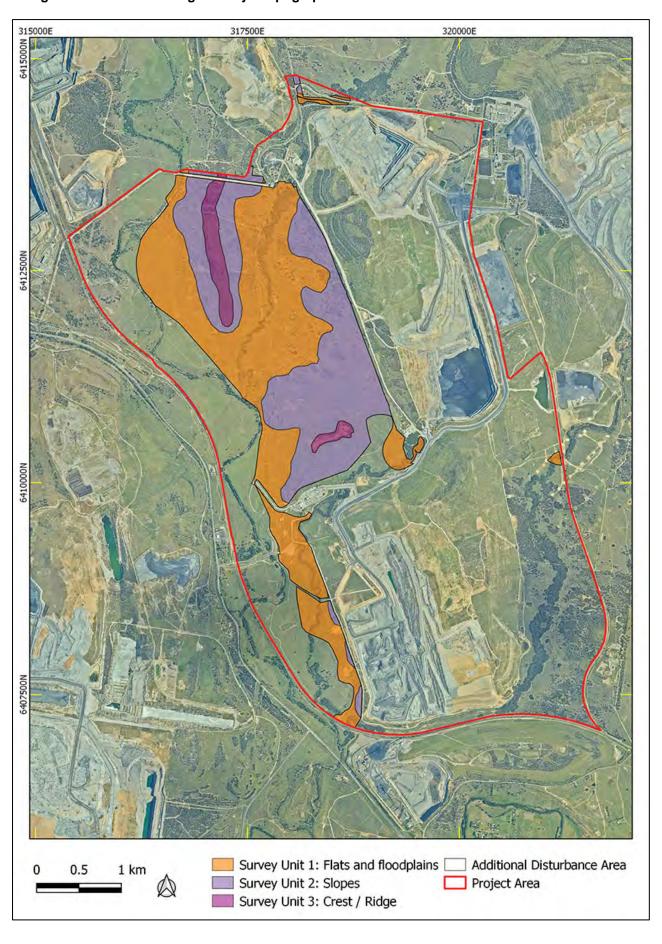


Figure 3-1: Aerial showing the major topographic zones within the Additional Disturbance Area.

Figure 3-2: Examples of the topography of each survey unit.



3.2 GEOLOGY AND SOILS

The Additional Disturbance Area is situated within the Permian Singleton Coal Measures, with some surface geology also being formed by the Permian Wittingham Coal Measures, as determined from regional geological mapping (Kovac and Lawrie 1991). According to Umwelt (2019: 15–21) there are six soil orders within the main portion of the Additional Disturbance Area:

- Sodosol: brown, red, yellow, grey or back Sodosols occur on the hillslope or foot slope of the rolling hills. Sandstone rock outcrop and surface rocks are scattered throughout the hillslopes, however the densities of these are low and occurrences are random. Rock outcrops are predominately flat. The Sodosols within the Additional Disturbance Area were generally characterised by A-Horizons with a silty or sandy loam to silty or sandy clay texture overlying a B2-Horizon with a light medium to medium heavy clay texture. Many of the Sodosols showed a bleached A2-Horizon and medium pebbles were often present. Bleaching of the soils is likely attributed to imperfect drainage and water logging.
- Tenosol: occur as brown-orthic and are associated with the floodplains of Yorks, Bowmans and Swamp Creeks. Due to the lower flow capacity of Yorks and Swamp Creek, the floodplain and associated Tenosols have a relatively narrow distribution. The textures of soils on the lower terraces were sandy clay loams, sandy loams and sand. On the upper terraces, sandy to silty clay loams are the dominant soil textures. Soils structures are mainly apedal to weak sub-angular blocky.
- Rudosol: clastic rudosols occur on hill crests where weathering of parent material is insufficient to form a more mature soil profile. Stratic Rudosols are found where repeated fluvial depositions have occurred without further soil profile development. The clastic Rudosols are derived from the underlying sandstone whereas the stratic Rudosol is formed from ex situ material deposit. The clastic rudosols have a sandy clay loam texture with a weak granular to strong sub-angular blocky structure and few coarse fragments throughout the profile. Soil textures of the stratic rudosols ranged from loamy coarse sand to silty clay loam, the profiles showed an apedal to weak, granular and sub-angular blocky structure.
- Kandosol: brown Kandosols occur isolated on hilltops, foot slopes and on a lower alluvial terrace. The occurrence of Kandosols may be a result of the weathering of isolated, coarser grained sandstones or sandstone conglomerates. Soils have a clay loam texture grading into light clay or sandy loam with apedal massive to moderate sub-angular blocky structures. Common to many moderate mottles were evident in the B-Horizon of all profiles which indicates waterlogging.
- Chromosol: brown or black Chromosols occur on the upper terrace of the creek floodplains and in one occasion on the mid-slope of the rolling hill. The Chromosols from the floodplain are derived from ex situ material. The A-Horizon texture of the floodplain Chromosols ranged from sandy loam, sandy clay loam and silty clay loam with a weak to moderate, granular to sub-angular blocky structure. The upper B textures were coarse sandy light medium clay medium clay and medium heavy clay, with predominately moderate sub-angular and angular blocky structures.
- Dermosol: red, black and brown Dermosols are found in isolation in floodplains areas and to a limited extent on a mid to lower slopes. Dermsolos on the floodplains are formed from exsitu material, while on the mid to lower slopes it may be a result of a slight variation of the

underlying sedimentary (mudstone) geology. The A-Horizon has a light clay texture with a moderate granular structure.

The majority of the Additional Disturbance Area is covered by soils that have a minor to moderate susceptibility to erosion, poor fertility, and high salinity, except for areas adjacent to Bowmans Creek where chemical fertility is higher and salinity levels more benign.

3.3 HYDROLOGY

The primary watercourse and catchment zone within the Additional Disturbance Area is Bowmans Creek (**Figure 3-3**). This stream traverses the western boundary of the Additional Disturbance Area along a generally north—south orientation, intersecting the boundary in several places. In the vicinity of the Additional Disturbance Area, Bowmans Creek is joined by Yorks Creek, Swamp Creek, Bettys Creek, along with a number of unnamed tributaries and flows towards its confluence with the Hunter River 3.5 km to the south.

Many sections of drainage lines near the Additional Disturbance Area, especially unnamed tributaries, have been subject to heavy erosion, sedimentation, and bank collapse. Some display evidence of salinity, primarily in the form of areas of spiny rush (*Juncus acutus*). Additionally, local sections of Yorks, Swamp, and Bettys Creeks have been diverted and/or modified because of approved mining activities (**Figure 3-3**).

At the time of the survey, Yorks Creek, Swamp Creek, and Bettys Creek were dry because of drought conditions preceding the survey (**Figure 3-4**). While the routes of these drainages have seen significant alteration in the historic period, the dryness of these creek systems in the Additional Disturbance Area are an indication of their ephemeral nature. While these systems may have contained ponds prior to their channelisation, it is unlikely that these ponds would have been extensive enough to retain water during long dry spells.

Bowmans Creek retained some silted, standing pools of water in some areas. However, the level of these pools diminished over the course of the survey. This may suggest that this system has the capacity to retain water during dry spells for a restricted period of time.

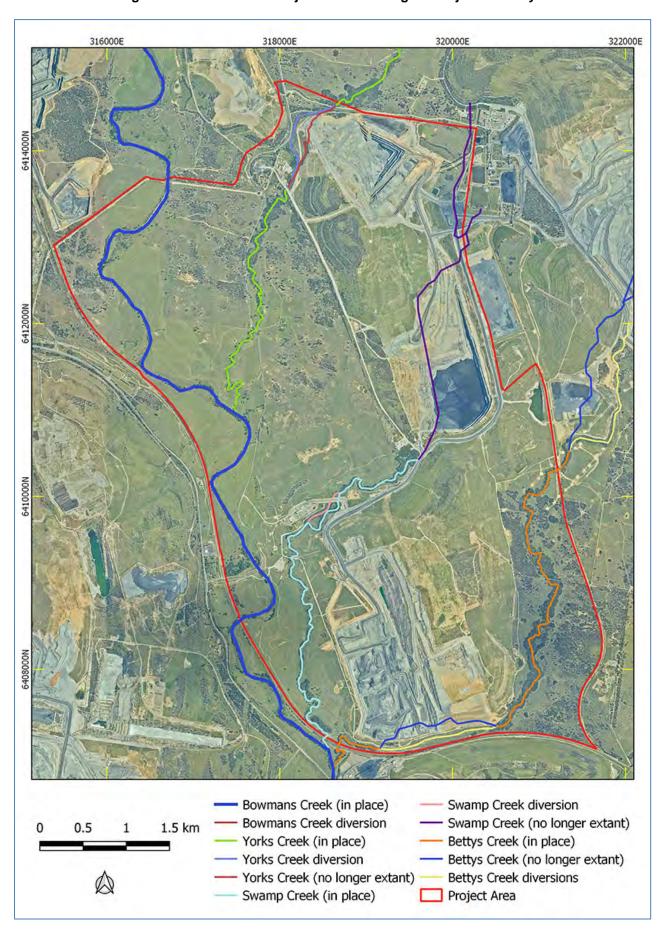
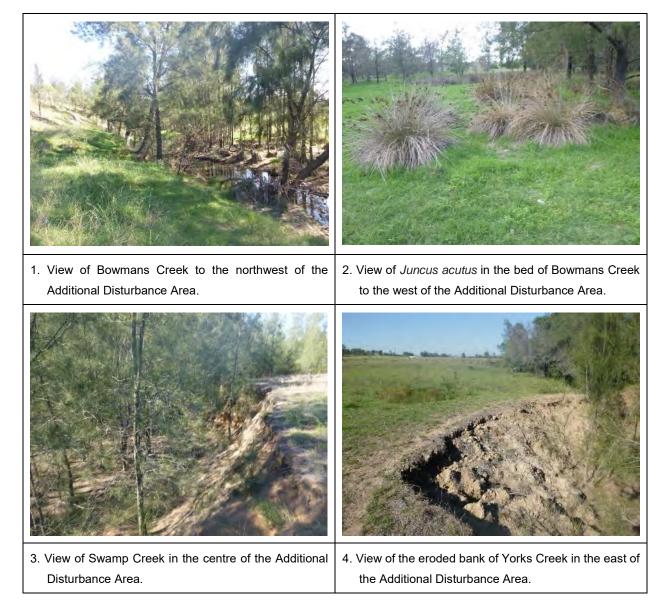


Figure 3-3: Aerial of the Project Area showing the major waterways.

Figure 3-4: Examples of the hydrology within the Additional Disturbance Area.



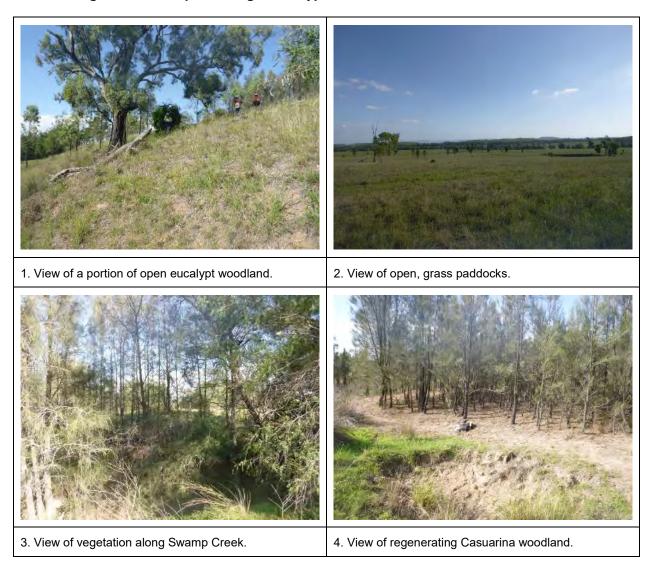
3.4 VEGETATION

In the past, Aboriginal people would have encountered a variety of vegetation communities in the region of the Additional Disturbance Area, however, extensive areas of native vegetation have been cleared since colonial settlement.

The Additional Disturbance Area encompasses sections of the Central Hunter Foothills, and Upper Hunter Channels and Floodplains landscape units (Mitchell 2002). Before historical clearing, the dominant vegetation of the Central Hunter Foothills landscape unit would have been comprised of woodlands to open forest of spotted gum, forest red gum, narrow-leaved ironbark, red ironbark, white box, slaty gum, rough-barked apple, with kangaroo and wallaby grass (Mitchell 2002: 112). The vegetation of the Upper Hunter Channels and Floodplains landscape unit would have comprised of open grassland with Blakely's red gum, white box, yellow box, and rough-barked apple on saline flats, with casuarinas along streams (Mitchell 2002: 89).

Currently, the primary vegetation of the Additional Disturbance Area includes mostly derived native grassland paddocks with small pockets of exotic grasslands, dense casuarina regrowth forests and stands of open regrowth eucalypt woodland on flats and slopes (**Figure 3-5**). Similarly, local ridges and spurs have shallow soils as evidenced by rock outcropping and primarily support sparse grass cover. Vegetation along the named drainage lines largely constitute boxthorn thickets and stands of regrowth casuarina, with few remnant mature trees remaining. As such, there are no noteworthy stretches of remnant vegetation which would be consistent with those characterising the landscape pre-colonial settlement.

Figure 3-5: Examples of vegetation types within the Additional Disturbance Area.



3.5 CLIMATE

The nearest Bureau of Meteorology (BoM) record station to the Additional Disturbance Area is situated at the Singleton STP location (BoM 2018). Climate statistics from the Singleton STP indicate that the region experiences a mostly temperate climate with temperatures above zero during the cooler months. The climate statistics show that the highest mean monthly temperatures are in January (31.9°C) and the lowest mean monthly temperatures are in July and August (4.3°C). Rainfall

is greatest in February (mean rainfall: 85.6 millimetres [mm]) and the lowest in July (mean rainfall: 24.3 mm). The annual average rainfall is 659.1 mm.

As such, the climate of the region would not have offered any obstacles to past Aboriginal occupation.

3.6 LAND USE HISTORY AND EXISTING LEVELS OF DISTURBANCE

The Additional Disturbance Area is bordered to the southeast and east by the existing Glendell and Ravensworth East coal mines, respectively. Land parcels situated within and to the north, west and south of the Additional Disturbance Area are dominated by low intensity grazing. Collectively these land uses dominate the area surrounding the Additional Disturbance Area.

Figure 3-6 shows the Additional Disturbance Area superimposed on to a 1958 aerial image. This imagery allows an examination of the types of impacts that have occurred to the landforms within the Additional Disturbance Area because of European farming practices. These include:

- Extensive clearing of native vegetation. Apart from some small pockets of vegetation along sections of creek lines, the majority of the Additional Disturbance Area has been cleared. This would suggest that certain site types, such as scarred trees, will be extremely rare within the Additional Disturbance Area. In addition, extensive clearing will have encouraged downslope movement of soils. As the Additional Disturbance Area is generally sloping from east to southwest, this would indicate that soils, as well as the artefacts that may have been within them, have accumulated in the south-western portions of the Additional Disturbance Area or along drainage lines.
- Soil movement. As noted above, landforms within the centre and east of the Additional Disturbance Area are within degrading environments, while landforms in the southwest adjacent to Bowmans Creek are within an aggrading environment. The archaeological implications are that sites in the north may have been displaced or destroyed, while sites in the southwest are either buried or are representations of artefacts that have accumulated in these more low-lying areas.
- <u>Cultivation</u>. The 1958 aerial shows several areas of the Additional Disturbance Area under cultivation. Physical inspection confirmed that cultivation has impacted the floodplains and terraces of many creek lines within the Additional Disturbance Area. Cultivation acts to redistribute artefacts both horizontally and vertically within the soil profile and ultimately destroys the integrity of artefact assemblages within the top 50 centimetres (cm) of the soil profile.
- <u>Erosion</u>. Inspection of the 1958 aerial does not suggest that erosion adjacent to creeks was extensive during this time. However, physical inspection of the Additional Disturbance Area during the current assessment found that erosive degradation of drainages has been extensive in the past. The drainage systems of the Additional Disturbance Area, especially,

Yorks, Swamp, and Bettys Creeks, have become channelised and many show evidences of bank collapse. Previous studies of the soil profiles exposed in the banks of Swamp, Yorks and Bettys Creeks indicate that these creeks formerly had shallow channels with a chain of ponds morphology (Umwelt 2004). In some areas, erosion has formed gullies up to 2 m deep. Large areas of sheet wash erosion are present in the north and centre of the area. Additionally, extensive gully erosion of unnamed drainages and sheet wash erosion of adjacent landforms was identified across the Additional Disturbance Area.

More recently, approved coal mining activities, has been the major source of impact within the landscape. Coal mining activities have resulted in the modification of portions of Yorks Creek, Swamp Creek, Bettys Creek and surrounding landforms.

In summary, the impact of European farming practices within the Additional Disturbance Area has led to a significant modification of the pre-1788 environment. This includes a marked change in vegetation cover, increased erosion and morphological changes to the local creeks. The impact of all these disturbances on the archaeological record is profound and any archaeological investigations of areas such as the Additional Disturbance Area are inevitably examining a depleted and disrupted archaeological landscape.

3.6.1 Land use conclusion

The predominant land uses within the localities surrounding the Additional Disturbance Area include grazing, intensive agriculture, rural residential and commercial land uses. Other surrounding land uses include bushland, areas set aside for conservation, community uses, Commonwealth Government land use and State Forest.

The Additional Disturbance Area has been subject to agricultural land uses, including intensive grazing, pasture improvement and cultivation. This has resulted in a landscape that is a patchwork of existing and demolished residences, fencing, roads, and dams and other earthworks. Due to the erodible nature of the soils the intensive use of the area has resulted in sizeable areas of erosion; both sheet wash and gully erosion (**Figure 3-7**).

Other disturbances within the Additional Disturbance Area include infrastructure installations such as former and current communications, including a Telstra communications tower, and electricity transmission lines (ETLs), approved mine related activities related to the establishment of operational areas and infrastructure, exploration, installation of groundwater monitoring bores and other soil investigations (**Figure 3-7**). Mining related disturbances were subject to Due Diligence inspections prior to the works commencing (OzArk 2015a; EMM 2017 & 2018; OzArk 2017b, c & d; OzArk 2018a & b).

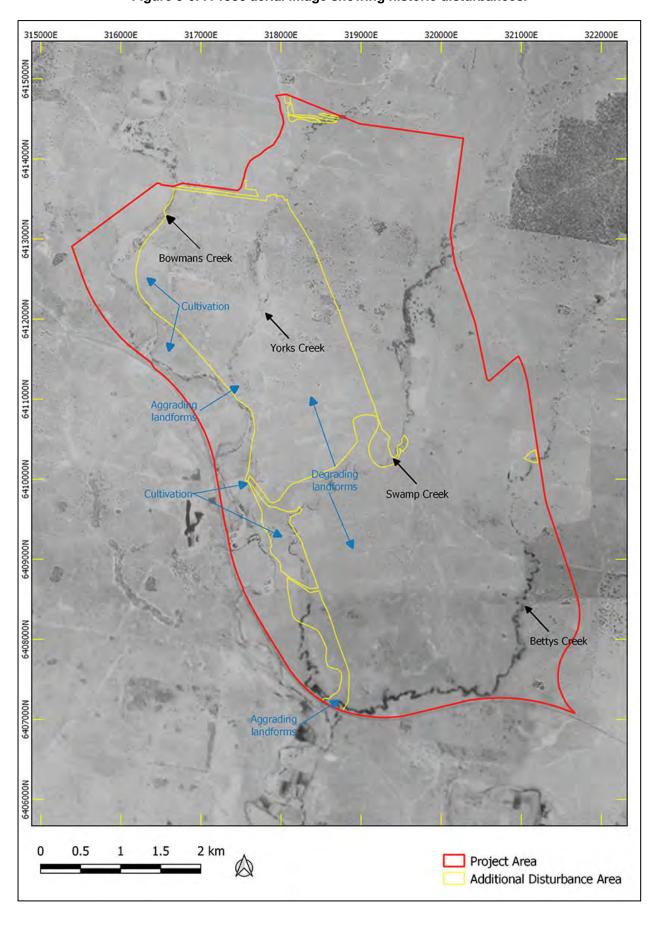


Figure 3-6: A 1958 aerial image showing historic disturbances.

Figure 3-7: Examples of disturbances within the survey area.





1. Disturbances related to the past agricultural land use phase include dwellings, buildings, fences and roads.

Infrastructure works such as ETL structures have impacted portions of the survey area.





3. View of extensive sheet wash erosion.

4. View of extensive earth works and gully erosion.





5. Numerous dams and associated contour banking are located within the survey area.

6. Approved mine related impacts and infrastructure works have disturbed discrete portions of the survey area.

3.7 Environmental context conclusion

Review of the environmental landscape of the Additional Disturbance Area and surrounding landforms presents a landscape that has been extensively disturbed and modified, primarily because of agricultural practices and associated hydrological changes.

In the past, the presence of semi-permanent watercourses, such as Bowmans Creek and its tributaries, would have provided resources to enable short-term occupation within the Additional Disturbance Area. However, due to the naturally occurring high salinity of the watercourses within the Additional Disturbance Area, occupation was probably more restricted along this watercourse when compared to areas closer to the Hunter River.

As all watercourses within the Additional Disturbance Area have a relatively restricted catchment, and all were dry or diminishing at the time of the survey, the indication is that these systems would have only supported sporadic and short-term visitation. While it is accepted that some of these systems may have had a Chain of Ponds morphology prior to their modification following colonial settlement, it is suspected that these ponds would not have been extensive enough to encourage long-term occupation.

Mapping these landform features demonstrates the environmental zones most conducive to Aboriginal occupation within the Additional Disturbance Area (**Figure 3-8**). This figure shows the Additional Disturbance Area with a 100 m buffer on either side of Bowmans, Swamp, Yorks and Bettys Creeks, all semi-permanent or ephemeral waterways, and a 50 m buffer on either side of the tributaries of these named waterways. **Figure 3-8** shows that most of the Additional Disturbance Area is outside of any environmental zones conducive to Aboriginal occupation.

Extensive clearing of much of the Additional Disturbance Area has likely removed any culturally modified trees, disturbed significant portions of the landscape, and translocated much of the archaeological material record into a secondary context. Erosion, however, will also mean that larger sites, while disturbed, will be more visible and more likely to be recorded.

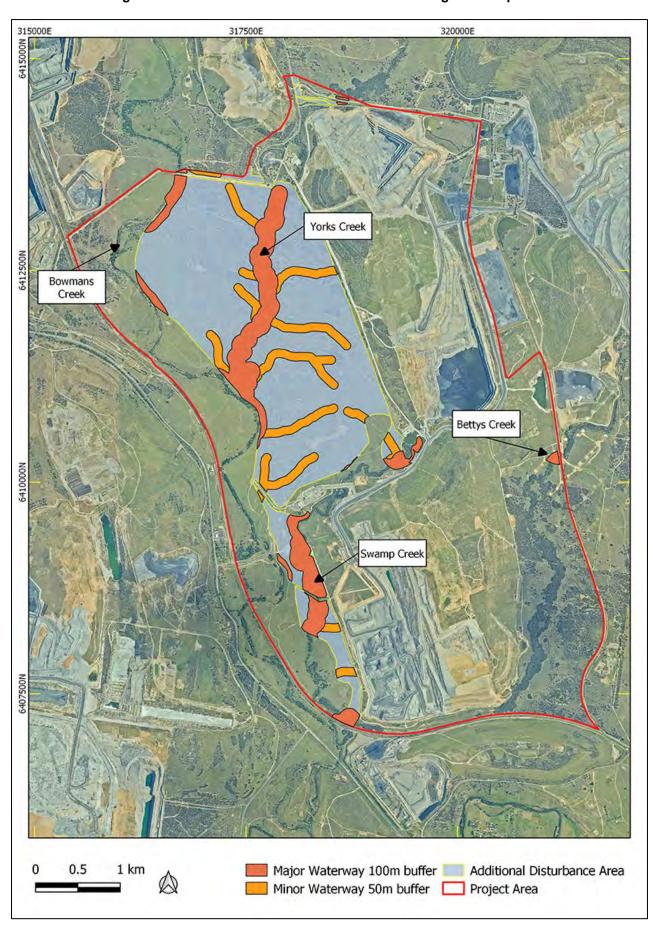


Figure 3-8: Environmental zones conducive to Aboriginal occupation.

4 ABORIGINAL ARCHAEOLOGY BACKGROUND

4.1 ETHNO-HISTORIC SOURCES OF REGIONAL ABORIGINAL CULTURE

The Additional Disturbance Area is in the Wonnarua tribal area of the upper Hunter Valley.

The Aboriginal people in the region of the Additional Disturbance Area lived in an environment rich in food resources. Freshwater fish, shellfish, reptiles, mammals, birds and plant food provide a diverse diet. Brayshaw (1986: 82) suggests that inland groups visited the coast during the summer when marine resources were plentiful, and coastal groups travelled inland to participate in the winter kangaroo hunts. Trade and/or exchange also occurred between the coastal and inland groups including visiting by coastal and inland groups for initiations and ceremonies seemed to occur. These were conducted within earthen circles. Carved trees were associated with these sites (Brayshaw 1986: 86). Reed spears and shells were traded inland for possum skin rugs and fur cord (Brayshaw 1986: 41).

The only known ethnographic mentions of the use of stone artefacts relate to the use of stone hatchets as multi-purpose tools and of the attachment of quartz flakes as barbs on spears (Brayshaw 1986: 66, 68). There is also little ethnographic evidence concerning the locations of regional Aboriginal camping places, however, the factors of proximity to fresh water and of elevation for visibility are mentioned as important considerations (Fawcet 1898).

4.2 COLONIAL OCCUPATION

Due to its proximity to Sydney, its nutrient rich alluvial soils, grazing pastures for livestock and cedar trees on the higher terraces of the valley, the Hunter Valley was a desirable location for early colonial settlement. Within a short timeframe, the Aboriginal people of the area had to deal with the depletion of their resources and major changes to the environment caused by ill-informed colonial farming practices.

The early colonial settlers observed valleys of grassland and rich alluvial soils adjacent to the major waterways that were ideal for agriculture and cattle/sheep grazing, and soon the prime land was occupied. But the allure of the area continued and as more colonists settled in the Hunter Valley the more marginal hill slopes were occupied and cleared of standing timber.

As noted by Tocomwall (2017: 35):

By 1825 more land was owned by the new settlers and the original Aboriginal inhabitants became increasingly disenfranchised from their traditional lands. The invasion by the European settlers changed the distribution of vegetation, with increasing landscape instability as a result of the logging of the forested areas around the higher elevations and the clearing of the brush around the understorey and along the tributaries for agriculture and pastoral farming. Aboriginal dependence of the Hunter River for many staples meant that the Wonnarua suffered severely when the Europeans settled: they

immediately lost access to water and the raw materials in the river and on the banks. They also lost their game to the intruders who chased kangaroos in hunts to reduce competition for their introduced grazing animals; shellfish and fish populations also declined. Breton (1833) wrote that he only noted 16 kangaroos, in contrast to a previous visit to the area when they had numbered in the hundreds. The loss of fish for protein and the loss of managed plains for game hunting and seed gathering destroyed long established hunting and gathering practices of the Aboriginal community. This exclusion and alteration of the landscape by the Europeans brought them into conflict with the local Wonnarua People.

Conflict between the Wonnarua and colonial settlers is documented in the wider region of the Additional Disturbance Area. AHIMS site 37-3-0390 (Ravensworth Massacre Site) is located on the western side of the New England Highway and outside of the Project Area (**Figure 4-2**). This site recording registers the historic account of the murder of 18 Aboriginal people in 1827, however primary source historic information has this event occurring in September 1826.

As noted on the site card, the location of the massacre was 'near (the) town of Ravensworth' although the 'exact location (is) unknown'. However, available historic information indicates that the massacre was not 'near the town of Ravensworth' as research has shown that the event occurred approximately 20 miles (32 km) from Alcorn's hut, which was the site of an earlier skirmish near Glennies Creek. The plotting of a 32 km radius circle from Alcorn's hut near Glennies Creek places the massacre event well beyond the Project Area. While the exact location may now be extremely difficult to pin-point, the historical accounts show that the wide-spread frontier war that accompanied the first colonial settlement of Aboriginal lands across Australia, also occurred in the Hunter Valley.

Further details on the outcomes of historical research by Dr Mark Dunn into the interactions between Aboriginal people and early settlers at the Ravensworth Estate and surrounding areas are provided in the ACHAR.

4.3 REGIONAL ARCHAEOLOGICAL CONTEXT

There have been numerous archaeological investigations in the local area with a significant number undertaken in the Additional Disturbance Area itself. The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (Section 4.5). The following section (Section 4.3.1) refers to archaeological investigations in areas outside of, but relevant to, the Additional Disturbance Area. Section 4.4.2 refers to those investigations that were entirely or partially within the Additional Disturbance Area, including salvage programs that have taken place at Glendell.

No declared Aboriginal places (under section 84 of the NPW Act) have been identified in the Additional Disturbance Area or its surrounds.

Aboriginal cultural heritage values may be identified through further Aboriginal consultation concerning the Additional Disturbance Area. These may relate to social, cultural or historic values associated with Aboriginal sites and objects or places with intangible values. If such cultural values are provided, they will be set out in the ACHAR.

4.3.1 Previous archaeological studies in the region

4.3.1.1 Antiquity

The Aboriginal occupation of Australia begins prior to 40,000 BP (years before present) and possibly earlier than 50,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period, poor preservation of archaeological materials (particularly dateable organic materials) and significant coastline change over the past 18,000 years.

In 1986, Koettig undertook an archaeological survey approximately 6 km southeast of the Project Area between Glennies Creek and Singleton (cited in Umwelt 2003). Following that survey, Koettig carried out several excavations at six locations along Glennies Creek. Koettig considered artefacts found in Site SGCD 16 (about 1 m deep in Unit B of on an old alluvial terrace) were 'markedly different' to artefacts recovered from the artefacts in Unit A. Her conclusion was formed based on the raw material used, large number of cores, the large percentage of cortex remaining on artefacts and larger sizes of artefacts. Artefacts from Unit B were from volcanic rocks while those in Unit A were predominantly mudstone and silcrete. Later, a date of >20,200 BP was obtained from a hearth associated with the artefacts placing the site well into the Pleistocene.

4.3.1.2 Archaeological characteristics

Evidence from the Central Lowlands sub-region of the Hunter Valley (broadly between Murrurundi in the north and Cessnock in the south-east), suggests that archaeological material is scattered almost continuously, but in varying density, along most creek banks and flats. It has been suggested that archaeological material is primarily contained in a corridor approximately 100 m wide on either side of a creek channel (Koettig 1990: 13).

In broad terms, these open artefact scatters appear to be confined to the A-Horizon of the soil (topsoil) profile which is generally less than 50 cm in depth (Hughes 1981; Stern 1981). These sites are often disturbed, and stratification is unclear (Hughes 1984: 8). Artefacts are generally manufactured from indurated mudstone and silcrete, with quartz, petrified wood and chert occurring less frequently (Hiscock and Koettig 1985). Features found at open surface scatters include hearths, pits, ovens and heat treatment areas (Burton *et al.* 1990). These sites are generally detected where some form of ground disturbance has occurred, for example erosion due to both cultural and non-

cultural processes, and thus the extent of the site is often difficult to determine. Often the density of artefacts on the surface do not relate to the amount of subsurface archaeological material (see Koettig 1990: 15).

Archaeological excavations have so far determined that human occupation of the Hunter Valley has occurred since the last Glacial Maximum approximately 27,000–17,000 BP (HLA-Envirosciences 2005). It is hypothesised that evidence predating this period will likely be discovered in the future.

A review of GHD (2005), HLA-Envirosciences (2005) and Umwelt (2007) provides the following regional synthesis:

- Archaeological sites, even where surface evidence is not present, occur on most landforms.
 This was confirmed by an HLA-Envirosciences (2005) excavation program, in which
 Aboriginal sites were encountered on alluvial terraces, flats, slopes, bench areas, spurs and
 ridgelines. HLA-Envirosciences acknowledges that the sample areas were biased somewhat
 as they were all near creek lines;
- Site frequency and density are dependent on their location in the landscape. This theme is
 consistent throughout NSW and is influenced by a range of factors, the most relevant of
 which the existing level of disturbance. More specifically, the potential for undisturbed in situ
 deposits remaining in the upper Hunter Valley on a mining property is generally low;
- The highest concentration of Aboriginal sites on the floor of the Hunter Valley is associated with creeks and waterways;
- Few scarred trees are recorded reflecting the high degree of tree clearing in the region;
- The most frequently recorded raw material is indurated mudstone (a fine gained siliceous material) associated with Hunter River gravels. Other frequently recorded materials include locally sourced silcrete, quartz and volcanic stones; and
- Assemblages recorded in the region consist largely of unmodified flakes with few formed tools. Backed blades comprise the characteristic diagnostic artefact in the region. The mid-to late-Holocene appears to have witnessed this move to smaller tools, perhaps as an impetus to conserve raw material during tool manufacture or due to new functionality requirements. This impetus seems to have driven the development of what Hiscock (1993) calls the Redbank A Strategy (RAS, after three sites along Redbank Creek within the United Colliery south of Singleton) of backed blade production. It is noted that RAS reduction has been infrequently recorded at other sites in the district.

4.3.1.3 Previous studies

A very large amount of archaeological work has been undertaken in the Hunter Valley and only a brief regional archaeological context that focuses on work in similar landforms to the Additional Disturbance Area is provided here.

Previous studies conducted in closer proximity to the Additional Disturbance Area are outlined below.

Resource Planning (1991) undertook a large assessment for the Mount Owen Coal Project that was focussed on Swamp and Yorks Creeks, located immediately east of the Additional Disturbance Area. This study included 25 km of drainage line (including left and right banks) along Swamp Creek and Yorks Creek. Traverses were also made across side slopes and along ridge lines. The survey area totalled 370 ha. 98 Aboriginal archaeological sites, ranging from isolated artefacts to dense concentrations of more than 100 pieces of flaked stone, were mapped and recorded. Table 4-1 presents the artefact densities recorded by Resource Planning and this shows clearly that Swamp Creek displays a lower artefact density when compared to Yorks Creek. In the case of Swamp Creek over 75% of sites were isolated finds or very low-density artefact scatters while along Yorks Creek 54% of sites recorded over 50 artefacts at each site (a moderate artefact density). Resource Planning noted that the sites in the Swamp Creek catchment are regarded as an excellent representative assemblage of occupational evidence in the small tributary valleys of the Hunter River (Resource Planning 1991: 5). This report recommends, based on the survey evidence "that part of the Yorks Creek drainage line would be set aside as an archaeological conservation zone" (Resource Planning 1991: 5): a recommendation that was followed as a section of the northern reaches of Yorks Creek are now within a permanent Voluntary Conservation Area (VCA). The Yorks Creek VCA is located outside the Project Area.

Table 4-1: Artefact densities at sites recorded by Resource Planning 1991.

Artefact Numbers	Swamp Creek (%)	Yorks Creek (%)
Isolated Artefact	28	9
<10 Flakes	50	18
10-20	14	18
20-50	6	27
50-100	2	18
>100	0	9

Resource Planning (1993) surveyed areas along Bettys Creek: locations that are now within the current Mount Owen disturbance area to the northeast of the Additional Disturbance Area. The western boundary of the survey area was defined by the drainage divide between Bettys Creek and Swamp Creek (now no longer extant but can be seen in historic aerial photographs: **Figure 3-6**). The southern boundary was formed by the proposed lease extension boundary. The proposed extension resulted in the disturbance of an additional 260 ha of land, including approximately 100 ha of the then Ravensworth State Forest.

The survey recorded 39 archaeological sites, of which 34 were recorded in detail. It was found that most sites were situated close to the drainage lines and that their location represented a verifiable distribution and was not a bias of survey coverage. It was, however, noted that erosion plays a vital role in the identification of sites. This is because, the report argued, most sites are subsurface in origin.

All the sites recorded were open artefact scatters although their content varied from one artefact to several hundred artefacts. The artefact types appear in the main to be the product of backed blade manufacture (Resource Planning 1993: 4). There were some sites, in the report's opinion, which had a high potential for further archaeological investigations due to their potential to contain subsurface deposits and the quantity of artefacts present. Several artefacts revealed retouch, the majority of which were classed as part of the backed blade industry. As with other sites in the Swamp Creek area, and other parts of the Hunter Valley, the dominant raw material was indurated mudstone/tuff followed by silcrete.

OzArk (2017a) was engaged by Umwelt, on behalf of Mt Owen Pty Limited to complete an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Mount Owen Continued Operations Modification 2.

The proposed modification disturbance area consisted of two portions: a smaller northern portion on both sides of, and south of, an existing diversion of Bettys Creek (Area A; approximately 9 ha); and a larger portion to the southeast of the Mount Owen North Pit (Area B; approximately 37 ha). Both areas are to the east of the Additional Disturbance Area.

The fieldwork component of the assessment was undertaken by an OzArk archaeologist and representatives of RAPs and Wonnarua Knowledge Holder Groups on 31 August 2017.

No Aboriginal sites were recorded during the assessment. Further, no landforms within the proposed disturbance area was seen as having potential to contain further, subsurface archaeological deposits due to the moderate level of disturbance across the proposed disturbance area and the generally thin soils.

MOCO IF-3 (37–3–1198) was the only valid previously-recorded site within the proposed disturbance area. This site was revisited during the site inspection, however, despite good areas of exposure, the artefact was unable to be located. One previously recorded site 37-3-0687 (MC-7) is located outside but close to the proposed disturbance area. This site may be harmed by future erosion stabilisation works along Main Creek and management recommendations regarding this site are made in OzArk 2017a.

4.3.2 The Place

The Place is shown in **Figure 4-1** and defined as being all the land located within the historic boundaries of the three land grants forming the core of the Ravensworth Estate (including Ravensworth Homestead), which is Portions 149 and 150 of the Parish of Liddell and Portion 1 of the Parish of Vane. Together this land comprises Dr. James Bowman's original "10,000" (10,439) acre (4,300 ha) land grants applied for under Governor Brisbane in 1824. The heritage significance of items within the Place is considered further in the Statement of Heritage Impact (refer LSJ 2019).

Two AHIMS searches were completed on 9 May 2019 and used in conjunction with the four searches completed on 5 November 2019 to provide coverage over The Place. 258 registered AHIMS sites are located within The Place, 158 of which remain extant in the landscape and five that are partially destroyed (**Figure 4-1**). Of the remaining valid or partially destroyed sites, site types include artefact site (unspecified number) (n=123), isolated find (n=19), artefact with PAD (12), PAD (n=1), art (engraving) (n=1), scarred tree (n=1), conflict (exact location unspecified) (n=1).

Sites with higher Aboriginal cultural significance are limited to an engraving site on Bowmans Creek (37-3-0772; Bowmans Creek 16) and a scarred tree recorded as part of the assessment for the Project (37-3-1561; GN ST1) as this site type is relatively rare in the immediate region. The conflict site (37-3-0390; Ravensworth Massacre) is significant but as the site card says 'location unknown' it cannot be certain that the events described by this site recording were located within The Place.

The Place also contains the Yorks Creek Voluntary Conservation Area (VCA) located in the north of the MOC. The Yorks Creek VCA has been highly disturbed by past land clearing and agricultural activities and comprises degraded open pasture land and areas of historic and active erosion along Yorks Creek and its tributaries. The Yorks Creek Catchment Enhancement Project (YCCEP) area, incorporating the Yorks Creek VCA, aims to rehabilitate the landscape to preserve the cultural heritage values contained within it. The Yorks Creek VCA contains approximately 29 ha area of land along Yorks Creek and was established because of the recognised Aboriginal cultural heritage values of the area. These values primarily stem from moderate to high artefact densities in sites associated with Yorks Creek that include knapping floors and a possible hearth.

Two items listed on the Singleton Local Environmental Plan of 2013 (LEP) are located within The Place. These include the Ravensworth Homestead (I41) and the former Ravensworth Public School (I42). The former Ravensworth Public School was destroyed by an arson attack in May 2019. No places listed on either the national or commonwealth heritage lists are located within The Place.

The Place includes land currently subject to Native Title Claim NC2013/006 (NSD1680/2013, Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People).

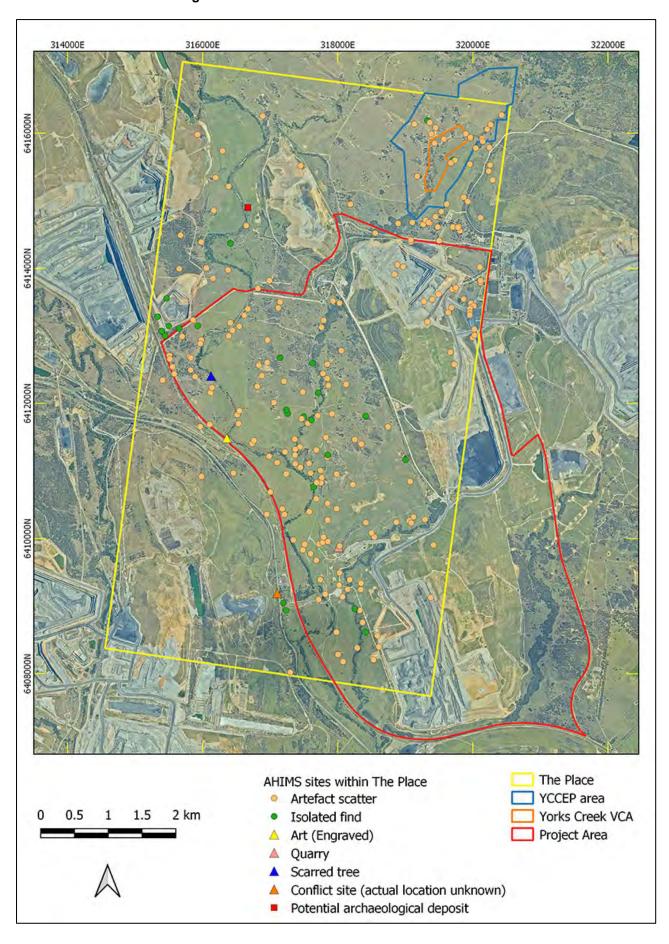


Figure 4-1: AHIMS sites located within The Place.

4.4 LOCAL ARCHAEOLOGICAL CONTEXT

4.4.1 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any potential previously-recorded heritage within the Additional Disturbance Area. The results of this search are summarised in **Table 4-2** and presented in detail in **Appendix 2**.

Table 4-2: Aboriginal heritage: desktop-database search results.

Name of Database Searched	Date of Search	Type of Search	Comment
Commonwealth Heritage Listings	30/10/18	Singleton LGA	No places listed on either the National or Commonwealth heritage lists are located within the Additional Disturbance Area.
National Native Title Claims Search	30/10/18	NSW	One registered Native Title claim encompasses the Additional Disturbance Area.
Department of Premier and Cabinet Aboriginal Heritage Information Management System (AHIMS)	05/11/18	GDA Zone 56 Eastings: 315100- 321800; Northings: 6406400-6415100. Four searches totalling 6.7 by 8.7 km centred on the Additional Disturbance Area. (see Appendix 2)	302 ¹ sites within the total search area. 39 sites are within the Additional Disturbance Area.
Local Environment Plan (LEP)	30/10/18	Singleton LEP of 2013	Ravensworth Homestead (I41) is located within the Additional Disturbance Area and a former public school (I42) is located 590 m to the west of the Additional Disturbance Area. However, none of the Aboriginal places noted in the LEP occur near the Additional Disturbance Area.

As per **Table 4-2**, it is noted that the wider region of the Additional Disturbance Area includes land currently subject to Native Title Claim NC2013/006 (NSD1680/2013, Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People). However, it is understood that there are no Crown parcels eligible for Native Title claim within the Additional Disturbance Area.

Four searches of the AHIMS database² together returned 330 records for Aboriginal heritage sites within a 6.7 km by 8.7 km combined search area centred on the Additional Disturbance Area. 28 of the returned records relate to sites newly recorded during the current assessment which have since been registered. These sites have been removed from consideration in the following discussion of previously recorded AHIMS sites.

Figure 4-2 maps the Additional Disturbance Area in relation to nearby previously recorded AHIMS sites. **Table 4-3** tabulates the AHIMS sites from the search divided into site type.

¹ 28 of the returned sites relate to newly recorded sites. These have not been included in the total.

² Four searches were required due to the number of sites recorded and the extent of the area. AHIMS extensive searches only allow for 120 sites per search.

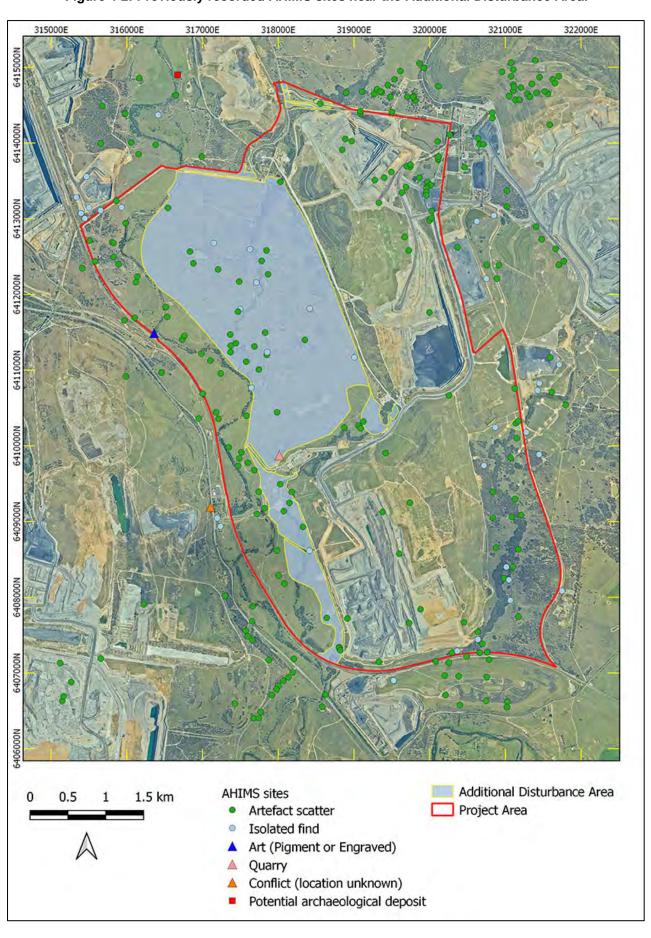


Figure 4-2: Previously recorded AHIMS sites near the Additional Disturbance Area.

Table 4-3: Previously recorded AHIMS sites near the Additional Disturbance Area: site types and frequencies.

Site Type	Number	% Frequency (may not equal 100% due to rounding)
Isolated Find	42	14%
Artefact (number unspecified)	214	71%
Artefact Scatter	33	11%
Potential Archaeological Deposit (PAD)	2	<1%
Artefact scatter with PAD	7	2%
Artefact scatter with quarry and PAD	1	<1%
Conflict	1	<1%
Art³ (engraving)	1	<1%
Restricted	1	<1%
Total	302	

The high sample size of the combined results for these searches allows for a representative understanding of the distribution of site types across the landscape surrounding the Additional Disturbance Area. Stone artefact sites (isolated finds, artefact scatters) are by far the most commonly recorded local site types, together representing 286 (95%) of the 302 sites returned in the AHIMS search area. The majority of these have been recorded in areas of high exposure, with the densest and most complex sites being recorded on distinct landforms in proximity to watercourses. The absence of modified trees conforms with the rarity of this site type for the region, likely related to the extensive clearance that has occurred historically.

These results inform the predictive model for site distribution outlined in **Section 4.5**.

One site is currently listed on AHIMS as a restricted site. This site, Bowmans Creek Complex (37-3-1506) was registered on 25 September 2018. This site is registered as an Aboriginal resource and gathering site, a burial site and a conflict site. After the registration, AHIMS changed the site status to 'not a site' pending further information being provided to determine the veracity of the large site area. Although this site covers all the Additional Disturbance Area, it does not currently need to be considered as it has no statutory protection⁴. However, should this change, and the site is reinstated on the AHIMS register, the following factors would need to be considered to determine if the values embodied with the site registration exist within the Additional Disturbance Area:

 Aboriginal resource and gathering site: all portions of the Additional Disturbance Area have been cleared of native vegetation in the past and currently only support regrowth trees. While the past disturbances to the landscape do not preclude the presence of Aboriginal resource plants or animals in the Additional Disturbance Area, it is likely that these have been highly disturbed. Further, there are contiguous and identical landforms to the north, and to a lesser

³ Two additional sites are listed on AHIMS as 'art' sites, however the site cards note the sites as being isolated finds.

⁴ As the site is listed as 'not a site' on AHIMS, the site is not included as an AHIMS site within the Additional Disturbance Area for the remainder of this report.

degree to the west, of the Additional Disturbance Area and should Aboriginal resource plants and animals be present within the Additional Disturbance Area, they will continue to be represented in these nearby areas;

- <u>Burial site</u>: due to the agricultural phase of land use in the Additional Disturbance Area, soil
 loss has been considerable and had there been burials in the area, it is likely that these have
 been disturbed and/or dispersed. Further, the Additional Disturbance Area does not contain
 sand bodies—a favoured burial location—and burials are extremely rare at the regional level
 potentially precluding their existence in the Additional Disturbance Area; and
- Conflict site: it is acknowledged that the wider area saw conflict between early colonial settlers and Aboriginal people (see Section 4.2), and the land comprising Ravensworth Estate, a potential focus for such conflict, is located within the Additional Disturbance Area. However, while material evidence of conflict in the Additional Disturbance Area cannot be discounted, it is difficult to identify precisely where such events may be located. As such, this aspect of the site recording would need to be borne in mind and responded to at such time when any such evidence comes to light.

4.4.2 Previous archaeological investigations within or overlapping the Additional Disturbance Area

There have been numerous archaeological investigations in the local area and a number within the Additional Disturbance Area itself. The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (Section 4.5). The following sections (4.4.2.1 to 4.4.2.2) refer to archaeological investigations that were entirely or partially within the Additional Disturbance Area and review the salvage programs that have taken place at the MOC.

4.4.2.1 Archaeological survey

Glendell Mining Lease Area (Brayshaw 1982)

The first survey to interact with the Additional Disturbance Area was by Helen Brayshaw in 1982 (Brayshaw 1982). Brayshaw's survey area included areas within the southern portions of the Additional Disturbance Area including the southern 6 km of Bettys Creek and 5 km of Bowmans Creek. Because of this assessment, three open sites and two isolated artefacts were recorded. The three open sites (artefact scatters) were recorded as follows:

- Site A: Artefact Scatter. 30 m west of Bettys Creek, principally on the southern bank of a tributary. 43 artefacts were recorded, occurring at an average density of 1/17 square metres (m²). Raw materials present included indurated mudstone 75%, siltstone 2.5%, quartz 2.5% and silcrete 20%;
- Site B. Artefact scatter. On the western bank of Bettys Creek, about 300 m north of the main northern railway. Four flakes were found here at an average density of 1/30 m²; and
- Site C. Artefact scatter. East of a tributary of Bettys Creek about 200 m north of the confluence. Five artefacts recorded, occurring at an average density of 1/24 m².

A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project (Dyall 1982)

To the northwest of the Additional Disturbance Area, along the northern reaches of Bowmans Creek, Len Dyall (1982) recorded 18 artefact scatters and two grinding groove sites. The artefact scatters were small except for one that contained over 150 artefacts. One grinding groove site was suggestive of a seed processing location rather than for axe grinding. Both grinding groove sites are outside of the Project Area.

Archaeological Survey of Pikes Gully Colliery Area, Liddell, NSW (Haglund 1982)

In the same area of Bowmans Creek and to the northwest of the Additional Disturbance Area, Laila Haglund (1982) recorded two artefact scatters:

- Site 1: Aboriginal stone artefacts were noted in several exposures within, and along, the edge of a river terrace west of Bowmans Creek. It was noted that the artefacts recorded varied in type, size range and density between the exposures. Small thin flakes and small, well-made artefacts such as bondi points were noted only close to the southern end. Artefact density appeared greater in this part. These observations may reflect real distribution trends, but may also result from the smaller and more shallow areas of exposure further north; and
- Site 2: Aboriginal stone artefacts were noted in two exposures along the northeast bank of Bowmans Creek, northwest of its junction with Stringybark Creek, and within a minor erosion gully on the slope above.

Aboriginal Archaeological Assessment - Glendell Open Cut Mine (Umwelt 2004)

Umwelt conducted an Aboriginal Archaeological Assessment for the Glendell Open Cut Mine survey area involving survey during September, October and December 2001, as well as geomorphic investigations during May 2002.

The Glendell survey area incorporated sections of Bowmans Creek, Swamp Creek and Bettys Creek and included the southern portion of the Additional Disturbance Area. As part of the archaeological brief, a desk-top study and an in-field reconnaissance were undertaken with the aim of identifying areas within the Glendell survey area that contained Aboriginal resources. The resources sought for identification within the Glendell survey area included fresh water supplies, food and medicine plants, faunal prey species, stone suitable for implement manufacture, areas suitable for camping, areas that provided an extensive outlook, areas with major and minor creek confluences that had often been found to have Aboriginal camp sites and the terrain units that may have acted as pathways between resource locations.

The information compiled was then used to assist in the preparation of a predictive model related to the location and nature of sites within the then Glendell survey area. In addition, past land-use practices and geomorphic studies were used to determine areas where artefactual material may remain in a relatively undisturbed context. Geomorphic studies were also used to investigate a buried soil profile within the shared Bowmans Creek/Swamp Creek floodplain and to determine the

likelihood of this soil profile containing artefactual material from the late Pleistocene to early Holocene periods.

Because of the research it was concluded that the entire Glendell survey area would have supplied adequate resources for small groups of hunter-gatherers living a mobile lifestyle. Bowmans Creek was highlighted as an area that could have formed the focus of camping activities of longer duration, possibly by larger numbers of people, due to an increased abundance and reliability of the resource base.

Other areas, such as the lower western slopes adjacent to Bettys Creek were assessed as having attracted groups of people for short-term visits to harvest abundant seasonal foods. Bowmans Creek was therefore cited as likely to have the largest sites in terms of spatial extent and numbers of artefacts.

Such sites were predicted as likely to be found on the lower slopes, terraces and floodplains along Bowmans Creek, spreading further across the Bowmans Creek/Swamp Creek floodplain. Bettys Creek and Swamp Creek were listed as likely to have evidence of more sporadic and short-term use as overnight camping locations.

A pattern of site distribution was evident from the previously recorded sites in the locale with most sites located along the watercourses (58%). More of these were associated with ephemeral tributaries (30%) than major creek lines and their associated floodplains and terraces (30%). A little more than half (54%) of the sites were within 30 m of the closest watercourse and 66% within 100 m. In relation to the slopes, sites were more commonly located on the foot slopes/lower slopes (19%), than the crest/upper slopes (17%) and mid slopes (8%).

A total of 37 previously unrecorded sites were located during the 2001 fieldwork survey of the Glendell survey area. The sites consisted of 30 artefact scatters, including one small quarry site with an associated artefact scatter, one scatter in an area with a buried soil profile and seven isolated finds. The Bowmans Creek 5 quarry site was recorded as having an associated artefact scatter as most of the artefacts in the site were manufactured from mudstone and silcrete rather than the quartz and quartzite materials available at the site.

The artefact scatter in the area with the buried soil profile (Bowmans Creek/Swamp Creek Trench 1) was located on the shared floodplain between Bowmans Creek and Swamp Creek. In this area a trench approximately 300 m in length was constructed during the 1980s to divert Swamp Creek into Bowmans Creek. At the time of the 2001 survey the trench was not connected to the creeks and it currently remains unconnected. The artefact scatter eroding from the A-Horizon of the floodplain was observed to be approximately one metre above the buried soil profile. This profile was later determined through geomorphic investigation to be of early Pleistocene to Tertiary age and did not contain any artefactual material (Mitchell 2002).

Artefact analysis of the salvage assemblage recorded:

- Flakes and broken flakes dominated the assemblage (78%), followed by flaked pieces (15%) and cores (3%). Within the flake category, 4% were retouched and half of the retouched flakes were backed. Heat shatter accounted for 3% of the artefacts;
- The mudstone and silcrete flakes were of similar size. Volcanic flakes were generally larger and heavier than flakes composed of other raw materials;
- Volcanic flakes had a significantly higher percentage of cortex than silcrete or mudstone, and mudstone artefacts had a higher percentage of cortex than silcrete;
- Silcrete artefacts had a higher overall rate of retouch than mudstone artefacts (8.2% and 6.3% respectively), and silcrete retouched artefacts were more likely to be backed than retouched mudstone artefacts; and
- Several artefacts relating to colonial occupation of the area were also recovered, including
 fragments of glass and pottery. The location of this material closely correlated with
 concentrations of Aboriginal stone artefacts. Additionally, at least one Aboriginal artefact
 manufactured from glass was salvaged, suggesting that the area was used by Aboriginal
 people in the post-contact period.

Environmental Assessment for Modification of Glendell Mine Operations (Umwelt 2007)

In 2007 an Environmental Assessment was undertaken to modify the Glendell Mine Development Consent (DA 80/952) to enable the integration of Glendell Mine operations with the approved MOC operations and the implementation of a revised mine plan.

The assessment noted that a range of surveys of the Glendell Mine site had been undertaken to identify areas and sites of significance in relation to Aboriginal archaeology. Appendix 10 of the Environmental Assessment lists several sites that had been previously identified at the Glendell Mine site and have been salvaged in accordance with a permit from the then Department of Environment and Conservation. The assessment stated that the remaining sites within the Glendell Mine site will be protected and managed in accordance with an Aboriginal Heritage Management Plan developed for the site.

Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations (OzArk 2013)

The assessment area for the Mount Owen Continued Operations (MOCO) Project disturbance area covered approximately 500 ha with portions of the assessment area encompassing part of the southern portion of the Additional Disturbance Area.

ACHM was engaged by Mt Owen Pty Ltd to undertake Aboriginal community consultation for the MOCO Project and to author the ACHAR to which OzArk 2013 contributed (ACHM 2013). The ACHM report appeared as Appendix 13a (Parts 1 and 2) of the MOCO Project *Environmental Impact Statement* (EIS) (Umwelt 2015). ACHM 2013 contains the cultural, aesthetic and historic values of the area, while OzArk 2013 contains an examination of the scientific values of the area.

Cultural values

ACHM 2013: 114 summarises the cultural values of the area in which the Additional Disturbance Area is located. What follows is an edited excerpt of the MOCO Project Statement of Significance (ACHM 2013: Section 5:10):

It is noted that the numerous Aboriginal stakeholders who participated in this cultural values assessment process hold values which relate to the wider Hunter Valley region generally, and less directly to the MOCO area specifically. However, one of the Knowledge Holder groups holds very strong values over the MOCO area. Other than the one group expressing strong connection to the MOCO area, there was very little other information presented in the disclosed material or values workshops which relates specifically to the MOCO area.

A common theme in many Aboriginal cultural heritage assessments is the proprietary interest members of the relevant Aboriginal communities hold in regard to the wider cultural landscape including archaeological sites or places within any given area. The project is no exception in this regard. Within the context of the current assessment, there are strong on-going connections to places created and used by ancestors alongside demonstrably strong interests in the manner in which those places are managed or harmed as a result of this project. These sentiments are not unique, and must certainly be considered in the overall assessment of the significance of the places in question. The connection to these places is noted as often being relatively unspecific and generally do not appear to relate to any surviving traditional knowledge or customary cultural practices, apart from one of the Knowledge Holder groups who express a strong connection to on-going cultural knowledge and customary lore in this location.

The cultural values expressed by the participants in this assessment have been consistent in voicing an over-arching concern for the wider landscape and criticism of the negative impact of mining on that landscape. Consistent in the material disclosed is a sense of 'outrage' and grief at the treatment of Aboriginal people since First Settlement (dispossession and genocide are mentioned repeatedly) through to more contemporary experiences (i.e. the Stolen Generation).

ACHM 2013: Section 5:10 concludes:

There is little doubt that the wider cultural landscape surrounding (and encompassing) the MOCO area is of high cultural and historical significance to Wonnarua people. The historical associations with early settlement, conflict, dispossession and survival are important, and the nature of the area as a surviving cultural landscape of significance to numerous members of the Wonnarua people makes this an area of regional and national significance. The regional archaeological record is also of high regional significance.

Overall, the cultural significance of the wider region is considered to be high and requires considerable additional research to fully understand.

Scientific values

The archaeological survey for the MOCO Project took place over two weeks from 26 November 2012 to 7 December 2012. The archaeological test excavation program for the MOCO Project took place over one week from 11 March 2013 to 15 March 2013. In 2014, the proposed disturbance area for the MOCO Project was expanded slightly necessitating a further one day of survey that took place on 29 April 2014. The results of these investigations are detailed in OzArk 2014 and contained in Appendix 13b of the MOCO Project EIS (Umwelt 2015).

Large portions of the MOCO Project (223 ha) had been subject to previous AHIPs with extensive areas having already undergone archaeological assessment and salvage. Within the disturbance area, 18 sites had already been salvaged by manual excavation and more expansive additional areas have been subject to grader scrapes to salvage subsurface artefacts. Over the years, both from within the disturbance area and from adjacent landforms, over 11,000 artefacts had already been recovered because of these programs.

Because of the scientific values assessment for the MOCO Project, 39 Aboriginal sites were recorded; consisting of:

- 11 artefact scatters (37-3-1189 to 37-3-1199);
- 25 isolated finds (37-3-1170 to 37-3-1188 and 37-3-1212 to 37-3-1216); and
- Three extensions to previously recorded sites (Extension to site 37-3-0649, Extension to site 37-3-0611 and Extension to site 37-3-0600).

In addition, the disturbance area contained three previously recorded sites, 37-3-0611, 37-3-0985 (low density artefact scatters) and 37-3-0527 (isolated artefact). Thus, 42 sites were known to exist within or close to the disturbance area.

At two locations within the disturbance area, test excavations were carried out under the Code of Practice. At one location (37-3-1191), no artefacts were recorded during the test excavations, while at the second location (37-3-1192), 114 artefacts were recorded, with over 80% coming from one discrete concentration. As a result, it was determined that 37-3-1191 is a displaced site with no associated archaeological deposits, while 37-3-1192 is a low-density artefact scatter along the banks of the 'eastern drainage' line with one known concentration of artefacts.

Two sites recorded during the survey, 37-3-1194 and 37-3-1198, remain partially extant in the Additional Disturbance Area.

Conclusion

Those archaeological sites in the MOCO Project disturbance area investigated revealed relatively sparse artefact concentrations in shallow and disturbed contexts. Archaeologically, all the places located and/or identified conform to the Australian Small Tool Tradition⁵, and most likely date to no more than 2,000–3,000 BP.

Most of the disturbance area had been subjected to varying degrees of land clearing and mining since first settlement, destroying the primary context of much of the physical cultural material present, and irretrievably altering the landscape itself.

Given the nature and extent of the archaeological sites identified, there was little additional knowledge which could be added to the archaeological record from any further investigation of this material. There is little probability for the presence of undisturbed and deeply stratified archaeological sites within the disturbance area.

In general, the archaeological sites in the MOCO disturbance area offered:

- Limited research potential regarding regional and/or localised subsistence and resource procurement activities;
- Limited research potential to address questions on stone tool technologies in the region;
- Limited potential for radiometric dating methods to be applied to the sites;
- Limited research potential to address questions about the timing of the first occupation of this region of the Hunter Valley;
- Limited research potential to address questions about the timing of the Aboriginal settlement history of the Hunter Valley; and
- Limited potential to reveal further unique spatiotemporal patterning which would add to the archaeological record.

Glendell Mine Proposed Light Vehicle Access Track (OzArk 2015a)

In 2015, OzArk completed an archaeological assessment for the construction of a 7 km road within the Glendell Mine lease area. The field survey was completed on 2 September 2015. The assessed study area was parallel and to the east of Swamp Creek; however, it also crosses Swamp Creek at one location. No new recordings were made of Aboriginal sites or archaeologically sensitive landforms within the study area during the visual inspection. Several likely landforms such as the banks of Swamp creek and the lower slopes overlooking the creek were identified during the inspection and were made a focus of the assessment. However, these landforms were not assessed as archaeologically sensitive in the portions encompassed by the study area. One previously

Aboriginal Archaeology Impact Assessment: Glendell Continued Operations Project.

⁵ The Australian Small Tool Tradition (also sometimes referred to as 'Bondaian') is a term applied to the Holocene period Aboriginal tool kit; distinguishing it from the earlier Australian Core Tool and Scraper Tradition generally dated to the Pleistocene period.

recorded site (37-3-1199; MOCO OS-11) was revisited during the survey. No artefacts related to MOCO OS-11 were visible during the field inspection at the location where MOCO OS-11 intersects the study area. The field inspection found that the proposed road would not have an impact to 37-3-1199.

Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping, Groundwater Monitoring Boreholes Due Diligence Assessments (OzArk 2017b, c & d and OzArk 2018a & b)

In mid to late 2017 and early 2018, OzArk completed five archaeological due diligence assessments of over 100 soil test pit and groundwater monitoring bore locations surrounding Bowmans, Swamp and Yorks Creek for alluvium and Biophysical Strategic Agricultural Land verification and mapping assessments within the Project Area (OzArk 2017b, c & d). Over the five assessments, two new Aboriginal sites (Bowmans Creek 6 and Yorks Creek 19) were recorded and the extent of one previously recorded artefact scatter was updated (#37-3-0748; York Creek 5).

Bowmans Creek 6 is located on a lower slope landform adjacent to a tributary of Bowmans Creek. A total of 12 artefacts were identified, consisting largely of unmodified flakes, with one end scraper and core also recorded. Yorks Creek 19 consists of two flakes recorded on an upper terrace landform near the confluence of Bowmans and Yorks Creeks. In addition to this, one complete flake was recorded along a grazing track near #37-3-0748. Given its location on the same upper terrace landform, the artefact was assessed as being an extension to site #37-3-0748, as were an additional seven artefacts recorded eroding from the edge of the upper terrace. Site #37-3-0748 was also initially recorded as having potential archaeological deposit (PAD), although it was considered likely to be disturbed by cultivation. Recorded materials across the three sites were consistent with the predominate materials of the region being mudstone and silcrete, with a volcanic flake also recorded at Yorks Creek 19.

Mt Owen Complex Aboriginal cultural heritage due diligence site inspection results - EL6594, EL8184, ML1629 and ML1415 (EMM 2017)

EMM Consulting Pty Limited (EMM) was engaged to prepare an Aboriginal cultural heritage due diligence assessment for the proposed exploration program across the Additional Disturbance Area. As part of this exploration program, a total of 20 drill holes were proposed.

A field survey of proposed drill locations was undertaken by EMM on 23 May 2017 and no artefacts were identified within the areas of proposed exploration disturbance. In addition, the proposed locations are considered to have low archaeological potential. No additional measures were recommended in relation to heritage management for the proposed drilling program.

EMM 2018

EMM completed a Due Diligence inspection for an additional six drill holes across the Additional Disturbance Area; two in EL6594, three in EL8184 and one in ML1415. No sites were identified

during the visual inspection nor were any areas of archaeological potential. This was attributed to the little raw material at the drill hole locations and the previous high levels of disturbance.

4.4.2.2 Archaeological salvage

Ravensworth East Archaeological Investigation (ERM 2002)

In 2002 ERM conducted archaeological excavations and salvage grader scrapes over areas of the Ravensworth East Mine under Permit SZ323. These investigates were in the north-eastern portion of the Project Area, in areas along the former course of Swamp Creek (ERM 2002). **Table 4-4** lists the six sites salvaged within the Project Area under the 2002 ERM program. These sites are shown on **Figure 4-3**.

AHIMS#	Site name
37-3-0399	Ravensworth 10
37-3-0398	Ravensworth 09
37-3-0400	Ravensworth 11
37-3-0401	Ravensworth 12
37-3-0402	Ravensworth 13
37-3-0403	Ravensworth 14

The combined geomorphological investigations undertaken by ERM highlighted the Swamp Creek valley as the key area likely to yield archaeological evidence of Aboriginal occupation within the ERM study area. However, these studies also showed that although buried land surfaces were apparent within the valley, evidence of Pleistocene Aboriginal occupation was unlikely to be recovered. Archaeological sampling of soil from these land surfaces failed to yield any archaeological material, confirming this view. Considering this, no further pursuit of Pleistocene archaeological deposits was undertaken within the scope of the excavation program.

The initial archaeological component of ERM's investigation, which included grader scrapes spread over three different landscapes across the valley, at varying distances from water sources, yielded little archaeological evidence. Of the three grader scrapes, three artefacts were recovered over a total area of 560 m².

A low rise adjacent to the swampy meadow channel west of Swamp Creek near surface sites RE 12–14, revealed substantial archaeological material with several artefact concentrations located approximately 40 m to 60 m away from the channel. Test pit excavation yielded an artefact spread up-slope of the channel from approximately 10 m from the current channel edge, extending across the rise in all directions. A total of 87 artefacts were recovered from the 11 test pits. Over a combined excavated area of 11 m², this represents an artefact density of 7.9 artefacts/m². The largest artefact concentration (44 pieces or 50.57% of the total assemblage) was excavated from Test Pit 4 located on the peak of the rise. Without the Test Pit 4 artefact concentration, artefact density would have

been substantially lower, at 4.3 artefacts/m², as most test pits contained five artefacts or less. 82.75% of the assemblage was mudstone and 17.25% was silcrete.

Open excavation of the site complex RE 12–14 recovered a concentrated artefact scatter across the peak of the rise within the very shallow A-Horizon soil. Open excavation on this rise was proposed by Margrit Koettig (then at the NSW Department of Environment and Climate Change) to define the apparent spread of artefacts from TP4, and to further establish the nature of this subsurface deposit, specifically to investigate whether it contained hearths and identifiable activity areas. The open area excavation of 86 m² (including TP4) was conducted in July–August 2001 by ERM. 1,168 artefacts were excavated in the open excavation and the investigations revealed a continuation of artefacts over the low rise, rather than what was originally recorded as three individual surface sites. Within this scatter, several distinct areas of artefact concentration were recorded, all with quantities of associated charcoal and burnt earth. The assemblage comprised backed artefacts and associated manufacturing debitage, mostly of mudstone.

Seven raw materials were represented in the open excavation. Mudstone was the dominant raw material observed, accounting for almost 80% of the total artefact numbers. This mirrored the initial trend set in testing phase. Silcrete was the next most common material and comprised nearly 20% of the assemblage. The remainder of the artefacts (less than 2%) was produced from six other raw material types.

Five artefact types were identified in the assemblage. Most artefacts were whole flakes accounting for more than 50% of the assemblage with broken flakes (almost 30%) and flaked pieces (approximately 15%) making up much of the remaining assemblage numbers. All modified artefacts, consisting of cores and retouched flakes, made up just under 2% of the assemblage.

Glendell Project Area (Umwelt 2013)

Salvage of the Glendell project area was undertaken under National Parks and Wildlife Services (NPWS) section 90 Consent #2267 and formed Part 4 of the salvage program for the Bettys Creek valley. This archaeological salvage within the Glendell project area was conducted by Umwelt and the Aboriginal community between November 2005 and February 2006. **Table 4-5** lists those sites within the Project Area that were salvaged under Consent #2267. These sites are shown on **Figure 4-3**.

Table 4-5. Sites within the Project Area salvaged under Consent #2267.

AHIMS	site name	Salvage methodology
37-3-0599	Bettys Creek 9	Surface Collection with Subsurface Investigation (manual excavation)
37-3-0601	Bettys Creek 11	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0602	Bettys Creek 12	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0604	Bettys Creek 14	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0605	Bettys Creek 15	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0606	Bettys Creek 16	Surface Collection with Subsurface Investigation (grader scrapes)

AHIMS	site name	Salvage methodology
37-3-0607	Bettys Creek 17	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0608	Bettys Creek 18	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0609	Bettys Creek 19	Surface Collection
37-3-0610	Bettys Creek 20	Surface Collection
37-3-0617	Bowmans Creek 5	Surface Collection
37-3-0618	Swamp Creek 1	Surface Collection
37-3-0619	Swamp Creek 2	Surface Collection
37-3-0620	Swamp Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0621	Swamp Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0622	Swamp Creek 5	Surface Collection
37-3-0623	Swamp Creek 6	Surface Collection
37-3-0624	Swamp Creek 7	Surface Collection
37-3-0026	Glennies Creek Site B / Bettys Creek - B	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0625	Swamp Creek 8	Surface Collection
37-3-0027	Glennies Creek Site C / Bettys Creek - C	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0626	Swamp Creek 12	Surface Collection
37-3-0592	Bettys Creek 1	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0627	Swamp Creek 13	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0593	Bettys Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0594	Bettys Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0595	Bettys Creek 5	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0596	Bettys Creek 6	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0597	Bettys Creek 7	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0598	Bettys Creek 8	Surface Collection with Subsurface Investigation (grader scrapes)

A total of 2,713 artefacts were recovered from the Glendell project area salvage including 824 (30.6%) from the surface collection, 274 (10.1%) from Excavation 1 (Bettys Creek 10), 19 (0.7%) from Excavation 2 (Bettys Creek 9), 1,414 (52.1%) from Excavation 3 (Bettys Creek 2) and 177 (6.5%) from the grader scrapes. A total of 2,604 (96%) of the artefacts were recovered from the Bettys Creek catchment, 52 (1.9%) from the Bowmans Creek catchment and 57 (2.1%) from the Swamp Creek catchment.

Observations made from the surface collection assemblage are as follows:

- The highest number of artefacts were collected from Bettys Creek 14 (26.7% of the surface collection assemblage), followed by Bettys Creek 10 (19.5% of the assemblage);
- 60.6% of the artefacts were collected from lower slopes and floodplains associated with creek lines (56.7% from Bettys Creek; 3.3% from Swamp Creek and 0.7% from Bowmans Creek);
- Sites on low but elevated spurs in tributary confluences comprised 22.2% of the assemblage; ridge crests (7.5%); sites on lower slopes on tributary channels more than 150 m from the main creek channel (7.5%); mid slope sites (1.3%) and upper slopes (0.6%);

- The dominant artefact type was broken flakes (45%); followed by flakes (26.7%); flaked pieces (10.9%); retouched flakes (10%), cores (3.7%), heat shatter (3.4%) and grindstones (0.4%);
- A total of 31 cores were recovered from the surface collection. Of these, 21 were recovered from the Bettys Creek sites (17 from areas with tributary confluences with Bettys Creek); and
- Mudstone was dominant within the assemblage making up 58.5% of the artefacts, followed by silcrete (31.9%) with the remaining raw materials making up 9.6% of the total assemblage.

Excavation was targeted at Bettys Creek 2, Bettys Creek 9 and Bettys Creek 10 indicated the following:

- Bettys Creek 10 and Bettys Creek 2 retained a level of spatial integrity reflected by knapping events and raw material distribution patterns;
- Bettys Creek 9 contained artefacts in a secondary context;
- All three locations contained backed flakes;
- A ground oven identified at Bettys Creek 2 had an absolute date of 2188+/-39 BP;
- It was possible to obtain one radiocarbon date of 3077±40 BP (calibrated-Wk-20912) from Square K Spit 3 of Excavation 3 within the Mount Owen Extension Area. The date was relative in nature as it belonged to a large piece of burnt wood that was associated with artefacts both above and below it. Thus, the artefacts above it must be dated to later than 3077±40 BP and those below it to earlier:
- Broken flakes (45.7%) dominated the artefact assemblage, followed by flakes (38.7%);
- Bettys Creek 10 and Bettys Creek 2 were dominated by mudstone while Bettys Creek 9 was dominated by silcrete. Overall, mudstone was dominate (55.7%) over silcrete (32.3%);
- A small knapping event was evident at Bettys Creek 10, with greater amounts of knapping noted at Bettys Creek 2; and
- Core to flake ratios for Bettys Creek 10 were 1:28.7 and for Bettys Creek 2 were 1:27.4 suggesting knapping on site.

Because of the Umwelt investigations outlined above, today's archaeological landscape, particularly along Bettys Creek, but also along Swamp Creek and Bowmans Creek near the Additional Disturbance Area, has been extensively studied.

Archaeological Salvage. Liddell Coal Operations Development Modification 5 (OzArk 2015b)

OzArk was engaged by Liddell Coal Operations (LCO) to undertake the salvage of 15 Aboriginal archaeological sites for Modification 5 of DA 305-11-01 and was approved under AHIP #C0000623. The salvage of the sites was undertaken on 28 January 2015 and 24 to 25 February 2015.

Artefacts were retrieved from seven of the 15 sites. A total of 46 artefacts were salvaged across all sites. The majority of the 46 artefacts recovered from the salvage were flakes (73.9%). Other artefact

types included cores, flaked pieces, debitage, blades and a core fragment. Almost all artefacts were made from mudstone (56.5%) and silcrete (39.1%). Quartz and basalt artefacts were also present. Most artefacts were at a tertiary (65.2%) stage of reduction, with the rest secondary (34.8%). There were no artefacts at the primary stage of reduction.

The artefacts that were salvaged closely correspond to the regional context. The low proportion of formal tools (just one in 46) and the high percentage of flakes and debitage (76%) in the salvaged assemblage are typical of the region, but this is probably true in most sites across Australia. Mudstone has been recorded to be the most common raw material in the region, which was the case for the salvaged artefacts, and the other materials salvaged are also common.

Details of the two sites in this program that are within the Project Area are listed in **Table 4-6** and shown on **Figure 4-3**.

AHIMS#	Site name	Artefacts salvaged	Notes
37-3-0419	Rav 24 East	12	This site was salvaged by surface collection and grader-scrape salvage. The ground surface visibility (GSV) of 15% is based on pre-grader-scrape visibility. The grader-scrapes added an additional 20% GSV.
37-3-1152	LID 36	1	Rakes were used to remove wood chips from the ground and improve GSV.

Table 4-6. Details of sites within the Project Area salvaged under AHIP C0000623.

Mount Owen Continued Operations Project Salvage Program (OzArk 2017e)

In early 2017 the MOCO salvage program took place under the authority of the 2016 Mount Owen Complex ACHMP (XMO SD PLN 0060). This program was completed in the approved disturbance areas associated with the MOCO Project (SSD-5850) (see **Section 4.4.2.1** for details of the survey associated with the MOCO Project).

This program included the collection of surface artefacts at 26 sites resulting in 163 artefacts being recorded. Included in the tally of 26 sites, were two sites where limited archaeological excavation took place resulting in a further 187 artefacts being recorded. An additional area on the east bank of Bowmans Creek proposed for impact by the new Hebden Road bridge was also subject to archaeological investigation by manual excavation but the area proved to be highly disturbed and no artefacts were recorded.

In addition, there were three sites that were unable to be salvaged, one as it was on land not owned by Mount Owen, and the remaining because the area of the sites had previously been unintentionally impacted by mining activity⁶. These unintentional impacts were self-reported to the OEH (now BCD) who issued an official caution to Mount Owen on 17 March 2016. Sites salvaged within the Project Area under SSD-5850 are listed in **Table 4-7** and shown on **Figure 4-3**.

Aboriginal Archaeology Impact Assessment: Glendell Continued Operations Project.

⁶ In addition, MOCO OS-3 was unintentionally partially impacted by mining activities and the remainder of this site was salvaged during the salvage program.

Table 4-7. Sites salvaged within the Project Area under SSD-5850.

Site ID	Site Name	Site Type	Number of Artefacts Salvaged	Salvage methodology
37-3-0611	Extension to Bettys Creek 21	Artefact Scatter	4	Surface collection only
37-3-1174	MOCO IF-5	Isolated Find	1	Surface collection only
37-3-1195	MOCO OS-7	Artefact Scatter	0	Surface collection only
37-3-1199	MOCO OS-11	Artefact Scatter	7	Surface collection only
37-3-1211	MOCO IF-18	Isolated Find	0	Surface collection only
	Bowmans Creek East Bank (Hebden Road)	PAD	0	Manual excavation.

Of all the sites investigated in the 2017 salvage program, 37-3-1192 recorded the highest artefact density with 71 surface artefacts (43.5% of all surface artefacts recorded during the salvage program) and 186 artefacts recorded in the excavation component of the program (constituting almost all the artefacts recorded in the excavation component of the program). 37-3-1192 was located on an unnamed watercourse (termed the 'eastern drainage') approximately 2.5 km east of the Project Area. 37-3-1192 was in area heavily affected by erosion and the investigation showed that while one concentration of artefacts remained *in situ*, most of the site had been displaced by the erosion.

Other sites that recorded more than 10 artefacts during the salvage program were 37-3-1191, 37-3-1197 and 37-3-1198. 37-3-1198 remains partially extant within the Additional Disturbance Area. All other sites recorded very low artefact numbers supporting the conclusion reached in OzArk 2014 that the remaining archaeological values at MOC consist of low density, often displaced, artefact scatters.

The recording of these sites affords with the general picture emerging that sites located away from permanent water are likely to have a low artefact density and low site complexity.

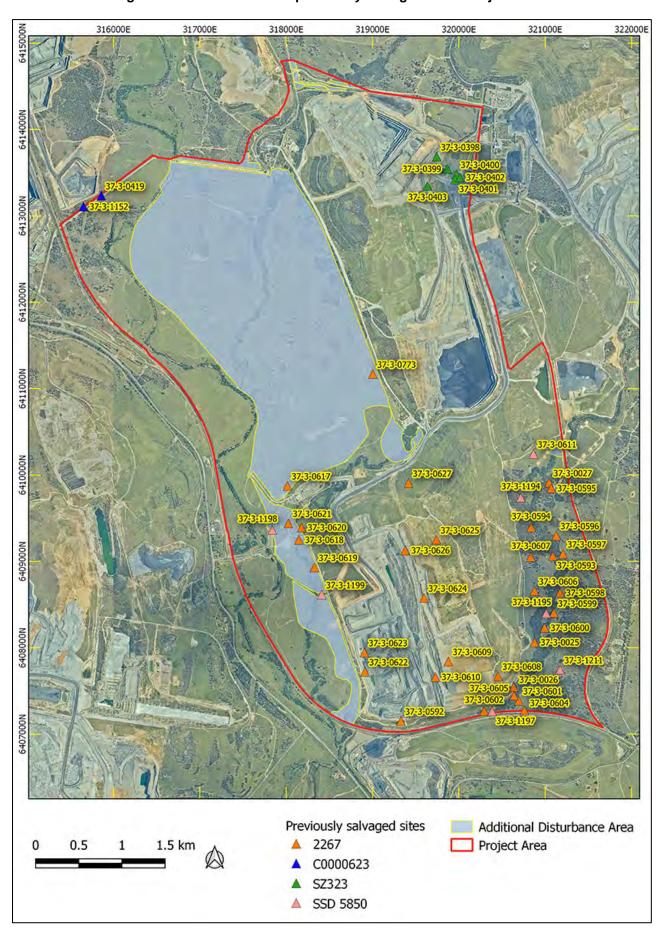


Figure 4-3. Location of sites previously salvaged in the Project Area.

4.4.2.3 Archaeological context: Conclusion

The extensive and long running archaeological investigations within and near the Additional Disturbance Area indicate that:

- Stone artefact sites (isolated finds and artefact scatters) are the most commonly recorded site types in the area and that other site types, such as culturally modified trees, are very rare or non-existent;
- At the current state of knowledge, only stone artefact sites will be impacted by the Project.
 Other site types such as grinding grooves or the Bowmans Creek engraving site (Bowmans Ck 16, 37-3-0772) are located outside of the Project Area. In addition, the Yorks Creek VCA is located outside of the Project Area. No sites have been found showing evidence of conflict between Aboriginal people and colonial settlers;
- Artefacts tend to be associated only with the A-Horizon soil layers indicating a date in the Holocene period (i.e. 12,000 BP to the present);
- The predominant raw materials used for stone artefact manufacture are locally sourced mudstone and silcrete;
- Excavations generally reveal a low artefact density, but some spatial patterning has been observed: principally concentrations of artefacts interpreted as 'knapping areas'. Other archaeological features such as hearths are rare;
- Sites tend to be associated with waterways and a discernible pattern has been observed whereby larger sites are associated with larger waterways offering permanent water supplies; and
- While all waterways have been equally studied, Yorks and Bettys Creeks appear to have attracted past Aboriginal occupation more often than Swamp Creek. Bowmans Creek would have been a major focus of past occupation but much of the evidence of this occupation has been removed by major channel migrations or intensive historical land use disturbances such as cultivation.

4.4.3 Previously recorded sites within the Additional Disturbance Area

Because of these previous assessments, there are 39 valid Aboriginal sites that have been recorded within the Additional Disturbance Area at the time of the survey. **Table 4-8** displays the site characteristics of these previously recorded sites.

Table 4-8. Site types of valid, previously recorded sites within the Additional Disturbance Area.

Site type	Frequency		
Artefact scatter	24		
Isolated find	15		
Total	39		

Of the 39 sites, 41% (16) occur within 50 m of a watercourse. These sites are typically artefacts identified on eroding creek banks and spurs and elevated flat areas overlooking watercourses. There is a significant drop-off in site frequency between 50 m and 100 m from watercourses with only four

sites identified within this zone. At distances greater than 200 m of watercourses there are five sites; three artefact scatters and two isolated finds. This constitutes 13% of the 39 sites in the Additional Disturbance Area. This is a low proportion and may be indicative of the historical disturbances that have occurred in the Additional Disturbance Area that may have moved artefacts within the landscape away from locations closer to waterways.

Figure 4-4 illustrates the location of the 39 previously recorded sites at the time of the survey within the Additional Disturbance Area and **Table 4-9** lists the sites.

Table 4-9: Previously recorded sites within the Additional Disturbance Area.

ld	AHIMS#	Site name	GDA Zone 56 East	GDA Zone 56 North	Site status	Site type	Notes
1	37-3-0294	Site 2; (MORL2)	321168	6410327	Valid	Artefact scatter	
2	37-3-0469	Bowmans/Swamp Creek Trench 1	318072	6409137	Partially destroyed	Artefact scatter	Permit 2267
3	37-3-0689	G11 Glendell	319223	6410211	Valid	Artefact scatter	
4	37-3-0744	York Creek 1	317440	6411356	Valid	Artefact scatter	
5	37-3-0745	York Creek 2	317577	6411112	Valid	Artefact scatter	
6	37-3-0746	York Creek 3	317745	6411008	Valid	Artefact scatter	
7	37-3-0747	York Creek 4	317373	6411322	Valid	Artefact scatter	
8	37-3-0748	York Creek 5	317365	6411471	Valid	Artefact scatter	
9	37-3-0749	York Creek 6	317501	6411814	Valid	Artefact scatter	
10	37-3-0750	York Creek 7	317483	6411169	Valid	Artefact scatter	
11	37-3-0751	York Creek 8	317496	6412805	Valid	Isolated find	
12	37-3-0752	York Creek 9	317685	6411312	Valid	Artefact scatter	
13	37-3-0753	York Creek 10	317865	6412266	Valid	Artefact scatter	
14	37-3-0754	York Creek 11	317782	6412443	Valid	Artefact scatter	
15	37-3-0755	York Creek 12	317870	6412581	Valid	Artefact scatter	
16	37-3-0756	York Creek 13	318352	6411400	Valid	Artefact scatter	
17	37-3-0757	York Creek 14	318417	6411813	Valid	Isolated find	
18	37-3-0758	York Creek 15	317849	6411202	Valid	Artefact scatter	
19	37-3-0759	York Creek 16	317827	6411497	Valid	Artefact scatter	
20	37-3-0760	York Creek 17	317626	6412595	Valid	Isolated find	
21	37-3-0761	York Creek 18	317712	6412158	Valid	Isolated find	
22	37-3-0762	Bowmans Ck 6	317657	6410790	Valid	Isolated find	
23	37-3-0763	Bowmans Ck 7	316542	6413142	Valid	Artefact scatter	

ld	AHIMS#	Site name	GDA Zone 56 East	GDA Zone 56 North	Site status	Site type	Notes
24	37-3-0764	Bowmans Ck 8	317205	6412329	Valid	Artefact scatter	
25	37-3-0765	Bowmans Ck 9	316878	6412410	Valid	Artefact scatter	
26	37-3-0766	Bowmans Ck 10	316833	6412566	Valid	Artefact scatter	
27	37-3-1198	MOCO OS-10	317840	6409364	Partially destroyed	Artefact scatter	Permit: SSD- 5850
28	37-3-0773	Swamp Ck 10	319006	6411169	Valid	Isolated find	
29	37-3-1155	MT OWEN ISOLATED FIND2	317854	6411236	Valid	Isolated find	
30	37-3-1156	MT OWEN ISOLATED FIND1	318001	6410455	Valid	Isolated find	
31	37-3-1158	RPS DLW IF1	317148	6412677	Valid	Isolated find	
32	37-3-1490	Swamp Creek IF-4	318805	6407340	Valid	Isolated find	
33	37-3-1492	Swamp Creek IF-2	318807	6407327	Valid	Isolated find	
34	37-3-1493	Swamp Creek IF-3	318805	6407330	Valid	Isolated find	
35	37-3-1494	Swamp Creek IF-1	318640	6407727	Valid	Isolated find	
36	37-3-1499	Swamp Creek-OS1	318819	6407299	Valid	Artefact scatter	
37	37-3-0521	MO-IF1	319123	6410319	Valid	Isolated find	
38	37-3-1503	Yorks Creek 19	317369	6411237	Valid	Artefact scatter	
39	37-3-0612	Bettys Creek 22	321138	6410296	Valid	Isolated find	

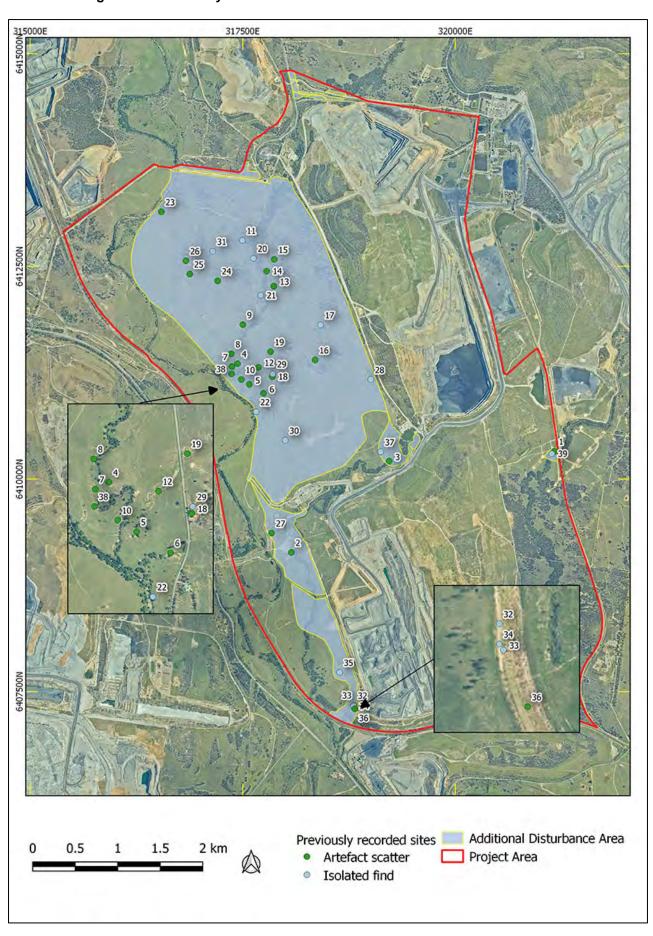


Figure 4-4. Previously recorded sites within the Additional Disturbance Area.

4.5 PREDICTIVE MODEL FOR SITE LOCATION

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rockshelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions, very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short and long-time scales—or (b) the historical impacts associated with the introduction of European farming practices. Scarred trees, by their nature, may survive for up to several hundred years but rarely beyond.

4.5.1 Settlement strategies

The large number of archaeological studies undertaken within the vicinity of the Additional Disturbance Area provides information to obtain a sound understanding of the nature and distribution of archaeological sites within the area. Although there is some conjecture about the relationship between stream order, site numbers and densities, the general pattern is that most sites are present within 30 m of watercourses (Dean-Jones 1992: 26–27; AMBS 1997: 29). Although sites are present at locations at a greater distance from water, these sites are limited in terms of both number and size, constituting a lower density scatter than is found along the creek lines (Dean-Jones 1992: 24; ERM 1999: 22–23). Most of these sites distant to water are spatially small, with larger sites typically found in association with permanent watercourses. Reduced visibility has been proffered as an explanation for the higher number of sites and artefacts present along the more heavily eroded and less vegetated minor watercourses as compared to major creeks (Umwelt 2004: 7.7; ERM 1999: 84).

Figure 4-5 maps the previously recorded sites within the Additional Disturbance Area in relation to the area's drainage lines with major drainage lines having a 100 m buffer and minor drainage lines having a 50 m buffer. As can be seen, most of previously recorded sites fall into these zones, with a clear majority being associated with the named waterway buffer. Sites located outside of these

zones are often isolated finds. This would indicate that the settlement strategies noted elsewhere within the Hunter Valley are also valid for the Additional Disturbance Area in that most sites will be in association with water sources.

317000E 318000E 320000E 321000E 315000E 316000E 319000E 322000E Minor Waterway 50m buffer Previously recorded sites 1.5 km 0.5 Additional Disturbance Area Artefact scatter Project Area Isolated find Major Waterway 100m buffer

Figure 4-5: Aerial showing the correlation between site recordings and drainage lines.

4.5.2 Past land use

Crucial for the preservation of archaeological deposits is the history of past land use in an area. In particular, the colonial history of the Hunter Valley lowlands, where the Additional Disturbance Area is located, is a stark example of historic land mismanagement leading to wide-spread erosion as the dispersible soils were exposed to rain and broken apart by stock. On **Figure 4-6**, for example, the wide-spread sheet wash erosion is noticeable; particularly on the slopes to the southeast of the Additional Disturbance Area where the Glendell Mine is now located. While this portion of the Project Area contained more-sloping landforms compared to other areas, it remains indicative of the soil loss that has occurred across the Project Area.

An analysis of aerial photography of the Additional Disturbance Area 60 years ago in 1958 (**Figure 4-6**) shows that there is very little tree cover within the Additional Disturbance Area and evidence of sheet wash erosion, with the much of the area impacted either by degrading or aggrading factors. The 1958 image shows largely de-vegetated creek lines with noticeable gully erosion within the channel (channelisation) and, in places, extensive sheet wash erosion at their margins.

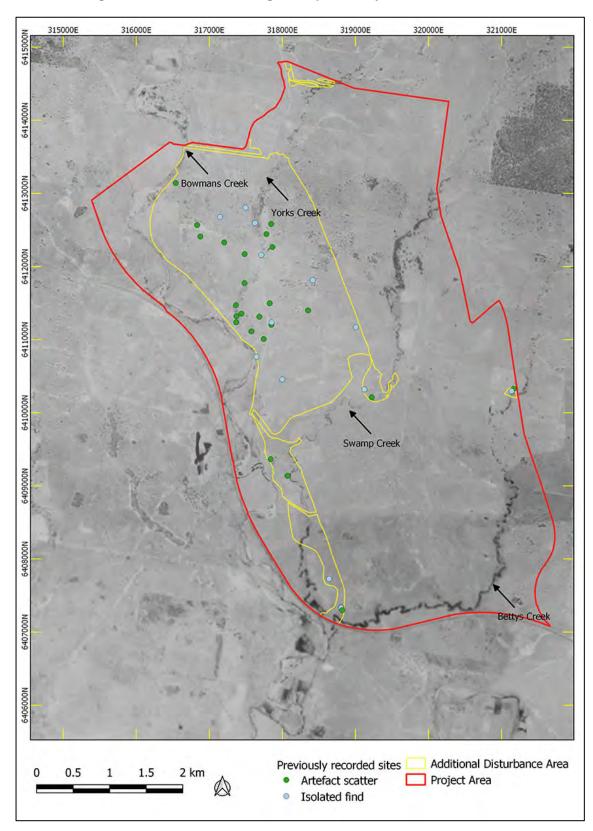
Such widespread impacts have undoubtedly affected the archaeological landscape in that many tens of centimetres of soils have been removed from many areas within the Additional Disturbance Area, along with any archaeological deposits they may have contained. With such widespread soil movement, it is also important to remember that accumulations of artefacts that may be termed a 'site' today may have, in fact, been washed into that location during the historic period and bear no relationship to past Aboriginal occupation patterns in the area.

When previously recorded sites are overlain on the 1958 aerial image (**Figure 4-6**), several observations can be made:

- The landforms in the east and central-northern portions of the study area appear to be degrading toward the major north/south orientated drainage lines. Particularly, the low gradient hills in the centre of the Additional Disturbance Area are devoid of previously recorded sites probably due to the soil loss in these landforms;
- The areas of cultivation on the east bank of Bowmans Creek are also devoid of previously recorded sites, probably because of repeated disturbances arising from long-term cultivation;
- Cultivation in the flat landforms between Swamp and Bowmans Creeks in the south of the Additional Disturbance Area probably also explains the small number of previously recorded sites in this area. This is especially marked when it is noted that this southern area of the Additional Disturbance Area has been subject to a greater number of assessments when compared to the northern portions;
- Site density is greatest at the confluence on Yorks Creek with Bowmans Creek. This likely
 reflects the high suitability of this area for Aboriginal occupation due to the proximity of two
 significant water sources and the convergence of associated trails and resource zones. It is
 possible, however, that this partly also reflects the aggrading nature of landforms in this area,

- where artefacts may have accumulated during secondary depositional event and formed new assemblages; and
- In general, with a few exceptions, artefact scatters are associated with the drainage lines of the Additional Disturbance Area while isolated finds tend to be recorded in landforms that have been stripped of the topsoil.

Figure 4-6: A 1958 aerial image with previously recorded valid sites.



4.5.3 Previously recorded sites

Due to the history of archaeological investigation near the Additional Disturbance Area, there have been several sites recorded either within the Additional Disturbance Area, or nearby. 39 valid sites remain extant within the Additional Disturbance Area or within close proximity (**Figure 4-4**).

As discussed in **Section 4.4.2** and below in **Section 4.5.5**, the results of previous investigations would suggest that:

- The most common site type will be stone artefact sites; either low density artefact scatters or isolated finds;
- Culturally modified trees will be extremely rare due to the level of historical clearing and the fact that they are a regionally rare site type;
- Grinding grooves will be unlikely to occur in the Additional Disturbance Area as the major creek lines have been subject to previous assessment and it would be expected that these site types would have already been recorded; and
- Other site types such as burials or stone arrangements will be very rare due to the long-term agricultural disturbances that have occurred in the Additional Disturbance Area.

4.5.4 Landform modelling

The Additional Disturbance Area is entirely contained within landforms between 80 m and 140 m in altitude (**Section 3.1**). Generally, the land is sloping towards the southwest and is within the Bowmans, Yorks, Swamp, and Bettys Creek catchments. In the eastern and central-northern portions of the Additional Disturbance Area there are localised rises with some associated steeper slopes, however, generally the Additional Disturbance Area has a gentle undulating gradient.

The primary hydrological resource in the Additional Disturbance Area is Bowmans Creek, fed by the Yorks, Swamp, and Bettys Creeks and their ephemeral tributaries.

As such there are a variety of topographic features within the Additional Disturbance Area that would have encouraged past Aboriginal occupation; namely:

- The landforms adjacent to the Bowmans, Yorks, Swamp, and Bettys Creeks have the capability of providing elevated landforms adjacent to water: landforms recognised in the area as having archaeological sensitivity;
- The rises in the centre of the Additional Disturbance Area could well have afforded vantage points and could have been periodically used as observation posts; and
- The landforms at the confluences of Yorks, Swamp, and Bettys Creeks with Bowmans Creek have especial suitability for Aboriginal occupation due to the proximity of multiple significant water sources and the convergence of associated trails and resource zones.

When previously recorded sites are mapped against the major landform types of the Additional Disturbance Area (**Figure 4-7**), there is a strong correlation between site location and landform type

as a clear majority of sites are associated with flat/floodplain landforms. There is a marked lack of sites associated with slopes, and very few sites associated with ridges. Possible reasons for this observed dichotomy are that drainage lines are associated with flat/floodplain landforms, and as shown in **Section 4.5.1**, sites tend to be associated with drainage lines. However, it also may be a product of the degradation noted in **Section 4.5.2** that has seen soils, and accompanying archaeological deposits, stripped from hillslopes due to land mismanagement during the agricultural phase of land use.

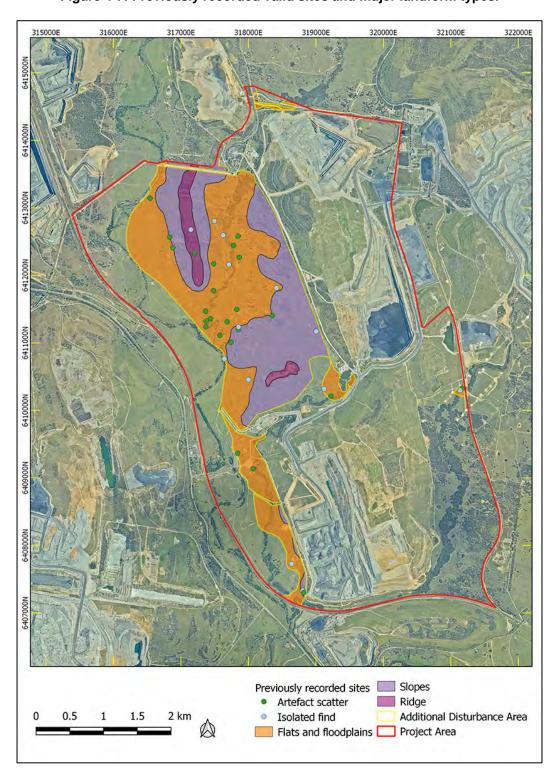


Figure 4-7: Previously recorded valid sites and major landform types.

4.5.5 Previous studies

Upper Hunter Valley Aboriginal Heritage Baseline Study (ERM 2004)

ERM (2004) undertook a review of the archaeology in the upper Hunter Valley on behalf of Upper Hunter Aboriginal Heritage Trust. Following is several of ERM's conclusions about archaeological sites in the upper Hunter Valley of relevance to this assessment:

- Artefact assemblages will typically be comprised of flaked stone with a component associated with the manufacture of backed artefacts. Backed artefacts typically make up less than 2 per cent (and up to 5 per cent in rare cases) of an assemblage;
- Evidence of backed artefacts is generally found wherever large numbers of artefacts have been recorded:
- Cores and flakes associated with backed artefact manufacture typically show evidence of
 platform modification to increase platform angles. This modification is sometimes referred to
 as faceting, and is typical of open site assemblages between Singleton and Muswellbrook;
- The backed artefact component may typically include a larger proportion of asymmetric, elongate (bondi point) forms and a smaller proportion of symmetric (geometric microlith) forms in the same assemblage;
- Eloueras occur occasionally and sometimes exhibit use-wear chipping and polishing along the chord;
- Artefact assemblages have, on rare occasions, included small grindstones or fragments thereof, and ground-edge hatchet heads made on flat ovate water rolled small cobbles;
- Hearths, comprising tight concentrations of heat-retainer stones clearly distinguishable from the natural environment are rare;
- Sites along creek lines have potential for subsurface archaeological deposit. Topsoil is often quite deep, commonly between 100 and 300 mm;
- The small numbers of artefacts found on slopes and ridge crests generally do not allow identification of particular activities, but do provide evidence for occupation of these areas and at the very least transient movement over, and use of, all parts of the landscape;
- In areas close to the Hunter River (very likely to have been the major foci of occupation)
 alluvial deposits may have buried sites, or periods of flooding may have eroded and
 displaced archaeological material. Nevertheless, excavations at a number of sites indicate
 that high density subsurface assemblages may occur in this context;
- Sites on or within colluvial deposits are also rare, however, they do occur and may represent stratified cultural deposits providing evidence of chronological change;
- Archaeological sites other than artefact scatters or isolated artefacts are not common;
- Quarry sites have been identified where silcrete outcrops occur; however, most of the raw material used in the manufacture of stone artefacts would have been derived (quarried/collected) from the Hunter River;

- Axe-grinding grooves often occur where suitable sandstone is in association with water or a creek line;
- Scarred trees are rare, presumably because most trees that may be old enough to have been scarred have been cleared or died naturally (and rotted away or been burnt in fires); and
- Art sites, ceremonial sites or Bora grounds are also rare and are either deteriorating or can no longer be located.

4.5.6 Conclusion

Utilising knowledge of the environmental contexts of the Additional Disturbance Area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of those site types being recorded within the Additional Disturbance Area:

- <u>Isolated finds</u> may be indicative of: random loss or deliberate discard of a single artefact, the
 remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or
 subsurface artefact scatter. They may occur anywhere within the landscape but are more
 likely to occur in topographies where open artefact scatters typically occur.
 - As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the Additional Disturbance Area.
 It is noted in **Section 4.4** that isolated finds are commonly recorded near the Additional Disturbance Area.
- Open artefact scatters are here defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or subsurface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

This site type is likely to be located within landforms of a gentle gradient associated with the main channels of Bowmans, Swamp, Yorks and Bettys Creeks as these are likely to have been attractive camping areas. Smaller sites containing low density and low complexity assemblages are predicted near semi-permanent watercourses (Swamp, Yorks and Bettys Creeks), while the more permanent nature of Bowmans Creek suggests that this creek may have been the focus of more intensive (longer duration) camping which would have produced larger sites with higher density and more complex assemblages. Moderate to steeply sloping landforms are unlikely to have been utilised with lower gradient ridges and spurs being more attractive for camping. The lack of water in these elevated landforms would suggest, however, that camping would have been short-term and that sites would be smaller and contain low complexity assemblages. The review of environmental and anthropomorphic factors discussed in **Sections 4.5.1** to **4.5.5** would indicate:

- Most sites will be located within 100 m of waterways. This is either due to the desirability of these locations for Aboriginal occupation, a result of larger exposures in these areas due to bank and sheet wash erosion and due to the fact that artefacts have been washed into these areas in the historical period.
- The high degree of impact from past agricultural practices along the floodplains, i.e. cultivation, in the Additional Disturbance Area will probably mean that surface scatters and archaeological deposits are likely to have become displaced. There has been a noted lack of previous recordings in these landforms due to this very reason.
- o It is noted that the Additional Disturbance Area already has a number of artefact scatters recorded by investigations over the years. This suggests that many of the larger sites have probably been previously recorded and that the Additional Disturbance Area will probably not record many more large sites.
- There is a bias in site distribution to flat/floodplain landforms with very few sites recorded in slope or ridge landforms. This is likely due to the high degree of soil loss from these landforms.
- o It would be expected that most sites located would date to the late Holocene (i.e. less than 4,000 BP), the age attributed to the A-Horizon artefact bearing deposits. Although Pleistocene sites contained within B-Horizon sediments may also occur, there have been only one or two instances of Pleistocene deposits being identified in the district and this must be considered a rare eventuality.
- Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed because of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any particular example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and early colonial bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early colonial houses. Consequently, the distinction between colonial and Aboriginal scarred trees may not be clear.

- Due to the near-total clearance of trees from within the Additional Disturbance Area (see Figure 3-6), this site type is not predicted likely to occur. It is also noted that this site type is very rare at a regional level due to historical tree clearance.
- Quarry sites and stone procurement sites typically consist of exposures of stone material
 where evidence for human collection, extraction and/or preliminary processing has survived.
 Typically, these involve the extraction of siliceous or fine grained igneous and metasedimentary rock types for the manufacture of artefacts. The presence of quarry/extraction
 sites is dependent on the availability of suitable rock formations.
 - This site type could be recorded within the Additional Disturbance Area should suitable rock outcroppings be available. One quarry site, Bowmans Creek 5, was located within the Additional Disturbance Area to the north of Swamp Creek (Figure 4-2).
- <u>Burials</u> are generally found in soft sediments such as aeolian sand, alluvial silts and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of subsurface sediments or where some erosional process has exposed them.
 - O Although it is possible that this site type could be found within the Additional Disturbance Area in the alluvial landforms, it is considered a rare site type especially given the disturbance that has occurred within the Additional Disturbance Area. It is noted that the Additional Disturbance Area may have been the location of conflict between Aboriginal people and colonial settlers and had deaths resulted from this conflict then it is not known whether these people were formerly buried. It is noted that the landforms within the Additional Disturbance Area are unlikely to preserve any such burials had they existed.
- Conflict sites are common across Australia due to the frontier war waged between colonial settlers and the Aboriginal occupants of an area. As demonstrated in the Sydney Basin (Gapps 2018), conflict was widespread, organised and long-running resulting in considerable death and destruction of property on both sides of the conflict. While contact sites are likely to leave an identifiable archaeological signature, conflict sites are much less likely to be preserved in the archaeological record.
 - O As the Additional Disturbance Area is situated within Ravensworth Estate, one of the earliest settlements in the upper Hunter Valley, conflict sites could be in the Additional Disturbance Area. However, as such sites are unlikely to have a physical manifestation, it is unlikely this site type will be recorded.
- Aboriginal resource sites can be located anywhere in the landscape as resources, in the form of both plants and animals, were a major determinant in Aboriginal site distribution. Given the changes to the morphology of Australian rivers and creeks, it is often difficult to appreciate the former chain-of-ponds morphology that characterised these waterways prior to colonial mismanagement of the land. However, the distribution of sites along a waterway may be a way of indicating where former ponds were located. Similarly, changes in the hydrology in many parts of Australia has modified the water table and the former location of springs. The location of sites, often in ridge landforms, in areas where there is no obvious reason for their

location, could be an indication of a former spring that is no longer in evidence. Likewise, the location of a site away from obvious landforms attractive for occupation could be an indication of the location of former resource plants.

o While the survey is not equipped to catalogue existing Aboriginal resource plants and animals in the Additional Disturbance Area, it is likely that these have been highly modified and disturbed due to the long-term and intensive agricultural activity within the area. As there are no areas of lower disturbance within the Additional Disturbance Area, it is likely that many of the former resources will have been removed entirely. While any remaining resources will not be mapped as part of the archaeological investigation, the role of resources will be considered when discussing site distribution patterning.

An examination of the landforms within the Additional Disturbance Area (**Section 3**) indicate that the northern portions of the Additional Disturbance Area is in a degrading environment where soils have been moved from the slopes towards the creek systems where aggrading landforms are evident. This would have the effect of displacing or impacting archaeological deposits had they existed in the north of the Additional Disturbance Area. Landforms adjacent to Bowmans Creek, in particular, are in an aggrading environment. This may mean that archaeological deposits may have become buried or mixed with artefacts that have washed down from adjoining slopes.

5 RESULTS OF ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

This section refers to the survey area which is a larger area from the current Additional Disturbance Area (see **Section 1.4**). Thus, sites discussed here are within the survey area and some are outside of the Additional Disturbance Area. The survey area encompasses all the Additional Disturbance Area.

5.1 SAMPLING STRATEGY AND FIELD METHODS

Standard archaeological field survey and recording methods were employed in this study (Burke & Smith 2004). Visual inspection of the survey area was conducted systematically according to predetermined parallel transects spaced 100 m apart. Surveyors walked at even spacing sufficient to sample the entirety of each transect. RAPs, or their representatives, assisted the field effort by identifying objects/features of cultural interest and by placing flags at artefact locations to assist with the recording of artefact sites. Vehicles were only used for access between transects. The survey area was divided into three landform units for recording purposes (**Section 3.1**), with ground surface exposure (GSE) and ground surface visibility (GSV) noted for each, however, transects were not confined to these landform units but were organised spatially so that one transect could sample two or even three landscape units where applicable. GSE and GSV are further examined in **Section 5.3**.

It should be noted that the aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within the survey area are known. Therefore, the aims of the survey were to:

- Reinspect the location of all 55⁷ previously recorded sites within the survey area so that their current condition and scientific heritage values could be assessed;
- Conduct pedestrian transects across all landforms in the survey area so that their archaeological potential could be determined;
- Evaluate whether the predictive model set out in **Section 4.5** is valid;
- Determine if any portions of the survey area require test excavation to understand the archaeological potential at a particular location; and
- Determine whether any previously recorded sites within 100 m of the survey area extend into areas where proposed impacts are to occur.

The entirety of the survey area was subjected to full pedestrian survey as set out in the survey methodology (**Appendix 1**). The survey methodology also describes the zoning of the survey area into three zones that predicated the methodology of the survey, namely:

⁷ While there are 39 previously recorded sites in the Additional Disturbance Area, the survey area covered a larger area of land. See **Section 1.4**.

- High survey priority: The assessment included approximately 1,085 ha that was classified as 'high survey priority'. This constituted approximately 34 per cent of the project area as it was at the time of the survey. In this area the major Project components such as the Glendell Pit Extension, the Hebden Road realignment, the new Mine Infrastructure Area (MIA), the heavy vehicle access road to the new MIA or the then proposed option to use the Liddell MIA, and the realignment of Yorks Creek will be located. Although a significant part of the high survey priority area had been subject to survey (over 10 years ago), much of this area was outside of land that had been systematically surveyed in the recent past. This area included approximately 2.5 km of Bowmans Creek, 3.5 km of Yorks Creek and 3.9 km of Swamp Creek; all drainage systems with known Aboriginal cultural heritage values;
- Low survey priority: This 208 ha area contains generally flat landforms surrounding Bettys
 Creek. This area constitutes approximately 7 per cent of the project area as it was at the time
 of the survey. This area had been extensively surveyed in the recent past, including most
 recently for the MOCO Project. As this area had been extensively surveyed, the
 archaeological characteristics of this area were largely known; and
- Area of modified landforms: This 1,607 ha area has been highly modified by approved mining
 activities and includes open cut pits, waste emplacements, dams, buildings and other surface
 infrastructure. This constituted approximately 55 per cent of the project area as it was at the
 time of the survey. Due to the highly modified nature of these landforms, they are extremely
 unlikely to contain archaeological sites and no survey took place in this area.

See figure 4.1 in the survey methodology (Appendix 1) for a map of the location of these zones.

Figure 5-1 shows the Additional Disturbance Area that was surveyed by pedestrian transects by OzArk archaeologists and members of the Aboriginal community. The survey effort illustrated on **Figure 5-1** is the data taken on a GPS device operated by one of the archaeologists in each team. It therefore does not take into account the other five surveyors in each team that 'filled in' the spaces between the transects shown.

Portions of the Additional Disturbance Area shown on **Figure 5-1** without survey transects are in the 'area of modified landforms' where no survey was necessary.

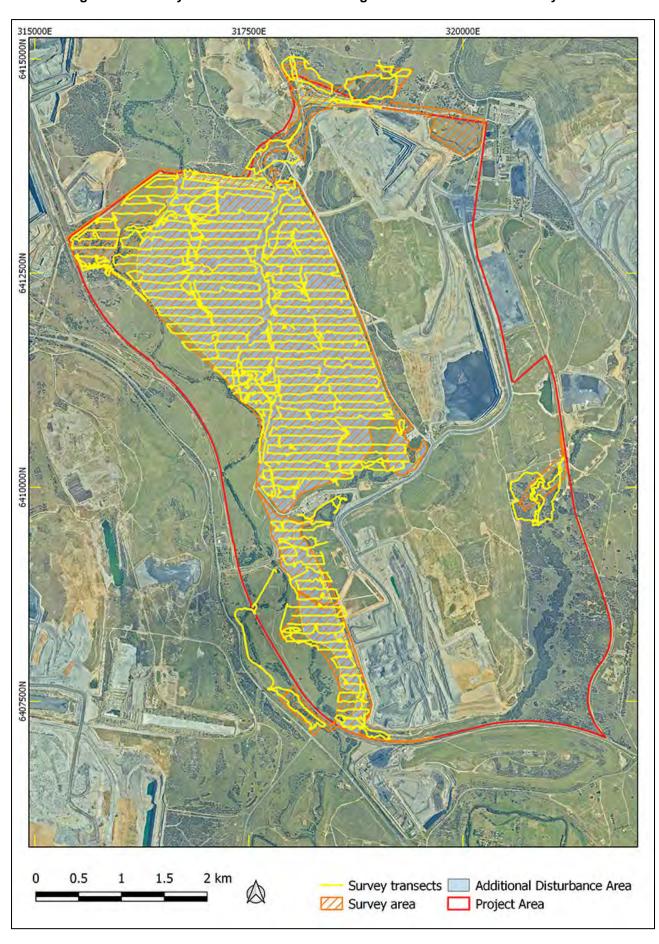


Figure 5-1: Survey transects undertaken during the assessment of the survey area.

5.2 PROJECT CONSTRAINTS

There were no access issues in any region of the survey area that prevented the archaeological assessment from being carried out. The weather was mostly dry with warm to hot temperatures that did not inhibit the progress of the survey team. The survey area also consists of landforms with gentle gradients that were able to be easily traversed and there were few areas of dense vegetation.

There were no other constraints that hindered the successful completion of the archaeological assessment apart from the usual archaeological constraint: variable GSV (**Section 5.3**).

5.3 EFFECTIVE SURVEY COVERAGE

Two of the key factors influencing the effectiveness of archaeological survey are GSV and GSE. These factors are quantified to ensure that the survey data provides adequate evidence for the evaluation of the archaeological materials across the landscape. For the purposes of the current assessment, these terms are used in accordance with the definitions provided in the Code of Practice (DECCW 2010).

GSV is defined as:

... the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. Things like vegetation, plant or leaf litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals' (DECCW 2010: 39).

GSE is defined as:

... different to visibility because it estimates the area with a likelihood of revealing buried artefacts or deposits rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals' (DECCW 2010: 37).

The landscape was dry at the time of assessment and significant die-back of vegetative ground cover had occurred. As such, in the majority of instances, GSE was moderate allowing for adequate investigation of the ground surface within the Additional Disturbance Area (**Table 5-1**).

In general, **Table 5-1** and **Table 5-2** present an approximation of the amount of ground surface able to be seen at any location within the particular landform units. For example, at any one location within the flat landforms of the Additional Disturbance Area approximately 14% of the ground surface could be seen. Exposures in these landforms were generally confined to the edges of drainage lines. The amount of visible ground increased across the slopes and ridges as these were generally cleared with less ground cover than the flat landforms. Visibility within these landforms was

hampered by leaf litter and gravels from weathered bedrock. Crest landforms often contained sizeable exposures where the soils had been depleted by erosion (**Figure 5-2**).

Figure 5-1 shows pedestrian coverage across the three landform units present within the survey area (1011 ha). 116 sites, both previously recorded (n=52) and newly recorded (n=64), have been recorded in the survey area. Eight sites, both previously recorded (n=3) and newly recorded (n=5), are recorded in the buffer area around the survey area. A total of 124 sites are subject to the discussion below.

Table 5-2 demonstrates that although the survey efficacy within flat/floodplain landforms was the lowest at 14 per cent, this did not hamper the recording of sites; generally, because the available exposures were in the most archaeologically sensitive areas (i.e. along the banks of waterways). As has been noted previously (**Section 4.5.4**), many more sites are recorded in flat/floodplain landforms when compared to slope/ridge landforms; primarily due to the soil loss in these landforms along with the loss of associated archaeological deposits. Therefore, as seen in **Table 5-2**, although survey efficacy was higher in these landforms, this still did not result in an increase in site recordings.

Table 5-1: Survey coverage data for the survey area.

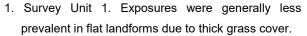
Survey Unit	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
1	Flats and floodplains	6 225 000	70	20	871 500	14%
2	Slopes	3 500 000	50	35	612 500	17.5%
3	Ridges	385 000	60	30	69 300	18%

Table 5-2: Landform summary and recorded sites within the survey area.

Landform	Landform area (sq m)	Area Effectively Surveyed (sq m) (= Effective Coverage Area)	% of Landform Effectively Surveyed (= Area Effectively Surveyed / Landform x 100)	Number of Sites
1	Flats and floodplains	871 500	14%	89
2	Slopes	612 500	17.5%	29
3	Ridges	69 300	18%	6

Figure 5-2: Examples of GSE/GSV within the survey area.







Survey Unit 1. Areas of exposure in the flat landforms were generally confined to the edges of creek and drainage lines.



3. Survey Unit 2. Casuarina regrowth along the slope landforms inhibited GSV due to thick leaf litter.



4. Survey Unit 2. The amount of exposure increased on the slopes, however, GSV within the exposures was affected by the high cover of gravels present.



5. Survey Unit 3. Grass cover was still present in areas across much of the ridges, however, it was less than in the flat landforms.



6. Survey Unit 3. Areas of exposure along the ridges was affected by the high amount of gravels present because of the weathering conglomerate bedrock.

5.4 ABORIGINAL SITES RECORDED

69 Aboriginal cultural heritage sites within the survey area and its immediate buffer were identified during the survey and test excavation program (**Figure 5-3** to **Figure 5-5**). Most sites were artefact sites; either artefact scatters (n=39) or isolated finds (n=29), except for one scarred tree (n=1). Further details including the GPS locations, site features and landform have been recorded for each site (**Table 5-3**). The significance assessment and impact assessment for the new sites, and previously recorded sites, has been undertaken in **Section 8**.

The nomenclature of all site recordings uses the term 'Glendell North' to signify that these recordings are generally north of the current operations of the Glendell Mine. 'Glendell North' is abbreviated to 'GN' for brevity. The site names also use the term 'IF' (isolated find), 'ST' (scarred tree) and 'OS' (for artefact scatter). 'OS' is an abbreviation of 'open site' and here refers to artefact scatters which are obviously only one type of open site.

Table 5-3: Newly recorded sites noted during the survey.

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Feature(s)	Landform
			Artefact so	catters		
1	37-3-1560	Glendell North OS1	316820	6413702	Artefacts: 6	Flats and floodplains
2	37-3-1559	Glendell North OS2	317930	6413515	Artefacts: 7	Flats and floodplains
3	37-3-1558	Glendell North OS3	317792	6413230	Artefacts: 3	Flats and floodplains
4	37-3-1557	Glendell North OS4	317761	6413127	Artefacts: 5	Flats and floodplains
5	37-3-1569	Glendell North OS5	316619	6413304	Artefacts: 5; PAD	Flats and floodplains
6	37-3-1571	Glendell North OS6	316443	6413081	Artefacts: 14; PAD	Flats and floodplains
7	37-3-1536	Glendell North OS7	316412	6413195	Artefacts: 3	Flats and floodplains
8	37-3-1549	Glendell North OS8	316386	6412999	Artefacts: 2	Flats and floodplains
9	37-3-1556	Glendell North OS9	315698	6412992	Artefacts: 3	Slopes
10	37-3-1555	Glendell North OS10	315557	6412542	Artefacts: 6	Slopes
11	37-3-1554	Glendell North OS11	318126	6412284	Artefacts: 3	Flats and floodplains
12	37-3-1553	Glendell North OS12	316810	6412250	Artefacts: 2	Flats and floodplains
13	37-3-1552	Glendell North OS13	317915	6411844	Artefacts: 7	Flats and floodplains
14	37-3-1551	Glendell North OS14	317705	6411820	Artefacts: 5	Flats and floodplains
15	37-3-1550	Glendell North OS15	317055	6412013	Artefacts: 6	Slopes
16	37-3-1573	Glendell North OS16	317599	6410970	Artefacts: 9; PAD	Flats and floodplains
17	37-3-1542	Glendell North OS17	317850	6410521	Artefacts: 4	Flats and floodplains

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Feature(s)	Landform
18	37-3-1541	Glendell North OS18	317852	6410274	Artefacts: 2	Flats and floodplains
19	37-3-1572	Glendell North OS19	317790	6410020	Artefacts: 19; PAD	Flats and floodplains
20	37-3-1540	Glendell North OS20	317856	6409957	Artefacts: 5	Flats and floodplains
21	37-3-1539	Glendell North OS21	318418	6410236	Artefacts: 2	Slopes
22	37-3-1538	Glendell North OS22	319293	6410281	Artefacts: 3	Flats and floodplains
23	37-3-1537	Glendell North OS23	318500	6410083	Artefacts: 3	Slopes
24	37-3-1510	Glendell North OS24	318346	6409339	Artefacts: 7	Flats and floodplains
25	37-3-1570	Glendell North OS25	318367	6408758	Artefacts: 2; PAD	Flats and floodplains
26	37-3-1548	Glendell North OS26	318224	6410798	Artefacts: 2	Slopes
27	37-3-1509	Glendell North OS27	318588	6408562	Artefacts: 2	Slopes
28	37-3-1508	Glendell North OS28	318611	6408397	Artefacts: 3	Slopes
29	37-3-1547	Glendell North OS29	318291	6408381	Artefacts: 4	Flats and floodplains
30	37-3-1546	Glendell North OS30	318530	6408206	Artefacts: 3	Flats and floodplains
31	37-3-1545	Glendell North OS31	318827	6407525	Artefacts: 15	Slopes
32	37-3-1544	Glendell North OS32	317951	6407475	Artefacts: 2	Flats and floodplains
33	37-3-1543	Glendell North OS33	319166	6407069	Artefacts: 12	Flats and floodplains
34	37-3-1574	Glendell North OS34	317447	6411053	Artefacts: 29; PAD	Flats and floodplains
35	37-3-1567	Glendell North OS35	317371	6411106	Artefacts: 18; PAD	Flats and floodplains
36	37-3-1568	Glendell North OS36	316670	6413398	Artefacts: 3; PAD	Flats and floodplains
37	37-3-1562	Glendell North OS37	317843	6412369	Artefacts; 5	Flats and floodplains
38	37-3-1565	Glendell North OS38	317557	6411704	Artefacts; 2	Flats and floodplains
39	37-3-1576	Glendell North OS39	318028	6409888	Artefacts; 6	Flats and floodplains
	T		Isolated	finds		
40	37-3-1535	Glendell North IF1	318189	6414948	Isolated find	Slopes
41	37-3-1534	Glendell North IF2	317146	6413503	Isolated find	Ridges
42	37-3-1533	Glendell North IF3	317120	6413414	Isolated find	Ridges
43	37-3-1532	Glendell North IF4	316962	6412937	Isolated find	Slopes
44	37-3-1531	Glendell North IF5	318054	6412783	Isolated find	Slopes
45	37-3-1530	Glendell North IF6	315966	6412883	Isolated find	Flats and floodplains
46	37-3-1529	Glendell North IF7	315514	6412657	Isolated find	Slopes
47	37-3-1528	Glendell North IF8	316956	6412606	Isolated find	Slopes
48	37-3-1527	Glendell North IF9	316545	6411891	Isolated find	Flats and floodplains
49	37-3-1526	Glendell North IF10	318745	6411655	Isolated find	Slopes

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Feature(s)	Landform
50	37-3-1525	Glendell North IF11	317221	6411282	Isolated find	Flats and floodplains
51	37-3-1524	Glendell North IF12	317765	6410903	Isolated find	Slopes
52	37-3-1523	Glendell North IF13	317688	6410830	Isolated find	Slopes
53	37-3-1522	Glendell North IF14	317752	6410825	Isolated find	Slopes
54	37-3-1521	Glendell North IF15	317683	6410588	Isolated find	Flats and floodplains
55	37-3-1520	Glendell North IF16	319072	6410845	Isolated find	Slopes
56	37-3-1519	Glendell North IF17	317777	6409943	Isolated find	Flats and floodplains
57	37-3-1518	Glendell North IF18	317723	6409918	Isolated find	Flats and floodplains
58	37-3-1517	Glendell North IF19	318543	6410024	Isolated find	Flats and floodplains
59	37-3-1515	Glendell North IF20	318022	6409310	Isolated find	Flats and floodplains
60	37-3-1514	Glendell North IF21	318328	6408936	Isolated find	Flats and floodplains
61	37-3-1516	Glendell North IF22	317984	6410954	Isolated find	Slopes
62	37-3-1513	Glendell North IF23	318833	6407204	Isolated find	Slopes
63	37-3-1512	Glendell North IF24	318253	6411466	Isolated find	Flats and floodplains
64	37-3-1511	Glendell North IF25	318341	6409244	Isolated find	Flats and floodplains
65	37-3-1566	Glendell North IF26	318253	6408957	Isolated find; PAD	Flats and floodplains
66	37-3-1564	Glendell North IF27	317260	6411851	Isolated find	Ridges
67	37-3-1563	Glendell North IF28	317241	6411913	Isolated find	Ridges
68	37-3-1575	Glendell North IF29	317613	6411755	Isolated find	Flats and floodplains
			Scarred	tree		
69	37-3-1561	Glendell North ST1	316124	6412405	Modified tree (scarred): 1	Flats and floodplains

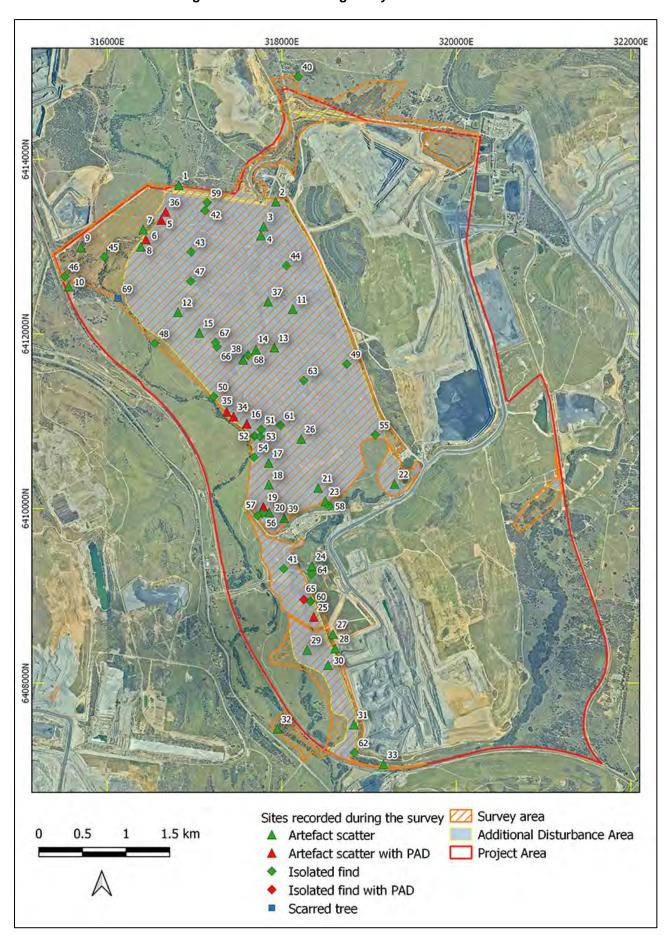


Figure 5-3: Aerial showing newly recorded sites.

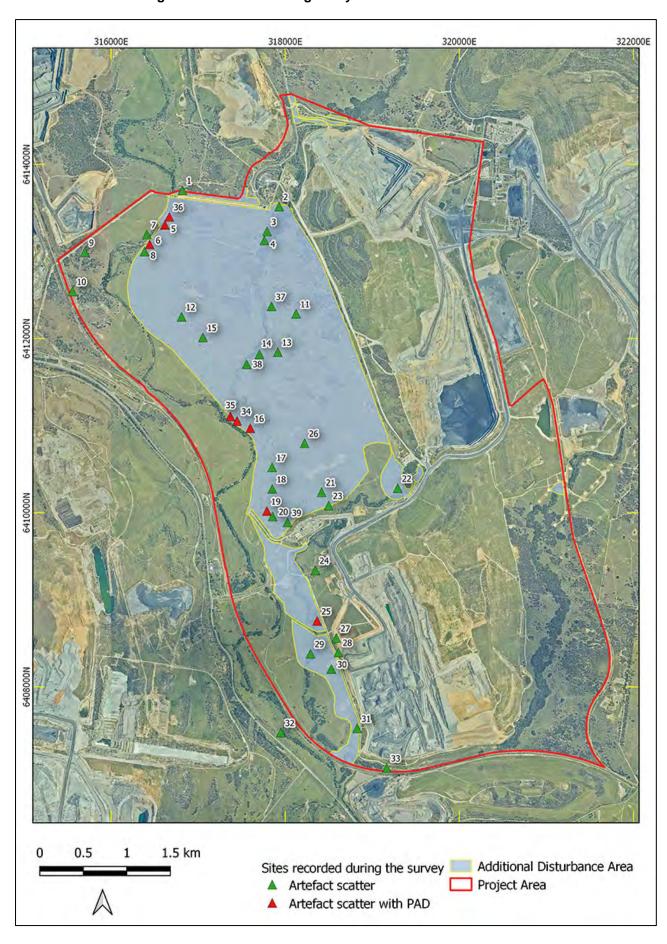


Figure 5-4: Aerial showing newly recorded artefact scatters.

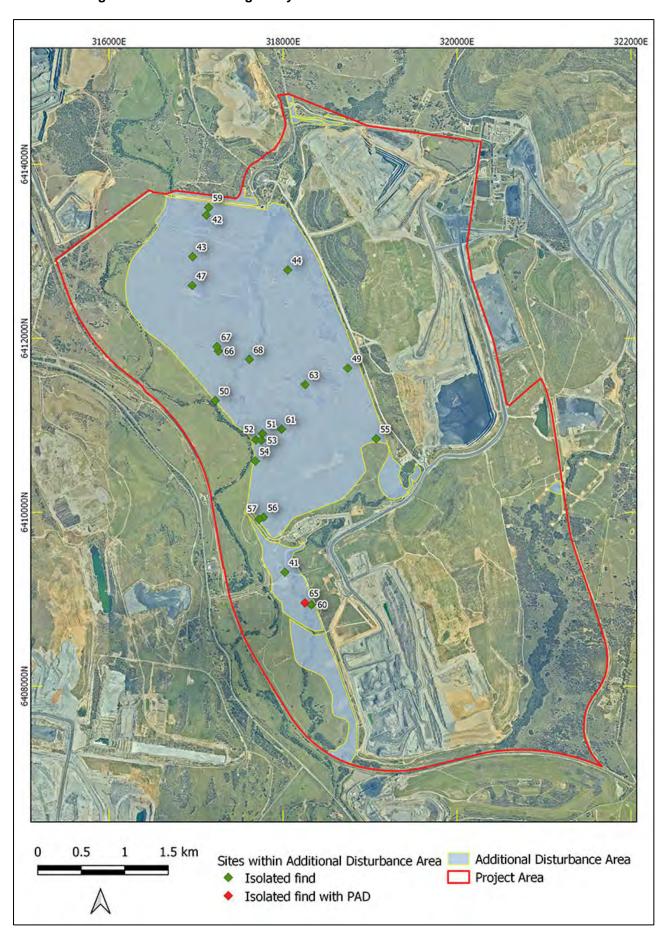


Figure 5-5: Aerial showing newly recorded isolated finds and the scarred tree.

5.4.1 Artefact scatters

39 artefact scatters were recorded during the survey and test excavation program. Details on each site follow.

Glendell North OS1

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 316820 N 6413702

<u>Location of Site</u>: 900 m west of Hebden Road, 60 m north of the Liddell pipeline and conveyor route, and 90 m east of Bowmans Creek, Ravensworth (**Figure 5-4**).

The site is in eroded B-Horizon deposits on a gentle gradient mid-slope (Figure 5-6).

<u>Description of Site</u>: Glendell North OS1 is a low-density artefact scatter comprising six artefacts, including mudstone and silcrete flakes and a mudstone core (**Table 5-4**; **Figure 5-7**). The 20 by 10 m extent of the site was defined by the area of exposure. Surrounding vegetation represented regrowth ironbark woodland with scattered regrowth casuarinas. The GSE at the time of recording was high (80%) with a GSV of 90% within these exposures. Scattered gravel and pebbles were very frequent. Identified disturbances included erosion, grazing and clearing.

Potential for the presence of further subsurface archaeological deposits at Glendell North OS1 is assessed as negligible.

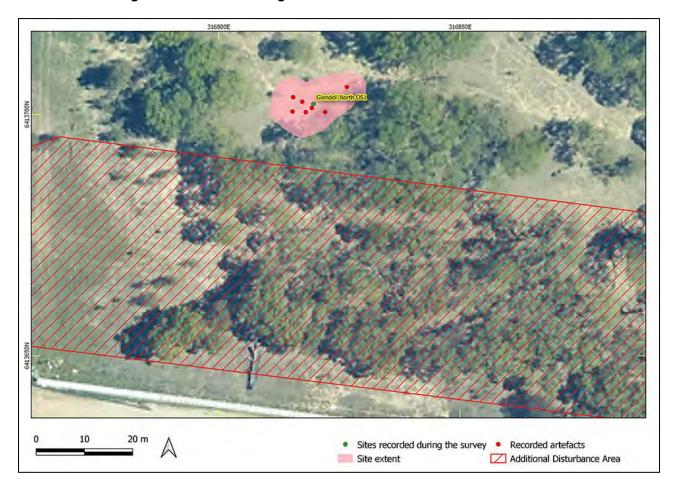
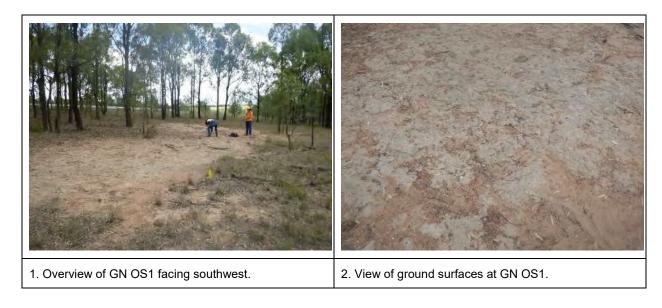


Figure 5-6: Aerial showing location and extent of Glendell North OS1.

Figure 5-7: Photographs showing an overview and details of Glendell North OS1.







3. View of select artefacts from GN OS1.

4. View of a mudstone core from GN OS1.

Table 5-4: Glendell North OS1. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Core	Mudstone	N/A	Tertiary	4cm	Multidirectional, reduced, 6 scars, no cortex
Flake	Mudstone	Complete	Tertiary	0-2cm	
Flake	Mudstone	Complete	Tertiary	0-2cm	
Flake	Silcrete	Proximal fragment	Tertiary	2-4cm	
Flake	Silcrete	Proximal fragment	Tertiary	0-2cm	
Flake	Mudstone	Complete	Secondary	2-4cm	

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317930 N 6413515

<u>Location of Site</u>: 100 m east of Hebden Road and 1.5 km north of Ravensworth Homestead, Ravensworth on the west side of a property dam (**Figure 5-4**). The site is located on a lower slope landform, 75 m north of Yorks Creek (**Figure 5-8**).

<u>Description of Site</u>: Glendell North OS2 is a low-density artefact scatter comprising seven artefacts including flakes made from silcrete and mudstone and a silcrete core (**Table 5-5**; **Figure 5-9**). These artefacts are in an erosive scour adjacent to an artificial trough associated with the property dam. The 15 by 10 m extent of the site was defined by the area of exposure. Surrounding vegetation has been extensively previously cleared, currently representing grassy paddock fringed by regrowth casuarinas. The GSE at the time of recording was low (20%) with a GSV of 60% within these exposures. Scattered gravel and pebbles were frequent. Identified disturbances included cattle grazing, erosion, and the construction of the adjacent property dam and trough.

Potential for the presence of further subsurface archaeological deposits at Glendell North OS2 is assessed as negligible.

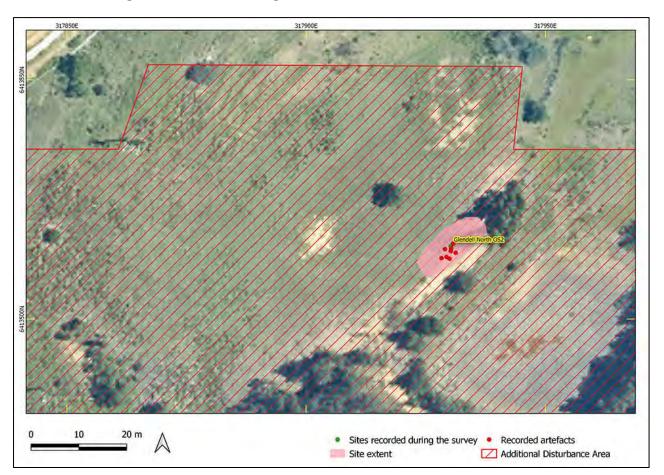
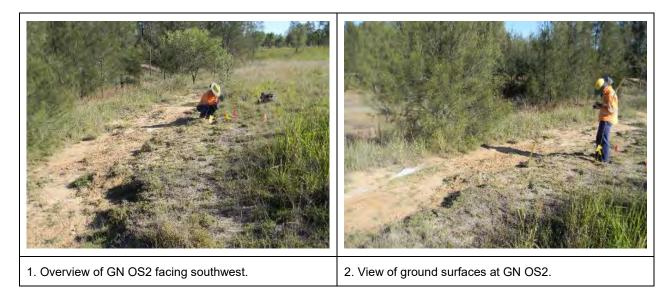


Figure 5-8: Aerial showing location and extent of Glendell North OS2.

Figure 5-9: Photographs showing an overview and details of Glendell North OS2.







3. View of select artefacts from GN OS2.

4. View of GN OS2 silcrete core.

Table 5-5: Glendell North OS2. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Silcrete	Proximal fragment	Tertiary	2-4cm	
Flake	Silcrete	Longitudinal break	Tertiary	2-4cm	
Flake	Silcrete	Complete	Secondary	4-6cm	
Core	Silcrete	N/A	Secondary	5.1cm	Multidirectional, 7 scars, 15% cortex
Flake	Silcrete	Longitudinal break	Tertiary	0-2cm	
Flake	Mudstone	Complete	Secondary	2-4cm	
Flake	Mudstone	Proximal fragment	Secondary	2-4cm	

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317792 N 6413230

<u>Location of Site</u>: 15 m east of Hebden Road and 1.2 km north of Ravensworth Homestead, Ravensworth, on an access track adjacent to a dam (**Figure 5-4**). The site is located on an artificial bund, 45 m to the east of Yorks Creek on a lower terrace (**Figure 5-10**).

<u>Description of Site</u>: Glendell North OS3 is a low-density artefact scatter comprising a mudstone flake, a mudstone blade, and a silcrete blade (**Table 5-6**; **Figure 5-11**). The 30 by 10 m extent of the site was defined by the area of exposure. Surrounding vegetation has been previously cleared and currently represents open weedy grassland and regrowth casuarina by the creek line. The GSE at the time of recording was moderate (55%) with a GSV of 70% within these exposures. Scattered conglomerate fragments were present. Identified disturbances included grazing, erosion, clearing, vehicle damage, and the construction of the adjacent dam.

Potential for the presence of further subsurface archaeological deposits at Glendell North OS3 is assessed as negligible.

Figure 5-10: Aerial showing location and extent of Glendell North OS3 and OS4.

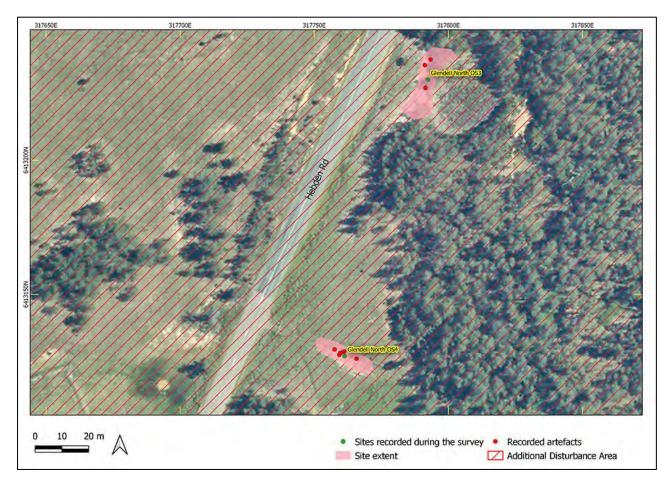


Figure 5-11: Photographs showing an overview and details of Glendell North OS3.





Table 5-6: Glendell North OS3. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Complete	Tertiary	2-4cm
Blade	Silcrete	Distal fragment	Tertiary	0-2cm
Blade	Mudstone	Complete	Tertiary	2-4cm

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317761 N 6413127

<u>Location of Site</u>: 20 m east of Hebden Road and 1.1 km north of Ravensworth Homestead, Ravensworth, on an access track (**Figure 5-4**). The site is located 25 m east of Yorks Creek on a lower terrace landform (**Figure 5-12**).

<u>Description of Site</u>: Glendell North OS4 is a low-density artefact scatter comprising five flakes and a side scraper made of mudstone (**Table 5-7**; **Figure 5-13**). The 25 by 6 m extent of the site was defined by the area of exposure. Surrounding vegetation has been previously cleared and currently represents regrowth casuarina along the riparian corridor. The GSE at the time of recording was moderate (60%) with a GSV of 90% within these exposures. Scattered gravel and pebbles were present. Identified disturbances included grazing, erosion, clearing, vehicle damage, and brick foundations from a historic building.

Potential for the presence of further subsurface archaeological deposits at Glendell North OS4 is assessed as negligible.

Figure 5-12: Photographs showing an overview and details of Glendell North OS4.



Table 5-7: Glendell North OS4. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Distal fragment	Tertiary	2-4cm	Marginal use wear
Flake	Mudstone	Complete	Tertiary	0-2cm	
Flake	Mudstone	Complete	Tertiary	0-2cm	Marginal use wear
Flake	Mudstone	Complete	Tertiary	0-2cm	
Side scraper	Mudstone	N/A	Tertiary	2-4cm	Steep, invasive, unifacial retouch on margin
Flake	Mudstone	Complete	Tertiary	2-4cm	

<u>Site Type</u>: Open artefact scatter; PAD

GPS Coordinates: GDA Zone 56 E 316619 N 6413304

<u>Location of Site</u>: 1.1 km west of Hebden Road and 350 m south of the Liddell pipeline and conveyor route, Ravensworth, above the east bank of Bowmans Creek (**Figure 5-4**). The site is located eroding out of a spur above Bowmans Creek (**Figure 5-13**).

<u>Description of Site</u>: Glendell North OS5 is a low-density artefact scatter comprising four artefacts, including an end scraper, a core, and two flakes, made of chert and mudstone (**Table 5-8**; **Figure 5-14**). The 75 by 50 m extent of the site was defined by the results of later subsurface investigation (see **Section 6.4.2**). Surrounding vegetation at the site was grassy paddock fringed by isolated mature eucalypts. The GSE at the time of recording was very limited (5%) with a GSV of 50% within these exposures. Scattered gravel and pebbles were present. Identified disturbances included clearing, grazing, and erosion.

At the time of survey, potential for the presence of subsurface archaeological deposits at Glendell North OS5 was assessed as likely towards the east of the site across the spur landform where A-Horizon soils are present.

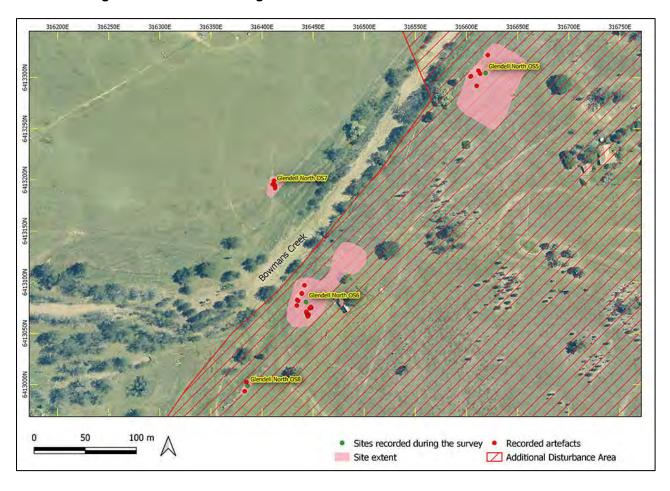


Figure 5-13: Aerial showing location and extent of Glendell North OS5 to OS7.

Figure 5-14: Photographs showing an overview and details of Glendell North OS5.

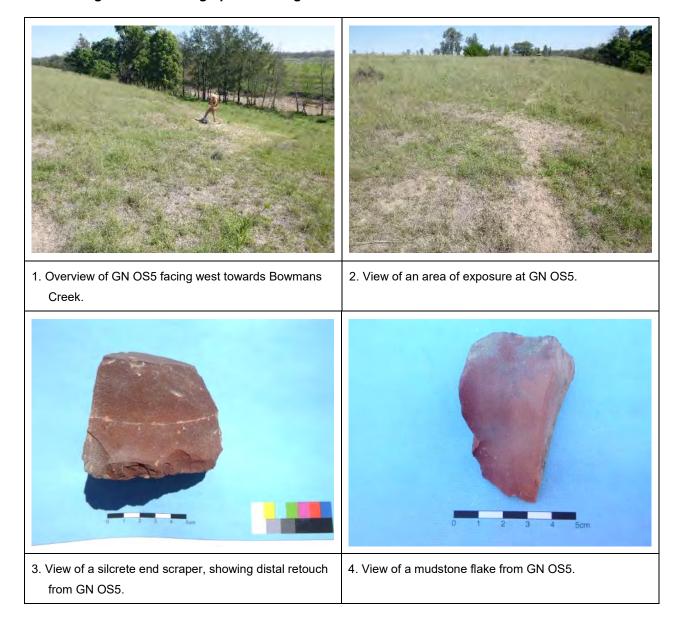


Table 5-8: Glendell North OS5. Surface artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
End scraper	Silcrete	Complete	Secondary	6-8cm	Fine distal retouch
Core	Chert	Complete	Tertiary	8cm	Multidirectional, no cortex, 7 scars
Flake	Mudstone	Distal fragment	Secondary	4-6cm	
Flake	Chert	Proximal flake	Tertiary	2-4cm	

Site Type: Open artefact scatter; PAD

GPS Coordinates: GDA Zone 56 E 316443 N 6413081

<u>Location of Site</u>: 1.2 km west of Hebden Road and 600 m south of the Liddell pipeline and conveyor route, Ravensworth, to the east of Bowmans Creek (**Figure 5-4**). The site is located eroding out of a spur above the floodplain of Bowmans Creek (**Figure 5-15**).

<u>Description of Site</u>: Glendell North OS6 is a low-density artefact scatter comprising 14 artefacts, including flakes, pieces of shatter, flaked pieces, and cores made of silcrete, chert and mudstone (**Table 5-9**; **Figure 5-13**). The 100 by 40 m extent of the site was defined by the results of later subsurface investigation (see **Section 6.4.2**). Surrounding vegetation at the site was grassy paddock fringed by isolated mature eucalypts. The GSE at the time of recording was very limited (5%) with a GSV of 50% within these exposures. Gravel and regular stones were prevalent. Identified disturbances included clearing, grazing, and erosion.

At the time of survey, potential for the presence of subsurface archaeological deposits at Glendell North OS6 was assessed as likely in the north east of the site extent across the spur landform where A-Horizon soils are present.

Figure 5-15: Photographs showing an overview and details of Glendell North OS6.

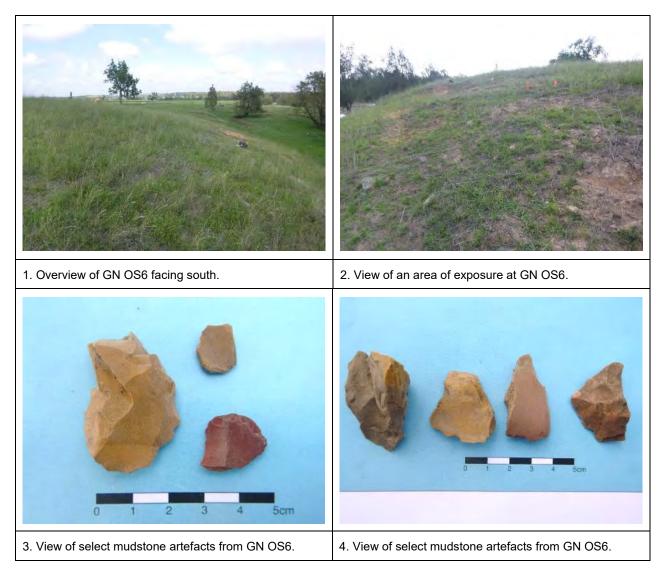


Table 5-9: Glendell North OS6. Surface artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flaked piece	Mudstone	Complete	Secondary	4-6cm	
Shatter	Mudstone	Complete	Tertiary	0-2cm	
Shatter	Mudstone	Complete	Tertiary	2-4cm	
Flake	Mudstone	Complete	Primary	0-2cm	
Flake	Mudstone	Complete	Tertiary	2-4cm	Steep unifacial marginal retouch
Shatter	Mudstone	Complete	Tertiary	0-2cm	
Flaked piece	Chert	Distal fragment	Tertiary	4-6cm	
Core	Chert	Complete	Tertiary	6cm	Multidirectional, 40% cortex, 6 scars
Flake	Mudstone	Longitudinal break	Secondary	2-4cm	
Flake	Chert	Complete	Tertiary	0-2cm	
Core	Silcrete	Complete	Secondary	6-8cm	Unidirectional, 15% cortex, 5 scars
Flaked piece	Mudstone	Longitudinal break	Secondary	4-6cm	
Flake	Mudstone	Complete	Secondary	4-6cm	
Flake	Silcrete	Distal fragment	Primary	2-4cm	

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 316412 N 6413195

Location of Site: 1.2 km west of Hebden Road and 500 m south of the Liddell pipeline and conveyor route, on a lower terrace of Bowmans Creek to the west of the break of slope (Figure 5-4). The site is in the exposure of a vehicle track leading across the landform toward Bowmans Creek (Figure 5-15).

<u>Description of Site</u>: Glendell North OS7 is a low-density artefact scatter comprising three mudstone flakes a mudstone shatter piece (**Table 5-10**; **Figure 5-16**). The 20 by 12 m extent of the site was defined by the observed area of deposit associated with the terrace landform. Surrounding vegetation at the site has been subject to extensive clearing and currently represent grassy floodplain paddock fringed by casuarina regrowth and isolated mature eucalypts by the creek. The GSE at the time of recording was low (15%) with a GSV of 70% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, grazing, erosion, and vehicle damage.

Potential for the presence of subsurface archaeological deposits at Glendell North OS7 is assessed as likely, with good A-Horizon soil depth observed.

Figure 5-16: Photographs showing an overview and details of Glendell North OS7.

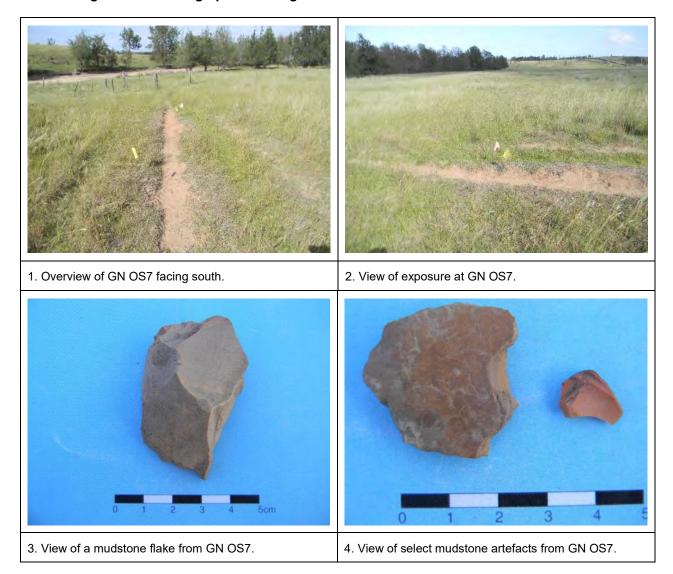


Table 5-10: Glendell North OS7. Artefact attributes.

Artefact type	Material Integrity		Reduction	Size
Flake	Mudstone	Proximal fragment	Primary	2-4cm
Flake	Mudstone Proximal fragment		Secondary	0-2cm
Shatter	Mudstone	N/A	Secondary	0-2cm
Flake	Mudstone	Complete	Secondary	4-6cm

<u>Site Type</u>: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 316386 N 6412999

<u>Location of Site</u>: 1.2 km west of Hebden Road and 700 m south of the Liddell pipeline and conveyor route, Ravensworth, above the east bank of Bowmans Creek (**Figure 5-4**). The site is located eroding out of a terrace above Bowmans Creek (**Figure 5-17**).

<u>Description of Site</u>: Glendell North OS8 is a low-density artefact scatter comprising a silcrete flake and a piece of mudstone shatter (**Table 5-11**; **Figure 5-18**). The 20 by 7 m extent of the site was defined by the area of exposure across the terrace landform. Surrounding vegetation at the site was grassy paddock fringed by isolated mature eucalypts. The GSE at the time of recording was very limited (5%) with a GSV of 50% within these exposures. Gravel and small regular stones were prevalent. Identified disturbances included clearing, grazing, and erosion.

Potential for the presence of subsurface archaeological deposits at Glendell North OS8 is assessed as low.

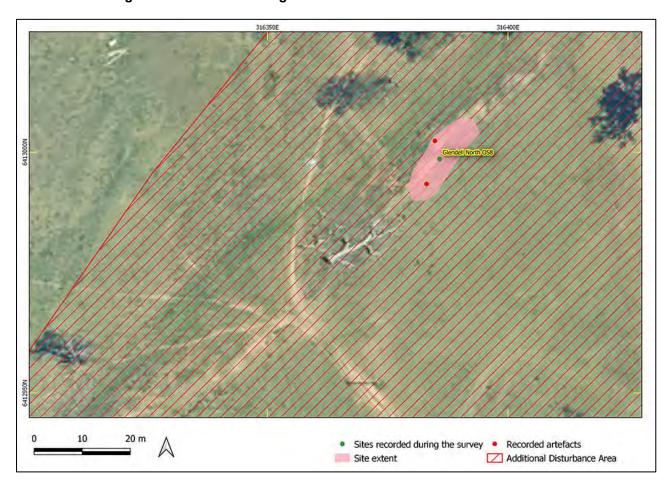


Figure 5-17: Aerial showing location and extent of Glendell North OS8.

Figure 5-18: Photographs showing an overview and details of Glendell North OS8.



Table 5-11: Glendell North OS8. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Silcrete	Complete	Primary	0-2cm
Shatter	Mudstone	Complete	Tertiary	0-2cm

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 315698 N 6412992

<u>Location of Site</u>: 1.4 km north of the New England Highway and 100 m south of the Liddell pipeline and conveyor route, within an electricity easement (**Figure 5-4**). The site is located on the break of a gentle crest on an access track (**Figure 5-19**).

<u>Description of Site</u>: Glendell North OS9 is a low-density artefact scatter comprising three silcrete flakes (**Table 5-12**; **Figure 5-20**). The 20 by 10 m extent of the site was defined by the area of exposure across. Surrounding vegetation at the site has been previously cleared,

currently representing regrowth casuarina woodland fringed by grassy paddock. The GSE at the time of recording was moderate (50%) with a GSV of 80% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, grazing, erosion, vehicle damage, and the establishment of the electricity easement.

Potential for the presence of subsurface archaeological deposits at Glendell North OS9 is assessed as negligible.

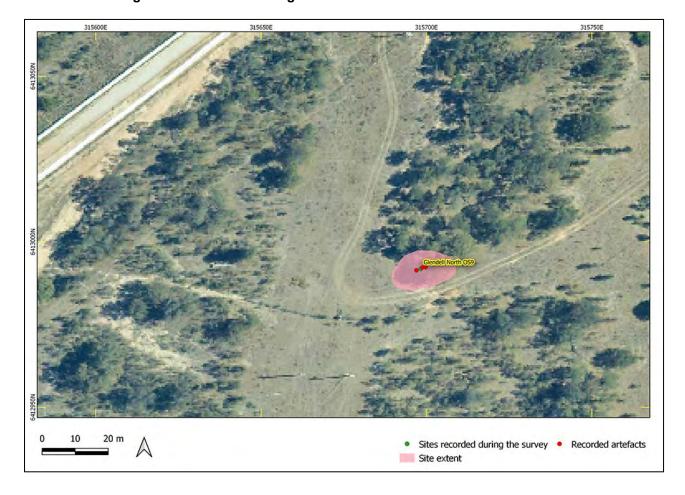


Figure 5-19: Aerial showing location and extent of Glendell North OS9.

Figure 5-20: Photographs showing an overview and details of Glendell North OS9.





1. Overview of GN OS9 facing northeast.

2. View of ground surfaces at GN OS9.



3. View of silcrete artefacts from GN OS9.

Table 5-12: Glendell North OS9. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Silcrete	Distal fragment	Tertiary	4-6cm
Flake	Silcrete	Complete	Tertiary	0-2cm
Flake	Silcrete	Proximal fragment	Secondary	0-2cm

Glendell North OS10

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 315557 N 6412542

<u>Location of Site</u>: 900 m north of the New England Highway and 400 m south of the Liddell pipeline and conveyor route, Ravensworth, within an electricity easement (**Figure 5-4**). The site is located on a mid-slope landform on an access track (**Figure 5-21**).

<u>Description of Site</u>: Glendell North OS10 is a low-density artefact scatter comprising five flakes and a core made of mudstone (**Table 5-13**; **Figure 5-22**). The 15 by 10 m extent of

the site was defined by the area of exposure along the access track. Surrounding vegetation at the site has been extensively cleared, currently representing grassy paddock fringed by stands of regrowth casuarina. The GSE at the time of recording was low-moderate (30%) with a GSV of 65% within these exposures. Gravel and regular stones were prevalent. Identified disturbances included clearing, grazing, erosion, vehicle damage, and the establishment of the electricity easement.

Potential for the presence of subsurface archaeological deposits at Glendell North OS10 is assessed as negligible.



Figure 5-21: Aerial showing location and extent of Glendell North OS10.

Figure 5-22: Photographs showing an overview and details of Glendell North OS10.



3. View of select mudstone artefacts from GN OS10.

4. View of mudstone core from GN OS10.

Table 5-13: Glendell North OS10. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Core	Mudstone	Complete	Secondary	5cm	Multidirectional, 10+ scars, <5% cortex
Flake	Mudstone	Complete	Tertiary	4-6cm	
Flake	Mudstone	Complete	Tertiary	4-6cm	Right lateral use wear
Flake	Mudstone	Distal fragment	Tertiary	0-2cm	
Flake	Mudstone	Distal fragment	Tertiary	0-2cm	
Flake	Mudstone	Complete	Tertiary	2-4cm	

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318126 N 6412284

<u>Location of Site</u>: 450 m east of Hebden Road, 250 m north of Ravensworth Homestead and 345 m east of Yorks Creek, Ravensworth (**Figure 5-4**). The site is located on skeletal soils on the crest of hill (**Figure 5-23**).

<u>Description of Site</u>: Glendell North OS11 is a low-density artefact scatter comprising a porcellanite flake, a mudstone flake, and a mudstone core (**Table 5-14**; **Figure 5-24**). The 40 by 25 m extent of the site was defined by the area of exposure across the crest landform. Surrounding vegetation at the site had been extensively previously cleared, sparse-moderate grassy paddock fringed by isolated regrowth. The GSE at the time of recording was moderate (35%) with a GSV of 70% within these exposures. Gravel and regular stones were prevalent. Identified disturbances included clearing, grazing, and erosion.

Potential for the presence of subsurface archaeological deposits at Glendell North OS11 is assessed as negligible.

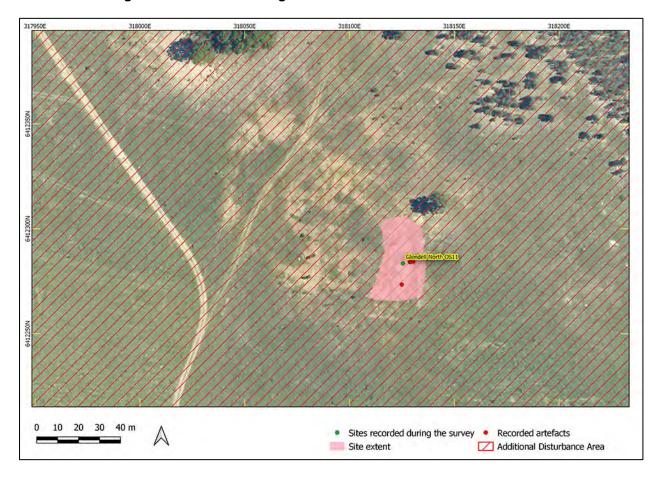


Figure 5-23: Aerial showing location and extent of Glendell North OS11.

Figure 5-24: Photographs showing an overview and details of Glendell North OS11.

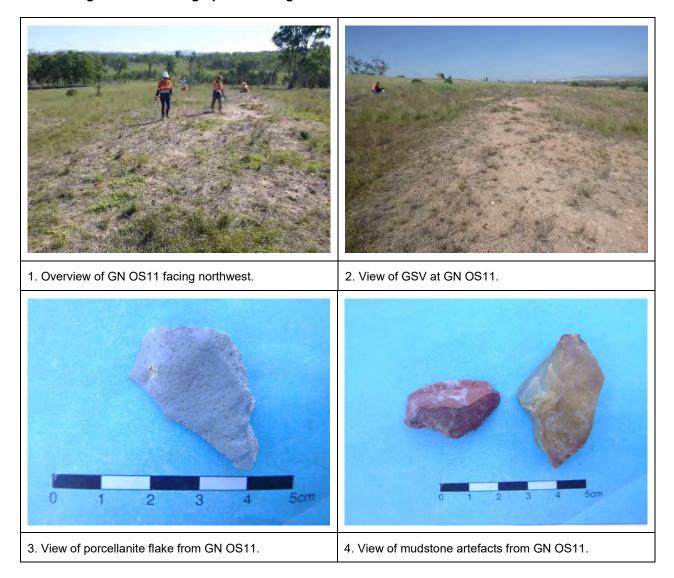


Table 5-14: Glendell North OS11. Artefact attributes.

Artefact Type	Material	Integrity	Reduction	Size
Flake	Porcellanite	Complete	Tertiary	2-4cm
Flake	Mudstone	Longitudinal break	Primary	4-6cm
Core	Mudstone	Complete	Secondary	4-6cm

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 316810 N 6412250

<u>Location of Site</u>: 850 m west of Hebden Road and 500 m east of Bowmans Creek, Ravensworth, on the southern wall of a property dam (**Figure 5-4**). The site is located within a gently sloping landform (**Figure 5-25**).

<u>Description of Site</u>: Glendell North OS12 is a low-density artefact scatter comprising two mudstone flakes (**Table 5-15**; **Figure 5-26**). The 40 by 35 m extent of the site was defined

by the area of exposure across the wall of the dam. Surrounding vegetation has been intensively previously cleared and represents grassy paddock with shrubs. The GSE within the vicinity of the dam was moderate (40%) with a GSV of 90% within these exposures. Gravel and regular stones were prevalent. Identified disturbances included clearing, grazing, erosion, and the construction of the adjacent dam.

Potential for the presence of subsurface archaeological deposits at Glendell North OS12 is assessed as negligible.

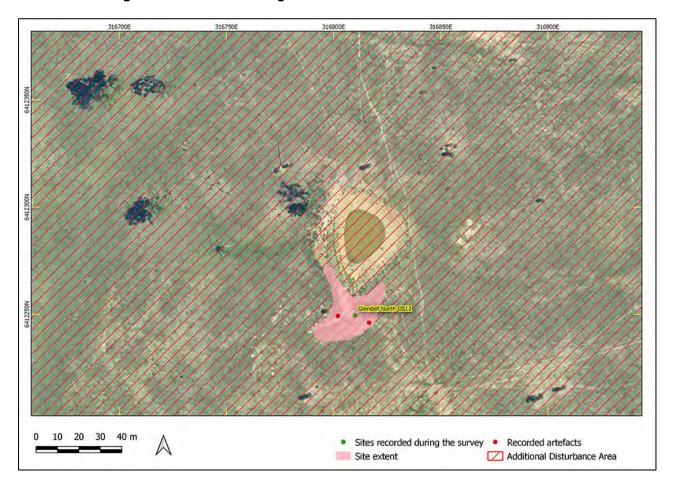


Figure 5-25: Aerial showing location and extent of Glendell North OS12.

Figure 5-26: Photographs showing an overview and details of Glendell North OS12.



Table 5-15: Glendell North OS12. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Complete	Tertiary	0-2cm
Flake	Mudstone	Proximal fragment	Secondary	0-2cm

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317915 N 6411844

<u>Location of Site</u>: 100 m east of Hebden Road and 80 m southwest of Ravensworth Homestead, Ravensworth, by a property dam (**Figure 5-4**). The site is located over two main exposures on either side of a drainage swale running downslope of the dam (**Figure 5-27**).

<u>Description of Site</u>: Glendell North OS12 is a low-density artefact scatter comprising seven artefacts including flakes and pieces of shatter made of silcrete and mudstone (**Table 5-16**; **Figure 5-28**). The 80 by 90 m extent of the site was defined by the area of exposures

across the wall of the dam. Surrounding vegetation has been intensively previously cleared and represents grassy paddock with shrubs. The GSE within the vicinity of the dam was low-moderate (25%) with a GSV of 70% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, grazing, sheet wash erosion and scouring.

Prior to the construction of the nearby property dam and associated modification of local drainage, the area of the site may have represented a section of terrace above a tributary to Yorks Creek located 200 m to the west. For this reason, the potential for the presence of subsurface archaeological deposits at Glendell North OS13 to the north on the elevated, flat landforms was assessed as likely.



Figure 5-27: Aerial showing location and extent of Glendell North OS13.

Figure 5-28: Photographs showing an overview and details of Glendell North OS13.

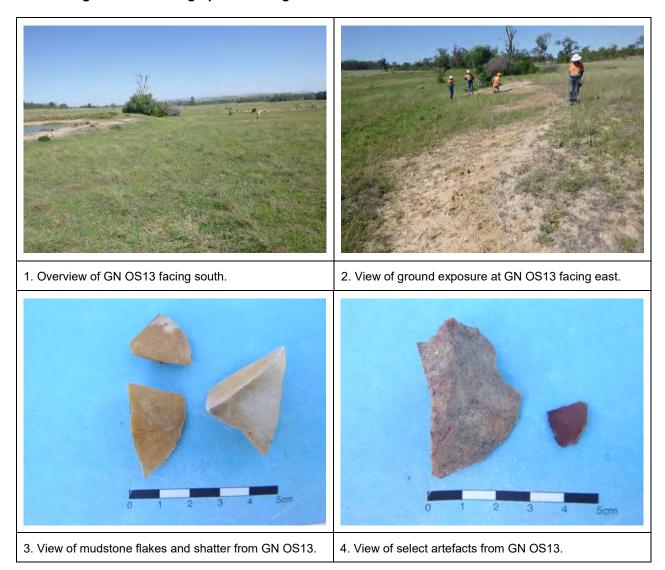


Table 5-16: Glendell North OS13. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake (A1)	Mudstone	Distal fragment	Tertiary	2-4cm	Refits A3 (distal portion)
Shatter	Mudstone	N/A	Secondary	4-6cm	
Flake (A3)	Mudstone	Proximal fragment	Tertiary	0-2cm	Refits A1 (proximal portion)
Flake	Silcrete	Complete	Tertiary	2-4cm	
Flake	Mudstone	Distal fragment	Tertiary	0-2cm	
Shatter	Mudstone	N/A	Tertiary	0-2cm	
Flake	Silcrete	Complete	Tertiary	0-2cm	

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317705 N 6411820

<u>Location of Site</u>: 15 m west of Hebden Road and 1.5 km northeast of the New England Highway, Ravensworth, with an erosion scour (**Figure 5-4**). The site is located on a lower terrace of Yorks Creek, eroding onto the floodplain (**Figure 5-29**).

<u>Description of Site</u>: Glendell North OS14 is a low-density artefact scatter comprising five flakes made of mudstone and silcrete (**Table 5-17**; **Figure 5-30**). The 100 by 10 m extent of the site was defined by the area of erosion over the landform. Surrounding vegetation has been intensively previously cleared and represents grassy paddock with low shrubs fringed by casuarina and exotics along the creek line. The GSE within the vicinity of the site was moderate (45%) with a GSV of 75% within these exposures. Gravel and regular stones were rare. Identified disturbances included clearing, grazing, ploughing, and erosion.

Potential for the presence of subsurface archaeological deposits at Glendell North OS14 is assessed as negligible.

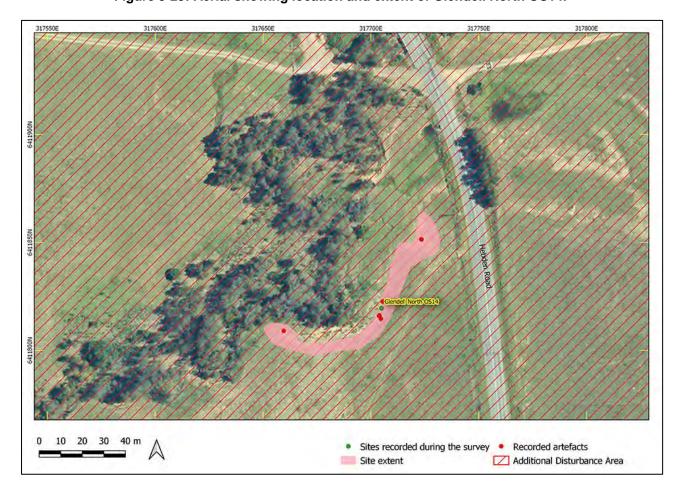


Figure 5-29: Aerial showing location and extent of Glendell North OS14.

Figure 5-30: Photographs showing an overview and details of Glendell North OS14.



Table 5-17: Glendell North OS14. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Complete	Tertiary	0-2cm
Flake	Mudstone	Distal fragment	Tertiary	0-2cm
Flake	Mudstone	Complete	Secondary	2-4cm
Flake	Mudstone	Complete	Tertiary	0-2cm
Flake	Silcrete	Complete	Tertiary	2-4cm

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317055 N 6412013

<u>Location of Site</u>: 650 m west of Hebden Road and 1.3 km northeast of the New England Highway, Ravensworth, by a vehicle track (**Figure 5-4**). The site is located within eroded B-Horizon deposits on a moderate gradient mid-slope (**Figure 5-31**).

<u>Description of Site</u>: Glendell North OS15 is a low-density artefact scatter comprising six artefacts including flakes, shatter, a blade, and a core (**Table 5-18**; **Figure 5-32**). The 60 by 40 m extent of the site was defined by the area of the landform. Surrounding vegetation has been intensively previously cleared, currently representing grassy paddock with low shrubs fringed by sparse eucalypts and regrowth casuarina. The GSE within the vicinity of the dam was moderate-high (60%) with a GSV of 75% within these exposures. Gravel and regular stones were prevalent. Identified disturbances included clearing, grazing, erosion, and vehicle damage.

Potential for the presence of subsurface archaeological deposits at Glendell North OS15 is assessed as negligible.

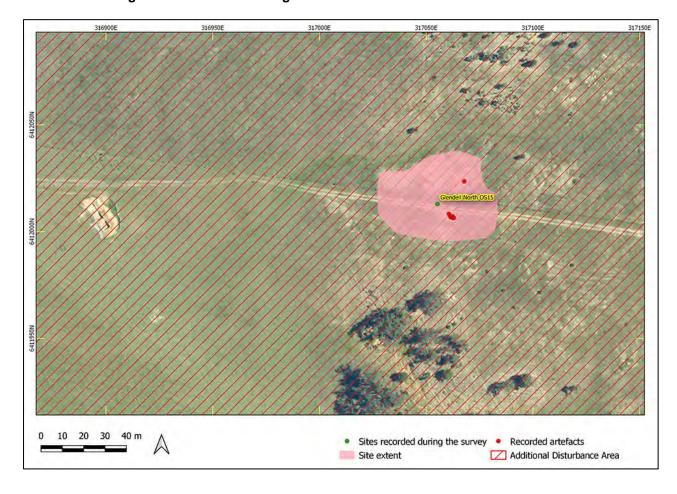


Figure 5-31: Aerial showing location and extent of Glendell North OS15.

Figure 5-32: Photographs showing an overview and details of Glendell North OS15.

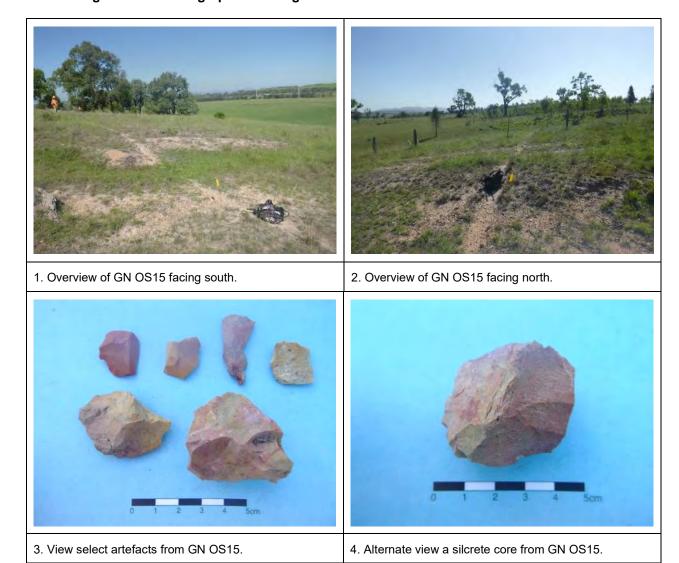


Table 5-18: Glendell North OS15. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Complete	Tertiary	0-2cm	
Blade	Silcrete	Distal fragment	Tertiary	2-4cm	
Flake	Silcrete	Complete	Tertiary	0-2cm	
Flake	Silcrete	Complete	Tertiary	2-4cm	
Core	Silcrete	N/A	Secondary	3.1cm	Multidirectional, 10+scars, reduced, 10% cortex
Shatter	Mudstone	N/A	Tertiary	0-2cm	

Site Type: Open artefact scatter; PAD

GPS Coordinates: GDA Zone 56 E 317599 N 6410970

<u>Location of Site</u>: 175 m west of Hebden Road and 75 m north of Bowmans Creek, Ravensworth, in an erosive scour (**Figure 5-4**). The site is located on the edge of a dissected spur landform within an open paddock (**Figure 5-33**).

<u>Description of Site</u>: Glendell North OS16 is a low-density artefact scatter comprising nine artefacts, including flakes, a core, and a muller stone made of mudstone, chert and silcrete (**Table 5-19**; **Figure 5-34**). The 50 by 20 m extent of the site was defined by the results of later subsurface investigation (see **Section 6.4.2**). Surrounding vegetation represents grassy paddock with stands of regrowth eucalypts and exotics. The GSE within the vicinity was moderate (40%) with a GSV of 70% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, grazing, scouring and sheet wash erosion.

At the time of survey, potential for the presence of subsurface archaeological deposits at Glendell North OS16 was assessed as low-moderate in areas not dissected by drainage channels.



Figure 5-33: Aerial showing location and extent of Glendell North OS16.

Figure 5-34: Photographs showing an overview and details of Glendell North OS16.

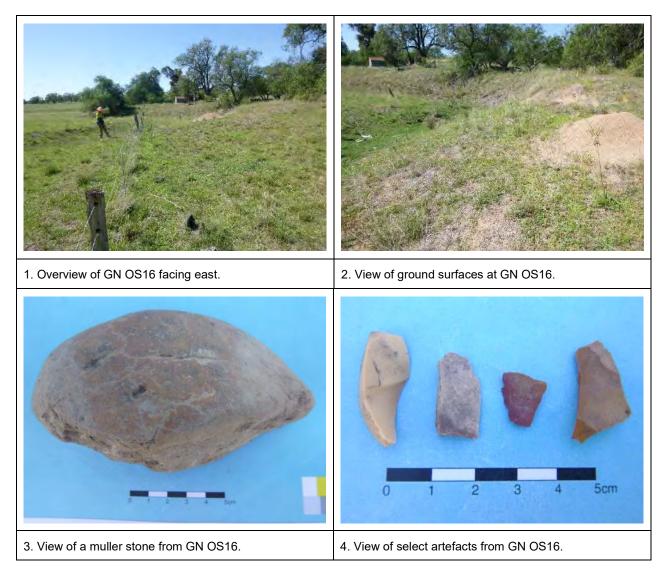


Table 5-19: Glendell North OS16. Surface artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Muller stone	Mudstone	Complete	None	20cm	
Flake	Mudstone	Longitudinal break	Tertiary	0-2cm	
Flake	Mudstone	Complete	Primary	0-2cm	
Core	Chert	Longitudinal break	Secondary	2cm	Unidirectional, 20% cortex, 6 scars
Flake	Mudstone	Complete	Tertiary	2-4cm	
Flake	Mudstone	Longitudinal break	Tertiary	0-2cm	
Flake	Silcrete	Longitudinal break	Tertiary	2-4cm	
Flake	Silcrete	Proximal fragment	Tertiary	0-2cm	
Flake	Mudstone	Longitudinal break	Tertiary	2-4cm	

Site Type: Open Artefact Scatter

GPS Coordinates: GDA Zone 56 E 317850 N 6410521

<u>Location of Site</u>: 125 m east of Hebden Road and 1.4 km south of Ravensworth Homestead, Ravensworth, extending north of a property dam (**Figure 5-4**). The site is located on a lower slope landform on an artificial bund. The site also partially extends into the inundation area of the dam (**Figure 5-35**).

<u>Description of Site</u>: Glendell North OS17 is a low-density artefact scatter comprising four flakes made of mudstone and silcrete (**Table 5-20**; **Figure 5-36**). The 70 by 15 m extent of the site was defined by the area of exposure within the artificial bund. Surrounding vegetation has been intensively cleared and currently represents grassy paddock with sparse low shrubbery. The GSE within the vicinity was moderate (40%) with a GSV of 70% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, cattle trampling, sheet wash erosion and the construction of the adjacent dam and artificial bund.

Potential for the presence of subsurface archaeological deposits at Glendell North OS17 is assessed as negligible.



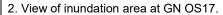
Figure 5-35: Aerial showing location and extent of Glendell North OS17.

Figure 5-36: Photographs showing an overview and details of Glendell North OS17.





1. Overview of GN OS17 facing south.





3. View of select artefacts from GN OS17.



4. View of a silcrete flake from GN OS16.

Table 5-20: Glendell North OS17. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Proximal fragment	Tertiary	4-6cm
Flake	Mudstone	Complete	Tertiary	4-6cm
Flake	Mudstone	Proximal fragment	Tertiary	4-6cm
Flake	Silcrete	Longitudinal break	Secondary	6-8cm

Glendell North OS18

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317852 N 6410274

<u>Location of Site</u>: 200 m east of Hebden Road and 370 m east of Bowmans Creek, Ravensworth, along a property access track adjacent to a fence (**Figure 5-4**). The site is located on a slight slope receding west toward the Bowmans Creek within an open paddock (**Figure 5-37**).

<u>Description of Site</u>: Glendell North OS18 is a low-density artefact scatter comprising a mudstone flake and possible sandstone flaked stone (**Table 5-21**; **Figure 5-38**). The 15 by 10 m extent of the site was defined by the area of exposure within the access track. Surrounding vegetation has been intensively cleared, currently representing grassy paddock with sparse low shrubs. The GSE within the vicinity was low (25%) with a GSV of 60% within these exposures. Gravel and regular stones were rare. Identified disturbances included clearing, grazing, and vehicle damage.

Potential for the presence of subsurface archaeological deposits at Glendell North OS18 is assessed as negligible.

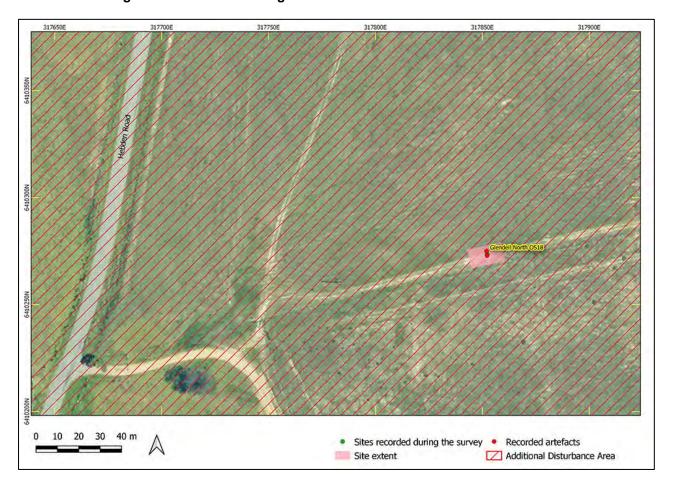


Figure 5-37: Aerial showing location and extent of Glendell North OS18.

Table 5-21: Glendell North OS18. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Possible grind stone	Sandstone	Longitudinal break	N/A	6-8cm
Flake	Mudstone	Complete	Tertiary	2-4cm

Figure 5-38: Photographs showing an overview and details of Glendell North OS18.





5. View of a sandstone pebble showing potential ground surface from GN OS18.

Site Type: Open artefact scatter; PAD

GPS Coordinates: GDA Zone 56 E 317790 N 6410020

<u>Location of Site</u>: 150 m east of Hebden Road and 480 m east of Bowmans Creek, Ravensworth, along a property access road (**Figure 5-4**). The site is located on an upper terrace landform associated with Bowmans Creek adjacent to a shed and the location of a previous farm building (**Figure 5-39**).

<u>Description of Site</u>: Glendell North OS19 is a low-moderate density artefact scatter comprising 19 artefacts, including complete and broken flakes, a core, a flaked piece, shatter, a retouched flake, and a retouched blade. All artefacts are manufactured either from mudstone and silcrete (**Table 5-22**; **Figure 5-40**). The 200 by 30 m extent of the site was defined by the results of later subsurface investigation (see **Section 6.4.2**). Surrounding vegetation represents grassy paddock with isolated eucalypts and farmhouse garden exotics. The GSE within the vicinity was low-moderate (35%) with a GSV of 85% within these exposures. Gravel and regular stones were very frequent. Identified disturbances included clearing, grazing, sheet wash erosion, vehicle damage, and the construction of adjacent farm buildings.

At the time of survey, potential for the presence of subsurface archaeological deposits at Glendell North OS19 was assessed as likely extending from the west of the site extent to the edge of the upper terrace landform.

Table 5-22: Glendell North OS19. Surface artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Longitudinal break	Secondary	2-4cm	Fine distal bifacial retouch
Blade	Mudstone	Complete	Secondary	2-4cm	Fine unifacial marginal retouch
Flake	Mudstone	Longitudinal break	Tertiary	0-2cm	
Flake	Mudstone	Complete	Tertiary	2-4cm	
Flake	Mudstone	Complete	Tertiary	0-2cm	
Flake	Mudstone	Complete	Tertiary	0-2cm	
Flake	Silcrete	Complete	Tertiary	2-4cm	
Core	Silcrete	Fragment	Secondary	2.5cm	10% cortex, 6 scars, multidirectional
Flake	Mudstone	Distal fragment	Secondary	0-2cm	
Flake	Mudstone	Longitudinal break	Secondary	4-6cm	
Flake	Mudstone	Complete	Secondary	0-2cm	
Flaked piece	Mudstone	Complete	Tertiary	8-10cm	
Flake	Mudstone	Longitudinal break	Tertiary	8-10cm	
Flake	Mudstone	Longitudinal break	Tertiary	0-2cm	
Flake	Mudstone	Complete	Primary	4-6cm	
Flake	Silcrete	Complete	Tertiary	0-2cm	

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Shatter	Silcrete	N/A	Tertiary	4-6cm	
Flake	Silcrete	Longitudinal break	Tertiary	2-4cm	
Flake	Mudstone	Proximal fragment	Tertiary	0-2cm	

Figure 5-39: Aerial showing location and extent of Glendell North OS19 and OS20.

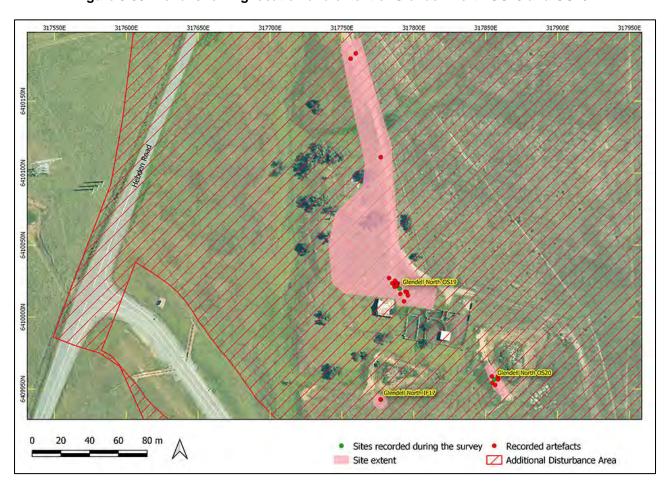
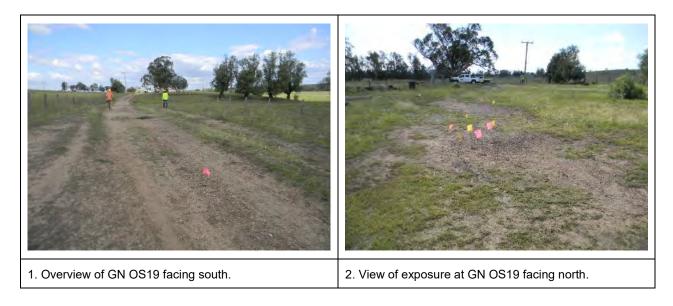


Figure 5-40: Photographs showing an overview and details of Glendell North OS19.





Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317856 N 6409957

<u>Location of Site</u>: 300 m east of Hebden Road and 455 m north of Bowmans Creek, Ravensworth, on the wall of a property dam (**Figure 5-4**). The site is on an upper terrace landform associated with Bowmans Creek, and adjacent to a shed and stock holding area (**Figure 5-39**).

<u>Description of Site</u>: Glendell North OS20 is a low-density artefact scatter comprising five artefacts, including flakes, shatter pieces, and a side scraper made of mudstone and silcrete (Table 5-23; Figure 5-41). The 25 by 10 m extent of the site was defined by the area of exposure within the dam wall. Surrounding vegetation has been intensively cleared, currently representing grassy paddock with sparse low shrubs. The GSE within the vicinity was moderate (60%) with a GSV of 80% within these exposures. Gravel and regular stones were dominant. Identified disturbances included clearing, cattle trampling, erosion and the construction of the adjacent dam.

Potential for the presence of subsurface archaeological deposits at Glendell North OS20 is assessed as negligible.

Table 5-23: Glendell North OS20. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Silcrete	Complete	Secondary	2-4cm	
Shatter	Mudstone	N/A	Secondary	2-4cm	
Side scraper	Mudstone	Complete	Tertiary	2-4cm	Steep marginal unifacial retouch
Shatter	Mudstone	N/A	Tertiary	0-2cm	
Flake	Silcrete	Complete	Secondary	4-6cm	

Figure 5-41: Photographs showing an overview and details of Glendell North OS20.

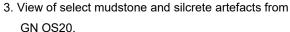


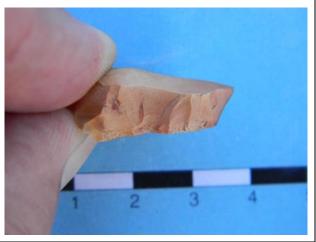
1. Overview of GN OS20 facing north.



2. View of ground surfaces at GN OS20.







4. View of a mudstone side scraper from GN OS20.

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318418 N 6410236

<u>Location of Site</u>: 750 m east of Hebden Road and 400 m north of Swamp Creek, Ravensworth, in the exposed earth at the base of a tree (**Figure 5-4**). The site is located mid-slope within an open paddock that has been impacted by extensive contour banking (**Figure 5-42**).

<u>Description of Site</u>: Glendell North OS21 is a low-density artefact scatter comprising two flakes made of mudstone and quartz (**Table 5-24**; **Figure 5-43**). The 50 by 15 m extent of the site was defined by the area of exposure. Surrounding vegetation has been extensively previously cleared, currently representing grassy paddock with isolated regrowth casuarinas. The GSE within the vicinity was moderate (40%) with a GSV of 80% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing and cattle grazing.

Potential for the presence of subsurface archaeological deposits at Glendell North OS21 is assessed as negligible.

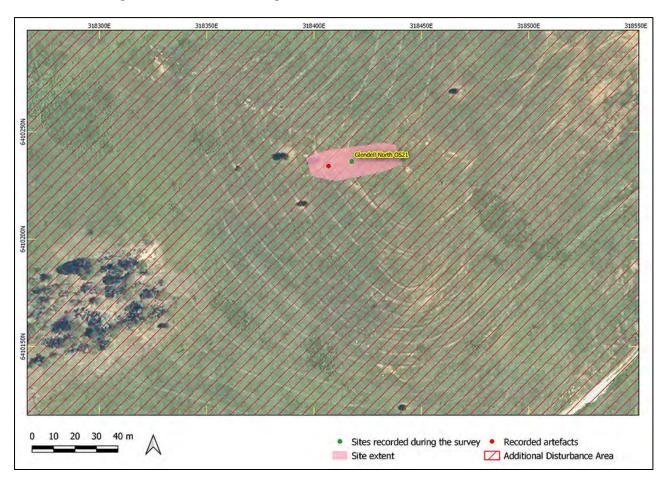
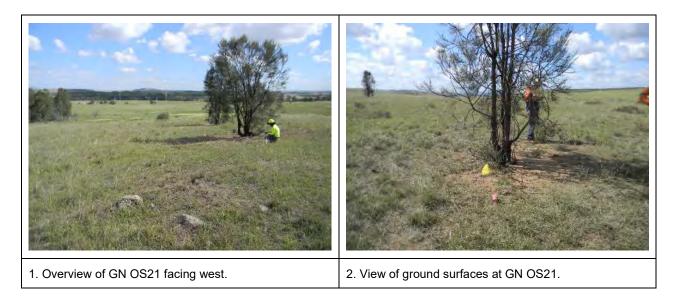


Figure 5-42: Aerial showing location and extent of Glendell North OS21.

Figure 5-43: Photographs showing an overview and details of Glendell North OS21.







3. View of a mudstone flake from GN OS21.

4. View of a quartz flake from GN OS21.

Table 5-24: Glendell North OS21. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Complete	Secondary	4-6cm
Flake	Quartz	Proximal fragment	Tertiary	0-2cm

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 319293 N 6410281

<u>Location of Site</u>: 2.3 km west of Hebden Road and 25 m northwest of Swamp Creek, Ravensworth, along an ephemeral tributary (**Figure 5-4**). The site is located on a flat lower terrace of Swamp Creek (**Figure 5-44**).

<u>Description of Site</u>: Glendell North OS22 is a low-density artefact scatter comprising three mudstone flakes (**Table 5-25**; **Figure 5-45**). The 30 by 15 m extent of the site was defined by the area of exposure over the landform. Surrounding vegetation has been extensively previously cleared, currently representing grassy paddock fringed by stands of regrowth casuarina along the creek line. The GSE within the vicinity was moderate (40%) with a GSV of 70% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, grazing, and sheet wash erosion.

Potential for the presence of subsurface archaeological deposits in the south at Glendell North OS22 along the terrace is assessed as low.

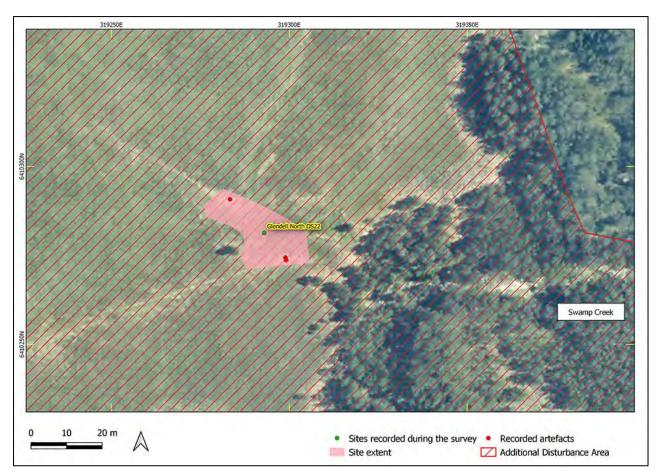
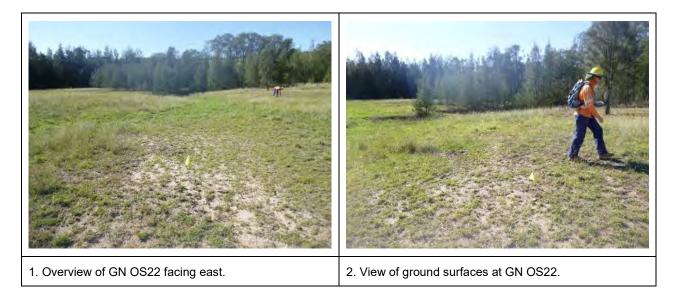


Figure 5-44: Aerial showing location and extent of Glendell North OS22.

Figure 5-45: Photographs showing an overview and details of Glendell North OS22.



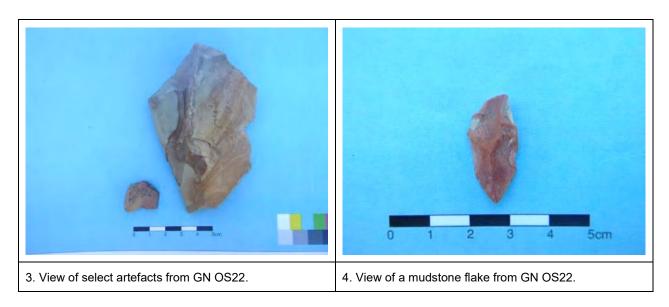


Table 5-25: Glendell North OS22. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Complete	Tertiary	2-4cm	
Flake	Mudstone	Complete	Secondary	8-10cm	Right lateral use wear
Flake	Mudstone	Complete	Tertiary	2-4cm	

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318500 N 6410083

<u>Location of Site</u>: 900 m east of Hebden Road and 250 m north of Swamp Creek, Ravensworth, within an electricity easement (**Figure 5-4**). The site is located within a mid-slope landform (**Figure 5-46**).

<u>Description of Site</u>: Glendell North OS23 is a low-density artefact scatter comprising three flakes made from silcrete and mudstone and a core made of mudstone (**Table 5-26**; **Figure 5-47**). The 70 by 15 m extent of the site was defined by the area of exposure over the landform. Surrounding vegetation has been extensively previously cleared, currently representing grassy paddock with low shrubs and isolated regrowth casuarinas. The GSE within the vicinity was moderate-high (70%) with a GSV of 85% within these exposures. Gravel and regular stones were frequent. Identified disturbances included clearing, grazing, erosion, and the establishment of the electricity easement.

Potential for the presence of subsurface archaeological deposits at Glendell North OS23 is assessed as negligible.

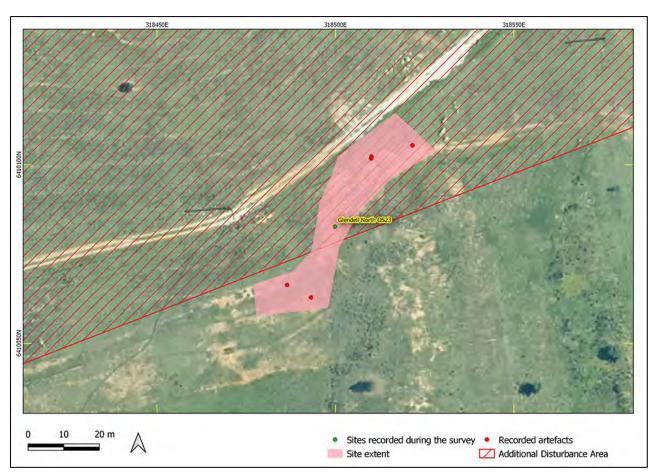
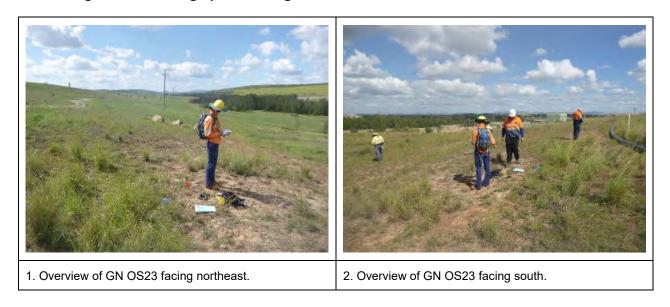


Figure 5-46: Aerial showing location and extent of Glendell North OS23.

Figure 5-47: Photographs showing an overview and details of Glendell North OS23.







3. View of a mudstone flake from GN OS23.

4. View of a mudstone core from GN OS23.

Table 5-26: Glendell North OS23. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Core	Mudstone	N/A	Tertiary	5.2cm	Multidirectional, reduced, 6 scars, 20% cortex
Flake	Mudstone	Complete	Secondary	10+cm	
Flake	Mudstone	Longitudinal break	Tertiary	6-8cm	
Flake	Silcrete	Distal fragment	Tertiary	4-6cm	

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318346 N 6409339

<u>Location of Site</u>: 500 m east of Hebden Road and 60 m southeast of Swamp Creek, Ravensworth, adjacent to an artificial trench (**Figure 5-4**). The site is located on the floodplain of Swamp Creek along an artificial bund for a raised track (**Figure 5-48**).

<u>Description of Site</u>: Glendell North OS24 is a low-density artefact scatter comprising seven mudstone flakes (**Table 5-27**; **Figure 5-49**). The 150 by 10 m extent of the site was defined by the area of exposure along the bund. Surrounding vegetation has been extensively previously cleared, currently representing grassy paddock. The GSE within the vicinity was moderate (30%) with a GSV of 70% within these exposures. Gravel and regular stones were prevalent. Identified disturbances included clearing, grazing, and erosion.

Potential for the presence of subsurface archaeological deposits at Glendell North OS24 is assessed as negligible.

Glendell North OS24 was salvaged on 12 November 2018 according to Section 6.2.1.1 of the MOC ACHMP as it was located within the approved disturbance area for the Glendell Mine. The results of the salvage program are presented in **Appendix 3**.

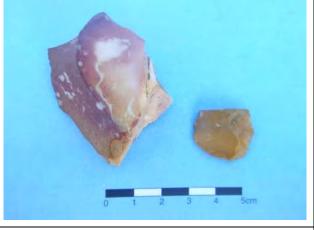


Figure 5-48: Aerial showing location and extent of Glendell North OS24.

Figure 5-49: Photographs showing an overview and details of Glendell North OS24.







3. View of select mudstone and silcrete artefacts from GN OS24.

4. View of select mudstone artefacts from GN OS24.

Table 5-27: Glendell North OS24. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Complete	Secondary	2-4cm
Flake	Mudstone	Complete	Secondary	2-4cm
Flake	Mudstone	Complete	Primary	4-6cm
Flake	Mudstone	Complete	Secondary	4-6cm
Flake	Mudstone	Distal fragment	Tertiary	0-2cm
Flake	Mudstone	Complete	Secondary	4-6cm
Flake	Mudstone	Distal fragment	Tertiary	0-2cm

Site Type: Open artefact scatter; PAD

GPS Coordinates: GDA Zone 56 E 318367 N 6408758

Location of Site: 1.2 km east of the New England Highway and 1.5 km north of Bettys Creek, Ravensworth (Figure 5-4). The site is located on the east side of Swamp Creek eroding out of the bank (Figure 5-50).

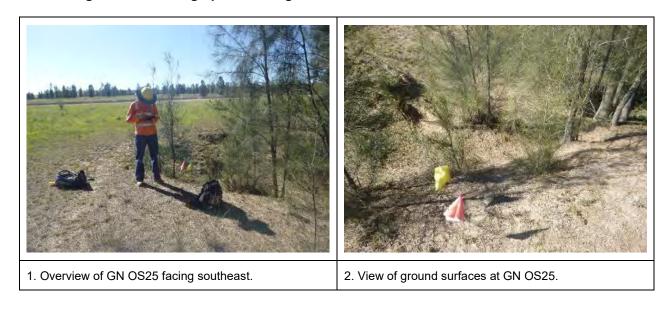
<u>Description of Site</u>: Glendell North OS25 is a low-density artefact scatter comprising two mudstone flakes (**Table 5-28**; **Figure 5-51**). The 40 by 15 m extent of the site was defined by the results of later subsurface investigation (see **Section 6.4.2**). Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by casuarina regrowth along the creek line. The GSE at the time of recording was moderate (60%) with a GSV of 50% within these exposures. Ordinary stone fragments and pebbles were rare. Identified disturbances included erosion, previous clearing, and grazing.

At the time of survey, potential for the presence of subsurface archaeological deposits at Glendell North OS25 was assessed as low-moderate east of the area of erosion by the creek line.



Figure 5-50: Aerial showing location and extent of Glendell North OS25.

Figure 5-51: Photographs showing an overview and details of Glendell North OS25.







3. View of mudstone flakes from GN OS25.

View of a mudstone flake showing use wear from GN OS25.

Table 5-28: Glendell North OS25. Surface artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Proximal fragment	Tertiary	4-6cm	Conjoin marginal use wear
Flake	Mudstone	Complete	Tertiary	4-6cm	Marginal use wear

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318224 N 6410798

<u>Location of Site</u>: 450 m east of Hebden Road and 1.2 km south of Ravensworth Homestead, Ravensworth, on the western wall of a property dam (**Figure 5-4**). The site is located on a lower slope landform sloping toward a tributary of Bowmans Creek (**Figure 5-52**).

<u>Description of Site</u>: Glendell North OS26 is a low-density artefact scatter comprising a flake and shatter piece made from mudstone (**Table 5-29**; **Figure 5-53**). The 15 by 5 m extent of the site was defined by the area of exposure within the dam wall. Surrounding vegetation represents grassy paddock fringed by eucalypt and casuarina regrowth. The GSE within the vicinity was moderate (40%) with a GSV of 70% within these exposures. Gravel and regular stones were moderately frequent. Identified disturbances included clearing, cattle trampling, contour banking and the construction of the adjacent dam.

Potential for the presence of subsurface archaeological deposits at Glendell North OS26 is assessed as negligible.



Figure 5-52: Aerial showing location and extent of Glendell North OS26.

Figure 5-53: Photographs showing an overview and details of Glendell North OS26.



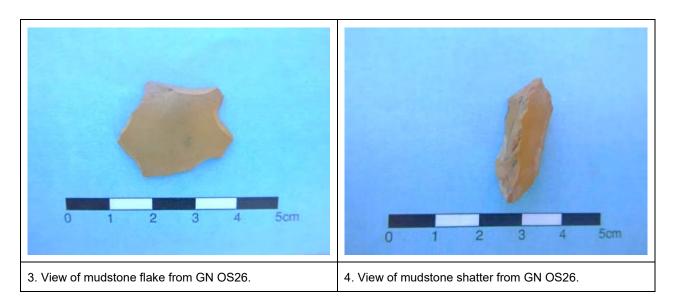


Table 5-29: Glendell North OS26. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Complete	Primary	2-4cm
Shatter	Mudstone	N/A	Tertiary	2-4cm

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318588 N 6408562

<u>Location of Site</u>: 200 m east of Swamp Creek, Ravensworth, along the north-western edge of a dam (**Figure 5-4**). The site is located on a gentle-moderate gradient mid-slope on an artificial bund (**Figure 5-54**).

<u>Description of Site</u>: Glendell North OS27 is a low-density artefact scatter comprising a mudstone flake and a silcrete flake (**Table 5-30**; **Figure 5-55**). The 10 by 20 m extent of the site was defined by the area of exposure over the bund. Surrounding vegetation has been previously cleared, currently grassy paddock with low weeds and stands of regrowth casuarinas. The GSE within the vicinity was very high (80%) with a GSV of 50% within these exposures. Gravel and regular stones were dominant. Identified disturbances included clearing, cattle trampling, erosion, and the construction of the artificial bund.

Potential for the presence of subsurface archaeological deposits at Glendell North OS27 is assessed as negligible.

Glendell North OS27 was salvaged on 12 November 2018 according to Section 6.2.1.1 of the MOC ACHMP (V4, XMO SD PLN 0060) as it was located within the approved disturbance area for the Glendell Mine. The results of the salvage program are presented in **Appendix 3**.

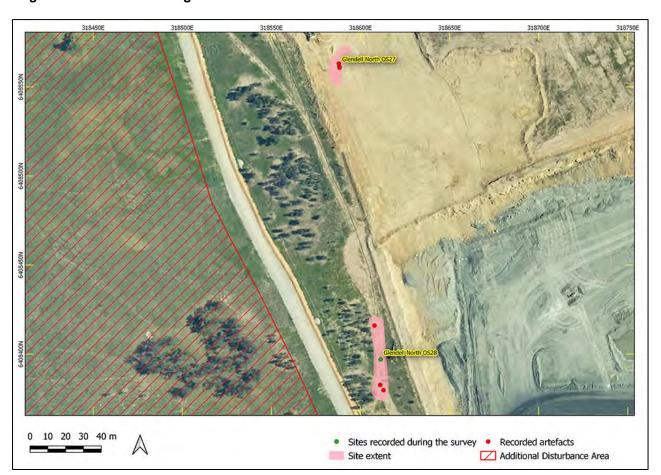


Figure 5-54: Aerial showing locations and extents of Glendell North OS27 and Glendell North OS28.

Figure 5-55: Photographs showing an overview and details of Glendell North OS27.





Table 5-30: Glendell North OS27. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Medial fragment	Tertiary	0-2cm
Flake	Silcrete	Proximal fragment	Tertiary	2-4cm

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318611 N 6408397

<u>Location of Site</u>: 1.7 km north of the New England Highway and 275 m east of Swamp Creek, Ravensworth, in the erosive scour of an access track (**Figure 5-4**). The site is located a gentle-moderate gradient sloping southwest toward Swamp Creek (**Figure 5-54**).

<u>Description of Site</u>: Glendell North OS28 is a low-density artefact scatter comprising a mudstone flake, a piece of mudstone shatter, and a quartz flake (**Table 5-31**; **Figure 5-56**). The 50 by 10 m extent of the site was defined by the area of exposure within an access track. Surrounding vegetation represents grassy paddock with stands of regrowth casuarinas. The GSE within the vicinity was moderate-high (60%) with a GSV of 70% within these exposures. Gravel and regular stones were frequent. Identified disturbances included clearing, grazing, scouring, sheet wash erosion, and vehicle damage.

Potential for the presence of subsurface archaeological deposits at Glendell North OS28 is assessed as negligible.

Figure 5-56: Photographs showing an overview and details of Glendell North OS28.





1. Overview of GN OS28 facing south.

2. View of select mudstone artefacts from GN OS28.

Table 5-31: Glendell North OS28. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Complete	Tertiary	2-4cm
Shatter	Mudstone	N/A	Secondary	2-4cm
Flake	Quartz	Complete	Tertiary	0-2cm

Glendell North OS29

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318291 N 6408381

Location of Site: 1.3 km north of the New England Highway and 30 m west of Swamp Creek, Ravensworth (Figure 5-4). The site is located on a topsoil dump by a dam (Figure 5-57).

<u>Description of Site</u>: Glendell North OS29 is a low-density artefact scatter comprising three flakes and a shatter piece made from mudstone and silcrete (**Table 5-32**; **Figure 5-58**). The 30 by 10 m extent of the site was defined by the area of exposure within the topsoil dump. Surrounding vegetation represents grassy paddock with low shrubs fringed by boxthorn, casuarina, and isolated eucalypts by the creek. The GSE within the vicinity was low (30%) with a GSV of 70% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, grazing, scouring, sheet wash erosion and the movement of topsoil.

Potential for the presence of subsurface archaeological deposits at Glendell North OS29 is assessed as negligible.

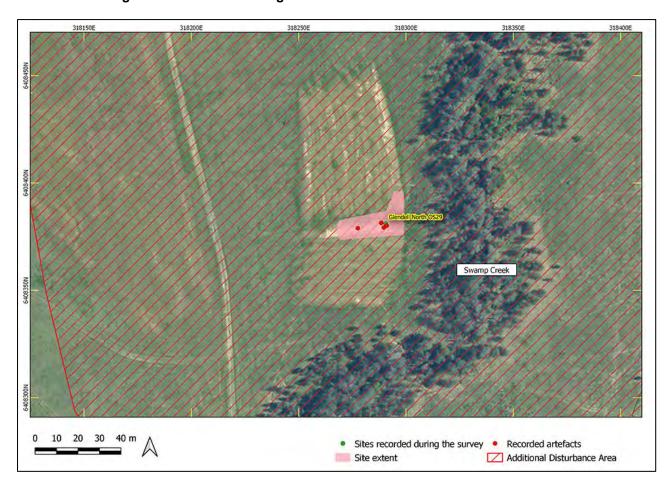


Figure 5-57: Aerial showing location and extent of Glendell North OS29.

Figure 5-58: Photographs showing an overview and details of Glendell North OS29.



Table 5-32: Glendell North OS30. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Complete	Tertiary	2-4cm
Flake	Silcrete	Proximal fragment	Tertiary	0-2cm
Shatter	Silcrete	N/A	Tertiary	0-2cm
Flake	Silcrete	Complete	Tertiary	2-4cm

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318530 N 6408206

<u>Location of Site</u>: 1.5 km north of the New England Highway and 175 m east of Swamp Creek, Ravensworth (**Figure 5-4**). The site is located within a moderate gradient sloping west towards Swamp Creek on the western wall of a dam (**Figure 5-59**).

<u>Description of Site</u>: Glendell North OS30 is a low-density artefact scatter comprising a flake, a retouched flake, and a core made from mudstone (**Table 5-33**; **Figure 5-60**). The 130 by 15 m extent of the site was defined by the area of exposure across the dam wall. Surrounding vegetation has been extensively previously cleared, currently representing grassy paddock with stands of regrowth eucalypts and casuarinas. The GSE within the vicinity was high (65%) with a GSV of 85% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, grazing, scouring, sheet wash erosion, and the construction of the adjacent dam.

Potential for the presence of subsurface archaeological deposits at Glendell North OS30 is assessed as negligible.

Table 5-33: Glendell North OS30. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Distal fragment	Secondary	4-6cm	
Core	Mudstone	N/A	Secondary	4-6cm	Multidirectional, 5 scars, 45% cortex
Flake	Mudstone	Complete	Tertiary	4-6cm	Core rejuvenation flake



Figure 5-59: Aerial showing location and extent of Glendell North OS30.

Figure 5-60: Photographs showing an overview and details of Glendell North OS30.







3. View of a retouched mudstone flake from GN OS30.

4. View of a mudstone core from GN OS30.

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318827 N 6407525

<u>Location of Site</u>: 1 km north of the New England Highway and 300 m north of Bettys Creek, Ravensworth, on an artificial bund (**Figure 5-4**). The site is located on a moderate gradient sloping west toward Swamp Creek (**Figure 5-61**).

<u>Description of Site</u>: Glendell North OS31 is a low-density artefact scatter comprising 15 artefacts, including flakes, shatter, a core, and a blade made of mudstone, silcrete, and quartz (Table 5-34; Figure 5-62). The 160 by 15 m extent of the site was defined by the area of exposure across the artificial bund and surrounds. Surrounding vegetation has been extensively previously cleared, currently representing grassy paddock with stands of regrowth eucalypts and casuarinas. The GSE within the vicinity was high (65%) with a GSV of 85% within these exposures. Gravel and regular stones were dominant. Identified disturbances included clearing, grazing, scouring, sheet wash erosion and the construction of the artificial bund.

Potential for the presence of subsurface archaeological deposits at Glendell North OS31 is assessed as negligible.

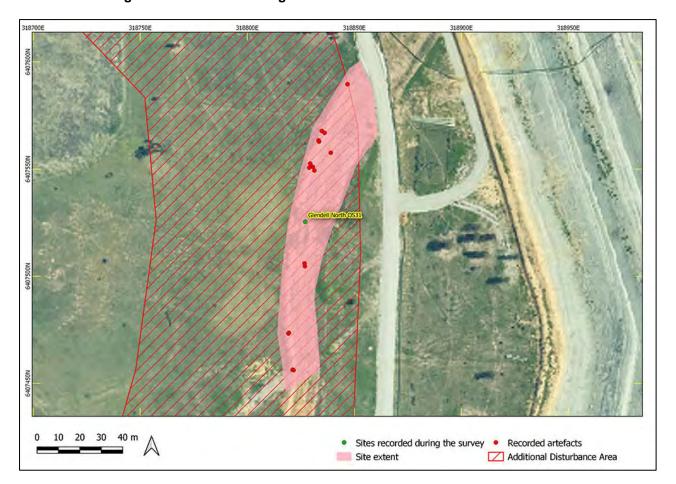
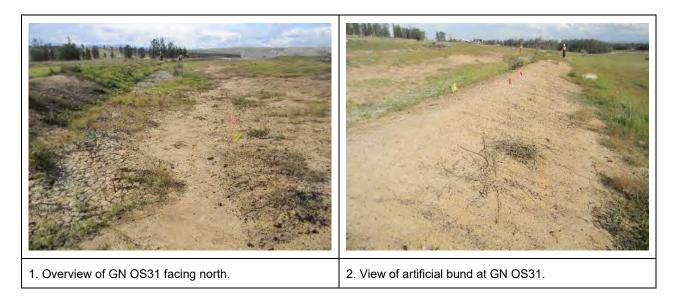


Figure 5-61: Aerial showing location and extent of Glendell North OS31.

Figure 5-62: Photographs showing an overview and details of Glendell North OS31.







3. View of select mudstone artefacts from GN OS31.

4. View of select mudstone artefacts from GN OS31.

Table 5-34: Glendell North OS31. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Complete	Tertiary	2-4cm	
Shatter	Mudstone	N/A	Tertiary	0-2cm	
Core	Silcrete	N/A	Secondary	2.5cm	Bifacial fragment, 6 scars, 25% cortex
Flake	Mudstone	Complete	Secondary	2-4cm	
Flake	Mudstone	Longitudinal break	Secondary	2-4cm	
Flake	Mudstone	Complete	Secondary	0-2cm	
Blade	Mudstone	Longitudinal break	Tertiary	4-6cm	
Flake	Mudstone	Complete	Primary	0-2cm	
Flake	Mudstone	Complete	Tertiary	2-4cm	
Flake	Mudstone	Longitudinal break	Primary	2-4cm	
Flake	Mudstone	Distal fragment	Primary	0-2cm	
Shatter	Mudstone	N/A	Tertiary	2-4cm	
Flake	Mudstone	Distal fragment	Primary	2-4cm	
Flake	Quartz	Complete	Tertiary	0-2cm	
Flake	Silcrete	Complete	Tertiary	2-4cm	

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317951 N 6407475

<u>Location of Site</u>: 80 m northeast of the New England Highway and 30 m west of Bowmans Creek, Ravensworth on an ant nest (**Figure 5-4**). The site is located on an upper terrace landform above Bowmans Creek (**Figure 5-63**).

<u>Description of Site</u>: Glendell North OS32 is a low-density artefact scatter comprising a silcrete flake and a mudstone core (**Table 5-35**; **Figure 5-64**). The 10 by 3 m extent of the site was defined by the area of exposure across the ant mound. Surrounding vegetation has been extensively previously cleared, currently representing grassy paddock with stands of

regrowth eucalypts and casuarinas along the creek channel. The GSE within the vicinity was moderate (40%) with a GSV of 70% within these exposures. Gravel and regular stones were rare. Identified disturbances included clearing, grazing, scouring, sheet wash erosion and the establishment of the adjacent ant mound.

Potential for the presence of subsurface archaeological deposits at Glendell North OS32 is assessed as low.



Figure 5-63: Aerial showing location and extent of Glendell North OS32.

Figure 5-64: Photographs showing an overview and details of Glendell North OS32.



Table 5-35: Glendell North OS32. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Silcrete	Proximal fragment	Tertiary	0-2cm	
Core	Mudstone	N/A	Tertiary	5.4cm	Multidirectional, 10+scars, <5% cortex

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 319166 N 6407069

<u>Location of Site</u>: 54 m north of the Main North Rail Line and 15 m south of the diversion channel for Bettys Creek, Ravensworth (**Figure 5-4**). The site is located on a modified bank feature of the Bettys Creek diversion (**Figure 5-65**).

<u>Description of Site</u>: Glendell North OS33 is a low-density artefact scatter comprising 12 artefacts, including flakes, blades, a core, and an end scraper made of mudstone and silcrete (**Table 5-36**; **Figure 5-66**). The 100 by 15 m extent of the site was defined by the

area of exposure along the modified bank. Surrounding vegetation has been extensively previously cleared, currently representing open grassy paddock with scattered shrubs and isolated regrowth casuarinas. The GSE within the vicinity was moderate (55%) with a GSV of 75% within these exposures. Gravel and regular stones were frequent. Identified disturbances included clearing, grazing, scouring, sheet wash erosion and the modification of Bettys Creek.

Potential for the presence of subsurface archaeological deposits at Glendell North OS33 is assessed as negligible.

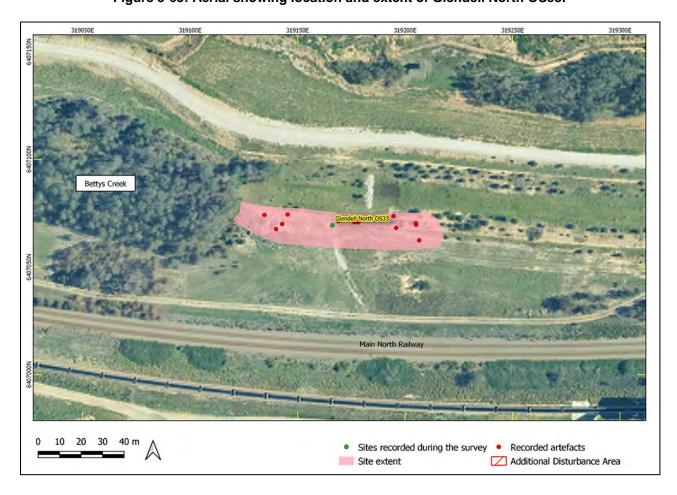


Figure 5-65: Aerial showing location and extent of Glendell North OS33.

Figure 5-66: Photographs showing an overview and details of Glendell North OS33.



Table 5-36: Glendell North OS33. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Blade	Silcrete	Complete	Tertiary	4-6cm	
Blade	Mudstone	Complete	Tertiary	4-6cm	
End Scraper	Mudstone	Complete	Secondary	10-12cm	Distal, semi-steep, unifacial, invasive retouch
Flake	Mudstone	Complete	Tertiary	4-6cm	
Flake	Mudstone	Complete	Secondary	2-4cm	
Flake	Silcrete	Proximal fragment	Tertiary	4-6cm	
Shatter	Silcrete	N/A	N/A	0-2cm	
Core	Silcrete	N/A	Secondary	3.1cm	Bifacial fragment, 4 scars, 50-75% cortex
Blade	Mudstone	Proximal fragment	Secondary	2-4cm	
Flake	Silcrete	Proximal fragment	Tertiary	0-2cm	
Flake	Mudstone	Distal fragment	Tertiary	0-2cm	
Flake	Mudstone	Proximal fragment	Tertiary	4-6cm	

Site Type: Open artefact scatter; PAD

GPS Coordinates: GDA Zone 56 E 317443 N 6411053

<u>Location of Site</u>: 350 m west of Hebden Road at the confluence of Bowmans Creek and Yorks Creek, Ravensworth (**Figure 5-4**). The site is in an open paddock along the steep, eroded edge of a terrace landform at the confluence of Yorks and Bowmans Creeks (**Figure 5-67**).

<u>Description of Site</u>: Glendell North OS34 is a low-density artefact scatter comprising four complete and broken flakes. The artefacts are made of mudstone, chert and silcrete (**Table 5-37**; **Figure 5-68**). The 40 by 15 m extent of the site was defined by the results of later subsurface investigation (see **Section 6.4.2**). Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by casuarina regrowth along the creek line. The GSE at the time of recording was moderate (60%) with a GSV of 50% within these exposures. Ordinary stone fragments and pebbles were rare. Identified disturbances included erosion, previous clearing, and grazing.

At the time of survey, potential for the presence of subsurface archaeological deposits at Glendell North OS34 was assessed as high given its location at the confluence of Yorks and Bowmans Creeks. The test excavation program allowed for a more accurate understanding of the site extent (**Section 6.4**).

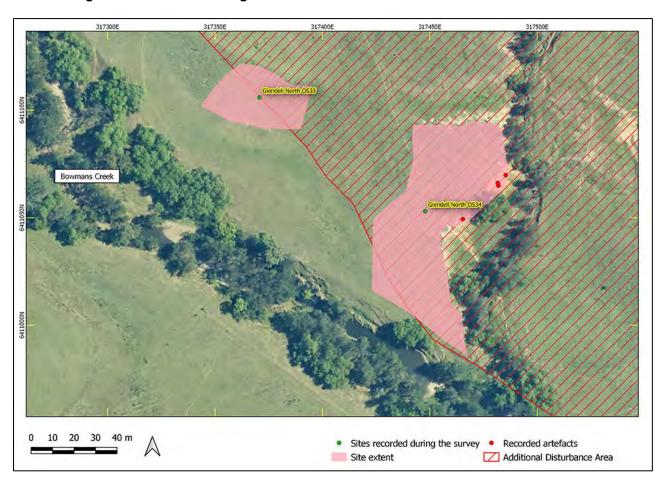


Figure 5-67: Aerial showing location and extent of Glendell North OS34 and OS35.

Figure 5-68: Photographs showing an overview and details of Glendell North OS34.

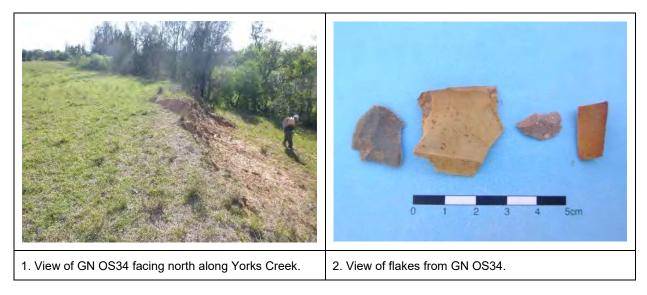


Table 5-37: Glendell North OS34. Surface artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Silcrete	Complete	Primary	4-6cm
Flake	Silcrete	Complete	Tertiary	0-2cm
Flake	Mudstone	Distal fragment	Tertiary	2-4cm
Flake	Chert	Longitudinal break	Tertiary	2-4cm

Glendell North OS35 (formerly Glendell North PAD2)

Site Type: Open artefact scatter; PAD

GPS Coordinates: GDA Zone 56 E 317371 N 6411106

<u>Location of Site</u>: 430 m west of Hebden Road near the confluence of Bowmans Creek and Yorks Creek, Ravensworth (**Figure 5-4**). The site is in open paddock on a terrace landform 25 m north of the bank of Bowmans Creek (**Figure 5-67**).

<u>Description of Site</u>: This site was recorded because of the test excavation program and has no surface manifestation. Details on the test excavation results at this site are presented in **Section 6.4.2**.

Glendell North OS36 (formerly Glendell North PAD1)

Site Type: Open artefact scatter; PAD

GPS Coordinates: GDA Zone 56 E 316670 N 6413398

Location of Site: 1.1 km west of Hebden Road and 250 m south of the Liddell pipeline and conveyor route, above the east bank of Bowmans Creek (Figure 5-4). The site is located on a flat bench above the confluence of Bowmans Creek and an ephemeral tributary in a cleared agricultural paddock (Figure 5-69).

<u>Description of Site</u>: Glendell North OS36 was identified during survey as a potential archaeological deposit identified based on a flat, secondary terrace adjacent to Bowmans Creek. Local depth of deposit was estimated to be 15+ cm (Figure 5-70). The 30 by 35 m extent of the site was defined by the results of later subsurface investigation (see Section 6.4.2) and there is no surface manifestation of artefacts. Surrounding vegetation at the site was grassy paddock fringed by isolated mature eucalypts. The GSE at the time of recording was very limited (5%) with a GSV of 50% within these exposures. Ordinary stone fragments and pebbles were not observed. Wooden and metal debris from previous historical activity in the area suggest that ground surfaces at the site have been disturbed or artificially levelled. Further identified disturbances included previous clearing and grazing.

At the time of survey, potential for the presence of subsurface archaeological deposits at Glendell North OS36 was assessed as likely despite the absence of surface artefacts.



Figure 5-69: Aerial showing location and extent of Glendell North OS36.

Figure 5-70: Photographs showing an overview and details of Glendell North OS36.







3. View of ground surfaces at GN OS36.

4. View of GN OS36 looking south.

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317843 N 6412369

Location of Site: 2.2 km north east of the New England Highway, 185 m east of Hebden Road, 50 m east of Yorks Creek and 340 m northwest of the Ravensworth Homestead, Ravensworth (Figure 5-4). The site is located on a terrace to the east of Yorks Creek in a cleared agricultural paddock (Figure 5-71).

<u>Description of Site</u>: Glendell North OS37 is a low-density artefact scatter comprising three flakes, one of which is broken into two pieces, and a mudstone core fragment. (**Table 5-38**; **Figure 5-72**). The 40 by 20 m extent of the site was defined by the area of exposure across the landform. Surrounding vegetation has been intensively previously cleared and represents grassy paddock with regrowth casuarinas lining the creek line. The GSE within the vicinity was moderate (40%) with a GSV of 70% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, grazing, scouring, sheet wash erosion, historic ploughing, and vehicle damage.

Potential for the presence of subsurface archaeological deposits at Glendell North OS37 is assessed as negligible.

Glendell North OS37 was identified during the historic heritage excavation program (Casey & Lowe 2019).

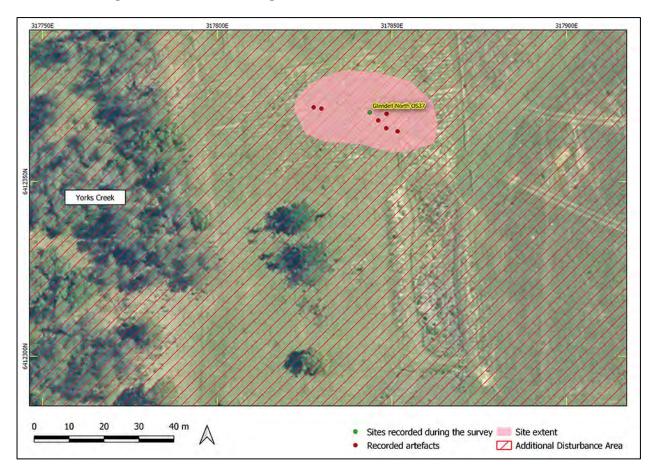


Figure 5-71: Aerial showing location and extent of Glendell North OS37.

Figure 5-72: Photographs showing an overview and details of Glendell North OS37.







3. View of silcrete and mudstone flakes from GN OS37.

4. View of a mudstone core fragment from GN OS37.

Table 5-38: Glendell North OS37. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Core	Mudstone	N/A	Secondary	1.2cm	Multidirectional, fragment, 5 scars, 10% cortex
Flake	Silcrete	Complete	Tertiary	2-4cm	
Flake	Mudstone	Proximal fragment	Tertiary	0-2cm	
Flake	Silcrete	Proximal fragment	Tertiary	2-4cm	Conjoin
Flake	Silcrete	Distal fragment	Tertiary	0-2cm	Conjoin

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 317557 N 6411704

Location of Site: 1.5 km north east of the New England Highway, 500 m southwest of the Ravensworth Homestead and 200 m west of Hebden Road, Ravensworth (**Figure 5-4**). The site is located on a terrace to the east of Yorks Creek in a cleared agricultural paddock (**Figure 5-73**). Glendell North OS38 was identified following the survey, during the historical archaeology test excavation program.

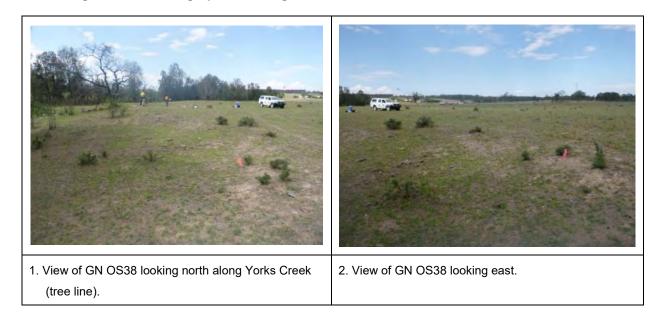
<u>Description of Site</u>: Glendell North OS38 is a low-density artefact scatter comprising two flakes, one of which is broken into three pieces. The flakes are manufactured from mudstone and silcrete (**Table 5-39**; **Figure 5-74**). One of the artefacts was found at a depth of 15 cm during a historic heritage test excavation program. The 30 by 15 m extent of the site was defined by the area of exposure across the landform. Surrounding vegetation has been intensively previously cleared and represents grassy paddock with regrowth casuarinas lining the creek line. The GSE within the vicinity was moderate (40%) with a GSV of 70% within these exposures. Gravel and regular stones were infrequent. Identified disturbances included clearing, grazing, scouring, sheet wash erosion, historic ploughing, and vehicle damage.

Potential for the presence of intact subsurface archaeological deposits at Glendell North OS38 is assessed as negligible. It is noted that the adjacent subsurface historic archaeological investigations that were monitored by an OzArk archaeologist and Aboriginal community members did not uncover further subsurface Aboriginal archaeological deposits.



Figure 5-73: Aerial showing location and extent of Glendell North OS38.

Figure 5-74: Photographs showing an overview and details of Glendell North OS38.







3. View of a mudstone flake from GN OS38.

4. View of the broken silcrete flake from GN OS38.

Table 5-39: Glendell North OS38. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size	Additional detail
Flake	Mudstone	Longitudinal break	Tertiary	0-2cm	
Flake	Silcrete	Complete	Secondary	2-4cm	Broken into three pieces

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318028 N 6409888

<u>Location of Site</u>: 960 m east of the New England Highway, 320m northwest of Swamp Creek, 560 m northeast of the Bowmans Creek, and 460 m east of Hebden Road, Ravensworth (**Figure 5-4**). The site is located on a slight crest which gently slopes to the west and east to creek lines (**Figure 5-75**).

<u>Description of Site</u>: Glendell North OS39 is a low-density artefact scatter comprising six flakes. The flakes are manufactured mainly from silcrete, with one mudstone flake also recorded (**Table 5-40**; **Figure 5-76**). Artefacts are eroding from the northern and eastern sides of the crest in exposures caused by slope wash. The 100 by 55 m extent of the site was defined by the area of exposure across the landform. Surrounding vegetation has been intensively previously cleared and represents grassy paddock. The GSE within the vicinity was moderate-high (70%) with a GSV of 80% within these exposures. Gravel and regular stones were frequent. Identified disturbances included clearing, grazing, scouring, sheet wash erosion.

Glendell North OS39 is located at the same location as AHIMS site 37-3-0617 (Bowmans Creek 5). Bowmans Creek 5 is listed as 'destroyed' on AHIMS following salvage under AHIP 2267 in 2005 when 42 surface artefacts were collected from the site. Artefacts present in 2005 were manufactured from silcrete, mudstone, quartz and quartzite. The presence of

additional artefacts since the 2005 collection is attributed to ongoing erosion which has exposed the additional artefacts.

Potential for the presence of intact subsurface archaeological deposits at Glendell North OS39 is assessed as negligible.

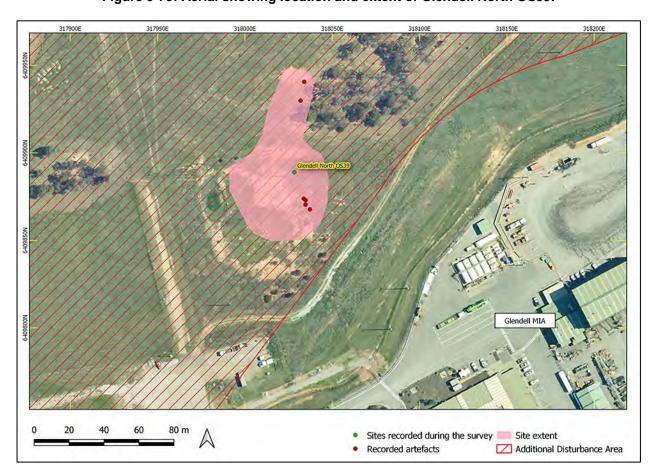


Figure 5-75: Aerial showing location and extent of Glendell North OS39.

Figure 5-76: Photographs showing an overview and details of Glendell North OS39.

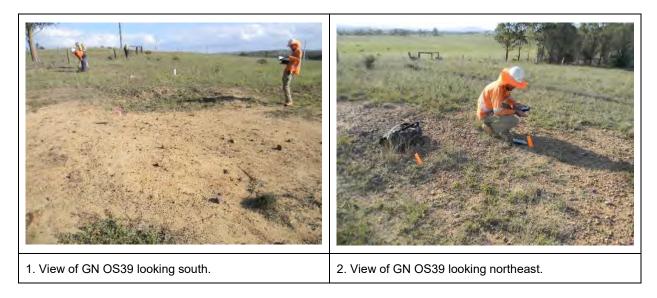




Table 5-40: Glendell North OS39. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size
Flake	Mudstone	Longitudinal break	Tertiary	4-6cm
Flake	Silcrete	Longitudinal break	Secondary	2-4cm
Flake	Silcrete	Proximal fragment	Tertiary	2-4cm
Flake	Silcrete	Complete	Tertiary	0-2cm
Flake	Silcrete	Distal fragment	Tertiary	0-2cm
Flake	Silcrete	Proximal fragment	Tertiary	2-4cm

5.4.2 Isolated finds

Twenty-nine isolated finds were recorded during the survey. These are listed in **Table 5-41** and shown on **Figure 5-5**. Details of each isolated find follows.

Table 5-41: Recorded isolated finds artefact attributes and coordinates.

Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Artefact type	Material	Size	Additional detail
GN IF1	318189	6414948	Flake	Mudstone	6-8cm	Complete, tertiary
GN IF2	317146	6413503	Flake	Mudstone	0-2cm	Proximal fragment, tertiary
GN IF3	317120	6413414	Flake	Mudstone	2-4cm	Complete, tertiary
GN IF4	316962	6412937	Flake	Tuff	0-2cm	Proximal fragment, tertiary
GN IF5	318054	6412783	Side scraper	Mudstone	4-6cm	Complete, secondary
GN IF6	315966	6412883	Flake	Silcrete	4-6cm	Complete, secondary
GN IF7	315514	6412657	Flake	Chert	0-2cm	Proximal fragment, tertiary, use wear
GN IF8	316956	6412606	Core	Silcrete	8cm	Multidirectional, opportunistic, 50-75% cortex, 5 scars
GN IF9	316545	6411891	Flake	Mudstone	2-4cm	Proximal fragment, tertiary
GN IF10	318745	6411655	Backed flake	Mudstone	4-6cm	Complete tertiary, marginal semi-steep retouch, unifacial, fine and proximal
GN IF11	317221	6411282	Flake	Silcrete	2-4cm	Complete secondary
GN IF12	317765	6410903	Shatter	Mudstone	0-2cm	Tertiary
GN IF13	317688	6410830	Flake	Mudstone	6-8cm	Complete tertiary

Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Artefact type	Material	Size	Additional detail
GN IF14	317752	6410825	Core	Mudstone	2-4cm	Bifacial fragment, 30% cortex, 4 scars
GN IF15	317683	6410588	Flake	Mudstone	0-2cm	Complete tertiary
GN IF16	319072	6410845	Hammerstone	Basalt	14cm	Flat ground on one side
GN IF17	317777	6409943	Flake	Mudstone	0-2cm	Longitudinal break, tertiary
GN IF18	317723	6409918	Flake	Mudstone	2-4cm	Proximal fragment, tertiary
GN IF19	318543	6410024	Blade	Silcrete	2-4cm	Distal fragment, tertiary,
GN IF20	318022	6409310	Flake	Chert	2-4cm	Proximal fragment, secondary
GN IF21	318328	6408936	Flake	Mudstone	0-2cm	Proximal fragment, tertiary
GN IF22	317984	6410954	Flake	Mudstone	4-6cm	Complete tertiary, fine marginal unifacial retouch
GN IF23	318833	6407204	Flake	Silcrete	4-6cm	Proximal fragment, tertiary
GN IF24	318253	6411466	Core	Mudstone	3cm	Multidirectional, 25% cortex, 4 scars
GN IF25	318341	6409244	Flake	Mudstone	2-4cm	Complete, secondary
GN IF26	318252	6408957	Flake	Mudstone	2-4cm	Complete, secondary
GN IF27	317257	6411851	Scraper	Mudstone	4-6cm	Horse shoe scraper; steep, invasive retouch; unifacial
GN IF28	317241	6411902	Flake	Silcrete	4-6cm	Complete, tertiary

Site Type: Isolated find

<u>Location of Site</u>: 170 m east of Hebden Road and 250 m north of the Mount Owen Mine entrance road, Ravensworth, on the north side of a property dam (**Figure 5-5**). The site is in a lightly wooded paddock on a landform with a gentle gradient sloping toward Yorks Creek located 550 m to the south (**Figure 5-77**).

<u>Description of Site</u>: Glendell North IF1 is a single mudstone flake located within the inundation zone of a property dam (**Figure 5-78**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is a combination of sparse-moderate mature and regrowth eucalypts. The GSE at the time of recording was moderate (40%) with a GSV of 80% within these exposures. Small ordinary stone fragments and pebbles were rare. Identified disturbances included erosion, cattle trampling, and the construction of the adjacent dam.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF1 is assessed as negligible.

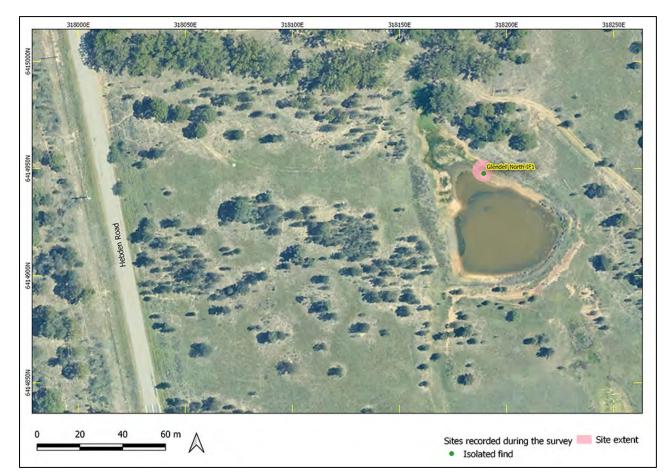
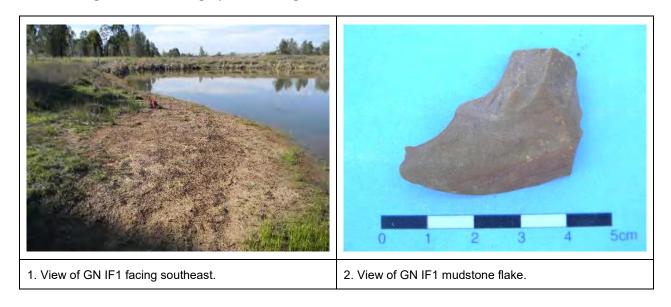


Figure 5-77: Aerial showing location and extent of Glendell North IF1.

Figure 5-78: Photographs showing an overview and details of Glendell North IF1.



Site Type: Isolated find

<u>Location of Site</u>: 700 m west of Hebden Road and 450 m east of Bowmans Creek, Ravensworth, upslope of the Liddell pipeline and conveyor route (**Figure 5-5**). The site is located on a lightly wooded hill crest above cleared agricultural paddock (**Figure 5-79**).

Description of Site: Glendell North IF2 is a single mudstone flake located in skeletal soils (**Figure 5-80**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site represents light-moderate casuarina regrowth. The GSE at the time of recording was low (20%) with a GSV of 80% within these exposures. Small ordinary stone fragments and pebbles were prevalent. Identified disturbances included erosion, previous clearing, cattle trampling, and the construction of nearby contour banks.

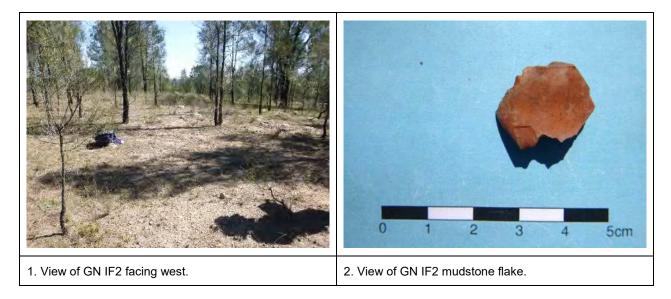
Potential for the presence of further subsurface archaeological deposits at Glendell North IF2 is assessed as negligible.

31700€ 317200€ 317200€ 317200€ 317200€

| 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 1000€ | 100

Figure 5-79: Aerial showing locations and extents of Glendell North IF2 and Glendell North IF3.

Figure 5-80: Photographs showing an overview and details of Glendell North IF2.



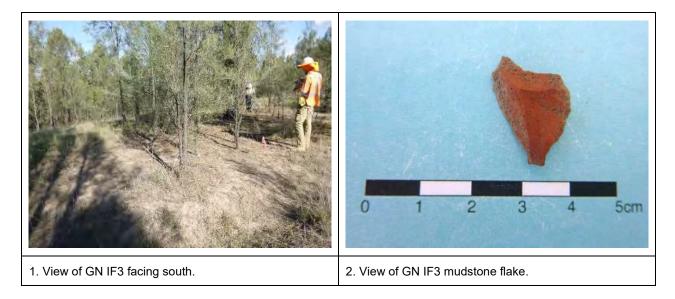
Site Type: Isolated find

<u>Location of Site</u>: 700 m west of Hebden Road and 450 m east of Bowmans Creek, Ravensworth, upslope of the Liddell pipeline and conveyor route (**Figure 5-5**). The site is located on a lightly wooded hill crest above cleared agricultural paddock (**Figure 5-79**).

<u>Description of Site</u>: Glendell North IF3 is a single mudstone flake located in skeletal soils (**Figure 5-81**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site represents light-moderate casuarina regrowth. The GSE at the time of recording was low (20%) with a GSV of 80% within these exposures. Small ordinary stone fragments and pebbles were moderate. Identified disturbances included erosion, previous clearing, cattle trampling, and the construction of nearby contour banks.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF3 is assessed as negligible.

Figure 5-81: Photographs showing an overview and details of Glendell North IF3.



Site Type: Isolated find

<u>Location of Site</u>: 650 m west of Hebden Road and 650 m south of the Liddell pipeline and conveyor route, Ravensworth (**Figure 5-5**). The site is located on a gentle gradient midslope on a vehicle track (**Figure 5-82**).

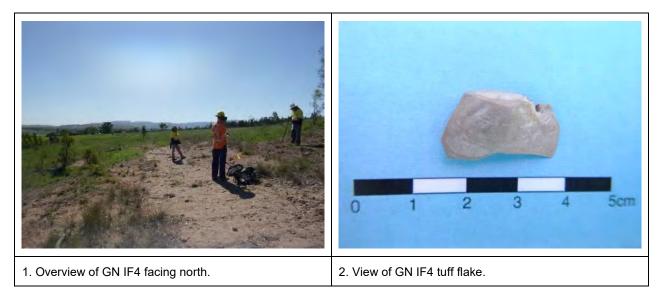
Description of Site: Glendell North IF4 is a single tuff flake located in skeletal soils (**Figure 5-83**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site represents sparse ironbark sapling and regrowth casuarinas. The GSE at the time of recording was very high (90%) with a GSV of 95% within these exposures. Small ordinary stone fragments of shale and conglomerate were frequent. Identified disturbances included erosion, previous clearing, cattle trampling, and vehicle damage.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF4 is assessed as negligible.



Figure 5-82: Aerial showing location and extent of Glendell North IF4.

Figure 5-83: Photographs showing an overview and details of Glendell North IF4.



Site Type: Isolated find

<u>Location of Site</u>: 450 m east of Hebden Road and 750 m north of Ravensworth Homestead, Ravensworth (**Figure 5-5**). The site is in shallow sandy soils within the mid-slope of a gentle spur (**Figure 5-84**).

<u>Description of Site</u>: Glendell North IF5 is a single mudstone side scraper (**Figure 5-85**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site currently represents regrowth ironbark woodland with isolated casuarina regrowth. The GSE at the time of recording was moderate (50%) with a GSV of 70% within these exposures. Small ordinary stone fragments and pebbles were rare. Identified disturbances included erosion, previous clearing, and grazing.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF5 is assessed as negligible.

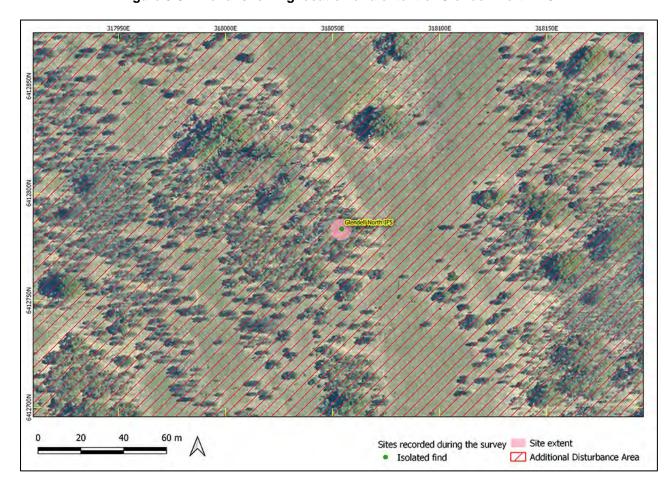
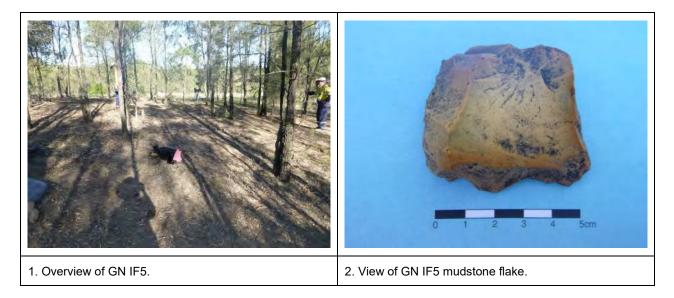


Figure 5-84: Aerial showing location and extent of Glendell North IF5.

Figure 5-85: Photographs showing an overview and details of Glendell North IF5.



Site Type: Isolated find

<u>Location of Site</u>: 1.6 km west of Hebden Road and 400 m south of the Liddell pipeline and conveyor route (**Figure 5-5**). The site is located on a lower terrace of Bowmans Creek in a cattle track (**Figure 5-86**).

Description of Site: Glendell North IF6 is a single silcrete flake (**Figure 5-87**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been previously cleared, currently representing grassy paddock fringed by stands of regrowth casuarinas along the creek line. The GSE at the time of recording was low (30%) with a GSV of 80% within these exposures. Small ordinary stone fragments and pebbles were frequent. Identified disturbances included erosion, previous clearing, and cattle trampling.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF6 is assessed as negligible.

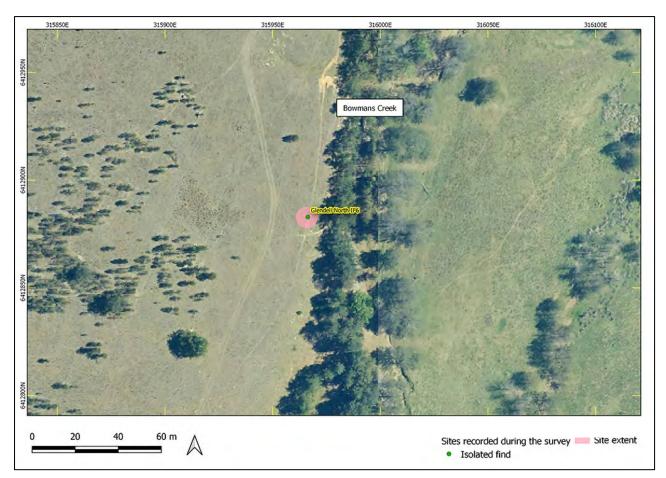
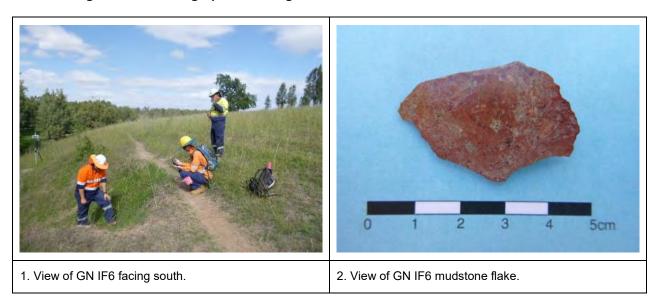


Figure 5-86: Aerial showing location and extent of Glendell North IF6.

Figure 5-87: Photographs showing an overview and details of Glendell North IF6.



Site Type: Isolated find

<u>Location of Site</u>: 1 km north of the New England Highway and 300 m south of the Liddell pipeline and conveyor route, Ravensworth, within an electricity easement (**Figure 5-5**). The site is located within a mid-slope on an access track (**Figure 5-88**).

<u>Description of Site</u>: Glendell North IF7 is a single chert flake (**Figure 5-89**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared, currently representing grassy paddock fringed by stands of regrowth casuarina. The GSE at the time of recording was low (30%) with a GSV of 65% within these exposures. Gravel and regular stones were prevalent. Identified disturbances included clearing, grazing, erosion, vehicle damage, and the establishment of the electricity easement.

Potential for the presence of subsurface archaeological deposits at Glendell North IF7 is assessed as negligible.

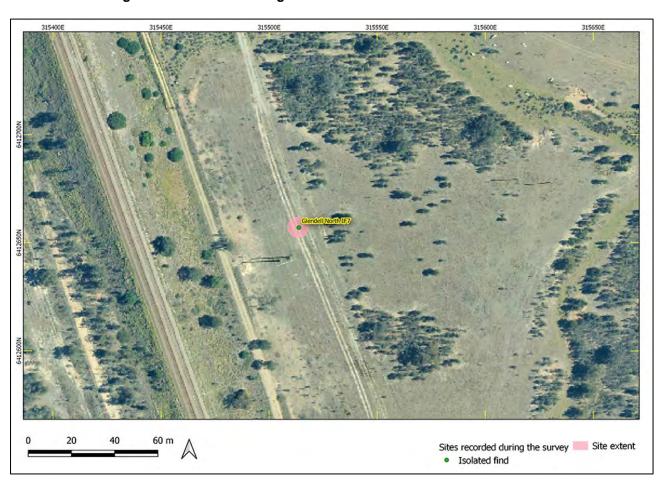
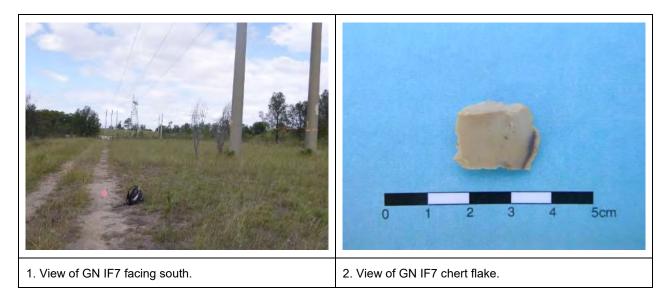


Figure 5-88: Aerial showing location and extent of Glendell North IF7.

Figure 5-89: Photographs showing an overview and details of Glendell North IF7.



Site Type: Isolated find

<u>Location of Site</u>: 650 m west of Hebden Road and 1 km south of the Liddell pipeline and conveyor route, Ravensworth (**Figure 5-5**). The site is in eroded B-Horizon deposits on a low-moderate gradient mid-slope (**Figure 5-90**).

<u>Description of Site</u>: Glendell North IF8 is a single silcrete core (**Figure 5-91**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation currently represents open forest of gum and casuarina saplings. The GSE at the time of recording was moderate (40%) with a GSV of 70% within these exposures. Small ordinary stone fragments and pebbles were infrequent. Identified disturbances included erosion, vehicle access track and previous clearing, and cattle grazing.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF8 is assessed as negligible.

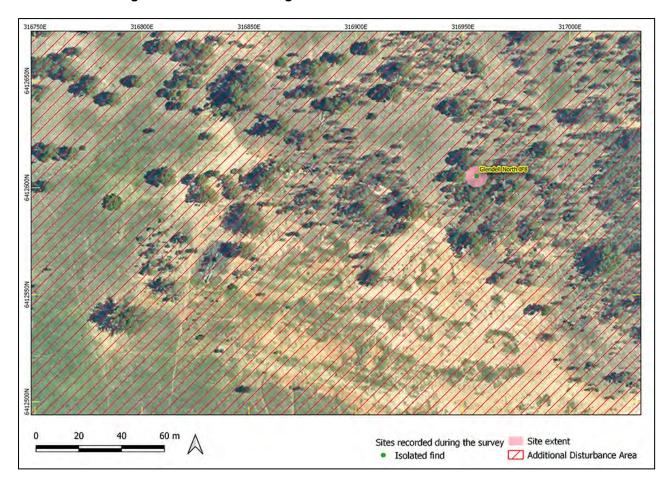
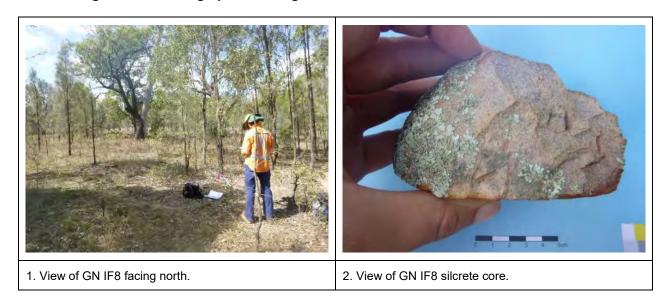


Figure 5-90: Aerial showing location and extent of Glendell North IF8.

Figure 5-91: Photographs showing an overview and details of Glendell North IF8.



Site Type: Isolated find

<u>Location of Site</u>: 1.2 km west of Hebden Road and 50 m east of Bowmans Creek, Ravensworth, on the east side of a property dam (**Figure 5-5**). The site is located on a gently sloping landform of cleared agricultural paddock (**Figure 5-92**).

<u>Description of Site</u>: Glendell North IF9 is a single mudstone flake located in disturbed context (**Figure 5-93**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock and shrubs. The GSE at the time of recording was low (20%) with a GSV of 70% within these exposures. Ordinary stone fragments and pebbles were rare. Identified disturbances included erosion, previous clearing, cattle trampling, and the construction of the nearby dam.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF9 is assessed as negligible.

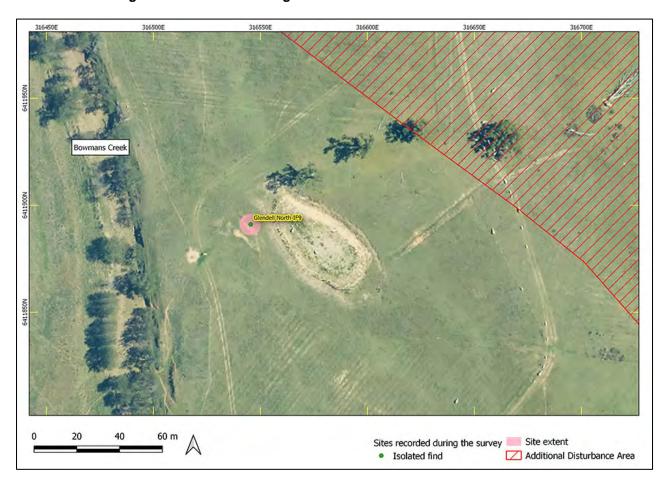
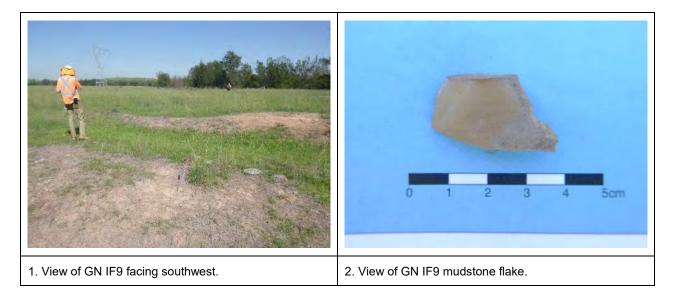


Figure 5-92: Aerial showing location and extent of Glendell North IF9.

Figure 5-93: Photographs showing an overview and details of Glendell North IF9.



Site Type: Isolated find

<u>Location of Site</u>: 970 m east of Hebden Road and 1.4 km north of Swamp Creek, Ravensworth (**Figure 5-5**). The site is located on sandy redeposited soils within a moderate gradient mid-slope (**Figure 5-94**).

<u>Description of Site</u>: Glendell North IF10 is a single mudstone backed flake (**Figure 5-95**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively previously cleared, currently representing grassy paddock with low weeds and isolated regrowth casuarina. The GSE at the time of recording was moderate (45%) with a GSV of 70% within these exposures. Ordinary stone fragments and pebbles were rare. Minimal conglomerate outcropping was present. Identified disturbances included erosion, previous clearing, and grazing.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF10 is assessed as negligible.

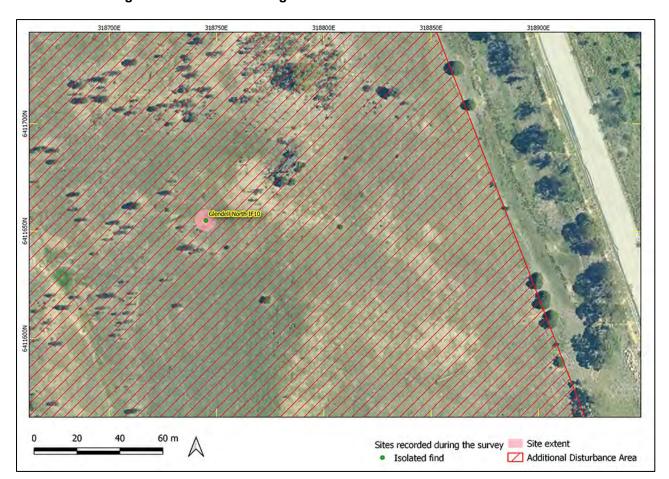
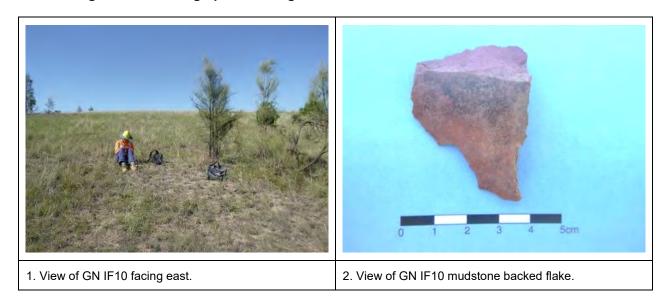


Figure 5-94: Aerial showing location and extent of Glendell North IF10.

Figure 5-95: Photographs showing an overview and details of Glendell North IF10.



Site Type: Isolated find

<u>Location of Site</u>: 600 m west of Hebden Road and 60 m north of Bowmans Creek, Ravensworth, within an erosive scour (**Figure 5-5**). The site is located on the edge of a gently sloping landform of cleared agricultural paddock (**Figure 5-96**).

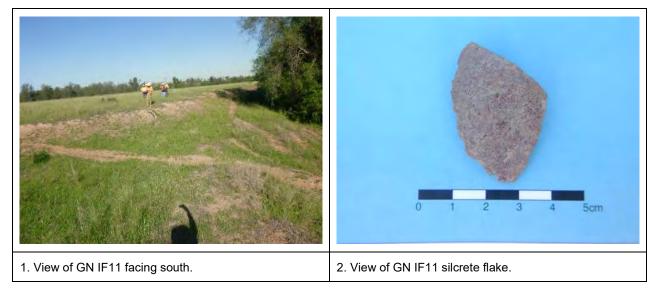
<u>Description of Site</u>: Glendell North IF11 is a single silcrete flake located in an erosive scour (**Figure 5-97**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringing on stands of mature growth. The GSE at the time of recording was low (20%) with a GSV of 80% within these exposures. Ordinary stone fragments and pebbles were prevalent. Identified disturbances included previous clearing, cattle trampling, scouring, and sheet wash erosion.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF11 is assessed as negligible.



Figure 5-96: Aerial showing location and extent of Glendell North IF11.

Figure 5-97: Photographs showing an overview and details of Glendell North IF11.



Site Type: Isolated find

<u>Location of Site</u>: 150 m east of Bowmans Creek and 1 km south of Ravensworth Homestead, Ravensworth, on the west side of Hebden Road (**Figure 5-5**). The site is located on a moderate gradient 650 m from the crest of the hill that slopes towards Bowmans Creek (**Figure 5-98**).

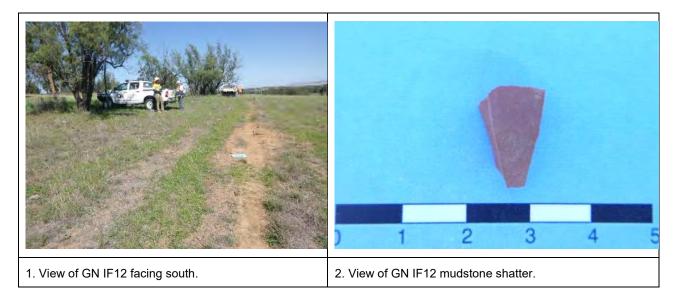
<u>Description of Site</u>: Glendell North IF12 is a single mudstone shatter located within the exposure of a property access track (**Figure 5-99**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by isolated regrowth natives. The GSE at the time of recording was low (25%) with a GSV of 60% within these exposures. Ordinary stone fragments and pebbles were infrequent. Identified disturbances included erosion, previous clearing, cattle trampling, and vehicle damage.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF12 is assessed as negligible.



Figure 5-98: Aerial showing locations and extents of Glendell North IF12 to Glendell North IF14.

Figure 5-99: Photographs showing an overview and details of Glendell North IF12.



Site Type: Isolated find

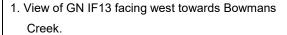
<u>Location of Site</u>: 50 m east of Bowmans Creek and 1.1 km south of Ravensworth Homestead, Ravensworth, west of Hebden Road (**Figure 5-5**). The site is located within a moderate gradient 750 m from the crest of the hill that slopes toward Bowmans Creek (**Figure 5-98**).

<u>Description of Site</u>: Glendell North IF13 is a single mudstone flake located on a lower slope (**Figure 5-100**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by isolated regrowth. The GSE at the time of recording was low (15%) with a GSV of 60% within these exposures. Ordinary stone fragments and pebbles were infrequent. Identified disturbances included erosion, previous clearing, and cattle trampling.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF13 is assessed as negligible.

Figure 5-100: Photographs showing an overview and details of Glendell North IF13.







2. View of GN IF13 mudstone flake.

Glendell North IF14

Site Type: Isolated find

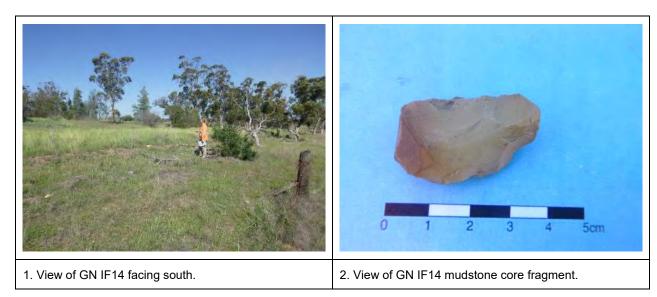
<u>Location of Site</u>: 100 m east of Bowmans Creek and 1.1 km south of Ravensworth Homestead, Ravensworth, on the west side of Hebden Road (**Figure 5-5**). The site is located within a moderate gradient 700 m from the crest of the hill that slopes toward Bowmans Creek (**Figure 5-98**).

<u>Description of Site</u>: Glendell North IF14 is a single mudstone core fragment located within the windrow of Hebden Road beneath a fence (**Figure 5-101**). The extent of the site is

defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by isolated regrowth natives. The GSE at the time of recording was low (25%) with a GSV of 60% within these exposures. Ordinary stone fragments and pebbles were dominant. Identified disturbances included erosion, previous clearing, cattle trampling, and the construction of Hebden Road and adjacent fence.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF14 is assessed as negligible.

Figure 5-101: Photographs showing an overview and details of Glendell North IF14.



Glendell North IF15

Site Type: Isolated find

<u>Location of Site</u>: 50 m east of Bowmans Creek and 1.4 km south of Ravensworth Homestead, Ravensworth, west of Hebden Road (**Figure 5-5**). The site is located within a moderate gradient 850 m from the crest of the hill that slopes toward Bowmans Creek (**Figure 5-102**).

<u>Description of Site</u>: Glendell North IF15 is a single mudstone flake located on an ant mound (**Figure 5-103**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by isolated regrowth. The GSE at the time of recording was low (20%) with a GSV of 70% within these exposures. Ordinary stone fragments and pebbles were frequent. Identified disturbances included erosion, previous clearing, cattle trampling, and the development of the adjacent ant mound.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF15 is assessed as negligible.



Figure 5-102: Aerial showing location and extent of Glendell North IF15.

Figure 5-103: Photographs showing an overview and details of Glendell North IF15.



Site Type: Isolated find

<u>Location of Site</u>: 1.3 km east of Hebden Road and 700 m north of Swamp Creek, Ravensworth, on a contour bank (**Figure 5-5**). The site is located within a low-moderate gradient mid-slope (**Figure 5-104**).

Description of Site: Glendell North IF16 is a single possible basalt grindstone (**Figure 5-105**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively previously cleared, currently representing grassy paddock with low weeds fringed by isolated regrowth casuarina. The GSE at the time of recording was moderate (45%) with a GSV of 80% within these exposures. Ordinary stone fragments and pebbles were rare. Minimal local conglomerate outcropping was present. Identified disturbances included erosion, previous clearing, grazing, and local contour banking.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF16 is assessed as negligible.

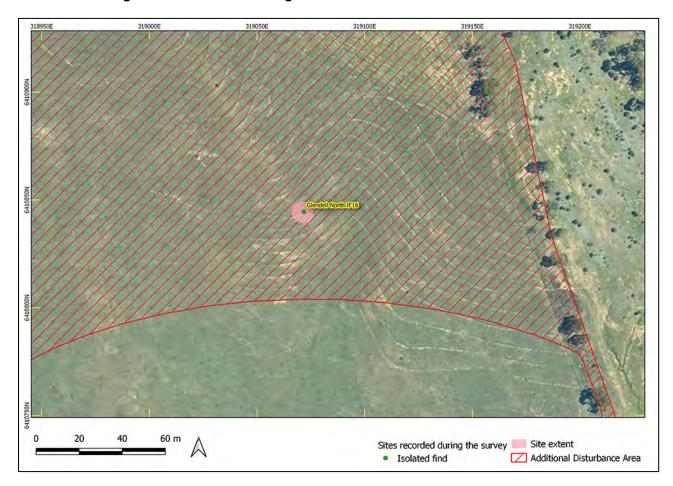
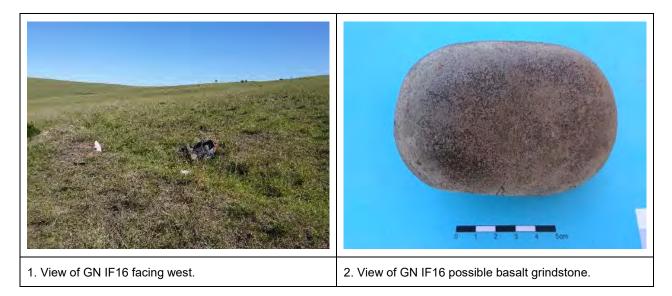


Figure 5-104: Aerial showing location and extent of Glendell North IF16.

Figure 5-105: Photographs showing an overview and details of Glendell North IF16.



Site Type: Isolated find

<u>Location of Site</u>: 220 m east of Hebden Road and 2 km south of Ravensworth Homestead, Ravensworth (**Figure 5-5**). The site is located within a slight gradient 50 m east of a terrace of Bowmans Creek, on the southern edge of a dam (**Figure 5-106**).

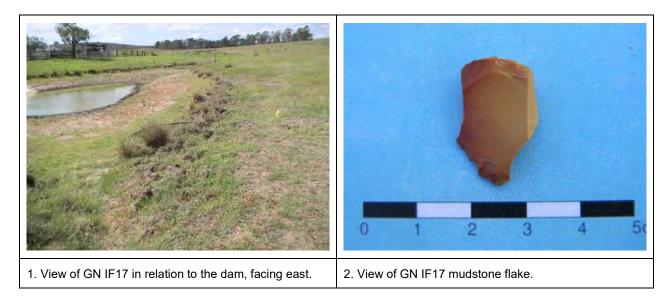
<u>Description of Site</u>: Glendell North IF17 is a single mudstone flake located on an artificial bund of a property dam (**Figure 5-107**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by isolated regrowth. The GSE at the time of recording was moderate (40%) with a GSV of 80% within these exposures. Ordinary stone fragments and pebbles were frequent. Identified disturbances included erosion, previous clearing, cattle trampling, and the construction of the adjacent dam.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF17 is assessed as negligible.



Figure 5-106: Aerial showing locations and extents of Glendell North IF17 and Glendell North IF18.

Figure 5-107: Photographs showing an overview and details of Glendell North IF17.



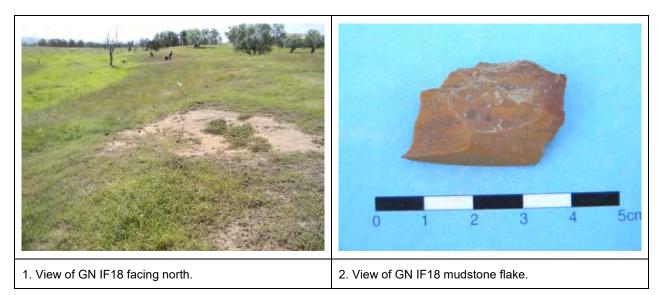
Site Type: Isolated find

<u>Location of Site</u>: 175 m east of Hebden Road and 2 km south of Ravensworth Homestead, Ravensworth (**Figure 5-5**). The site is located on a terrace of Bowmans Creek overlooking a grassy paddock floodplain (**Figure 5-106**).

<u>Description of Site</u>: Glendell North IF18 is a single mudstone flake (**Figure 5-108**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by isolated regrowth. The GSE at the time of recording was moderate (40%) with a GSV of 70% within these exposures. Ordinary stone fragments and pebbles were frequent. Identified disturbances included erosion, previous clearing, and grazing.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF18 is assessed as likely, with good soil depth observed.

Figure 5-108: Photographs showing an overview and details of Glendell North IF18.



Glendell North IF19

Site Type: Isolated find

<u>Location of Site</u>: 1 km east of Hebden Road and 150 m north of Swamp Creek, Ravensworth, west of Hebden Road (**Figure 5-5**). The site is located within an upper terrace of Swamp Creek adjacent to a graded road (**Figure 5-109**).

<u>Description of Site</u>: Glendell North IF19 is a single silcrete blade (**Figure 5-110**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared, currently representing grassy paddock with low shrubs fringed by stands of regrowth casuarina along the creek line. The GSE at the time of recording was high (70%) with a GSV of 90% within these exposures. Ordinary stone

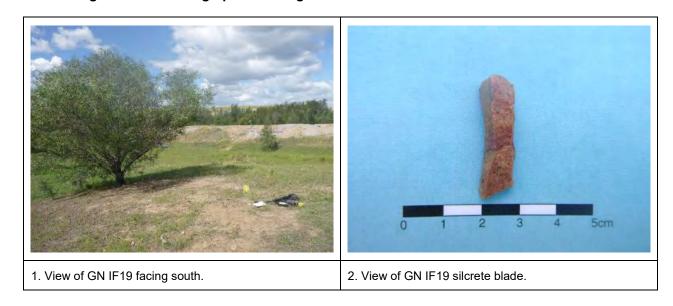
fragments and pebbles were frequent. Identified disturbances included erosion, clearing, and grazing.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF19 is assessed as negligible.



Figure 5-109: Aerial showing location and extent of Glendell North IF19.

Figure 5-110: Photographs showing an overview and details of Glendell North IF19.



Site Type: Isolated find

<u>Location of Site</u>: 220 m east of Hebden Road and 100 m west of Swamp Creek, Ravensworth, on an access track (**Figure 5-5**). The site is located on the break of slope of a gentle gradient and adjacent to a graded road (**Figure 5-111**).

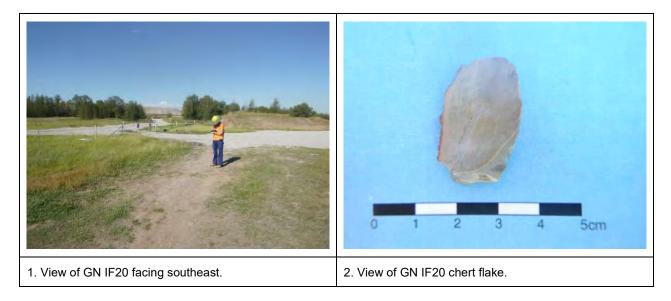
<u>Description of Site</u>: Glendell North IF20 is a single chert flake (**Figure 5-112**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by isolated casuarina regrowth. The GSE at the time of recording was low (30%) with a GSV of 60% within these exposures. Ordinary stone fragments and pebbles were frequent. Identified disturbances included erosion, previous clearing, grazing, and vehicle damage.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF20 is assessed as negligible.



Figure 5-111: Aerial showing location and extent of Glendell North IF20.

Figure 5-112: Photographs showing an overview and details of Glendell North IF20.



Site Type: Isolated find

<u>Location of Site</u>: 1.1 km northeast of The New England Highway and 1.7 km north of Bettys Creek, Ravensworth (**Figure 5-5**). The site is located on the east side of Swamp Creek eroding out of the bank (**Figure 5-113**).

<u>Description of Site</u>: Glendell North IF21 is a single mudstone flake (**Figure 5-114**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by casuarina regrowth along the creek line. The GSE at the time of recording was moderate-high (60%) with a GSV of 50% within these exposures. Ordinary stone fragments and pebbles were rare. Identified disturbances included erosion, previous clearing, and grazing.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF21 is assessed as negligible.

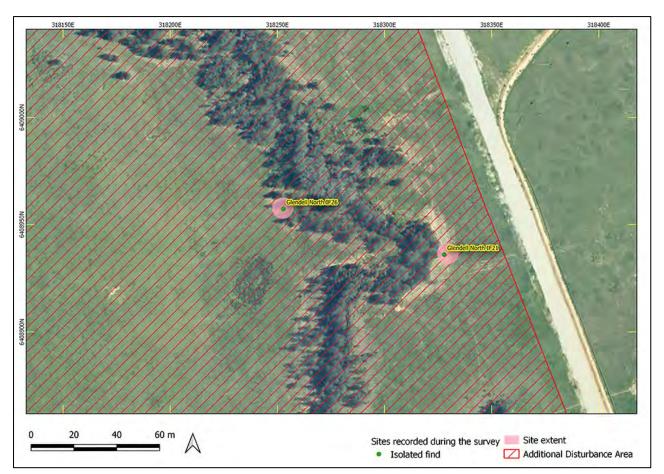
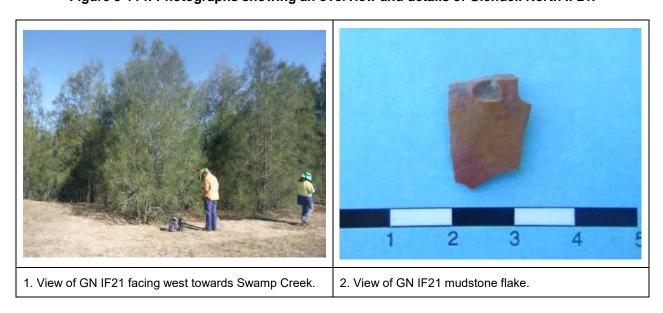


Figure 5-113: Aerial showing location and extent of Glendell North IF21.

Figure 5-114: Photographs showing an overview and details of Glendell North IF21.



Site Type: Isolated find

<u>Location of Site</u>: 150 m east of Hebden Road and 950 m south of Ravensworth Homestead, Ravensworth, on the eastern wall of a property dam (**Figure 5-5**). The site is located within a mid-slope landform that slopes towards Yorks Creek located 450 m to the west (**Figure 5-115**).

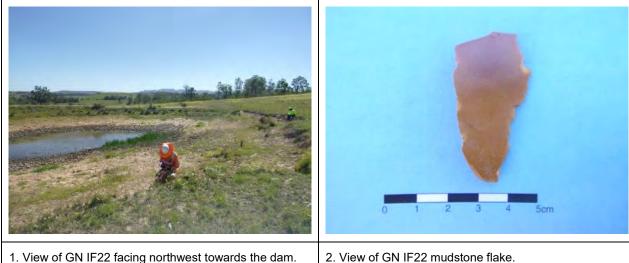
<u>Description of Site</u>: Glendell North IF22 is a single mudstone flake situated within the inundation area of a dam (**Figure 5-116**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by isolated casuarina regrowth. The GSE at the time of recording was moderate (50%) with a GSV of 80% within these exposures. Ordinary stone fragments and pebbles were infrequent. Identified disturbances included erosion, previous clearing, cattle trampling, and the construction of the adjacent dam.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF22 is assessed as negligible.



Figure 5-115: Aerial showing location and extent of Glendell North IF22.

Figure 5-116: Photographs showing an overview and details of Glendell North IF22.



Isolated find Site Type:

Location of Site: 125 m north of the Main North Rail Line and 50 m north of Bettys Creek, Ravensworth (Figure 5-5). The site is located at the junction of an access track and a graded road within a moderate gradient sloping south toward Bettys Creek (Figure 5-117).

Description of Site: Glendell North IF23 is a single silcrete flake (**Figure 5-118**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by boxthorn and regrowth casuarina. The GSE at the time of recording was low-moderate (25%) with a GSV of 60% within these exposures. Ordinary stone fragments and pebbles were infrequent. Identified disturbances included erosion, previous clearing, cattle trampling, and vehicle damage.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF23 is assessed as negligible.

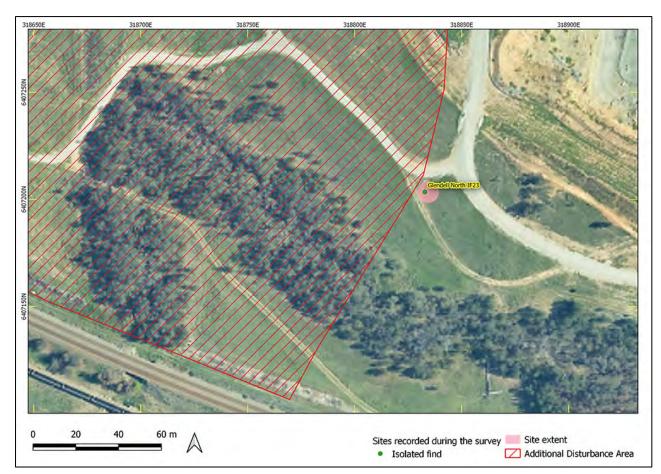
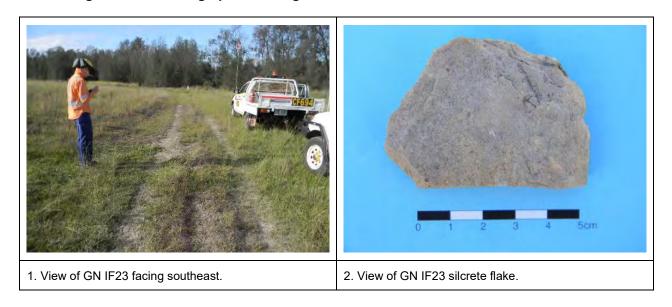


Figure 5-117: Aerial showing location and extent of Glendell North IF23.

Figure 5-118: Photographs showing an overview and details of Glendell North IF23.



Site Type: Isolated find

<u>Location of Site</u>: 450 m east of Hebden Road and 500 m south of Ravensworth Homestead, Ravensworth, on the south western wall of a property dam (**Figure 5-5**). The site is located within a mid-slope that descends towards Yorks Creek located 800 m to the west (**Figure 5-119**).

<u>Description of Site</u>: Glendell North IF24 is a single mudstone core situated within the disturbance area of an artificial bund (**Figure 5-120**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and represents grassy paddock fringed by stands of box, gum and casuarina regrowth to the south. The GSE at the time of recording was moderate (40%) with a GSV of 80% within these exposures. Ordinary stone fragments and pebbles were dominant. Identified disturbances included erosion, previous clearing, cattle trampling, and the construction of the adjacent dam.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF24 is assessed as negligible.

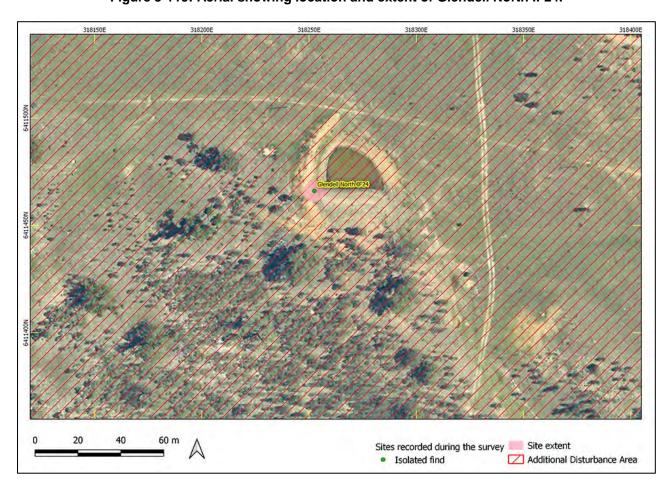
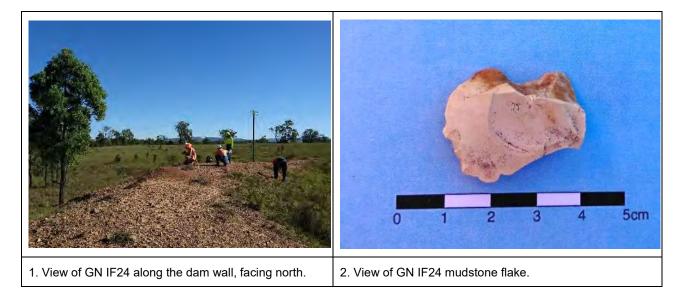


Figure 5-119: Aerial showing location and extent of Glendell North IF24.

Figure 5-120: Photographs showing an overview and details of Glendell North IF24.



Site Type: Isolated find

<u>Location of Site</u>: 1.2 km northeast of the New England Highway and 150 m southeast of Swamp Creek, Ravensworth (**Figure 5-5**). The site is located on the upper floodplain of Swamp Creek in stockpiled soil (**Figure 5-121**).

<u>Description of Site</u>: Glendell North IF25 is a single mudstone flake (**Figure 5-122**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared and disturbed by earthworks, currently representing high weed cover fringed by grassy paddock. The GSE at the time of recording was low (30%) with a GSV of 70% within these exposures. Ordinary stone fragments and pebbles were frequent. Identified disturbances included erosion, previous clearing, grazing, and earthworks. As a result, it is likely that the artefact has been transported to its find location from elsewhere.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF25 was assessed as negligible.

Glendell North IF25 was salvaged on 12 November 2018 according to Section 6.2.1.1 of the MOC ACHMP as it was located within the approved disturbance area for the Glendell Mine. The results of the salvage program are presented in **Appendix 3**.

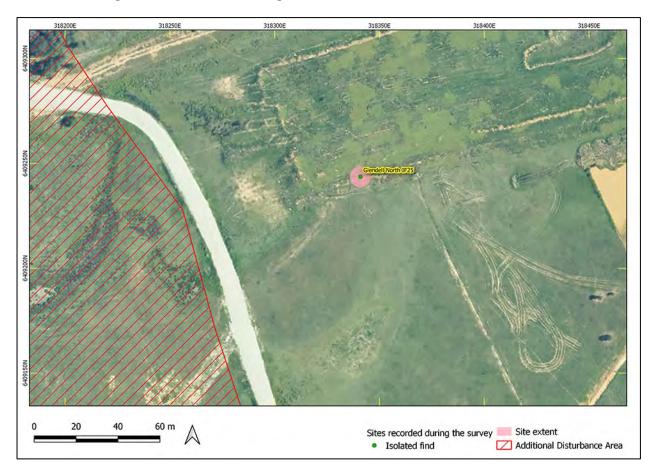


Figure 5-121: Aerial showing location and extent of Glendell North IF25.

Figure 5-122: Photographs showing an overview and details of Glendell North IF25.



Glendell North IF26 (formerly Glendell North PAD3)

Site Type: Isolated find with PAD

Location of Site: 1.1 km northeast of The New England Highway and 1.7 km north of Bettys Creek, Ravensworth (Figure 5-5). The site is located on the western side of Swamp Creek (Figure 5-123).

<u>Description of Site</u>: This site was recorded because of the test excavation program and has no surface manifestation. Details on the test excavation results at this site is presented in **Section 6.4.2**.

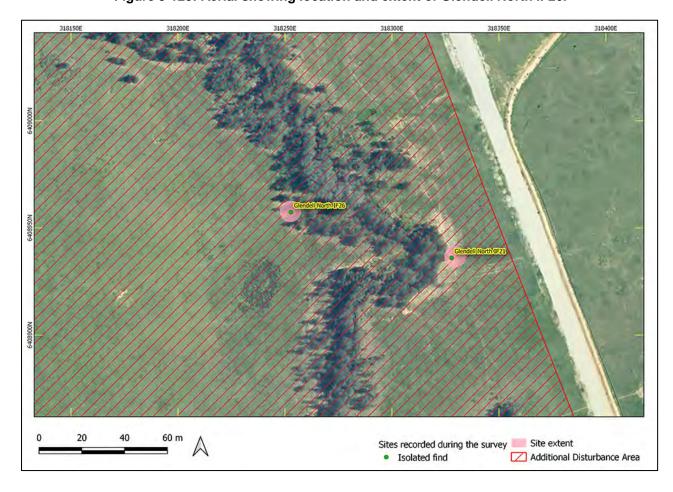


Figure 5-123: Aerial showing location and extent of Glendell North IF26.

Glendell North IF27

Site Type: Isolated find

Location of Site: 1.4 km north of the New England Highway, 485 m west of Hebden Road and at its closest 280 m northwest of Yorks Creek, Ravensworth (Figure 5-5). The site is located on the edge of a low ridge which overlooks the Yorks and Bowmans Creek floodplains (Figure 5-124).

<u>Description of Site</u>: Glendell North IF27 is a single mudstone horseshoe scraper (**Figure 5-125**). Glendell North IF27 was identified during the historical archaeology test excavation program.

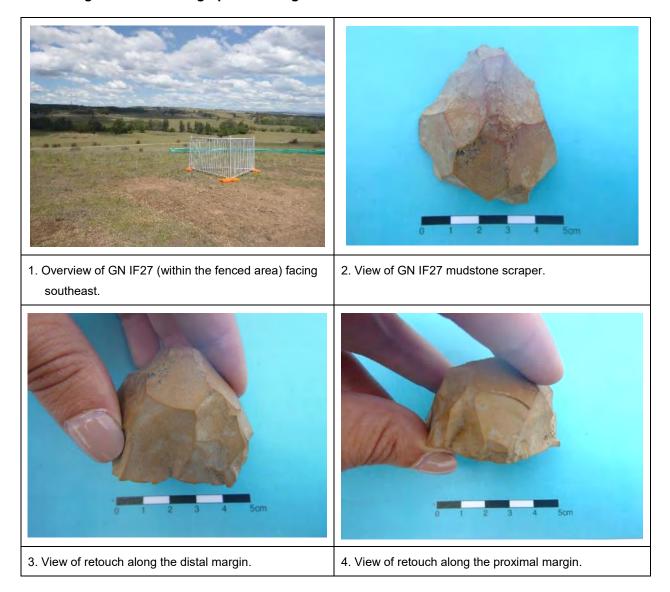
The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared, currently representing high weed cover fringed by grassy paddock. The GSE at the time of recording was low (30%) with a GSV of 70% within these exposures. Identified disturbances included erosion, previous clearing, grazing, and earthworks. Rock fragments and pebbles were frequent. Identified disturbances included erosion, previous clearing, grazing, and earthworks.

Potential for the presence of further, intact, subsurface archaeological deposits at Glendell North IF27 is assessed as negligible. It is noted that the adjacent subsurface historic archaeological investigations that were monitored by an OzArk archaeologist and Aboriginal community members did not uncover further subsurface Aboriginal archaeological deposits.



Figure 5-124: Aerial showing location and extent of Glendell North IF27 and Glendell North IF28.

Figure 5-125: Photographs showing an overview and details of Glendell North IF27.



Site Type: Isolated find

<u>Location of Site</u>: 1.4 km north of the New England Highway, 490 m west of Hebden Road and at its closest 335 m northwest of Yorks Creek, Ravensworth (**Figure 5-5**). The site is located along a low ridge which overlooks the Yorks and Bowmans Creek floodplains (**Figure 5-124**).

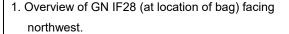
<u>Description of Site</u>: Glendell North IF28 is a single silcrete flake (**Figure 5-126**). Glendell North IF28 was identified during the historical archaeology test excavation program.

The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site has been extensively cleared, currently representing high weed cover fringed by grassy paddock. Identified disturbances included erosion, previous clearing and grazing. Rock fragments and pebbles were frequent.

Potential for the presence of further, intact, subsurface archaeological deposits at Glendell North IF28 is assessed as negligible. It is noted that the adjacent subsurface historic archaeological investigations that were monitored by an OzArk archaeologist and Aboriginal community members did not uncover further subsurface Aboriginal archaeological deposits.

Figure 5-126: Photographs showing an overview and details of Glendell North IF28.







2. View of GN IF28 silcrete flake.

Glendell North IF29

Site Type: Isolated find

Location of Site: 1.5 km northeast of the New England Highway, 140 m west of Hebden Road, Ravensworth (Figure 5-5). The site is located on the eastern side of Yorks Creek on an elevated terrace, approximately 30 m from the creek line (Figure 5-127).

<u>Description of Site</u>: Glendell North IF29 is a single mudstone flake (**Figure 5-128**). Glendell North IF29 was identified during the historical archaeology test excavation program.

The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation has been intensively previously cleared and represents grassy paddock with low shrubs fringed by casuarina and exotics along the creek line. The GSE within the vicinity of the dam was low-moderate (35%) with a GSV of 65% within these exposures. Gravel and regular stones were rare. Identified disturbances included clearing, grazing, ploughing, and erosion.

Potential for the presence of further subsurface archaeological deposits at Glendell North IF29 is assessed as negligible. It is noted that the adjacent subsurface historic archaeological investigations that were monitored by an OzArk archaeologist and Aboriginal community members did not uncover further subsurface Aboriginal archaeological deposits.

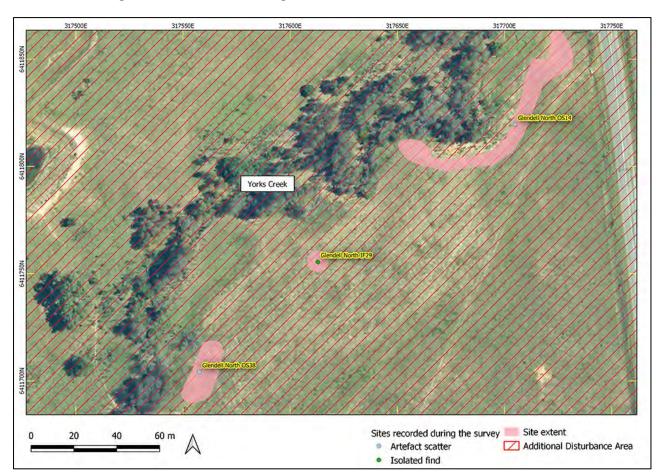
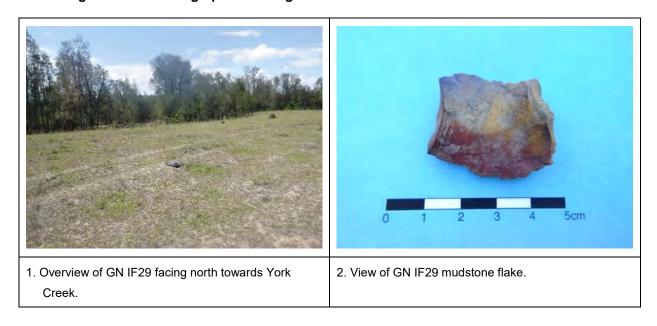


Figure 5-127: Aerial showing location and extent of Glendell North IF29.

Figure 5-128: Photographs showing an overview and details of Glendell North IF29.



5.4.3 Scarred tree

Glendell North ST1 (37-3-1561)

Site Type: Modified tree (scarred)

GPS Coordinates: GDA Zone 56 E 316124 N 6412405

<u>Location of Site</u>: 1 km north of the New England Highway and 1 km south of the Liddell pipeline and conveyor route, Ravensworth (**Figure 5-5**). The site is located on the southwestern bank of Bowmans Creek below a defined upper terrace (**Figure 5-129**).

<u>Description of Site</u>: Glendell North ST1 is a single scarred box tree (<u>Table 5-42</u>; <u>Figure 5-130</u>). The extent of the site is defined by a 10 m buffer around the tree. Surrounding vegetation at the site has been previously cleared, currently representing grassy paddock fringed by isolated eucalypts and casuarinas on the terrace and moderately-dense regrowth casuarinas along the creek line. The tree was not recorded in association with any other archaeological features. The GSE at the time of recording was low (20%) with a GSV of 60% within these exposures. Identified disturbances included erosion, previous clearing, and cattle trampling.

Potential for the presence of subsurface archaeological deposits at Glendell North ST1 is assessed as negligible.



Figure 5-129: Aerial showing location and extent of Glendell North ST1.

Figure 5-130: Photographs showing an overview and details of Glendell North ST1.



Table 5-42: Attributes of Glendell North ST1.

4. Alternate view of ST1 overgrowth.

Attribute	Description	Scar dimensions	Measurements (cm)
Tree species	Box	Length of dry face	210
Tree condition	Dead	Width of dry face	38
Scar orientation	Northwest	Height of base of scar above ground	<20
Type of scar	Elongated	Thickness of overgrowth (radial, from centre of tree)	30
Scar condition	Poor, rotten	Tree circumference	350

3. View of GN ST1 scar.

5.5 Previously recorded aboriginal sites located

In **Section 5.3** it was noted that 55 previously recorded sites remain 'valid' within the survey area or within immediate buffer areas. Of these 55 sites, 39 are within the Additional Disturbance Area. Two sites (37-3-0469; Bowmans/Swamp Creek Trench 1 and 37-3-1198; MOCO OS-10) have been partially salvaged under AHIP #2267 (Bowmans/Swamp Creek Trench 1) or the Mount Owen Continued Operations Project (SSD-5850) ACHMP (MOCO OS-10).

Table 5-43 lists all 55 registered sites and **Table 5-44** lists the results of the 2018 re-assessment of these sites. **Figure 5-131** shows the location of the previously recorded and registered Aboriginal sites. In **Table 5-43**, **Table 5-44** and **Figure 5-131**, the sites are identified by a unique ID (numeral from 70 to 124) to allow easier concordance between the tables and the figure. In addition, those sites not within the Additional Disturbance Area are marked by a blue highlight.

Further photographs of the sites and/or artefacts are presented in **Appendix 4**.

Table 5-43: All previously recorded and registered sites in or near the survey area.

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Site status	Notes
70	37-3-0294	Site 2; (MORL2)	321168	6410327	Artefact scatter	Valid	Within Additional Disturbance Area
71	37-3-0343	Mt Owen (1996) 1;MtO1;	318524	6414512	Artefact scatter	Valid	
72	37-3-0360	Mt Owen (1996)_2;	319084	6414419	Isolated find	Location uncertain	
73	37-3-0469	Bowmans/Swamp Creek Trench 1	318072	6409137	Artefact scatter	Partially destroyed	AHIP 2267 Within Additional Disturbance Area
74	37-3-0494	MO-IF2	319060	6410265	Isolated find	Valid	
75	37-3-0521	MO-IF1	319123	6410319	Isolated find	Valid	Within Additional Disturbance Area
76	37-3-0612	Bettys Creek 22	321138	6410296	Isolated find	Valid	Within Additional Disturbance Area
77	37-3-0686	Bowmans Ck 13	315983	6412942	Artefact scatter	Duplicate site	
78	37-3-0688	G12	315806	6412691	Artefact scatter	Valid	
79	37-3-0689	G11 Glendell	319223	6410211	Artefact scatter	Valid	Within Additional Disturbance Area
80	37-3-0727	Yorks Creek (Mt Owen Mine) 2	319041	6414427	Artefact scatter	Location uncertain	
81	37-3-0744	York Creek 1	317440	6411356	Artefact scatter	Valid	Within Additional Disturbance Area
82	37-3-0745	York Creek 2	317577	6411112	Artefact scatter	Valid	Within Additional Disturbance Area
83	37-3-0746	York Creek 3	317745	6411008	Artefact scatter	Valid	Within Additional Disturbance Area
84	37-3-0747	York Creek 4	317373	6411322	Artefact scatter	Valid	Within Additional Disturbance Area
85	37-3-0748	York Creek 5	317365	6411471	Artefact scatter	Valid	Within Additional Disturbance Area

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Site status	Notes
86	37-3-0749	York Creek 6	317501	6411813	Artefact scatter	Valid	Within Additional Disturbance Area
87	37-3-0750	York Creek 7	317484	6412170	Artefact scatter	Valid	Within Additional Disturbance Area
88	37-3-0751	York Creek 8	317496	6412805	Isolated find	Valid	Within Additional Disturbance Area
89	37-3-0752	York Creek 9	317685	6411312	Artefact scatter	Valid	Within Additional Disturbance Area
90	37-3-0753	York Creek 10	317865	6412266	Artefact scatter	Valid	Within Additional Disturbance Area
91	37-3-0754	York Creek 11	317782	6412443	Artefact scatter	Valid	Within Additional Disturbance Area
92	37-3-0755	York Creek 12	317846	6412581	Artefact scatter	Valid	Within Additional Disturbance Area
93	37-3-0756	York Creek 13	318352	6411400	Artefact scatter	Valid	Within Additional Disturbance Area
94	37-3-0757	York Creek 14	318417	6411813	Isolated find	Valid	Within Additional Disturbance Area
95	37-3-0758	York Creek 15	317849	6411202	Artefact scatter	Valid	Within Additional Disturbance Area
96	37-3-0759	York Creek 16	317827	6411497	Artefact scatter	Valid	Within Additional Disturbance Area
97	37-3-0760	York Creek 17	317626	6412595	Isolated find	Valid	Within Additional Disturbance Area
98	37-3-0761	York Creek 18	317712	6412158	Isolated find	Valid	Within Additional Disturbance Area
99	37-3-0762	Bowmans Ck 6	317645	6410765	Isolated find	Valid	Within Additional Disturbance Area
100	37-3-0763	Bowmans Ck 7	316542	6413142	Artefact scatter	Valid	Within Additional Disturbance Area
101	37-3-0764	Bowmans Ck 8	317205	6412329	Artefact scatter	Valid	Within Additional Disturbance Area
102	37-3-0765	Bowmans Ck 9	316878	6412410	Artefact scatter	Valid	Within Additional Disturbance Area
103	37-3-0766	Bowmans Ck 10	316833	6412566	Artefact scatter	Valid	Within Additional Disturbance Area
104	37-3-0768	Bowmans Ck_13	315982	6412940	Artefact scatter	Valid	
105	37-3-0770	Bowmans Ck 11	315824	6412493	Artefact scatter	Valid	
106	37-3-0771	Bowmans Ck 15	315825	6412677	Artefact scatter	Duplicate site	
107	37-3-0773	Swamp Ck 10	319006	6411169	Isolated find	Valid	Within Additional Disturbance Area
108	37-3-1013	REA141	318206	6407186	Artefact scatter	Valid	
109	37-3-1155	MT OWEN ISOLATED FIND2	317854	6411236	Isolated find	Valid	Within Additional Disturbance Area
110	37-3-1156	MT OWEN ISOLATED FIND1	318001	6410455	Isolated find	Valid	Within Additional Disturbance Area
111	37-3-1158	RPS DLW IF1	317148	6412677	Isolated find	Valid	Within Additional Disturbance Area
112	37-3-1166	LIDEE - IF3	315930	6413149	Isolated find	Valid	

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Site status	Notes
113	37-3-1194	MOCO OS-6	320718	6409739	Artefact scatter	Partially destroyed	
114	37-3-1198	MOCO OS-10	317840	6409364	Artefact scatter	Partially destroyed	Permit SSD 5850 Within Additional Disturbance Area
115	37-3-1490	Swamp Creek IF-4	318805	6407340	Isolated find	Valid Duplicate site	Within Additional Disturbance Area Description included in ID 122 (Swamp Creek- OS1)
116	37-3-1492	Swamp Creek IF-2	318807	6407327	Isolated find	Valid Duplicate site	Within Additional Disturbance Area Description included in ID 122 (Swamp Creek- OS1)
117	37-3-1493	Swamp Creek IF-3	318805	6407330	Isolated find	Valid Duplicate site	Within Additional Disturbance Area Description included in ID 122 (Swamp Creek- OS1)
118	37-3-1494	Swamp Creek IF-1	318640	6407727	Isolated find	Valid	Within Additional Disturbance Area Description included in ID 122 (Swamp Creek- OS1)
119	37-3-1496	SCK-9	318880	6410211	Artefact scatter	Valid	
120	37-3-1497	SCK-11	319086	6410220	Isolated find	Valid	
121	37-3-1498	Swamp Creek-OS2	318006	6408283	Artefact scatter	Valid	
122	37-3-1499	Swamp Creek-OS1	318819	6407300	Artefact scatter	Valid	Within Additional Disturbance Area. Encompasses Swamp Creek IF-1 to 4.
123	37-3-1502	Bowmans Creek 6	315509	6412710	Artefact scatter	Valid	Within Additional Disturbance Area
124	37-3-1503	Yorks Creek 19	317369	6411237	Artefact scatter	Valid	Within Additional Disturbance Area

Figure 5-131: Aerial showing the location of all previously recorded and registered sites in or near the survey area.

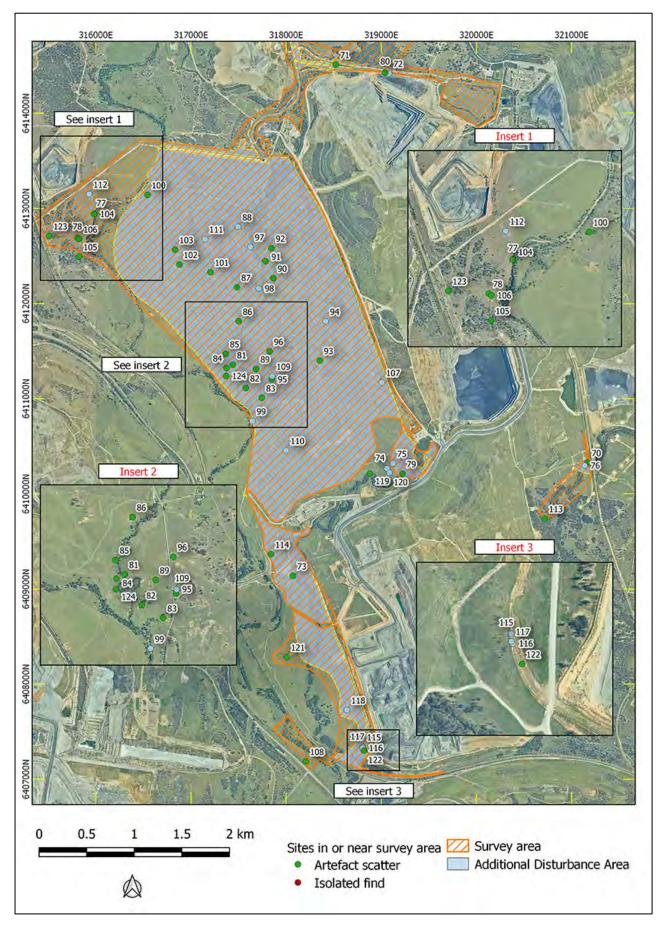


Table 5-44: Results of inspection of previously recorded, registered, sites in or near the survey area.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
70	37-3-0294	Site 2; (MORL2)	321168	6410327	Artefact scatter	20+ artefacts, including flakes and flaked pieces made from silcrete, chert, mudstone, and quartz, located adjacent to an ant's nest along Bettys Creek. The primary identified disturbance was grazing.	Artefacts were not able to be located, likely due to heavy vegetation cover and poor visibility. Location matches site card description and map plot. The site extent is currently fenced off.	VIEW OF SITE 2; (MORL2) LOCATION.
71	37-3-0343	Mt Owen (1996) 1;MtO1;	318524	6414512	Artefact scatter	11 artefacts, including flakes and flakes pieces made from mudstone and silcrete located on a vehicle track leading away from Yorks Creek. The primary identified disturbance was noted as grazing.	Artefacts were not able to be located, likely due to heavy vegetation cover and poor visibility. Location matches site card description and map plot.	VIEW OF MT OWEN (1996)1; MT01 LOCATION.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
72	37-3-0360	Mt Owen (1996)_2;	319084	6414419	Isolated find.	A single mudstone flake located mid-slope in grassland by a fence line.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Site card did not provide a photograph or description sufficient to be able to confirm accuracy of location.	VIEW OF MT OWEN (1996)2; LOCATION.
73	37-3-0469	Bowmans/Swamp Creek Trench 1	318072	6409137	Artefact scatter	479 artefacts, including flakes, retouched flakes, flaked pieces, cores, and a hammerstone, located within and along the wall of an artificial trench. Raw materials included mudstone, silcrete, quartz, quartzite, porcellanite, tuff, and volcanics. The 350 by 20 my extent was defined by the area of visibility within the trench.	Site comprises 100+ artefacts, consistent with those described, located in the context outlined in the site card. The primary identified disturbance, additional to the construction of the trench, was erosion. See Appendix 4 for additional site location and artefact photos.	VIEW OF BOWMANS/SWAMP CREEK TRENCH 1 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
74	37-3-0494	MO-IF2	319060	6410265	Isolated find	A single retouched chert flake. Context not described.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Site card did not provide a photograph or description sufficient to be able to confirm accuracy of location.	VIEW OF MO-IF2 LOCATION.
75	37-3-0521	MO-IF1	319123	6410319	Isolated find	A single mudstone flake. Context not described.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Site card did not provide a photograph or description sufficient to be able to confirm accuracy of location.	VIEW OF MO-IF1 LOCATION.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
76	37-3-0612	Bettys Creek 22	321138	6410296	Isolated find	A single mudstone flake located within an erosive scour on the bank of Bettys Creek. The surrounding area was assessed as a PAD. Identified disturbances included erosion and cattle trampling.	Artefact was not able to be located, likely due to heavy vegetation cover and poor visibility. Location matches site card description and map plot. The site extent is currently fenced off.	VIEW OF BETTYS CREEK 22 IN 2018.
77	37-3-0686	Bowmans Ck 13	315983	6412942	Artefact scatter	Five artefacts, including flakes and a microblade core, made from mudstone and silcrete, located on a lower slope above Bowmans Creek. The 20 by 10 m extent was defined by the area of visibility. The primary identified disturbance was erosion.	This site was determined to be a duplicate of Bowmans Creek_13 (#37-3-0768).	VIEW OF BOWMANS CK 13 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
78	37-3-0688	G12	315806	6412691	Artefact scatter	A scatter of chert, silcrete, mudstone, and quartz artefacts distributed at variable density over a segmented terrace of Bowmans Creek. The highest recorded artefact density was 7/m² and the presence of at least two knapping floors was noted. The 70 by 10 m extent was defined by the area of exposure over the landform. The primary identified disturbance was erosion.	Site comprises 100+ artefacts, including flakes, flaked pieces, backed flakes, blades, scrapers, and cores, located in the context described and in adjacent exposures along the same landform. Raw materials included mudstone, silcrete, quartz, chert, petrified wood, and tuff. The artefact scatter comprising this site was determined to be continuous over a 550 by 100 m area of creek terrace. Sites 37-3- 0771 and 37-3-0770 were recorded as duplicates of G12. Additional disturbances identified included previous clearing and grazing. See Appendix 4 for additional site location and artefact photos.	VIEW OF G12 IN 2018.
79	37-3-0689	G11 Glendell	319223	6410211	Artefact scatter	Three artefacts located on a low rise above Swamp Creek. Description of artefacts not included in site card. The primary identified disturbance was grazing.	Site comprises five artefacts, including flakes, a flaked piece, and a core, located in the context described. Raw materials included mudstone and silcrete. Additional identified disturbances included previous clearing and erosion. See Appendix 4 for additional site location and artefact photos.	VIEW OF G11 GLENDELL IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
80	37-3-0727	Yorks Creek (Mt Owen Mine) 2	319041	6414427	Artefact scatter	Twelve mudstone and silcrete artefacts located on an eroded bank of Yorks Creek.	Artefacts were not able to be located at the AHIMS location despite adequate areas of exposure. Context was not consistent with site card photograph or description. It is suspected that this site lies further north outside of the Additional Disturbance Area. However, as this cannot be verified by the information on the site card, it will be considered to be one of the sites within the Additional Disturbance Area.	VIEW OF YORKS CREEK (MT OWEN MINE) 2 IN 2018.
81	37-3-0744	Yorks Creek 1	317440	6411356	Artefact scatter	Six artefacts, including a flake and a backed flake, located on the floodplain of Yorks Creek at the toe of the first terrace. The 20 by 10 m site extent was defined by the area of exposure created by erosion. Raw materials included quartz, silcrete, and mudstone. No disturbances were noted.	Site comprises two silcrete flakes and a mudstone flake located along a vehicle track in the context described. Additional disturbances included previous clearing, grazing, and vehicle damage. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORKS CREEK 1 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
82	37-3-0745	Yorks Creek 2	317577	6411112	Artefact scatter	16 artefacts, including mudstone flakes, a core rejuvenation flakes, and a burin, located on an island of uneroded sediment (former terrace) on the floodplain of Yorks Creek. The 30 by 10 m extent of the site was defined by the area of visibility. No disturbances noted.	Site comprises 10+ artefacts, including mudstone flakes and chert shatter, recorded in the context described. Identified disturbances included erosion, vegetation clearing, and grazing. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORKS CREEK 2 IN 2018.
83	37-3-0746	Yorks Creek 3	317745	6411008	Artefact scatter	17 artefacts, including flakes, flaked pieces, and a core located over two exposures of a scoured tributary to Yorks Creek. Raw materials included mudstone and silcrete. The primary identified disturbance was erosion leading to heavy soil loss.	Site comprises 50+ artefacts, including mudstone cores, flakes, shatter, and debitage, as well as a pounder recorded in the context described. In the northern exposure of the site, many of these artefacts were distributed in a knapping floor complete with re-fits and debitage. Intactness of this feature suggested that a thin PAD may be present despite local erosion. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORKS CREEK 3 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
84	37-3-0747	Yorks Creek 4	317373	6411322	Artefact scatter	12 artefacts, including flakes, and a backed blade with PAD recorded along an access track on a terrace of Yorks Creek. Raw materials included mudstone, silcrete, and porcellanite. The primary identified disturbance was cultivation.	Site comprises 20+ artefacts recorded in the context described, including flakes, cores, and shatter made from mudstone and silcrete as well as a volcanic material axe blank. Additional identified disturbances included erosion and vehicle damage. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORKS CREEK 4 IN 2018.
85	37-3-0748	Yorks Creek 5	317365	6411471	Artefact scatter	The site was recorded in 2001 as sixteen flakes made from mudstone, silcrete, and petrified wood with PAD on an upper terrace of Yorks Ck. The 20 by 2 m extent was defined by area of exposure. The primary identified disturbance was cultivation. The site was re-recorded in 2017 as being sixteen artefacts with a 60 by 20 m extent. The PAD landform was delineated with a 130 by 75 m extent but described as having a thin A-Horizon, likely <10cm.	Site comprises seven silcrete and mudstone flakes recorded in the context described. Additional identified disturbances included erosion, vehicle damage, and stock trampling. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORK CREEK 5 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
86	37-3-0749	Yorks Creek 6	317501	6411813	Artefact scatter	Five artefacts, including flakes and a core, located on a lower slope along the wall of a dam. The 20 by 5 m site extent was defined by the area of visibility. Raw materials included mudstone, silcrete, and tuff. The primary identified disturbance was the construction of the adjacent dam.	Site comprises a silcrete flake and a retouched tuff flake located in the context described. Additional identified disturbances included previous clearing and grazing. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORKS CREEK 6 IN 2018.
87	37-3-0750	Yorks Creek 7	317484	6412170	Artefact scatter	Eighteen artefacts including flakes, cores, manuports, and a blade with PAD located on a lower slope above a tributary of Yorks Creek. The 100 by 20 m extent of the site was defined by exposure. The primary identified disturbance was slope wash erosion.	Site comprises three artefacts, including mudstone flakes as well as a possible pounder. These artefacts were primarily distributed along the steep eroded walls of the creek terrace. Additional identified disturbances included cultivation and cattle trampling. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORKS CREEK 7 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
88	37-3-0751	Yorks Creek 8	317496	6412805	Isolated find	A single mudstone flake recorded in a large area of sheet wash erosion along a tributary to Yorks Creek.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Area surrounding GPS plot matches site card description and figure.	VIEW OF YORKS CREEK 8 IN 2018.
89	37-3-0752	Yorks Creek 9	317685	6411312	Artefact scatter	Six artefacts, including flakes and a core, located mid-slope by an artificial drain. The 200 by 20 m extent is defined by the area of visibility along the drain. Raw materials included mudstone, silcrete, and tuff. The primary identified disturbance was the construction of the artificial drain, yet also included cultivation.	Site comprises four flakes, made from silcrete and mudstone, located in the context described. Additional identified disturbances included previous clearing and grazing. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORKS CREEK 9 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
90	37-3-0753	Yorks Creek 10	317865	6412266	Artefact scatter	Seven artefacts, including mudstone flakes and a backed point located on the lower slope of a creek terrace. Site described as being heavily disturbed by dam construction, fencing, and stock trampling.	Site comprises four artefacts, including flakes and a core made from silcrete and mudstone. These artefacts were recorded 50 m to the west within possible soil dumps associated with the construction/maintenance of the adjacent property dam. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORKS CREEK 10 IN 2018.
91	37-3-0754	Yorks Creek 11	317782	6412443	Artefact scatter	Nine artefacts, including flakes, flakes pieces, and a core located on a second creek terrace of Yorks Creek by a tributary. Raw materials included silcrete, mudstone, and quartz. The 20 by 2 m extent of the site was defined by area of exposure. The primary identified disturbance was cultivation.	Site comprises 15+ artefacts, including flakes, shatter, and cores, recorded in the context described. Was assessed as incorporating a PAD of limited depth in areas back from the creek. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORKS CREEK 11 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
92	37-3-0755	Yorks Creek 12	317846	6412581	Artefact scatter	Three mudstone flakes located mid-slope in an area of shade trees and frequent cattle movement. The 20 by 5 m extent was defined by area of exposure. The primary identified disturbance was cattle trampling.	Site comprises a single mudstone flake in the context described. See Appendix 4 for an additional artefact photo.	VIEW OF YORKS CREEK 12 IN 2018.
93	37-3-0756	Yorks Creek 13	318352	6411400	Artefact scatter	A mudstone flake and a silcrete flake located on an upper slope to the north of a tributary to Yorks Creek. The 15 by 5 m extent was defined by area of exposure. Identified disturbances included riling and scouring.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Area surrounding GPS plot matches site card description and photo.	VIEW OF YORKS CREEK 13 AHIMS LOCATION.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
94	37-3-0757	Yorks Creek 14	318417	6411813	Isolated find	A single quartzite flake recorded on an ant's nets mid-slope by a tributary to Yorks Creek. The primary identified disturbance was erosive scouring.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Area surrounding GPS plot matches site card description and photo.	VIEW OF YORKS CREEK 14 LOCATION.
95	37-3-0758	York Creek 15	317849	6411202	Artefact scatter	Seven artefacts, including flakes and an edge ground pebble axe made from mudstone, silcrete, and tuff. Located on a lower slope within a gully of extensive erosive scouring.	Site comprises four visible artefacts, including mudstone flakes and a mudstone core, located in the context described. Identified disturbances were consistent with the original recording. See Appendix 4 for additional site location and artefact photos.	VIEW OF YORK CREEK 15 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
96	37-3-0759	York Creek 16	317827	6411497	Artefact scatter	Two mudstone flakes located on a foot slope above a tributary to Yorks Creek. The 2 by 2 m extent was defined by the distribution of the artefacts within a large area of exposure. The primary identified disturbance was cultivation.	Site comprises a single mudstone flake located in the context described. See Appendix 4 for an additional artefact photo.	VIEW OF YORKS CREEK 16 IN 2018.
97	37-3-0760	York Creek 17	317626	6412595	Isolated find	A single mudstone flake located on a bank of Yorks Creek.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Area surrounding GPS plot matches site card description and figure. Additional identified disturbances included previous clearing and grazing.	VIEW OF YORKS CREEK 17 LOCATION.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
98	37-3-0761	York Creek 18	317712	6412158	Isolated find	A single silcrete flake located on a creek flat by a cattle track. The primary identified disturbance was cultivation.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Area surrounding GPS plot matches site card description and figure. Additional identified disturbances included previous clearing and grazing.	VIEW OF YORKS CREEK 18 LOCATION.
99	37-3-0762	Bowmans Ck 6	317645	6410765	Originally recorded as an isolated find; now an artefact scatter	A single mudstone blade located on the bank of Bowmans Creek in a scoured erosive scar.	Site comprises two mudstone flakes located 30 m to the northeast of the GPS plot in an area consistent with site description and photograph. Additional disturbances included cattle trampling and cultivation. See Appendix 4 for additional site location and artefact photos.	VIEW OF BOWMANS CK 6 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
100	37-3-0763	Bowmans Ck 7	316542	6413142	Artefact scatter	Artefact scatter (number of artefacts not disclosed) with PAD located along a track on a bench above Bowmans Creek. The 8 by 2 m extent was defined by exposure. The primary identified disturbance was land clearance.	Site comprises four mudstone flakes located in the context described. Additional identified disturbance included vehicle damage and the establishment of adjacent ant mounds. See Appendix 4 for additional site location and artefact photos.	VIEW OF BOWMANS CK 7 IN 2018.
101	37-3-0764	Bowmans Ck 8	317205	6412329	Artefact scatter	Four artefacts, including flakes, a flaked piece, and a core, located on a saddle landform along a linear erosive scour. The 30 by 2 m extent of the site was defined by the area of visibility along the scour. Raw materials included mudstone and silcrete. The primary identified disturbance was erosive scouring.	Artefact was not able to be located despite adequate areas of exposure. Area surrounding updated GPS plot matches site card description and photo. Additional disturbances included previous clearing and grazing.	VIEW OF BOWMANS CK 8 LOCATION.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
102	37-3-0765	Bowmans Ck 9	316878	6412410	Artefact scatter	A mudstone flake and a quartzite flake located in skeletal soils mid-slope, on the eroded banks of a tributary to Bowmans Creek. The 20 by 10 m site extent was defined by the area of visibility. The primary identified disturbance was erosive scouring.	Site comprises a single mudstone flake located in the context described. Additional disturbances included previous clearing and grazing. See Appendix 4 for additional site location and artefact photos.	VIEW OF BOWMANS CK 9 IN 2018.
103	37-3-0766	Bowmans Ck 10	316833	6412566	Artefact scatter	Seven artefacts, including flakes, a retouched flake, and a muller, located in skeletal soils mid-slope. The 150 by 20 m site extent was defined by area of visibility. Raw materials included mudstone, silcrete, quartz, and basalt. Identified disturbances included land clearance and slope wash erosion.	Site comprises five artefacts, including flakes and a retouched flake made of mudstone and a basalt axe blank, located in the context described. Identified disturbances were consistent with the original recording. See Appendix 4 for additional site location and artefact photos.	VIEW OF BOWMANS CK 10 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
104	37-3-0768	Bowmans Ck_13	315982	6412940	Artefact scatter	Five artefacts, including flakes and a microblade core made from mudstone and silcrete, located in skeletal soils on a lower slope at the head of a gully. The 20 by 10 m extent of the site was defined by the area of visibility. The primary identified disturbance was erosion.	Site comprises 15+ artefacts, including flakes, flaked pieces, a core, shatter pieces, and a blade, recorded in the context described. These were made from mudstone, silcrete, tuff, and volcanic raw materials. Additional identified disturbances included previous clearing, grazing, and water wash erosion. See Appendix 4 for additional site location and artefact photos.	VIEW OF BOWMANS CK_13 IN 2018.
105	37-3-0770	Bowmans Ck 11	315824	6412493	Artefact scatter	50+ artefacts, including flakes, retouched flakes, flaked pieces, cores, and a hammerstone, located either side of an eroded tributary to Bowmans Creek. The 200 by 300 m extent was defined by area of visibility. The potential for subsurface archaeological material was assessed as unlikely. The primary identified disturbance was erosion.	This site was determined to be a duplicate of G12 (#37-3-0688).	VIEW OF BOWMANS CK 11 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
106	37-3-0771	Bowmans Ck 15	315825	6412677	Artefact scatter	55+ artefacts, including flakes, retouched flakes, blades, cores, and a pebble basalt grindstone, located in the eroded bank of a tributary to Bowmans Creek. The 50 by 30 m extent was defined by area of visibility. The potential for subsurface archaeological material was assessed as highly likely back from the eroded bank. The primary identified disturbance was erosion.	This site was determined to be a duplicate of G12 (#37-3-0688).	VIEW OF BOWMANS CK 15 IN 2018.
107	37-3-0773	Swamp Ck 10	319006	6411169	Isolated find	A single mudstone flake recorded on the wall of a dam across a tributary to Swamp Creek. Identified disturbances include erosion and the construction of the adjacent dam.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Area surrounding GPS plot matches site card description and photo.	VIEW OF SWAMP CK 10 LOCATION.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
108	37-3-1013	REA141	318206	6407186	Artefact scatter	Eight flakes made from mudstone and silcrete located within the flooring of a shed on a terrace of Bowmans Creek. The 10 by 5 m extent of the site was defined by the distribution of these artefacts. Identified disturbances included construction of the shed, cultivation, grazing, and sheet erosion.	Site comprises a mudstone flake and a chert core located in the context described. Heavy vegetation cover hampered visibility surrounding the shed. No additional disturbances identified. See Appendix 4 for additional site location and artefact photos.	VIEW OF REA141 IN 2018.
109	37-3-1155	MT OWEN ISOLATED FIND2	317854	6411236	Isolated find	A single porcellanite core on an eroded lower slope on the edge of a small gully.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Area surrounding GPS plot matches site card description and photo. Recorded in an area of high general erosion.	VIEW OF MT OWEN ISOLATED FIND2 AHIMS LOCATION.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo		
110	37-3-1156	MT OWEN ISOLATED FIND1	318001	6410455 Isolated find				Artefact was not able to be located at the AHIMS location despite adequate	located at the AHIMS location despite adequate	VIEW OF MT OWEN ISOLATED FIND1 AHIMS LOCATION.
						access track.	location despite adequate areas of exposure. Area surrounding GPS plot matches site card description and photo			
111	37-3-1158	RPS DLW IF1	317148	6412677	Isolated find	A single mudstone flake located on an ant mound on a gentle slope.	Artefact was successfully re- recorded in the context described. Identified disturbances included clearing, grazing, and the establishment of the adjacent ant mound. See Appendix 4 for additional artefact photo.	VIEW OF RPS DLW IF1 IN 2018.		

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
112	37-3-1166	LIDEE – IF3	315930	6413149	Originally recorded as an isolated find; now an artefact scatter	A single mudstone flake located in an erosive scar at a break of slope above the Bowmans Creek Floodplain. Area was assessed as likely to contain further artefacts, however thick vegetation hampered visibility.	Site comprises seven artefacts, including silcrete and mudstone flakes and shatter located along the edge of a steep drop-off to Bowmans Creek floodplain amidst thin soils and heavy rock outcropping. The 130 by 30 m extent was defined by the area of visibility over the landform at the site. Identified disturbances included sheet wash erosion, severe subsidence, and cracking. See Appendix 4 for additional site location and artefact photos.	VIEW OF LIDEE-IF3 IN 2018.
113	37-3-1194	MOCO OS-6	320718	6409739	Artefact scatter	14 artefacts located adjacent Bettys Creek upon a flat plain within dense casuarina regrowth forest.	Site comprises five artefacts, including flakes, shatter, and a core made from mudstone and silcrete located in the context described. Identified disturbances included erosion and intensive previous clearing. The site has been partially destroyed under the Mount Owen Continued Operations Project (SSD-5850). See Appendix 4 for additional site location and artefact photos.	VIEW OF MOCO OS-6 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
114	37-3-1198	MOCO OS-10	317840	6409364	Artefact scatter	Ten artefacts, including mudstone and silcrete flakes, located on a rocky rise above Bowmans Creek. The 325 by 115 m extent was defined by area of exposure over the landform. Identified disturbances included construction of adjacent farm house and shed as well as vehicle damage. Site comprises two silcrete flakes and a mudstone core located in the context described. Additional identified disturbances included previous clearing and grazing. The site has been partially destroyed under the Mount Owen Continued Operations Project (SSD-5850). The site extent is currently fenced off.		VIEW OF MOCO OS-10 IN 2018.
115 116	37-3-1490 37-3-1492	Swamp Creek IF-4 Swamp Creek IF-2	318805 318807	6407340 6407327	Isolated finds	Description included in ID	122 (Swamp Creek-OS1)	
117	37-3-1494	Swamp Creek IF-1 Swamp Creek IF-1	318640	6407330	Isolated find	A single mudstone scraper located on the artificial wall of a dam.	Artefact was not able to be located at the AHIMS location despite adequate areas of exposure. Area represents highly modified artificial wall of dam. Additional disturbances included bulldozer trampling and erosion. Artefact was likely washed downslope or moved by machinery.	VIEW OF SWAMP CREEK-IF1 LOCATION.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
119	37-3-1496	SCK-9	318880	6410211	Artefact scatter	Four artefacts, including mudstone, volcanic, and silcrete flakes with use wear, recorded on an ant mound by the bank of Swamp Creek. The primary identified disturbance was the establishment of the adjacent ant mound.	Site comprises five artefacts, including flakes and a flaked piece made from mudstone, silcrete, and volcanic material, located in the context described. Additional disturbances included previously clearing, grazing, and erosion. See Appendix 4 for additional site location and artefact photos.	VIEW OF SCK-9 IN 2018.
120	37-3-1497	SCK-11	319086	6410220	Originally recorded as an isolated find; now an artefact scatter	A single mudstone end scraper located along a spur landform above Swamp Creek.	Site comprises two mudstone flakes located in the context described. Identified disturbances included previous clearing and grazing. See Appendix 4 for additional site location and artefact photos.	VIEW OF SCK-11 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
121	37-3-1498	Swamp Creek- OS2	318006	6408283	Artefact scatter	Six artefacts, including mudstone and silcrete flakes, located on the artificial bund of a property dam on the floodplain between Bowmans and Swamp Creeks. The 220 by 20 m extent was defined by the area of exposure over the bund. The primary identified disturbance was the construction and maintenance of the adjacent dam.	Site comprises three mudstone flakes and a silcrete flake recorded in the context described. Identified disturbances were consistent with those described. See Appendix 4 for additional site location and artefact photos.	VIEW OF SWAMP CREEK-OS2 IN 2018.
122	37-3-1499	Swamp Creek- OS1 (encompassing ID 116 to 118)	318819	6407300	Artefact scatter	26 artefacts, including flakes, cores, and retouched flakes made from mudstone, silcrete, and volcanic material located along an exposure created by earthworks associated with the construction of a large contour bank.	Site comprises 20+ artefacts, including flakes, cores, an end scraper, and a microlith located in the context described. Sites Swamp Creek-IF2 through to -IF4 (ID 115 to 117) were assessed as being part of this site. The 150 by 15 m extent of the site was defined by the area of exposure created by earthworks. Additional identified disturbances included erosion. See Appendix 4 for additional site location and artefact photos.	VIEW OF SWAMP CREEK-OS1 IN 2018.

ID	AHIMS ID	Site Name	GDA 56 Easting	GDA 56 Northing	Site type	Original site description	Current condition	2018 Site Photo
123	37-3-1502	Bowmans Creek 6	315509	6412710	Artefact scatter	Twelve artefacts, including flakes, flaked pieces, and an end scraper, located midslope within an electricity easement. Identified disturbances included previous clearing, grazing, sheet wash erosion, and the establishment of the electricity easement.	Site comprises 15+ artefacts, including flakes and a blade made from mudstone and silcrete, located in the context described. Disturbances were consistent with those previously described. See Appendix 4 for additional site location and artefact photos.	VIEW OF BOWMANS CREEK 6 IN 2018.
124	37-3-1503	Yorks Creek 19	317369	6411237	Artefact scatter	Two flakes made from silcrete and a fine-grained siliceous material located on an upper terrace by a vehicle track. Identified disturbances included previous clearing, grazing, vehicle damage, and erosion.	No artefacts were able to be located at the previously recorded location likely due to inadequate GSV. Area surrounding GPS plot matches previous description and photos.	VIEW OF YORKS CREEK 19 LOCATION.

6 ABORIGINAL ARCHAEOLOGICAL TEST EXCAVATION PROGRAM

6.1 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The test excavation program followed an extensive program of surface survey across areas that will be potentially impacted by the Project (**Section 5**).

The survey identified 12 areas where test excavation would provide a clearer picture of the subsurface archaeological potential. These areas, and the reasons why they were selected are outlined in **Table 6-1**. The location of these 12 areas are shown on **Figure 6-1**.

There several previously recorded sites in the Additional Disturbance Area where PADs are mentioned on the site card. However, not all these sites were investigated during the test excavation program and the reasons for their exclusion are outlined in **Table 6-2**.

The test excavation program was conducted at the 12 select locations from 3 September to 19 September 2018.

Table 6-1: Reasons why certain areas were chosen for test excavation.

Area	Landform	Reason for test excavation
Area 1	A broad elevated spur running parallel to Bowmans Creek.	Several artefact scatters are located within the landform.
Area 2	A large level area that is elevated above Yorks Creek on its eastern bank.	Area also occupied by Ravensworth Homestead, often an indicator of a prime occupational location.
Areas 3 & 4	Landforms on western bank of Yorks Creek close to its confluence with Bowmans Creek.	Appeared to have high archaeological potential during the survey.
Areas 5 & 6	Elevated landforms on the eastern bank of Yorks Creek close to its confluence with Bowmans Creek.	Appeared to have high archaeological potential during the survey.
Area 7	Terrace overlooking the floodplain for Bowmans Creek.	Several surface artefacts were visible during the survey.
Area 8	Elevated landform between Swamp Creek and what appears to be an old channel for Swamp Creek.	Allows landforms in this portion of Swamp Creek to be tested.
Areas 9 & 10	Two locations on either side of Swamp Creek.	Chosen at random in order to test the nature of deposits along this portion of Swamp Creek.
Areas 11 & 12	Centred on previously recorded sites where original recorders suggested PAD may be present.	Allows the banks on either side of Yorks Creek to be tested. Includes AHIMS #37-3-0754 and #37-3-0761.

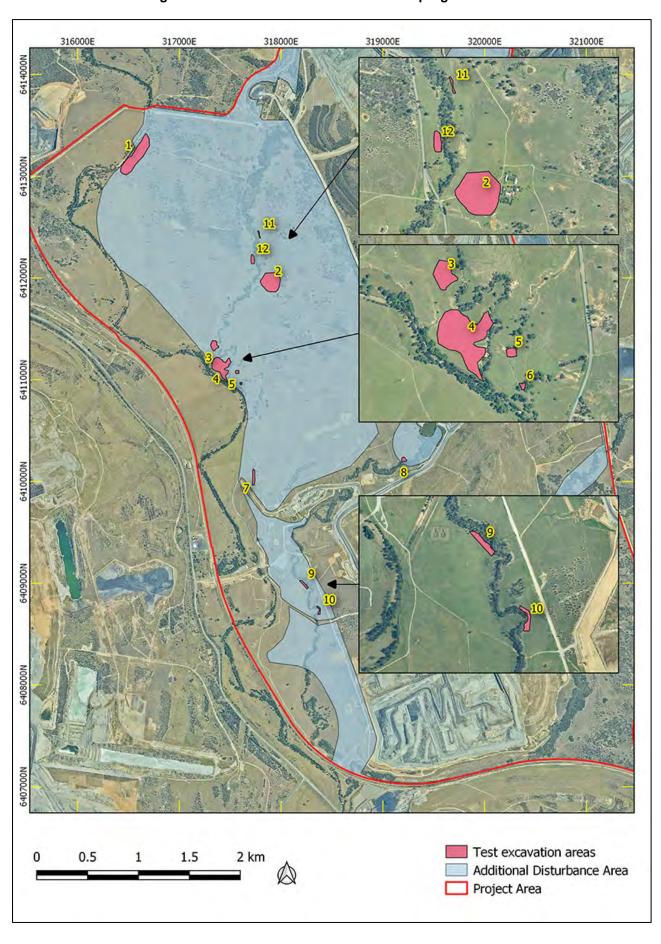


Figure 6-1: Location of the test excavation program areas.

Table 6-2: Previously recorded sites with PADs not included in the test excavation program.

Site ID	Site name	GDA East	GDA North	Reason for not including in test excavation
37-3-0753	York Creek 10	317865	6412266	Disturbed location. No potential noted during survey.
37-3-0752	York Creek 9	317685	6411312	Disturbed location. No potential seen during survey.
37-3-0748	York Creek 5	317365	6411471	Low-medium archaeological significance. Better location being tested to south (Area 3).
37-3-0617	Bowmans Creek 5	318015	6409874	Disturbed location. No potential seen during survey.
37-3-0612	Bettys Creek 22	321138	6410296	Within what was once a swamp/pond? Low archaeological potential.
37-3-0469	Bowmans/Swamp Creek Trench 1	318072	6409137	Previously investigated by Umwelt (see Section 4.4.2.1) and partially destroyed.
37-3-0766	Bowmans Ck 10	316833	6412566	Low archaeological values. Potential not visible at time of survey.
37-3-0764	Bowmans Ck 8	317205	6412329	Disturbance from buried pipeline. Will test nearby Bowmans Ck 7 (Area 1).
37-3-0762	Bowmans Ck 6	317645	6410765	Disturbed by cultivation. Other testing sites nearby (Area 4 to 6).
37-3-0760	York Creek 17	317555	6411497	Disturbed location. No potential noted during survey.
37-3-0759	York Creek 16	317827	6411497	Disturbed location. No potential seen during survey.

6.2 METHODOLOGY

6.2.1 Purpose of the test excavation program

Although the archaeologically sensitive areas that will be impacted by the Project are within a landscape that has undergone varying degrees of disturbance, there was still the potential for partially intact features and/or archaeological deposits to exist within the proposed disturbance area.

The purpose of the test excavation program was to understand more completely the nature of the subsurface material within the Additional Disturbance Area. Data obtained from the test excavation program informs the mitigation and management options in this AAIA.

The aims were therefore to:

- 1. Establish the extent and nature the of subsurface archaeological deposits at a site or landform with archaeological potential;
- 2. Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the Additional Disturbance Area; and
- 3. Develop, in consultation with the RAPs, an informed management strategy for the site to assist in mitigating the proposed impacts.

As a result, locations initially considered for the test excavation program are limited to:

- Areas identified during the pedestrian survey as having archaeological potential;
- Landforms which are relatively intact (i.e. not within disturbed contexts); and
- Previously recorded sites which were PADs or had PADs associated with them.

6.2.2 Rationale behind the test excavation methodology

The test excavation methodology is provided as **Appendix 5**. This document sets out the predictive model used to design the test exaction program.

While any test excavation program is limited in the level of research objectives it can achieve due to the restricted nature of the excavations, the test excavations for the Project attempted to shed light on:

- Do the results support previous findings that occupation appears denser along Yorks Creek when compared to Swamp Creek?
- Do elevated landforms associated with Bowmans Creek preserve subsurface archaeological deposits?
- Are additional archaeological features, such as hearths, present in the Additional Disturbance Area?
- How do the findings in terms of raw material use compare to other investigations in the vicinity of the Additional Disturbance Area?

6.2.3 Sampling methodology for text excavation program

For further details pertaining to the methodology of the test excavation program, see **Appendix 5**. **Table 6-3** summarises the methodology planned at each excavation area.

Table 6-3: Sampling methodology for the text excavation program.

Area	Test excavation methodology
Area 1	5 x 50 m transects, with each 50 m transect separated by 50 m. Transects will be positioned running along the spur, parallel to Bowmans Creek. Area 1 includes an area of PAD recorded during the survey. Decisions on the suitability of expansion will depend on the results of the first five transects.
Area 2	4 x 50 m transects will be initially excavated to examine areas closet to Yorks Creek and a tributary to Yorks Creek located to the south of the PAD area. Decisions on whether to expand excavation will depend on results of the initial four transects.
Area 3	2 x 50 m transects will be excavated so entire PAD area is investigated.
Area 4	5 x 50 m transects will be excavated to investigate areas closest to Yorks Creek and Bowmans Creek, as well as landforms near the confluence of the two creeks.
Areas 5 & 6	These PADs are too small for an entire transect. Instead two sets of two conjoined 0.5 m x 0.5 m pits will initially investigate these areas.
Area 7	2 x 50 m transects will be excavated running along the length of the terrace.
Area 8, 9, 10, 11 & 12	1 x 50 m transect excavated initially at each location.

6.3 THE ARTEFACT CATALOGUE

6.3.1 Analysis terminology

The artefact catalogue of the excavation assemblage forms the basis of the presentation and discussion of test excavation results that follow. The full catalogue is presented in **Appendix 6**.

Preliminary examination of the assemblage prior to cataloguing noted that it was not a complex assemblage with almost all artefacts being unmodified flakes. As a result, a tailored analysis was

carried out on the assemblage that allowed the site's characteristics to be captured. The flake attributes that were analysed for the assemblage are shown in **Table 6-4**.

Table 6-4. Terminology used in the artefact catalogue.

Catalogue entry	Description of catalogue entry
Area	Denotes which of the twelve excavation areas is being referred to (see Figures 6–1 and 6–2).
Transect	(Tr) Denotes which transect within an area is being referred to.
Square	(Sq) Denotes which square within a transect is being referred to.
Spit	All spits were 5cm. Therefore Spit 1 is 0cm to 5cm. If no spit is recorded it is because, due to the paucity of results, the entire pit was excavated in one spit.
Artefact type	Describes the type of artefact recorded. At this excavation, primarily flakes or less commonly blades, cores or scarpers etc. The following abbreviations are used:
	F = Flake; B = Blade; FP = Flaked Piece; BF = Backed Flake; BB = Backed Blade; M = Microlith; ES = End scraper; SS = Side scraper; A = Ground edge axe; AB = Axe blank; C = Core; S = Shatter; AH = Anvil/hammerstone; O = Other
Raw Material	Silcrete, mudstone, quartz and volcanics were recorded in the Survey Area.
	The following abbreviations are used:
	MS = Mudstone; S = Silcrete; C = Chert; T = Tuff; B = Basalt; V = Volcanics (other); PW = Petrified Wood; QZ = Quartzite; Q = Quartz; O = Other
Integrity	Records whether an artefact is complete or broken, and if broken, what type of break has occurred (i.e. whether the break is to the top (proximal) end of a flake, to the bottom (distal) end or medial if both proximal and distal ends are missing. Rarely longitudinal breaks (i.e. broken down the flake's axis) were recorded.
Max. dimension	Most often this measurement is along the plane of percussion. In some instances, such as when a flake is inordinately wide, measurement along the largest plane is taken.
	Size ranges are provided where: 1 = 0-10mm; 2 = 10-20mm; 3 = 20-30mm; 4 = 30-50mm; 5 = 50-100mm; 6 = greater than 100mm.
Reduction phase	The percentage of cortex in comparison to the full artefact was catalogued according to the following scale.
	Primary reduction (1): 50% or more cortex; Secondary reduction (2): 1% to 50% cortex; Tertiary reduction (3): no cortex.
Rotation	A parallel rotation (p) is one where the dorsal scars are in the same direction as the flake's plane of percussion. A rotated flake (r) is one where the dorsal flake scars are at a varying angle to the flake's plane of percussion. Not discernible (n) refers to flakes with cortical dorsal surfaces where rotation cannot be determined or on often small flakes that only retain one previous flake scar on the ventral surface.
Platform type	Records the proximal characteristics of a flake. Terms used to describe platforms are 'simple' (s) for what would commonly be regarded as a standard platform showing no faceting; 'point' (p) for very small platforms; 'Cortex' © for platforms containing cortex; 'Crushed' (cr) for platforms displaying crushing/shattering to the platform; and "Flaked (f) for platforms displaying platform preparation in the form of several flake removals from the platform surface.
Platform size	When intact on an artefact the platform size was described through the following abbreviations:
	1 = Point; 2 = Very small (up to c. 3mm); 3 = Small (up to c. 5mm); 4 = Moderate (up to c. 10mm); 5 = Large (over c. 10mm)
Termination type	Records the distal characteristics of a flake. At this excavation 'Feather' (f) terminations were common where a flake terminates in a smooth, triangular cross-section. Also present were 'Step/Hinge' (sh) terminations and rarely 'Plunge' (p) terminations.
Notes	Any additional comments are provided here.
	I .

A discussion on why these attributes were analysed follows.

Artefact type

Description: Possible artefact types include flakes, blades, retouched flakes/blades, cores, scrapers, shatter/fragments and other (hammerstones, grindstones, ground-edge axes) although not all may be present at any one site.

Issues: Classing artefacts, generally, does not usually entail significant problems. A minority of artefacts are difficult to define such as ambiguities between recognising flaked pieces (flakes subsequently used as a core to source further flakes), and between cores and scrapers.

Uses: This category will be used to assess differences in provisioning strategies (e.g. core provisioning as opposed to flake provisioning), differences in site function/use (e.g. presence/absence of grindstones), and the taphonomic effects of past land use on the site (are more broken artefacts part of the assemblage?).

Raw Material

Description: A largely self-explanatory attribute, raw materials expected to be present include silcrete, mudstone, quartz and volcanics.

Issues: This category often has problems for analysts without a geological background. Even then, without breaking an artefact, the true nature of the stone will sometimes remain uncertain. Illustrations are provided in **Figure 6-2** to remove the ambiguity often associated with stone raw material identification. This will allow other researchers to identify the type of stone recorded here as, for example, 'silcrete'. By far the most common stones utilised for artefact manufacture in the Additional Disturbance Area are mudstone and silcrete; both of which come in a variety of colours from pale, through yellow to red. Sometimes a single artefact will have been struck from a cobble displaying two distinct colours. While heat treatment has been put forward to explain this colour variation; particularly from yellow to red in silcrete (Moore 2000), examples from the Additional Disturbance Area lack a lustre that would suggest that heat treatment has caused this colour change. Other stone types such as chert, quartz, volcanics etc. occur but in much smaller quantities when compared to mudstone and silcrete.

Uses: Raw material is an important attribute, which may broadly indicate the place of origin of an artefact. The dominance of one raw material or another may also be used to group or differentiate sites. Raw material is also frequently used in concert with attributes in the creation of analytic units for more in-depth inter and intra site comparisons.

Figure 6-2. Examples of raw material types from the Additional Disturbance Area.



Artefact Breakage

Description: At a basic level, flakes break in three different ways. Two are transverse (at 90 degrees to the direction of percussion) – proximal and distal; one is longitudinal (along the plane of percussion).

Issues: It is occasionally difficult to be certain of the breakage on an artefact. In most cases, however, the kind of breakage can be ascertained.

Use: It is important to differentiate broken from complete flakes for the purposes of analysis, as the two are not comparable in regard to a number of measures. The amount of artefact breakage in an assemblage also indicates the degree of fragmentation to which the assemblage has been subject. In highly fragmented assemblages, the actual number of artefacts represented may be significantly exaggerated. Quantifying breakage allows a more accurate approximation of artefact numbers to be made.

Dimensions⁸

Description: Percussive dimensions measure the maximum length of the flake in the direction of force application from the point that force was applied. In this regard it relates to the length of core face that was removed during the manufacture of the artefact.

Issues: There is some uncertainty as to what these attributes are actually measuring in terms of the flake manufacturing process.

Use: Flake dimensions are expected to correlate with differences in the provisioning and reduction strategies at different places. For example, the reduction of cores at a site will produce many moderate to small flakes and some larger flakes. As a result, a histogram of flake length will show a relatively consistent increase in number of flakes from large to small. Contrastingly, when most flakes are the result of retouching or maintenance tasks on other flakes, most of the flakes remaining should be very small, with comparably few large to moderate flakes. However, it may be the case that a few moderate to large flakes will be discarded at the site as they are exhausted through excessive/heavy retouch or simply thrown away prior to a reprovisioning event. In such a case, a histogram of artefact size should show bimodality regarding length (a small peak in the moderate range and a large peak in the small range).

Aboriginal Archaeology Impact Assessment: Glendell Continued Operations Project

⁸ From experience OzArk does not routinely weigh artefacts as this information has been found to closely correlate either to artefact size or the raw material from which the flake has been struck. Thus, smaller artefacts are lighter than larger artefacts when made from the same material and artefacts made from denser stone (such as volcanics) are heavier than comparably sized artefacts from lighter (less-dense) stones such as IMT. In practice, the category cataloguing the maximum size of the artefact is analogous with the artefact's weight.

Reduction

Description: This category refers to the level of reduction evident on an artefact. This is assessed by the amount of cortex remaining on the artefact. Cortex refers to the 'skin' of a rock – the surface that has been weathered to a different texture and colour by exposure to the elements over a long period. The amount of cortex as a percentage of surface area will be measured on all artefacts (in relation to flakes, cortex can, by definition only occur on the dorsal and platform surfaces). The nature of cortex – its shape and texture – will vary depending on where the raw material was sourced. This measurement will help determine if a particular artefact is at a primary, secondary or tertiary level of reduction.

Issues: This is a relatively unambiguous descriptive category.

Use: When a natural cobble is first selected it will usually be covered in cortex. Therefore, the first artefacts produced from it will have a complete coverage of cortex on the dorsal side (primary reduction). As the cobble is increasingly reduced the amount of cortex on each artefact will rapidly decrease (secondary reduction) until it ceases to be present on artefacts (tertiary reduction). As a result of this trend, it should be possible to determine how early in the reduction sequence the artefact was produced. If large numbers of artefacts or a high proportion of the artefacts of a raw material retain cortex it may indicate that the site is in close proximity to the source. Differences between the proportions of artefacts retaining cortex between different raw material indicates relative differences in distance to source. This does not necessarily mean distance in terms of measurable distance across the landscape; it may also reflect length of time since leaving the source. For example, the last campsite when a group is returning to the source of the raw material may be very close to the source in terms of distance, but distant in terms of time elapsed since the group left the source. If artefacts with cortex are occurring in sites a long distance from the place of origin of the natural cobble, then it is likely that cobbles were being transferred to the site when still only slightly reduced. This would imply an attempt to maximise the amount of stone being provisioned with the weight of transported material being a relatively minor concern.

Rotation

Description: Describes whether a particular flake was struck from a core that was rarely rotated (a unidirectional or bidirectional core), or from a core that has been rotated frequently (a multidirectional core).

Issues: There is little ambiguity in assessing this category. If the orientation of previous flakes was unclear, this category is left blank.

Use: An examination of the direction in which previous flake scars on an artefact's dorsal surface have been removed, along with the orientation in which the flake itself was removed from its core, will give evidence about the core from which the flake was struck. This enables a greater sample

pool to determine the types of cores used in the Project Disturbance Boundary even if the original core may not have been recorded in the investigation.

Platform Surface

Description: Platform surface will be recorded as one of the following: simple, point, cortical, crushed or flaked.

Issues: This is a largely unambiguous descriptive attribute.

Use: The surface of a platform provides information about the history of the core prior to the detachment of the flake, and also about methods employed to control the flaking process. In particular 'point' platforms often imply the use of an intermediary punch (or in-direct percussion) to remove a flake; while 'simple' platforms are often indicative of free-hand percussion. Crushing on the platform surface can imply a bipolar reduction technique where the core is first rested on an anvil prior to the flake being detached. Platforms displaying flaking have been linked to the systematic production of 'blades'. Patterns in the spatial distribution of these attributes may be used to infer differences in reduction strategies.

Platform Size

Description: Platform size will be recorded as fulfilling one of a series of size ranges.

Issues: This is a largely unambiguous descriptive attribute.

Use: Like the platform surface, platform size is illustrative in determining the type of reduction technique used to detach a flake. Generally speaking, the smaller (finer) the platform size implies a greater likelihood that it was detached by in-direct percussion rather than direct percussion which often results in a large platform size.

Termination

Description: Termination refers to the way in which force leaves a core during the detachment of a flake. Every complete flake has a termination. There are patterns in the forms that terminations will take, with the three major categories (those to be used here) being feather, hinge/step and plunging (outrepasse).

Issues: This is a largely unambiguous descriptive attribute although care needs to be taken to distinguish terminations on a previous flake scar from hinge/step terminations or breakages.

Use: Different terminations have different implications both for flake and core morphology. A flake with a feather termination (in which force exits the core at a low or gradual angle) will have a continuous sharp edge around the periphery beneath the platform. This has advantages in terms of the amount of the flake edge that can be used for cutting and makes the flake more amenable to subsequent retouching or resharpening activities. Detaching flakes with feather terminations also

has minimal impact on the effective platform angle of the core, and so platform angle thresholds are reached relatively slowly while feather terminating flakes continue to be produced.

Hinge and step terminating flakes have none of these advantages. They result in edges that are amenable neither to cutting nor to retouching. Furthermore, hinge and step terminations lead to rapidly increasing effective platform angles, leading to a requirement for core rejuvenation and core exhaustion. For these reasons, such terminations are considered undesirable or *aberrant*. The number of aberrant flake terminations is expected to increase towards the end of a core's use-life, as reduction in core size and increase in core platform angle make it increasingly difficult to detach feather terminating flakes. In areas where aberrantly terminating flakes are relatively common it may be inferred that core potential was more thoroughly exploited. From this it may in turn be inferred that the pressure to realize core potential (e.g. a strategy of heavy raw material conservation) was greater. Increased mobility/emphasis on portability is one possible explanation of such a pattern.

Plunging or outrepasse flakes have the opposite effect on core morphology to step and hinge flakes, in that they remove the entire core face and part of the core bottom. As a result, such flakes may be used to rejuvenate cores in which core angles have become high, but which still retain useable potential (e.g. are still quite large). The presence of outrepasse flakes may be taken to indicate core rejuvenation and the requirement to increase core use-life.

6.3.2 Research considerations

Stone artefacts are probably the most resilient physical evidence of Aboriginal occupation in Australia and for many parts of the country form the most abundant archaeological evidence of Aboriginal occupation. Stone artefacts are important because they are tangible evidence of Aboriginal use of an area and can potentially contain information about lithic activities, the organisation of stone technologies, and potentially information about larger-scale issues of settlement organisation across regions and even social change over time.

The kinds of information which can be obtained from stone artefacts may vary considerably, depending in part on:

- The numbers of artefacts which can be examined and recorded: generally, the larger the number of artefacts the more reliable will be statistical statements about them;
- The presence of other assemblages with which the artefacts can be compared;
- The condition of sites in which they occur: generally undisturbed sites have more information potential than disturbed sites, depending on the scale at which research is carried out; and
- The theory which underlies the artefact recording and analysis.

6.3.2.1 Statistically useful sample sizes

A large enough number of artefacts need to be recorded so that analyses can be based on statistically sound data (Leonard and Jones 1989). The numbers of artefacts which are needed in a sample will depend on how common or rare certain kinds of artefacts are. If a summary of most common raw material types is required, then a random sample of 20 or 30 artefacts might suffice. On the other hand, if no backed artefacts were found, and this type normally makes up 1% of an assemblage, then several hundred artefacts would need to be recorded to indicate whether or not backed artefacts are present on a site or in a certain landscape setting. Ideally, sample sizes should be large enough to be able to carry out statistical tests of significance (Clegg 1990).

6.3.2.2 Condition

As a rule, artefacts from undisturbed sites may be able to provide more information than artefacts from disturbed sites. On sites in good physical condition it may be possible to identify artefacts relating to individual lithic activities, such as knapping floors (Hiscock & Mitchell 1993). It may be possible to refit or conjoin artefacts and analyse the evidence from those activities (White 1999). On very heavily disturbed sites the artefacts themselves may be very broken, making it harder to analyse them.

6.3.2.3 Theory and recording

Stone artefacts can be recorded and analysed in different ways to give different kinds of information about different topics. The variables that are recorded and the interpretations which are made will depend in part on the theory which underlies the analysis. If someone wants to know what stone tools were used for, then artefacts should be examined under a microscope for use-wear and residues. If someone wants to know how stone was flaked and tools were made, then a technological analysis may record data on stone flaking such as patterns of scarring on cores or flakes. If someone wants to know about how stone materials were obtained (procured), transported and discarded then recording might focus on stone raw materials – information about raw material types and where they occur naturally in the landscape will be critical, and raw material type and size of artefacts may be recorded.

Consulting projects may seek to provide a basic description of an assemblage, recording just a few variables to give information about general topics. The present analysis records provenance information (where each artefact was found) and nine other variables, with some additional information for modified artefacts and cores. This level of recording should not be regarded as a definitive record of the assemblage. If artefacts are kept in a safe place they can be reanalysed in the future to provide new information and address new questions.

6.4 TEST EXCAVATION RESULTS

6.4.1 Preamble

The results of the test excavation program were surprisingly sparse. 152 0.5 m by 0.5 m excavation squares were excavated at 12 separate localities: a total of 38 square metres. From this area of excavation, 180 artefacts were recovered; an average of 4.7 artefacts per square metre or 1.18 artefacts per excavation square. This density of artefacts is extremely low.

In addition, there were only two excavation squares that recorded artefacts in numbers greater than 15. Both squares were located at Area 1 along Tr5, however, squares excavated adjacent to them failed to record similar artefact numbers.

Therefore, in summary, the results show an extremely low incidence of subsurface artefacts apart from two isolated clusters at Area 1. Based on these results it would appear that, as a result of the historic disturbances to the area, intact subsurface deposits are extremely rare within the Project Area and that the visible artefacts are the remnants of sites that have been comprehensibly disturbed.

Consequently, due to the low artefact numbers it is difficult to draw many conclusions from the test excavation assemblage as any one location did not record artefacts in sufficient quantities to make analysis, beyond the most basic, meaningful (see **Section 7.2.1**).

Table 6-5 summarises the location and results from each excavation square (locations of each area are shown in **Figure 6-1**). The artefact count in this table records all artefacts, regardless of size, and regardless of whether they are broken, or pieces catalogued as 'shatter'. As can be seen in this table, 101 excavation squares (or 66 per cent) recorded no artefacts and a further 43 excavation squares (or 28 per cent) recorded between one and five artefacts. Therefore, only six per cent of the excavation squares contained artefacts at a density greater than five per excavation square and no squares recorded more than 20 artefacts: a benchmark which is commonly regarded as the division between a 'background scatter of artefacts' and artefacts being recorded at densities that allow meaningful interpretation.

Table 6-5. Summary of results from each excavation square.

GDA Zone 56 East	GDA Zone 56 North	Area	Transect	Square	Artefacts (total)
316638	6413318	Area 1	TR1	1	2
316632	6413310	Area 1	TR1	2	0
316626	6413301	Area 1	TR1	3	1
316619	6413292	Area 1	TR1	4	0
316614	6413284	Area 1	TR1	5	1
316607	6413275	Area 1	TR1	6	6
316612	6413270	Area 1	TR2	1	0
316620	6413264	Area 1	TR2	2	0
316630	6413258	Area 1	TR2	3	1

GDA Zone 56 East	GDA Zone 56 North	Area	Transect	Square	Artefacts (total)
316641	6413250	Area 1	TR2	4	0
316648	6413245	Area 1	TR2	5	0
316656	6413239	Area 1	TR2	6	0
316682	6413410	Area 1	TR3	1	1
316677	6413404	Area 1	TR3	2	0
316672	6413398	Area 1	TR3	3	2
316667	6413392	Area 1	TR3	4	0
316662	6413386	Area 1	TR3	5	0
316662	6413386	Area 1	TR3	6	0
316656	6413378	Area 1	TR4	1	4
316558	6413180	Area 1	TR4	2	4
316552	6413174	Area 1	TR4	3	2
316547	6413166	Area 1	TR4	4	5
316540	6413160	Area 1	TR4	5	1
316534	6413150	Area 1	TR4	6	8
316527	6413143	Area 1	TR5	1	17
316481	6413132	Area 1	TR5	2	3
316477	6413120	Area 1	TR5	3	11
316472	6413107	Area 1	TR5	4	4
316468	6413097	Area 1	TR5	5	17
316462	6413087	Area 1	TR5	6	1
317942	6412044	Area 2	TR1	1	0
317932	6412043	Area 2	TR1	2	0
317922	6412041	Area 2	TR1	3	0
317912	6412041	Area 2	TR1	4	0
317903	6412040	Area 2	TR1	5	0
317892	6412039	Area 2	TR1	6	0
317884	6412023	Area 2	TR2	1	0
317882	6412015	Area 2	TR2	2	0
317880	6412005	Area 2	TR2	3	0
317877	6411996	Area 2	TR2	4	0
317875	6411987	Area 2	TR2	5	0
317872	6411981	Area 2	TR2	6	0
317947	6411954	Area 2	TR3	1	0
317947	6411942	Area 2	TR3	2	0
317946	6411930	Area 2	TR3	3	0
317945	6411920	Area 2	TR3	4	0
317945	6411910	Area 2	TR3	5	0
317944	6411900	Area 2	TR3	6	0
317927	6411918	Area 2	TR4	1	0
317919	6411922	Area 2	TR4	2	0
317910	6411925	Area 2	TR4	3	0
317899	6411929	Area 2	TR4	4	0
317890	6411933	Area 2	TR4	5	0

GDA Zone 56 East	GDA Zone 56 North	Area	Transect	Square	Artefacts (total)
317881	6411936	Area 2	TR4	6	0
317363	6411375	Area 3	TR1	1	0
317363	6411363	Area 3	TR1	2	0
317363	6411352	Area 3	TR1	3	1
317363	6411341	Area 3	TR1	4	0
317363	6411333	Area 3	TR1	5	1
317364	6411324	Area 3	TR1	6	0
317340	6411372	Area 3	TR2	1	0
317339	6411360	Area 3	TR2	2	0
317340	6411350	Area 3	TR2	3	4
317340	6411341	Area 3	TR2	4	2
317340	6411332	Area 3	TR2	5	2
317339	6411324	Area 3	TR2	6	0
317368	6411221	Area 4	TR1	1	1
317371	6411211	Area 4	TR1	2	0
317375	6411202	Area 4	TR1	3	0
317379	6411194	Area 4	TR1	4	1
317386	6411186	Area 4	TR1	5	0
317390	6411177	Area 4	TR1	6	2
317489	6411195	Area 4	TR2	1	1
317489	6411188	Area 4	TR2	2	2
317489	6411179	Area 4	TR2	3	0
317490	6411168	Area 4	TR2	4	1
317489	6411157	Area 4	TR2	5	0
317488	6411145	Area 4	TR2	6	0
317460	6411092	Area 4	TR3	1	0
317459	6411084	Area 4	TR3	2	0
317458	6411074	Area 4	TR3	3	0
317456	6411065	Area 4	TR3	4	1
317455	6411056	Area 4	TR3	5	2
317453	6411046	Area 4	TR3	6	2
317428	6411050	Area 4	TR4	1	0
317434	6411042	Area 4	TR4	2	1
317440	6411034	Area 4	TR4	3	0
317446	6411025	Area 4	TR4	4	11
317452	6411017	Area 4	TR4	5	3
317457	6411010	Area 4	TR4	6	2
317443	6411029	Area 4	TR4	7	0
317443	6411024	Area 4	TR4	8	3
317448	6411022	Area 4	TR4	9	0
317371	6411097	Area 4	TR5	1	14
317363	6411104	Area 4	TR5	2	0
317356	6411110	Area 4	TR5	3	0
317348	6411117	Area 4	TR5	4	0

GDA Zone 56 East	GDA Zone 56 North	Area	Transect	Square	Artefacts (total)
317341	6411123	Area 4	TR5	5	0
317334	6411130	Area 4	TR5	6	0
317374	6411095	Area 4	TR5	7	0
317374	6411101	Area 4	TR5	8	0
317367	6411101	Area 4	TR5	9	5
317565	6411087	Area 5	TR1	1	0
317568	6411085	Area 5	TR1	2	0
317574	6411086	Area 5	TR1	3	0
317576	6411083	Area 5	TR1	4	0
317611	6410955	Area 6	TR1	1	1
317610	6410951	Area 6	TR1	2	1
317612	6410950	Area 6	TR1	3	1
317611	6410947	Area 6	TR1	4	1
317747	6410190	Area 7	TR1	1	0
317746	6410180	Area 7	TR1	2	0
317745	6410170	Area 7	TR1	3	0
317744	6410161	Area 7	TR1	4	0
317743	6410153	Area 7	TR1	5	0
317742	6410146	Area 7	TR1	6	0
317750	6410066	Area 7	TR2	1	1
317750	6410057	Area 7	TR2	2	2
317750	6410046	Area 7	TR2	3	3
317750	6410036	Area 7	TR2	4	2
317751	6410026	Area 7	TR2	5	0
317751	6410016	Area 7	TR2	6	0
319242	6410219	Area 8	TR1	1	0
319232	6410218	Area 8	TR1	2	0
319223	6410215	Area 8	TR1	3	0
319213	6410213	Area 8	TR1	4	0
319203	6410210	Area 8	TR1	5	0
319193	6410207	Area 8	TR1	6	1
318230	6408987	Area 9	TR1	1	0
318236	6408978	Area 9	TR1	2	0
318242	6408971	Area 9	TR1	3	0
318247	6408963	Area 9	TR1	4	0
318253	6408954	Area 9	TR1	5	1
318362	6408773	Area 10	TR1	1	0
318371	6408765	Area 10	TR1	2	1
318379	6408759	Area 10	TR1	3	0
318381	6408748	Area 10	TR1	4	0
318383	6408738	Area 10	TR1	5	2
318385	6408728	Area 10	TR1	6	0
317776	6412466	Area 11	TR1	1	0
317781	6412458	Area 11	TR1	2	0

GDA Zone 56 East	GDA Zone 56 North	Area	Transect	Square	Artefacts (total)
317786	6412449	Area 11	TR1	3	0
317794	6412392	Area 11	TR1	4	1
317797	6412384	Area 11	TR1	5	0
317723	6412201	Area 12	TR1	1	0
317724	6412191	Area 12	TR1	2	5
317725	6412180	Area 12	TR1	3	0
317727	6412172	Area 12	TR1	4	0
317729	6412162	Area 12	TR1	5	1
317730	6412153	Area 12	TR1	6	0

6.4.2 Description of excavation areas

The following section will describe the landscape features of each excavation area along with an analysis of any landform modification present that may pertain to the excavation results. Excavation areas are shown in **Figure 6-1**.

Area 1

Area 1 stretches for approximately 450 m on the eastern bank of Bowmans Creek along a broad, elevated spur parallel to the creek. As the survey recorded a reasonable number of artefacts in areas of erosion along the edge of the spur, and in isolated areas along the crest of the spur, it was the intention of the test excavation program to investigate adjacent to the eroded areas to ascertain if intact archaeological deposits remain.

The landform where all transects were located, except for Tr3, is a reasonably broad spur elevated above Bowmans Creek with a gradual slope to the east. A former dwelling and farm infrastructure are present on the crest. The northernmost extent of Area 1, encompassing what was originally termed Glendell North PAD1 prior to the test excavation, is located on a lower, secondary terrace in a sheltered area. The area has been previously cleared of trees, although regrowth casuarina is present in small patches, as well as isolated mature eucalypts. The entire area is used largely for low-intensity livestock grazing.

Five transects (Tr1–5) were investigated and a total of 30 excavation squares excavated; six squares in each transect. Tr1 is located parallel to Bowmans Creek across the spur and adjacent to Glendell North OS5; Tr2 is perpendicular to Bowmans Creek heading upslope along the spur towards a dwelling and farm complex; Tr3 is parallel to Bowmans Creek on a secondary terrace at the location of Glendell North PAD1; Tr4 is parallel to Bowmans Creek on the crest of the spur adjacent to 37-3-0763; and Tr5 is located adjacent to Glendell North OS6, between Bowmans Creek and an farm shed (**Figure 6-3** and **Figure 6-4**).

Area 1 is in the vicinity of newly recorded sites Glendell North OS5 and Glendell North OS6, as well as previously recorded site 37-3-0763 (Bowmans Ck 7).

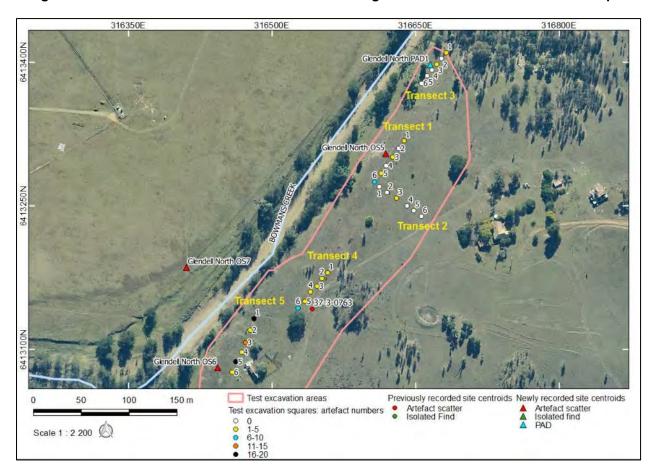


Figure 6-3. Location of transects within Area 1 showing total artefact numbers from each square.

Figure 6-4. Area 1. View of transects.







3. VIEW OF TRANSECT 4 ACROSS THE SPUR. VIEW NORTHWEST.

4. VIEW OF TRANSECT 5 ACROSS THE SPUR. VIEW SOUTHWEST.

Area 2

Area 2 is located between Yorks Creek in the west and the Ravensworth Homestead in the east. The area occupies a large, low gradient area that is elevated above Yorks Creek on its eastern bank and the Ravensworth Homestead. The rationale of this placement was based on the presence of the Ravensworth Homestead, often an indicator of a prime occupational location, and the elevated landform which it occupies on the eastern side of Yorks Creek.

Area 2 is located in an open paddock and while there are disturbances nearby, such as the Ravensworth Homestead, an underground Telstra line, a rehabilitated exploration site and associated farming infrastructure i.e. sheds and dams and vehicle tracks, there was little sign of extensive disturbance beyond that arising from the area's past agricultural use (vegetation clearing, stock trampling and erosion). Vegetation within Area 2 is limited to three isolated box trees. To the east, regrowth casuarinas line the bank of Yorks Creek.

Four transects were investigated at Area 2 through the excavation of 24 excavation squares (six along each transect spaced 10 m apart) (**Figure 6-5** and **Figure 6-6**). Tr1 and Tr2 were placed to the north of an access track which leads from Hebden Road in the west to the Ravensworth Homestead. Both transects occupy the lower slope above the floodplain of Yorks Creek, however the area is generally flat. Tr1 is perpendicular to Yorks Creek and is approximately 75 m from the perimeter of the Ravensworth Homestead, while Tr2 is parallel to Yorks Creek. Tr3 is located across the flat crest of a knoll, occupied by the Ravensworth Homestead, which slopes to the south towards an ephemeral drainage line that has been dammed. Tr4 is located along the edge of the elevated landform which slopes to the west to the same drainage line as Tr3, but also slopes to the west towards Yorks Creek. Tr3 was placed parallel to the drainage line to determine whether artefacts associated with Glendell North OS13 were present subsurface.

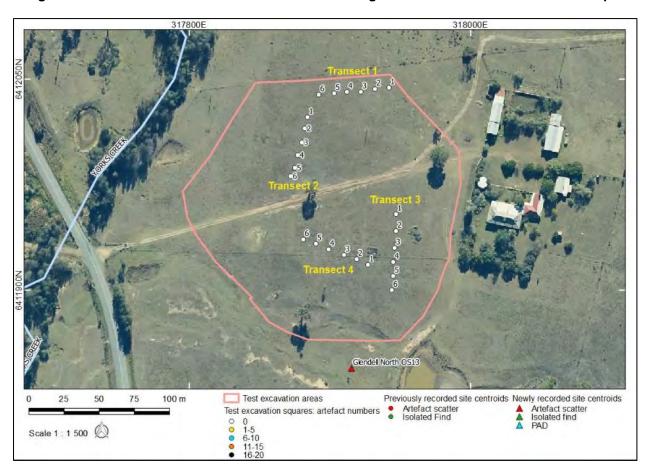
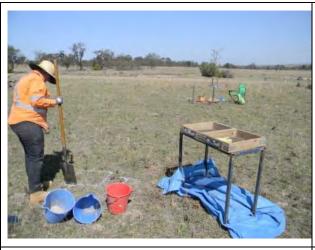


Figure 6-5. Location of transects within Area 2 showing total artefact numbers from each square.

Figure 6-6. Area 2. View of transects.







3. VIEW SOUTH ALONG TRANSECT 3 TOWARDS A DRAINAGE LINE OF YORKS CREEK.

4. VIEW SOUTHWEST ALONG TRANSECT 4 TOWARDS YORKS CREEK (TREE LINE).

Area 3 is located on the western bank of Yorks Creek, approximately 70 m north of Area 2. During the survey the area was identified as having high archaeological potential based on its proximity to Yorks Creek, its location on an elevated landform, and the presence of surface artefacts. Therefore, Area 3 was selected for test excavation to determine if intact deposits remained at this location and whether the visible artefacts originated locally from deposits in non-eroded landforms.

Two transects were investigated at Area 3 through the excavation of 12 excavation squares (**Figure 6-7** and **Figure 6-8**). Specifically, this was comprised of: Tr1 (six squares along the edge of a terrace where surface artefacts were visible) and Tr2 (six squares to the west of Tr1 where deeper A-Horizon deposits were predicted due to lower levels of erosion). Both transects were parallel to Yorks Creek and squares were spaced 10 m apart.

Area 3 encompasses site 37-3-0747, originally recorded by Umwelt in 2001, which identified 12 artefacts at the site location along an unformed road where A-Horizon soils have been removed. Additional disturbances at the site location include low-intensity grazing and potential past cultivation. The area has likely also been subject to vegetation clearing and now consists only of grass and weed cover.

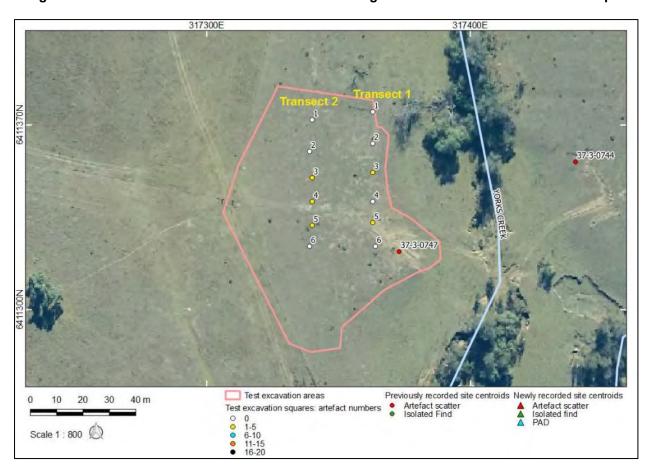


Figure 6-7. Location of transects within Area 3 showing total artefact numbers from each square.

Figure 6-8. Area 3. View of transects.



Area 4 encompasses an upper terrace landform at the confluence of Bowmans and Yorks Creeks, the only major creek confluence in the Project Area. Umwelt 2004 emphasises that creek confluences have often been found to have Aboriginal camp sites and terrain features that may have acted as pathways between resource locations. As such, there is increased archaeological sensitivity at the confluence of Bowmans and Yorks Creeks.

Area 4 encompasses previously recorded sites 37-3-0750 and is in close proximity to 37-3-1503. Site 37-3-0750 was originally recorded by Umwelt in 2001 and noted the area surrounding the surface scatter as having high PAD potential, but artefacts would likely be in a disturbed context. Area 4 also includes newly recorded site Glendell North OS34, a low-density artefact scatter recorded closest to the confluence of the creek lines, and Glendell North PAD2, located on an upper terrace adjacent to Bowmans Creek.

Area 4 is located in an open paddock with little sign of disturbances beyond that arising from the area's past agricultural use (vegetation clearing, stock trampling and erosion). Vegetation within the area is limited to one eucalypt tree and grass and weed cover. High levels of erosion are present along the edges of the upper terrace and along a drainage line.

The area extends for 260 m and is 70 m west of Area 5. Five transects were investigated at Area 4 through the excavation of 36 excavation squares (**Figure 6-9** and **Figure 6-10**). Specifically this comprised of: Tr1 (six squares spaced 10 m apart, parallel to Yorks Creek along a fence line and nearby site 37-3-1503); Tr2 (six squares spaced 10 m apart, parallel to Yorks Creek encompassing site 37-3-0750); Tr3 (six squares spaced 10 m apart, parallel to Yorks Creek but placed further back from the edge of the terrace and to the south of a drainage line); Tr4 (six squares spaced 10 m apart initially, with an additional three squares spaced 5 m to the northwest, southeast and southwest of Sq4, located closest to the confluence of the creeks); and Tr5 (six squares spaced 10 m apart initially, with an additional three squares spaced 5 m to the northwest, southeast and northeast of Sq1, located parallel to Bowmans Creek on an upper terrace). The additional investigation completed adjacent to Tr4 Sq4 (n=11) and Tr5 Sq1 (n=14) was completed due to the higher number of artefacts recorded within these squares compared to any others within the area. The investigation of three squares placed 5 m apart at each location was used to determine whether the artefact extent continued to different directions or if it was more localised.

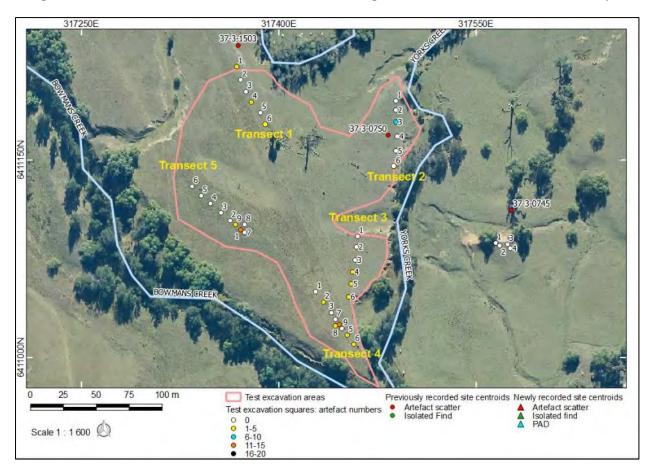
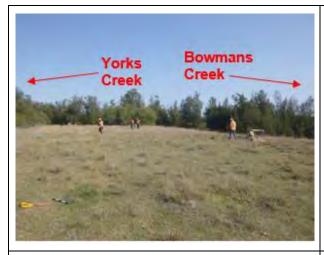


Figure 6-9. Location of transects within Area 4 showing total artefact numbers from each square.

Figure 6-10. Area 4. View of transects.







3. VIEW SOUTHEAST ALONG TRANSECT 4 ABOVE THE CONFLUENCE OF YORKS AND BOWMANS CREEK.

4. VIEW SOUTH TOWARDS TRANSECT 5. LOCATED ON THE NORTHERN BANK OF BOWMANS CREEK (TREE LINE).

Area 5 is located on an elevated landform to the east of Yorks Creek, extending for 30 m. The rationale of its placement was to obtain information on deposits from the eastern side of the creek, close to the confluence of Bowmans and Yorks Creek.

Area 5 is located in an open paddock encompassing a remnant confined portion of a terrace with drainage lines to the north and south.

Area 5 consisted of a single transect (Tr1) comprising four excavation squares (**Figure 6-11** and **Figure 6-12**). Due to the length of the area, two clusters consisting of two immediately adjacent squares were excavated. These clusters were positioned 10 m apart.

Area 5 is in the vicinity of site 37-3-0745, located 20 m to the north.

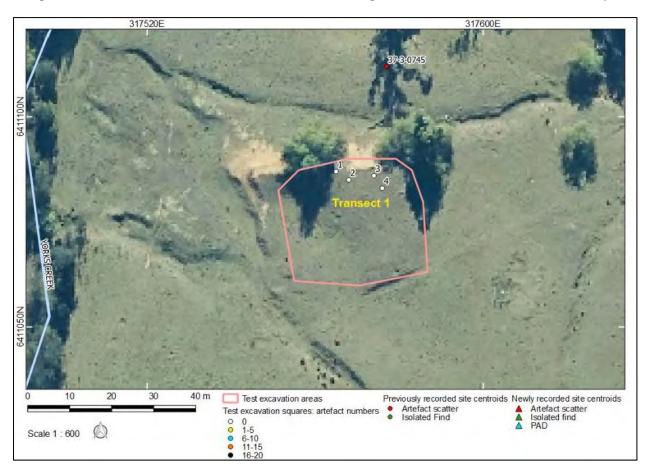


Figure 6-11. Location of transect within Area 5 showing total artefact numbers from each square.

Figure 6-12. Area 5. View of transect.



1. VIEW OF TRANSECT 1 VIEW WEST. LOCATED TO THE EAST OF YORKS CREEK (TREE LINE IN FOREGROUND).

Area 6 is located on an elevated landform to the east of Yorks Creek and extends for 30 m. The rationale of its placement was to obtain information on deposits from the eastern side of the creek, close to the confluence of Bowmans and Yorks Creeks, similar to Area 5.

Area 6 is located in an area with high levels of general disturbances including the construction of farm infrastructure. The area is lightly treed, but vegetation largely consists of grass and weed cover. The area is currently used for low-intensity grazing.

Area 6 consisted of a single transect (Tr1) comprising four excavation squares (**Figure 6-13** and **Figure 6-14**). Due to the length of the area, two clusters consisting of two immediately adjacent squares were excavated. These clusters were positioned 10 m apart.

Area 6 encompasses newly recorded site Glendell North OS16.

Figure 6-13. Location of transects within Area 6 showing total artefact numbers from each square.

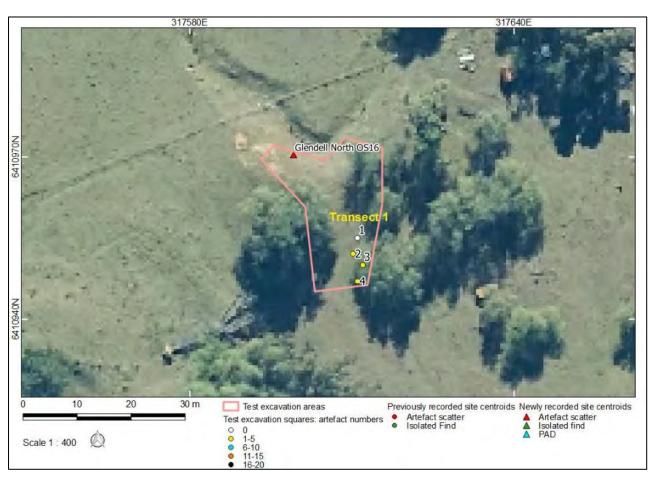


Figure 6-14. Area 6. View of transects.



1. VIEW OF TRANSECT 1, VIEW SOUTH ALONG A TERRACE EAST OF YORKS CREEK.

Area 7

Area 7 was investigated to gain an understanding of deposits along an elevated terrace overlooking the Bowmans Creek floodplain, where a number of visible artefacts were identified during the survey. The original extent of Area 7 extended for 155 m, however, during the test excavation program the extent was increased in the north for another 65 m to move Tr1 to part of an upper terrace landform to the north of a drainage line which has been subject to lower levels of disturbance.

Area 7 is adjacent to a historic farm complex and includes the foundations of a former dwelling and garden beds. Additional disturbances identified during the survey included clearing, grazing, sheet wash erosion and vehicle damage. Surrounding vegetation represents grassy paddocks with isolated eucalypts, and farmhouse garden exotics including a palm tree.

Specifically, the transects excavated at Area 7 consisted of Tr1 (six squares spaced 10 m apart along an upper terrace to the north of a drainage line and south of a vehicle track) and Tr2 (six squares spaced 10 m apart along an upper terrace bounded to the north and south by drainage lines) (Figure 6-15 and Figure 6-16).

Area 7 is located immediately west of newly recorded site Glendell North OS19.

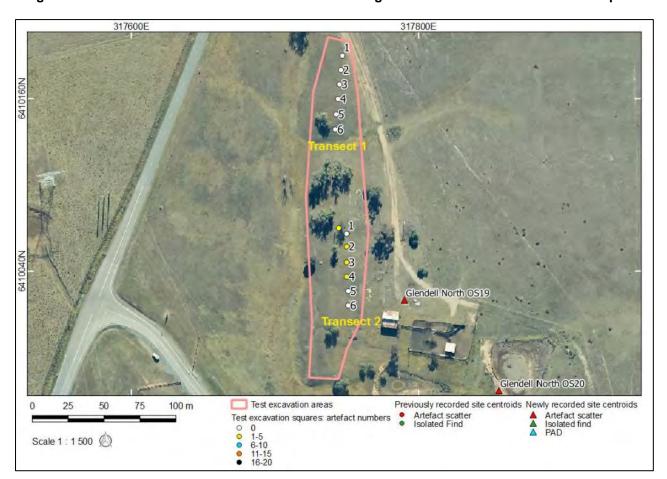


Figure 6-15. Location of transects within Area 7 showing total artefact numbers from each square.

Figure 6-16. Area 7. View of transects.



Area 8 is located approximately 10 m north of the break of slope to Swamp Creek on a generally flat, low rise. The area is grassed and located between the current channel of Swamp Creek and a

possible anabranch. The rationale of its placement was to obtain information on deposits from an elevated landform between Swamp Creek and what appears to be an old channel for Swamp Creek.

Area 8 is generally devoid of trees, excluding the regrowth casuarinas lining Swamp Creek. It has been subject to generally low levels of disturbance, although it is nearby an above ground pipeline, as well as being located 130 m north of a Glendell haul road.

Area 8 consisted of a single transect (Tr1) with six excavation squares (Sq1 to Sq6) spaced 10 m apart (**Figure 6-17** and **Figure 6-18**). The transect was laid parallel to Swamp Creek to test the extent of the low rise.

Area 8 encompasses previously recorded site 37-3-0689 and is near newly recorded site Glendell North OS22.



Figure 6-17. Location of transects within Area 8 showing total artefact numbers from each square.

Figure 6-18. Area 8. View of transects.



1. VIEW OF TRANSECT 1 VIEW NORTHEAST. LOCATED ON THE EDGE OF THE FRINGING CASUARINA REGROWTH ADJACENT TO SWAMP CREEK.

Area 9

Area 9 (encompassing Glendell North PAD3) is located on the western bank of Swamp Creek, to the southeast of the fenced off area of site 37-3-0649. The area was selected at random in order to test the nature of deposits along the more southern portion of Swamp Creek.

Area 9 is on a flat, grassed area along the fringe of regrowth casuarinas lining the creek line. Identified disturbances included clearing, grazing and the movement of topsoil. The area is currently used for low-intensity livestock grazing.

Area 9 consisted of a single transect (Tr1) of six excavation squares (Sq1 to Sq6) spaced 10 m apart (**Figure 6-19** and **Figure 6-20**). The transect was laid out, approximately 15 m back from the erosion edge of Swamp Creek.

No previously recorded sites exist near Area 9 on the western side of the creek line.

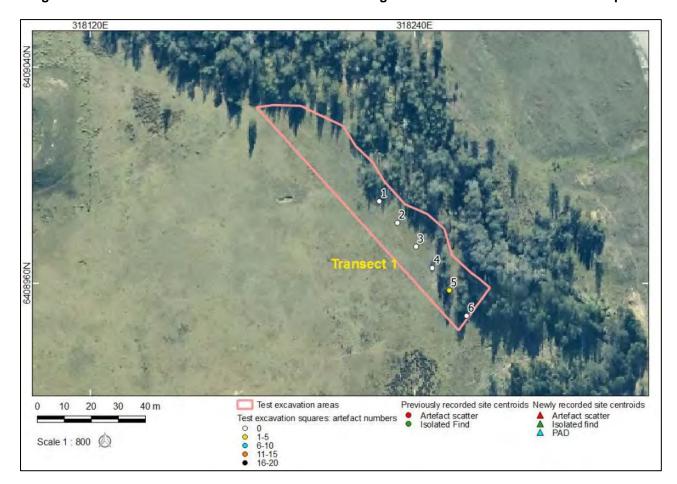


Figure 6-19. Location of transects within Area 9 showing total artefact numbers from each square.

Figure 6-20. Area 9. View of transects.



1. VIEW OF TRANSECT 1 VIEW SOUTHEAST. LOCATED ON THE EDGE OF THE FRINGING CASUARINA REGROWTH ADJACENT TO SWAMP CREEK.

Area 10

Area 10 is located on the eastern bank of Swamp Creek, and extends for 100 m, 190 m southeast of Area 9. The area, similarly to Area 9, was selected at random in order to test the nature of deposits along the more southern portion of Swamp Creek.

Area 10 is on a flat, grassed area along the fringe of regrowth casuarinas lining the creek line. Identified disturbances included clearing, grazing and the movement of topsoil. The current land use of the area is mine buffer land.

Area 10 consisted of a single transect (Tr1) of six excavation squares (Sq1 to Sq6) (**Figure 6-21** and **Figure 6-22**). Due to the curvature of the creek in this area, there is a slight bend in the transect to ensure it is was in closer proximity to the erosion edge of Swamp Creek.

Newly recorded site, Glendell North OS25, is encompassed within the extent of Area 10.

Figure 6-21. Location of transects within Area 10 showing total artefact numbers from each square.



Figure 6-22. Area 10. View of transects.



1. VIEW OF TRANSECT 1 VIEW NORTHWEST. LOCATED ON THE EDGE OF THE FRINGING CASUARINA REGROWTH ADJACENT TO SWAMP CREEK.

<u>Area 11</u>

Area 11 encompasses site 37-3-0754 and its associated PAD recorded by Umwelt in 2001. Umwelt noted at the time of recording that PADs were possible, but the area is likely to have been impacted by cultivation except at depths below 50 cm from the ground surface. As such, the test excavation program included the excavation of six squares along one transect to determine whether subsurface deposits were present in association with the identified surface artefact manifestation, and whether deposits present to a depth greater than 50 cm are disturbed.

Tr1 was placed parallel to Yorks Creek on a lower slope of a secondary terrace within 5 m of the break of slope to Yorks Creek. (**Figure 6-23** and **Figure 6-24**). Despite the specified 10 m spacing highlighted in the sampling strategy between squares (**Appendix 5**), the distance between Sq3 and Sq4 was increased to approximately 50 m in order to avoid either side of a gully where A-Horizon soils have been removed.

Area 11 is located to the east of Yorks Creek, within the grounds of the historic Ravensworth Homestead property. The area has been previously cleared of trees although regrowth casuarina trees are present along the riparian corridor of Yorks Creek. The area is currently used for low-intensity livestock grazing. Additional disturbances within Area 11 include the construction of a former structure, evidenced by the presence of larger building blocks along a fence line which traverses the central portion of the area. Some evidence of ploughing was also observed adjacent to Sq4 to 6.

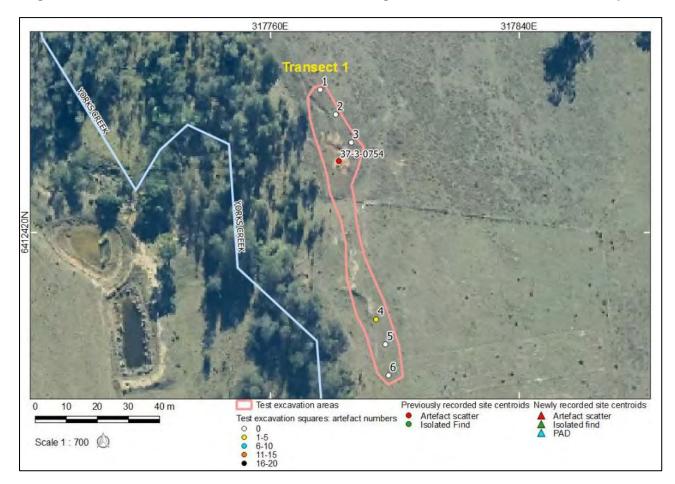


Figure 6-23. Location of transects within Area 11 showing total artefact numbers from each square.

Figure 6-24. Area 11. View of transects.



1. VIEW OF TRANSECT 1 VIEW SOUTH. LOCATED ON THE EDGE OF A TERRACE TO THE EAST OF YORKS CREEK.

Area 12

Area 12 encompasses site 37-3-0761 and its associated PAD recorded by Umwelt in 2001. Umwelt noted at the time of recording that PADs were possible, but the area is likely to have been impacted by cultivation. As such, the intention of the test excavation program was to place one transect parallel to Yorks Creek to test the western bank and determine whether subsurface deposits were present in association with the identified isolated surface artefact (**Figure 6-25** and **Figure 6-26**).

Area 12 is located between Hebden Road in the west and Yorks Creek in the east and extends for 90 m, approximately 145 m northwest of Area 2. The area has been previously cleared of trees although regrowth casuarina trees are present along the riparian corridor of Yorks Creek. The area is currently used for low-intensity livestock grazing.

Area 12 consisted of a single transect (Tr1) of six excavation squares (Sq1 to Sq6) spaced 10 m apart.

Figure 6-25. Location of transects within Area 12 showing total artefact numbers from each square.



Figure 6-26. Area 12. View of transects.



1. VIEW OF TRANSECT 1 VIEW NORTHWEST. LOCATED TO THE WEST OF YORKS CREEK (TREE LINE ON RIGHT).

6.4.2.1 Stratigraphy

Archaeological stratigraphy was not present at any of the excavation squares investigated. Generally, excavation squares consisted of a thin (c. 5 cm) humic layer at the surface resting on a light clay loam extending down to the basal clays. This generalisation varied from area to area as will be examined below but the general sequence of a thin A1-Horizon resting on a 10–20 cm A2-Horizon resting on the B-Horizon was reasonably consistent across the investigation area. Excavated depths typically averaged from 20 cm to 30 cm.

At a number of areas, the lack of artefacts and stratigraphy meant that a change of strategy was agreed to between the archaeologists and the RAPs present. This change was going from excavating in 5 cm spits to 10 cm spits. It was felt that without artefacts or stratigraphy to justify a finer excavation methodology that the main aim of the test excavation program was to identify where there may be surviving archaeological deposits of any note. The excavation depth at each area is highlighted below by location.

Area 1

All squares within Tr1 and Tr2 were excavated in 5 cm spits, as well as Tr3 Sq 6. The remainder of Tr3 and the entirety of squares within Tr4 to Tr5 were excavated in 10 cm spits. **Table 6-6** provides detail on the soil profiles at Area 1 and **Figure 6-27** shows a sample of excavated soil profiles from Tr1 to Tr5 excavated at Area 1.

Soils in this area had a high amount of gravels throughout when compared with the other investigation areas, with the exception of Area 2. The thick gravel lag layer was consistent across all transects except at Tr3. This difference is attributed to the different landform occupied by Tr3, a secondary terrace, compared to the remaining transects which were laid across the more elevated spur landform. The thick gravel lag layer comprised decomposed conglomerate or regolith, the bedrock present across portions of the Project Area which can also be seen outcropping throughout portions of Area 1 (**Figure 6-27**; image 1 & 2). Gravels generally ranged in size from 1–3 cm across

Tr1, Tr2 and Tr4, however, the maximum size of gravels increased significantly across Tr5 to approximately 12 cm. The average depth of squares across Tr1, Tr2, Tr4 and Tr5 was generally from 20 to 25 cm. The nature of soils across these transects generally consisted of a thin layer of humic topsoil (<5 cm) then a compact light grey/brown loam with gravels overlying an orange clay base.

Soils throughout Tr3 consisted of a thin humic layer above an undifferentiated mid-brown silt extending to a mottled brown and orange clay base. A few squares demonstrated disturbances from bioturbation and large tree roots (**Figure 6-27**; image 3).

Spit 2 (10–20 cm) recorded 54 per cent of artefacts at Area 1 (**Figure 6-28**). The second highest number of artefacts were recorded in spit 1 (0–10 cm). Only four artefacts were recovered from spit 3 (20–30 cm) and no artefacts were recorded in spit 4 (30–40 cm). At the two squares along Tr5 (Sq1 and Sq5) where 17 artefacts were recorded, all artefacts were recorded in either spit 1 or spit 2. Within Tr5 Sq1, 16 of the 17 artefacts were located in spit 1 (0–10 cm); differing from Tr5 S5 with only four recorded in spit 1 (0–10 cm) and the remainder recorded in spit 2 (10–20 cm).

Table 6-6. Area 1: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	18	2 cm humic topsoil. Hard, dry, light grey/brown loam with gravels to 18 cm. Hard orange clay at base.
Tr1 Sq2	20	3 cm humic topsoil. Hard, dry, light grey/brown loam with gravels to 15cm. Hard orange clay loam from 15-20 cm.
Tr1 Sq3	16	4 cm humic topsoil. Hard, dry, light grey/brown loam with gravels to 8 cm. Hard orange clay loam from 8-16 cm.
Tr1 Sq4	20	3 cm humic topsoil. Hard, dry, light grey/brown loam with gravels to 15 cm. Hard orange clay loam from 15-20 cm.
Tr1 Sq5	21	4 cm humic topsoil. Hard, dry, light grey/brown loam with gravels to 12 cm. Hard orange clay loam from 12-21 cm.
Tr1 Sq6	28	2 cm humic topsoil. Hard, dry, light grey/brown loam with gravels to 23 cm. Hard orange clay loam from 23-28 cm.
Tr2 Sq1	20	5 cm humic topsoil. Hard, dry, light grey/brown loam with gravels to 20 cm. Hard orange clay base.
Tr2 Sq2	12	3 cm humic topsoil. Hard, dry, light grey/brown loam with gravels to 12 cm. Hard orange clay base.
Tr2 Sq3	22	4 cm humic topsoil. Hard, dry, light grey/brown loam to 22 cm with gravels present from 17 cm. Hard orange clay base.
Tr2 Sq4	32	3 cm humic topsoil. Hard, dry, light grey/brown loam to 32 cm with gravels present from 15 cm. Hard orange clay base.
Tr2 Sq5	38	2 cm humic topsoil. Hard, dry, light grey/brown loam to 38 cm with gravels present from 23 cm. Hard orange clay base.
Tr2 Sq6	45	6 cm humic topsoil. Hard, dry, light grey/brown loam to 35 cm. Hard mottled orange/brown clay base with charcoal flecks.
Tr3 Sq1	30	5 cm humic topsoil. Hard, mid-brown silt to 28 cm. Mottled orange/brown clay base.
Tr3 Sq2	29	4 cm humic topsoil. Hard, mid-brown silt to 29 cm. Mottled orange/brown clay base.
Tr3 Sq3	28	5 cm humic topsoil. Hard, mid-brown silt to 28 cm. Mottled orange/brown clay base.
Tr3 Sq4	26	3 cm humic topsoil. Hard, mid-brown silt to 26 cm. Mottled orange/brown clay base.
Tr3 Sq5	33	3 cm humic topsoil. Hard, mid-brown silt to 33 cm. Mottled orange/brown clay base.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr3 Sq6	45	6 cm humic topsoil. Hard, mid-brown silt to 45 cm. Mottled orange/brown clay base with charcoal flecks and root at base.
Tr4 Sq1	20	4 cm humic topsoil. Hard, dry, light grey/brown silt to 20 cm with gravels present. Hard orange clay base.
Tr4 Sq2	29	3 cm humic topsoil. Hard, dry, light grey/brown silt to 29 cm with gravels present from 18 cm. Hard orange clay base.
Tr4 Sq3	26	2 cm humic topsoil. Hard, dry, light grey/brown silt to 26 cm with gravels present from 17 cm. Hard orange clay base.
Tr4 Sq4	20	2 cm humic topsoil. Hard, dry, light grey/brown silt to 20 cm with gravels present from 16 cm. Hard orange clay base.
Tr4 Sq5	22	1 cm humic topsoil. Hard, dry, light grey/brown silt to 22 cm with gravels present. Hard orange clay base.
Tr4 Sq6	29	2 cm humic topsoil. Hard, dry, light grey/brown silt to 29 cm with gravels present and large charcoal flakes. Hard orange clay base.
Tr5 Sq1	20	5 cm humic topsoil. Light brown/grey silt with gravels from 6 cm and charcoal flecks to 20 cm. Orange to brown clay base.
Tr5 Sq2	20	4 cm humic topsoil. Light brown/grey silt with gravels from 9 cm. Orange to brown clay base.
Tr5 Sq3	12	2 cm humic topsoil. Light mid-brown silt with few gravels. Orange to brown clay base.
Tr5 Sq4	24	3 cm humic topsoil. Light brown/grey silt with gravels from 5 cm. Orange to brown clay base.
Tr5 Sq5	25	3 cm humic topsoil. Light brown/grey silt with large rocks and gravels throughout. Orange to brown clay base.
Tr5 Sq6	12	2 cm humic topsoil. Mid-brown silt with large rocks and gravels throughout. Orange to brown clay base.

Figure 6-27. Test excavation Area 1. Stratigraphy.

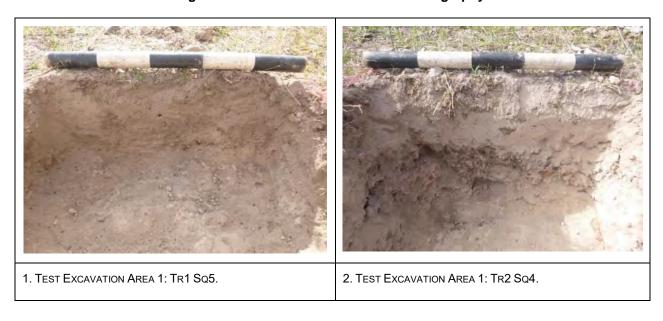
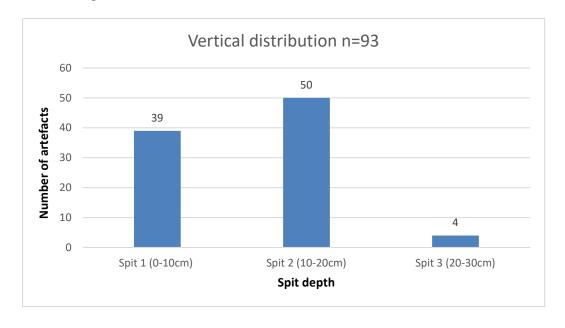




Figure 6-28. Test excavation Area 1. Vertical artefact distribution.



Tr2, the first transect excavated at Area 2, was excavated in 5 cm spits, however, due to a lack of artefacts the excavation depth was increased to 10 cm for Tr1, Tr3 and Tr4. **Table 6-7** provides detail on the soil profiles at Area 2 and **Figure 6-29** shows a sample of excavated soil profiles from Tr1 to Tr4 excavated at Area 2.

Area 2, similar to Area 1, recorded gravels in all excavated squares attributed to the presence of decomposed conglomerate bedrock (**Table 6-7**; **Figure 6-29**). Overall, A-Horizon soil depths did not exceed 30 cm. The soil profiles along Tr1 were consistent across all squares, including a mid-brown humic layer down to a maximum of 7 cm (often only extending to the depth of grass roots), overlying a brown clay loam with small gravels then down to a blocky clay loam with larger pebbles. The B-Horizon consists of a yellow clay base.

Soils differed between Tr1 and Tr2 with Tr2 consisting of leached loams as opposed to clayey loam. The depth of topsoil was also substantially lower, averaging 0.5 cm although Sq4 had 3 cm of topsoil. The A2-Horizon featured a light brown leached loam to an average depth of 10 cm then a darker brown leached loam with large and consistent pebble inclusions overlying an orange clay base. Soils between Tr2, Tr3 and Tr4 were similar, however, Tr3 and Tr4 squares generally retained a greater depth of topsoil.

No Aboriginal artefacts were recorded at Area 2, so the soil profile has no association with recorded artefacts. Several insignificant historic heritage items (glass and ceramic fragments) were excavated, however, and these were passed on to Casey & Lowe (Casey & Lowe 2019: Section 3.9.1).

Table 6-7. Area 2: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	20	Mid-brown humic layer down to 5 cm. Brown clay loam with small gravels down to 15 cm then blocky clay loam with weathered conglomerate to 20 cm overlying yellow clay base.
Tr1 Sq2	18	Mid-brown humic layer down to 5 cm. Brown clay loam with small gravels down to 12 cm then blocky clay loam with weathered conglomerate to 18 cm overlying yellow clay base.
Tr1 Sq3	15	Mid-brown humic layer down to 5 cm. Brown clay loam with small gravels down to 9 cm then blocky clay loam with weathered conglomerate to 15 cm overlying yellow clay base.
Tr1 Sq4	16	Mid-brown humic layer down to 4 cm. Brown clay loam with small gravels down to 10 cm then blocky clay loam with weathered conglomerate to 16 cm overlying yellow clay base.
Tr1 Sq5	13	Mid-brown humic layer down to 3 cm. Brown loamy clay with gravels from 3-5 cm in west of pit and 3-13 cm in east of pit. Yellow clay at base with some weathered conglomerate.
Tr1 Sq6	15	Mid-brown humic layer down to 7 cm. Mid-brown leached loam with small gravels from 7-10 cm in the western portion and 7-15 cm in the eastern portion. Yellow clay base.
Tr2 Sq1	25	0-5 cm mid-brown humic layer then light brown leached loam with a weathered conglomerate layer in the western section overlying orange clay base.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr2 Sq2	25	0-5 cm mid-brown humic layer then light brown leached loam to 15 cm. Weathered conglomerate and brown leached loam from 15 cm to 25 cm overlying orange clay base.
Tr2 Sq3	25	0-5 cm mid-brown humic layer then light brown leached loam to 17 cm. Weathered conglomerate and brown leached loam from 17 cm to 25 cm overlying orange clay base.
Tr2 Sq4	10	Mid-brown humic layer to 3 cm. Light brown leached loam with small gravels to 10 cm overlying orange clay base.
Tr2 Sq5	20	0-5c m mid-brown humic layer then light brown leached loam to 11 cm. Weathered conglomerate and brown leached loam from 12 cm to 20 cm overlying orange clay base.
Tr2 Sq6	20	0-5 cm mid-brown humic layer then light brown leached loam to 10 cm. Weathered conglomerate and brown leached loam from 10 cm to 20 cm overlying orange clay base.
Tr3 Sq1	23	Mid-brown loam to 10 cm then light brown leached loam to 23 cm overlying yellow clay base.
Tr3 Sq2	24	Dark brown humic layer to 3 cm. Light brown leached loam to 16 cm then decomposed conglomerate overlying clay base at 24 cm.
Tr3 Sq3	30	Dark brown humic layer to 4 cm. Light brown leached loam to 20 cm then decomposed conglomerate overlying clay base at 30 cm.
Tr3 Sq4	29	Dark brown humic layer to 3 cm. Mid-brown leached loam to 7 cm then a thick layer of decomposed conglomerate to 29 cm. Yellow clay base.
Tr3 Sq5	18	Dark brown humic layer to 5 cm. Light brown leached loam to 18 cm then decomposed conglomerate overlying clay base.
Tr3 Sq6	19	Dark brown humic layer to 5 cm. Light brown leached loam to 19 cm then decomposed conglomerate overlying clay base.
Tr4 Sq1	29	Dark brown humic layer to 7 cm. Mid-brown, fine loam to 20 cm. 20 cm+ comprised of decomposed conglomerate. Excavation ceased at 29 cm.
Tr4 Sq2	22	Dark brown humic layer to 7cm. Mid-brown, fine loam to 20cm. 20cm+ comprised of decomposed conglomerate. Excavation ceased at 22cm.
Tr4 Sq3	27	Dark brown humic layer to 5 cm. Dark brown loam up to 15 cm, then light brown leached loam to 27 cm. Decomposed conglomerate at 27 cm+.
Tr4 Sq4	16	Dark brown humic layer to 3 cm then mid-brown loam to 16 cm. Decomposed conglomerate from 16 cm.
Tr4 Sq5	10	Dark brown humic layer to 4 cm then mid-brown loam to 10 cm. Decomposed conglomerate from 10 cm.
Tr4 Sq6	20	Dark brown humic layer to 5 cm then mid-brown loam to 20 cm. Decomposed conglomerate from 20 cm.

Figure 6-29. Test excavation Area 2. Stratigraphy.



Squares within Tr1 and Tr2 at Area 3 were excavated in 10 cm spits. **Table 6-8** provides detail on the soil profiles at Area 3 and **Figure 6-30** shows a sample of excavated soil profiles from Tr1 and Tr2 at Area 1.

No archaeological stratigraphy or features were noted in any of the excavation squares. Generally, the A1-Horizon at Tr1 was non-existent, except for Sq3 and Sq6 which retained 3 cm and 6 cm of humic topsoil, respectively. Sq3 and Sq6 also recorded the deepest layer of A2-Horizon soil reaching depths up to 13 cm. All other pits across Tr1 possessed very thin A2-Horizons (<5 cm). As such, it can be concluded that the area along the terrace has been subject to high levels of erosion.

Soil depth across Tr2 was deeper than Tr1 and therefore this area has been subject to lower levels of erosion, with basal clay encountered between 12 and 20 cm. Squares recorded up to 5 cm of humic topsoil, on top of a mid-brown silt and followed by mid to dark brown clay.

At Area 3, most artefacts were recorded in spit 1 (0–10 cm; 60 per cent) with 40 per cent recorded in spit 2 (10–20 cm). Artefacts were recorded at both transects, however, 80 per cent were recorded at Tr2.

Table 6-8. Area 3: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	5	Mid-brown silt to 5 cm then hard mid to dark brown clay base.
Tr1 Sq2	1	Very thin mid-brown silt layer overlying hard mid to dark brown clay base.
Tr1 Sq3	13	3 cm humic topsoil, then mid-brown silt to 13 cm overlying hard mid-brown clay base.
Tr1 Sq4	3	Mid-brown silt to 3 cm then hard mid-brown clay base.
Tr1 Sq5	2	Very thin mid-brown silt to 2 cm then hard mid-brown clay base.
Tr1 Sq6	10	5 cm humic topsoil, then mid-brown silt to 10 cm overlying hard mid-brown clay base.
Tr2 Sq1	12	2 cm humic topsoil, then mid-brown silt to 12 cm overlying hard mid-brown clay base.
Tr2 Sq2	20	4 cm humic topsoil, then mid-brown silty clay to 13 cm with some clay nodules and a higher clay content, overlying hard mid-brown clay base.
Tr2 Sq3	14	5 cm humic topsoil, then mid-brown silty clay to 10 cm, becoming more compact with depth, overlying hard mid to dark brown clay base.
Tr2 Sq4	14	3 cm humic topsoil, then mid-brown silty clay to 14 cm overlying hard mid-brown clay base.
Tr2 Sq5	15	3 cm humic topsoil, then mid-brown silty clay to 15 cm, becoming more compact with depth, overlying hard mid-brown clay base.
Tr2 Sq6	13	3 cm humic topsoil, then mid-brown silty clay to 13 cm overlying hard mid to dark brown clay base.

Figure 6-30. Test excavation Area 3. Stratigraphy.



<u>Area 4</u>

Squares within Tr1 to Tr5 at Area 4 were excavated in 10 cm spits. **Table 6-9** provides detail on the soil profiles at Area 4 and **Figure 6-31** shows a sample of excavated soil profiles from Tr1 and Tr5 at Area 4.

Area 4 demonstrated, in general, hard-packed soils indicating past stripping of topsoils and redeposition. Tr1 to Tr 3 were excavated to basal clay, however, due to the nature of the soils,

becoming more compact with depth and therefore being difficult to excavate, Tr4 and Tr5 squares were not excavated to clay.

Tr4 and Tr5 demonstrated that the alluviums at the confluence of Bowmans and Yorks Creeks, and along the edge of Bowmans Creek, are deep (excavation stopped at 55 cm at Tr4 Sq2). The transects at Area 4 that were placed closer to the erosion edge of Yorks Creek at the confluence showed that soil depths were shallower, all reaching clay at 46 cm or less.

The highest density of artefacts at Area 4 were recorded in spit 2 (10–20 cm; 68 per cent) (**Figure 6-32**). The second highest density of artefacts were recorded in spit 3 (20–30 cm; 16 per cent), although this density was substantially lower than that of spit 2. Five artefacts were recorded in spit 1 (0–10 cm) and two in spit 4 (30–40 cm), and one artefact was recorded in spit 5 (40–50 cm). The greatest concentration of artefacts within a single square at Area 4 was Tr5 Sq1 with 14 artefacts. Of the 14 artefacts, one was in spit 1 (0-10 cm) and the remaining 13 were in spit 2 (10-20 cm). The second highest concentration of artefacts was recorded at Tr4 Sq4 with 11 artefacts. Similarly, with Tr5 Sq1, most artefacts were in spit 2 (10–20 cm) (n=9) and two were recorded in spit 1 (0–10 cm).

Table 6-9. Area 4: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	30	3 cm mid-brown humic layer. Mid-brown silt to 30 cm overlying compacted orange/brown clay base.
Tr1 Sq2	31	5 cm mid-brown humic layer. Mid-brown silt to 31 cm overlying compacted orange/brown clay base.
Tr1 Sq3	33	3 cm mid-brown humic layer. Mid-brown silt to 33 cm overlying compacted orange/brown clay base.
Tr1 Sq4	33	3 cm mid-brown humic layer. Mid-brown silt to 33 cm overlying compacted orange/brown clay base.
Tr1 Sq5	32	3 cm mid-brown humic layer. Mid-brown silt to 32 cm overlying compacted orange/brown clay base.
Tr1 Sq6	34	4 cm mid-brown humic layer. Mid-brown silt to 34 cm overlying compacted orange/brown clay base.
Tr2 Sq1	12	3 cm mid-brown humic layer. Mid-brown silt with some clay inclusions to 12 cm overlying compacted orange/brown clay base.
Tr2 Sq2	15	3 cm mid-brown humic layer. Mid-brown silt with some clay inclusions to 15 cm overlying compacted orange/brown clay base.
Tr2 Sq3	17	17 cm mid-brown humic layer. Mid-brown silt with some clay inclusions and charcoal flecks to 20 cm overlying compacted orange/brown clay base.
Tr2 Sq4	10	4 cm mid-brown humic layer. Mid-brown silt with some clay inclusions to 10 cm overlying compacted orange/brown clay base.
Tr2 Sq5	20	2 cm mid-brown humic layer. Mid-brown silt with some clay inclusions to 20 cm overlying compacted orange/brown clay base.
Tr2 Sq6	18	3 cm mid-brown humic layer. Mid-brown silt with some clay inclusions to 18 cm overlying compacted orange/brown clay base.
Tr3 Sq1	15	3 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth overlying compacted orange/brown clay base.
Tr3 Sq2	38	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth overlying compacted orange/brown clay base.
Tr3 Sq3	47	3 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth overlying compacted orange/brown clay base.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr3 Sq4	42	3 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth overlying compacted orange/brown clay base.
Tr3 Sq5	45	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth overlying compacted orange/brown clay base.
Tr3 Sq6	46	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth overlying compacted orange/brown clay base.
Tr4 Sq1	49	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 20 cm. Light brown silty sand with gravels from 40 cm. Not excavated to basal clay.
Tr4 Sq2	55	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 22 cm. Light brown silty sand with gravels from 45 cm. Not excavated to basal clay.
Tr4 Sq3	50	5 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 26 cm. Light brown silty sand with gravels from 50 cm. Not excavated to basal clay.
Tr4 Sq4	44	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 18 cm. Light brown silty sand from 18 cm to 44 cm. Not excavated to basal clay.
Tr4 Sq5	47	3 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 20 cm. Light brown silty sand with gravels from 49 cm. Not excavated to basal clay.
Tr4 Sq6	50	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 18 cm. Light brown silty sand with gravels from 40 cm. Not excavated to basal clay.
Tr4 Sq7	48	5 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 28 cm. Light brown sandy silt with small gravels. Not excavated to basal clay.
Tr4 Sq8	48	5 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 28 cm. Light brown sandy silt with small gravels to 48 cm. Not excavated to basal clay.
Tr4 Sq9	47	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 27 cm. Light brown sandy silt with small gravels to 37 cm. Not excavated to basal clay.
Tr5 Sq1	43	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 43 cm. Not excavated to basal clay.
Tr5 Sq2	42	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 42 cm. Not excavated to basal clay.
Tr5 Sq3	49	3 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 49 cm. Not excavated to basal clay.
Tr5 Sq4	45	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 45 cm. Not excavated to basal clay.
Tr5 Sq5	42	4 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 42 cm. Not excavated to basal clay.
Tr5 Sq6	48	3 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 48 cm. Not excavated to basal clay.
Tr5 Sq7	40	6 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 40 cm. Moderate gravels between 24 cm to 40 cm Not excavated to basal clay.
Tr5 Sq8	40	5 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 40 cm. Moderate gravels between 28 cm to 40 cm Not excavated to basal clay.
Tr5 Sq9	35	5 cm mid-brown humic layer. Mid-brown sandy silt becoming more compacted with depth to 35 cm. Not excavated to basal clay.

Figure 6-31. Test excavation Area 4. Stratigraphy.



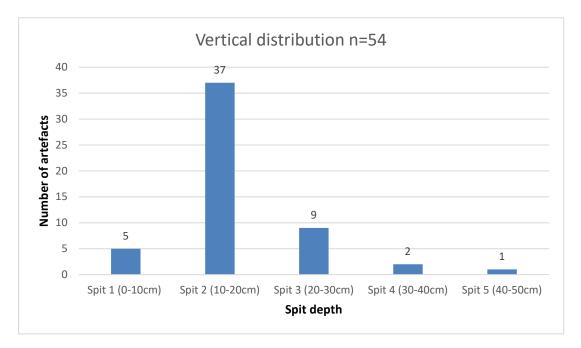


Figure 6-32. Test excavation Area 4. Vertical artefact distribution.

Squares within Tr1 at Area 5 were excavated in 5 cm spits. **Table 6-10** provides detail on the soil profiles at Area 5 and **Figure 6-33** shows a sample of excavated soil profiles from Tr1 at Area 5.

Tr1 Sq4 was the only excavation square that possessed any topsoil (4 cm). Despite the lack of topsoils across the remaining three squares, all excavation squares contained the same subsoil soil profiles. This included a light brown, leached loam extending down to a very light brown, leached loam. A notable difference was the two more western squares (Sq1 and 2) were only 15–16 cm deep and contained an orange/brown clay base, while the eastern squares (Sq3 and 4) were 10 cm deeper at 25 cm and contained a more yellow clay base.

No artefacts were recorded at Area 5, so these soil profiles have no association with recorded artefacts.

Total depth of Transect/Square Soil profile description square (cm) Light brown loam to 4 cm then very light brown leached loam to 16 cm overlying Tr1 Sq1 16 orange/brown clay. Light brown loam to 4 cm then very light brown leached loam to 15 cm overlying 15 Tr1 Sq2 orange/brown clay. Light brown loam to 13 cm then very light brown leached loam to 25 cm overlying Tr1 Sq3 25 yellowish clay. 4 cm humic topsoil above light brown loam to 15 cm then very light brown leached Tr1 Sq4 25 loam to 25 cm overlying yellowish clay.

Table 6-10. Area 5: Excavation log.

Figure 6-33. Test excavation Area 5. Stratigraphy.





1. TEST EXCAVATION AREA 5: TR1 SQ1.

2. TEST EXCAVATION AREA 5: TR1 SQ4.

Area 6

Squares within Tr1 at Area 6 were excavated in 5 cm spits. **Table 6-11** provides detail on the soil profiles at Area 4 and **Figure 6-34** shows a sample of excavated soil profiles from Tr1 at Area 6.

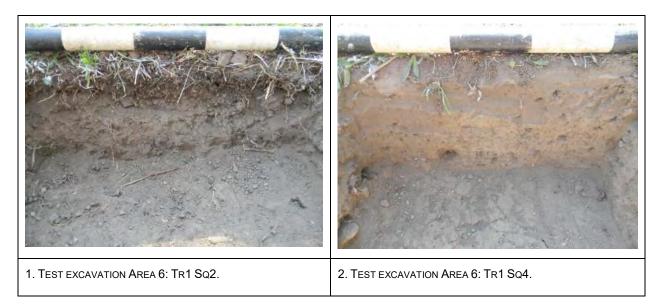
Area 6, as well as Area 5, demonstrated more evidence of leaching and re-deposition of soils when compared to all other excavated areas. Soil depth and profiles were consistent across Tr1 exhibiting 5–8 cm of topsoil then a light brown leached loam above a dark prismatic clay. Clay was encountered across the squares at either 18 or 20 cm deep.

Artefacts were recorded in all spits and squares at Area 6. More specifically, this included: a broken silcrete blade in Sq1 spit 3 (10–15 cm); a broken mudstone flake in Sq2 spit 4 (15–20 cm); a broken mudstone flake in Sq3 spit (0–5 cm); and a broken silcrete flake in Sq4 spit 2 (5–10 cm).

Table 6-11. Area 6: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	20	Dark brown topsoil to 5 cm, then light brown leached loam (hard-packed) down to 15 cm overlying a dark hard-packed prismatic clay/loam.
Tr1 Sq2	18	Dark brown topsoil to 5 cm, then friable leached loam to 18 cm above a dark, prismatic clay.
Tr1 Sq3	18	Dark brown topsoil to 5 cm, then friable leached loam to 18 cm above a dark, prismatic clay.
Tr1 Sq4	20	Dark brown loam to 8 cm, then light brown leached loam to 20 cm above a dark, clay.

Figure 6-34. Test excavation Area 6. Stratigraphy.



Squares within Tr1 and Tr2 at Area 7 were excavated in 10 cm spits. **Table 6-12** provides detail on the soil profiles at Area 7 and **Figure 6-35** shows a sample of excavated soil profiles from Tr1 and Tr2 at Area 7.

Soils profiles were consistent across both Tr1 and Tr2. This comprised dark brown, humic topsoil between 2 and 4 cm, overlying a mid-brown, clay loam with variable depths. Friable mid-brown, clay loam clay was encountered between 10 and 28 cm. Despite evidence of large amounts of disturbance across the terrace in which Tr1 was located from the construction of a dwelling and surrounding farm infrastructure, no disturbances were identified within any of the squares. Charcoal was entirely absent from the deposits and bioturbation was low apart from plant roots in the upper layers.

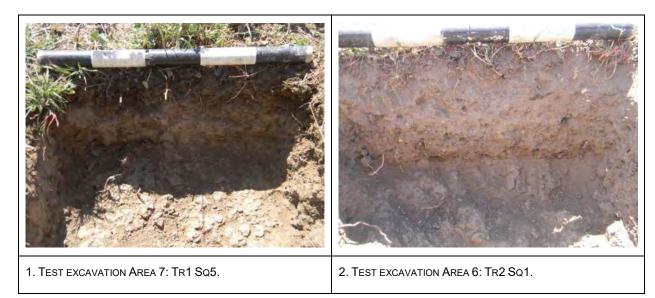
The depth at which artefacts were recorded at Area 7 Tr2 varied between spit 1 (0–10 cm) to spit 3 (20–30 cm). One artefact, a mudstone flaked piece, was recorded in spit 1 of Sq3. Four artefacts were recorded in spit 2 across two squares (Sq3 and Sq4) and two artefacts were recorded in spit 3 across two squares (Sq1 and Sq2). No artefacts were recorded within Tr1.

Table 6-12. Area 7: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	18	Dark drown humic topsoil to 4 cm above mid-brown clay loam to 18 cm. Friable mid-brown clay loam clay.
Tr1 Sq2	10	Dark drown humic topsoil to 2 cm above mid-brown clay loam to 6 cm. Friable mid-brown clay loam clay.
Tr1 Sq3	20	Dark drown humic topsoil to 4 cm above mid-brown clay loam to 20 cm. Friable mid-brown clay loam clay.
Tr1 Sq4	15	Dark drown humic topsoil to 3 cm above mid-brown clay loam to 15 cm. Friable mid-brown clay loam clay.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq5	20	Dark drown humic topsoil to 5 cm above mid-brown clay loam to 20 cm. Friable mid-brown clay loam clay.
Tr1 Sq6	20	Dark drown humic topsoil to 5 cm above mid-brown clay loam to 20 cm. Friable mid-brown clay loam clay.
Tr2 Sq1	25	Dark drown humic topsoil to 3 cm above mid-brown clay loam to 15 cm. Friable mid-brown clay loam to 25 cm.
Tr2 Sq2	22	Dark drown humic topsoil to 5 cm above mid-brown clay loam to 17 cm. Friable mid-brown clay loam clay.
Tr2 Sq3	20	Dark drown humic topsoil to 4 cm above mid-brown clay loam to 18 cm. Friable mid-brown clay loam clay.
Tr2 Sq4	18	Dark drown humic topsoil to 4 cm above mid-brown clay loam to 18 cm. Friable mid-brown clay loam clay.
Tr2 Sq5	20	Dark drown humic topsoil to 5 cm above mid-brown clay loam to 20 cm. Friable mid-brown clay loam clay.
Tr2 Sq6	15	Dark drown humic topsoil to 5 cm above mid-brown clay loam to 15 cm. Friable mid-brown clay loam clay.

Figure 6-35. Test excavation Area 7. Stratigraphy.



Squares within Tr1 at Area 8 were excavated in 10 cm spits. **Table 6-13** provides detail on the soil profiles at Area 8 and **Figure 6-36** shows a sample of excavated soil profiles from Tr1 at Area 8.

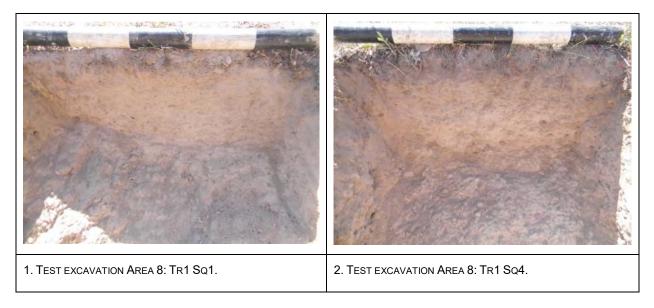
The squares excavated at Area 8 showed very little in the way of a soil profile and almost all consisted of a mid-brown, loam light extending down to basal clays. Apart from a very thin (<6 cm) humic layer, there was very little to distinguish the soils until clay was reached. The major difference between the squares was a gravel layer over the clay within the western squares in the transect.

The only artefact recorded at Area 8, a mudstone flaked piece, was in spit 1 (0–10 cm) of Sq6.

Table 6-13. Area 8: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	20	Dark brown humic topsoil to 4 cm, then mid-brown loam to 13 cm overlying a yellowish clay at 20 cm.
Tr1 Sq2	26	Dark brown humic topsoil to 4 cm, then mid-brown loam to 26 cm overlying a yellowish clay base.
Tr1 Sq3	28	Dark brown humic topsoil to 4 cm, then mid-brown loam to 18 cm overlying a gravel base and yellowish clay at 28 cm.
Tr1 Sq4	30	Dark brown humic topsoil to 4 cm, then mid-brown loam to 25 cm overlying a gravel base and yellowish clay at 30 cm.
Tr1 Sq5	30	Dark brown humic topsoil to 6 cm, then mid-brown loam to 15 cm overlying a gravel base and yellowish clay at 30 cm.
Tr1 Sq6	20	Dark brown humic topsoil to 4 cm, then mid-brown loam to 13 cm overlying a gravel base and yellowish clay at 20 cm.

Figure 6-36. Test excavation Area 8. Stratigraphy.



Squares within Tr1 at Area 9 were excavated in 10 cm spits. **Table 6-14** provides detail on the soil profiles at Area 9 and **Figure 6-37** shows a sample of excavated soil profiles from Tr1 at Area 9.

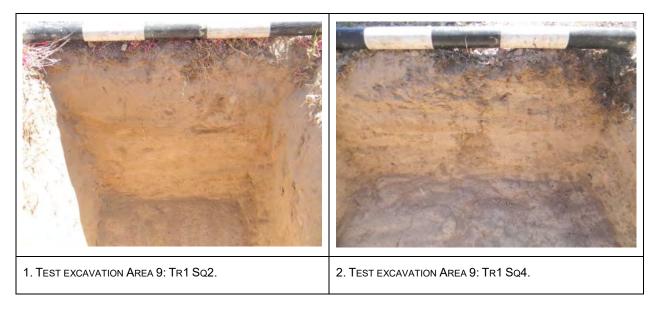
The soils were predominantly shallow and sandy with evidence of active erosion and alluvial origins. The squares presented two distinct A2-Horizons below a thin A1-Horizon. The topmost layer is a mid-brown, sandy loam extending down approximately 20 cm before a light brown layer is reached that extends for approximately 5 cm to B-Horizon clays. This pattern was consistent in the all excavation squares, however Sq2 was particularly deep compared to all other squares at 40 cm.

The only artefact recorded at Area 9, a complete mudstone flake, was located within spit 2 (10–20 cm) of Sq5.

Table 6-14. Area 9: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	26	Dark brown humic topsoil to 5 cm, then mid-brown sandy loam to 20 cm. Light brown sandy loam present between 20 cm and 26 cm where the orange clay base is present.
Tr1 Sq2	40	Dark brown humic topsoil to 5 cm, then mid-brown sandy loam to 18cm. Light brown sandy loam present between 18 cm and 40 cm where the orange clay base is present.
Tr1 Sq3	30	Dark brown humic topsoil to 5 cm, then mid-brown sandy loam to 22 cm. Light brown sandy loam present between 22cm and 30 cm where the orange clay base is present.
Tr1 Sq4	28	Dark brown humic topsoil to 5 cm, then mid-brown sandy loam to 22 cm. Light brown sandy loam down to 28 cm overlying an orange clay base.
Tr1 Sq5	20	Dark brown humic topsoil to 5 cm, then mid-brown sandy loam to 15 cm. Light brown sandy loam down to 20 cm overlying an orange clay base.
Tr1 Sq6	20	Dark brown humic topsoil to 4 cm, then mid-brown sandy loam to 18 cm. Light brown sandy loam present between 18 cm and 20 cm where the orange clay base is present.

Figure 6-37. Test excavation Area 9. Stratigraphy.



Squares within Tr1 at Area 10 were excavated in 10 cm spits. **Table 6-15** provides detail on the soil profiles at Area 10 and **Figure 6-38** shows a sample of excavated soil profiles from Tr1 at Area 10.

At Area 10, a typical profile was for a 4 to 5 cm mid-brown, humic layer of topsoil then a light brown, sandy loam down to between 10 and 14 cm and then a mid-brown loamy clay overlying an orange clay base.

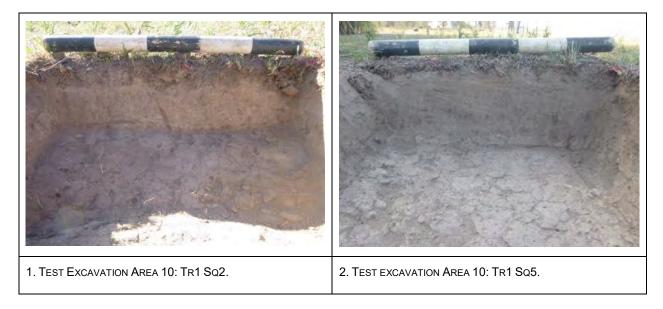
In general, soil depths were shallow across Area 10 with only one excavation square extending beyond 20 cm. While there was some variation in the colouring of the soil with some areas retaining more humic matter (making the soils darker), the same general sequence of soils was observed: namely, very thin A1-Horizon (often only extending to the depth of grass roots), a relatively thin A2-Horizon (sometimes containing gravels) and a consistent, culturally sterile B-Horizon clay.

All three artefacts recovered during excavations at Area 10 were recorded in spit 2 (10–20 cm). Two artefacts were recorded in Sq 2 and the remainder in Sq5.

Table 6-15. Area 10: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	20	Mid-brown humic topsoil to 5 cm. Light brown sandy loam to 12 cm then loamy clay to 20 cm overlying orange clay base.
Tr1 Sq2	16	Mid-brown humic topsoil to 4 cm. Light brown sandy loam to 10 cm then loamy clay to 16 cm overlying orange clay base.
Tr1 Sq3	17	Mid-brown humic topsoil to 4 cm. Light brown sandy loam to 11 cm then loamy clay to 17 cm overlying orange clay base.
Tr1 Sq4	18	Mid-brown humic topsoil to 5 cm. Light brown sandy loam to 10 cm then loamy clay with some gravels to 18 cm overlying orange clay base.
Tr1 Sq5	20	Mid-brown humic topsoil to 4 cm. Light brown sandy loam to 14 cm then loamy clay with some gravels to 20 cm overlying orange clay base.
Tr1 Sq6	24	Mid-brown humic topsoil to 5 cm. Light brown sandy loam to 11 cm then loamy clay with some gravels to 24 cm overlying orange clay base.

Figure 6-38. Test excavation Area 10. Stratigraphy.



<u>Area 11</u>

Squares within Tr1 at Area 11 were excavated in 10 cm spits. **Table 6-16** provides detail on the soil profiles at Area 11 and **Figure 6-39** shows a sample of excavated soil profiles from Tr1 at Area 11.

The excavated area at Area 11 is located on the eastern bank of Yorks Creek. The creek at this location has wide in-stream erosion and a deflated soil profile, although much of this area has revegetated. All excavation took place beyond the current erosion edge within the grassed and more level area to the east, on either side of an ephemeral drainage line/gully.

As shown in **Table 6-16**, most of the squares comprised mid-brown, silty loam before extending to basal clay. Most squares comprised dark brown topsoil (0–8 cm), then mid-brown loam above an orange clay base. Soils were relatively thin in this area (generally <17 cm), except for Sq3 which

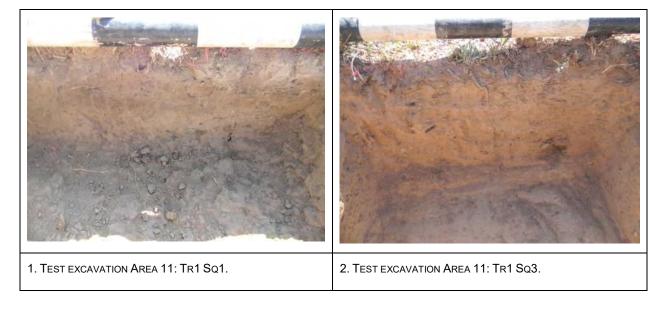
reached a depth of 25 cm. Soils are likely thinner closer to the erosion edge where erosion has the stripped top soil. This is particularly case for Sq2 and Sq5 which retained no topsoil.

The only artefact recorded at Area 11, a broken silcrete flake, was in spit 1 (0–10 cm) of Sq4.

Table 6-16. Area 11: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	17	Dark brown loam to 8 cm above mid-brown loam to 17 cm. Clay base at 17 cm.
Tr1 Sq2	10	Mid-brown loam to 10 cm overlying orange clay base.
Tr1 Sq3	25	Dark brown humic topsoil to 5 cm above mid-brown loam to 25 cm. Orange clay base at 25 cm.
Tr1 Sq4	12	Dark brown humic topsoil to 4 cm above mid-brown loam to 12 cm. Orange clay base at 12 cm.
Tr1 Sq5	7	Mid-brown loam to 7 cm overlying orange clay base.
Tr1 Sq6	15	Dark brown humic topsoil to 4 cm above mid-brown loam to 15 cm. Orange clay base at 15 cm.

Figure 6-39. Test excavation Area 11. Stratigraphy.



Area 12

Squares within Tr1 at Area 12 were excavated in 10 cm spits. **Table 6-17** provides detail on the soil profiles at Area 12 and **Figure 6-40** shows a sample of excavated soil profiles from Tr1 at Area 12.

In general, most squares had a thin organic layer (4–5 cm) overlying a fine, light-brown alluvial loam. Basal clay (B-Horizon) was encountered at 20 cm depth on average. The two shallower squares (Sq1 and Sq15) retained no topsoil.

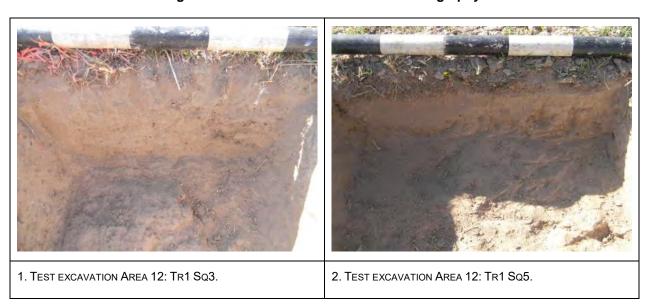
Non-Aboriginal disturbances were evident within Sq6, which recovered a number of historic items including broken pieces of glass, ceramic and metal⁹. Due to the presence of the items, this square was not excavated down to basal clay.

Of the six artefacts recovered during excavations at Area 12, 83 per cent (n=5) were recorded within Sq2, two in spit 1 (0–10 cm) and three in spit 3 (10–20 cm). The remaining artefact was recorded in spit 1 (0–10 cm) of Sq5.

Table 6-17. Area 12: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	19	Light brown loam (alluvium?) then orange clay at 19 cm.
Tr1 Sq2	28	Dark brown humic topsoil to 4 cm, then light brown loam (alluvium?) to 28 cm above. Orange clay at base.
Tr1 Sq3	23	Light brown loam (alluvium?) then orange clay at 23 cm.
Tr1 Sq4	20	Dark brown humic topsoil to 5 cm, then light brown loam (alluvium?) to 20 cm. Orange clay at base.
Tr1 Sq5	15	Dark brown humic topsoil to 5 cm, then light brown loam (alluvium?) to 19 cm. Orange clay at base.
Tr1 Sq6	20	Dark brown humic topsoil to 4 cm, then light brown loam (alluvium?) to 20 cm. Excavation stopped once non-Aboriginal items recovered at 20+ cm.

Figure 6-40. Test excavation Area 12. Stratigraphy.



⁹ All historic heritage items were passed on to Casey & Lowe.

6.4.2.2 Artefact distribution

Horizontal Distribution

There was no notable distribution pattern to the recorded artefacts.

Of the 180 artefacts recorded, the highest number of artefacts in one excavation square was 17 in both Tr5 Sq1 and Tr5 Sq5 at Area 1. The next highest numbers of artefacts in one excavation square was 14 at Area 4 Tr5 Sq1; 11 at Area 4 Tr4 Sq4 and 11 at Area 1 Tr5 Sq3.

Across the 12 areas excavated during the test excavation program, Tr5 at Area 1 recorded the highest number of artefacts (n=53 or 29 per cent of the overall artefact assemblage). While three squares at Tr5 recorded over 10 artefacts, no additional squares were excavated as the initial six squares confirmed that artefacts were relatively consistently present at the southern extent on the spur landform.

At two small clusters at Area 4, an additional three excavation squares were excavated in different directions spaced 5 m from Tr4 Sq4 and Tr5 Sq1 to determine whether they were part of a more extensive artefact scatter. One square (Sq8) surrounding Tr4 Sq4, recorded three artefacts while the other two squares (Sq7 and Sq9) recorded no artefacts. Similarly, at Tr5 Sq1, only one square (Sq9) located 5 m to the northwest recorded five artefacts, while Sq7 and Sq8 recorded no artefacts. Based on these results, it can be concluded that the density of artefacts at these two locations is isolated and not part of an extensive artefact scatter.

Vertical Distribution

Of those excavation squares containing artefacts, over half (58 per cent) came from spit 2 (10–20 cm). The second highest proportion of artefacts came from the top-most 10 cm of deposits (spit 1) with very few being recorded at depths greater than 20 cm (<10 per cent) (**Figure 6-41**). Two artefacts were recorded between 30–40 cm (spit 4) and only one artefact was recorded in spit 5 (40–50 cm). There is little differentiation between spits 1 and 2 (0–20 cm) and the only conclusion that can be drawn from this vertical distribution is that artefacts, at the areas investigated, are located closer to the surface.

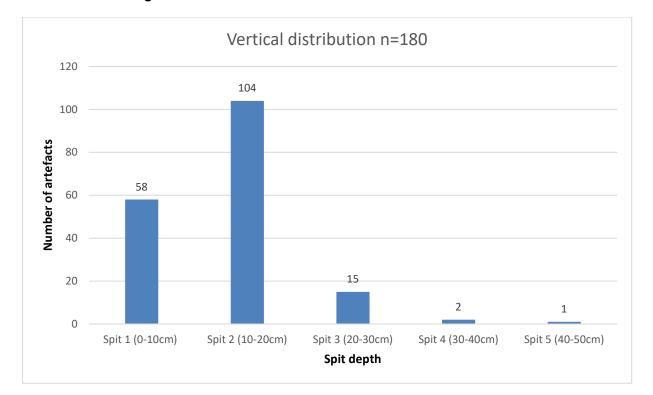


Figure 6-41. Test excavation. Vertical distribution of artefacts.

6.4.2.3 Artefact types

The most-numerous artefact type within the assemblage is the unmodified flake which accounted for 76 per cent of all artefacts recorded (**Figure 6-42**). The second most-numerous artefact type is 'shatter' defined as chips, chunks, and other undiagnostic pieces of raw material (nine per cent). Blades (eight per cent) are the only other sizeable category, with backed blades (two per cent), flaked pieces (defined as flakes which, in turn, have had flakes struck from them) (two per cent), cores (one per cent), microliths (0.5 per cent), side scrapers (0.5 per cent) and anvils/hammerstones (0.5 per cent) making up the remainder of the artefact assemblage.

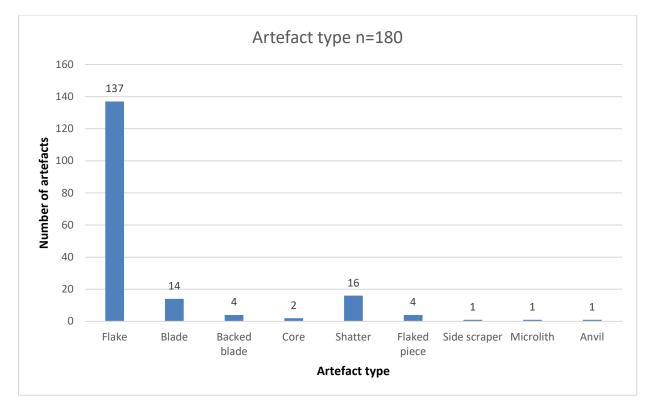


Figure 6-42. Test excavation. Artefact type.

6.4.2.4 Raw materials

Most recorded artefacts come from either mudstone or silcrete sources. 49 per cent of artefacts were silcrete and 42 per cent were mudstone with negligible numbers from quartz, volcanic sources, quartzite, petrified wood, chert and 'other' materials (**Figure 6-43**). The 'other' materials recorded include chalcedony and porcellanite.

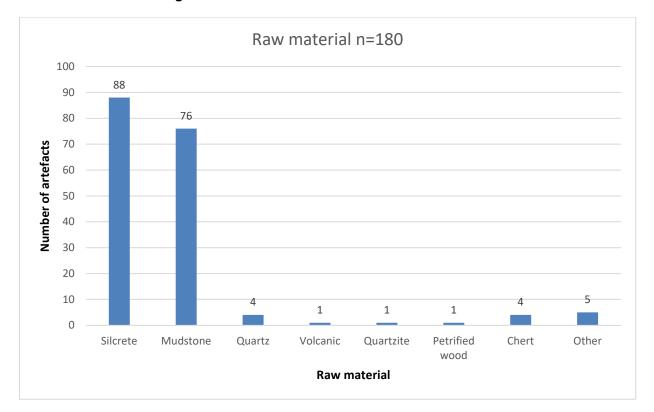


Figure 6-43. Test excavation. Artefact raw materials.

6.4.2.5 Artefact size

The most numerous size category of recorded artefacts is category 2 (10–20 mm) with 50.5 per cent of all artefacts (**Figure 6-44**). 24 per cent are size category 3 (20–30 mm), 13 per cent are size category 1 (0–10 mm), 11 per cent are size category 4 (30–50 mm), and less than two per cent are larger than 50 mm.



Figure 6-44. Test excavation. Artefact size.

6.4.2.6 Reduction Stage

80 per cent of all artefacts were at a tertiary stage of reduction and were without any cortex, 17 per cent were at a secondary stage of reduction and had between 1 and 50 per cent cortex and three per cent were at a primary stage of reduction with over 50 per cent of the artefact surface being cortex (**Figure 6-45**).

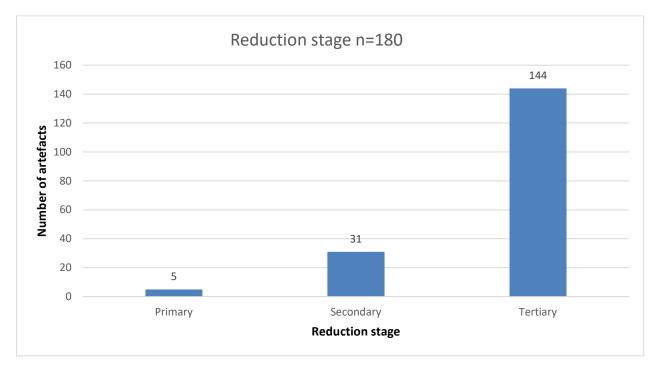


Figure 6-45. Test excavation. Artefact reduction stage.

6.4.2.7 Integrity

Of the 160 artefacts where integrity was recorded, 89 artefacts or 56 per cent of artefacts were complete (**Figure 6-46**). Of the broken flakes (44 per cent of the artefacts in which integrity was recorded), the most were recorded as having lost the proximal section of the flake (distal fragment: 22.5 per cent), followed by flakes with the distal portion missing (proximal fragment: 13.75 per cent), flakes with both the proximal and distal portions missing (medial fragments: 6.25 per cent) and flakes broken down the axis of percussion (longitudinal breaks: 1.5 per cent).

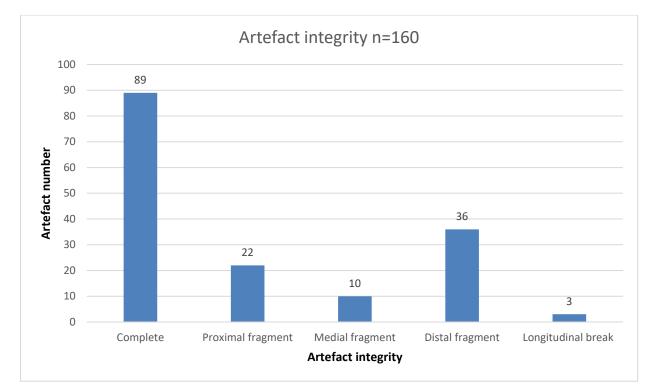


Figure 6-46. Test excavation. Artefact integrity.

6.4.2.8 Artefact Assemblage: Area by Area

Area 1

93 artefacts were recorded at Area 1 with artefacts being recorded at all transects (**Figure 6-47**). The greatest concentration was from Tr5 Sq1 and Sq5 with 17 artefacts each. The most common artefact type was unmodified flakes (n=78) (**Figure 6-48**). Other artefact types were recorded in much smaller proportions including blades, shatter and flaked pieces. Four retouched artefacts were recorded, including three backed blades and one side scraper. The side scraper and one backed blade displayed steep and invasive retouch, while the remaining two backed blades have semi-steep and fine retouch. Mudstone was the most common raw material (n=50), followed by silcrete (n=34) and small amounts of quartz, quartzite, chert, and chalcedony (**Figure 6-48** and **Figure 6-49**). Of the 85 artefacts where integrity was recorded (i.e. excluding flaked pieces/shatter), 58 are complete and the remaining 27 are broken in some form, predominately distal fragments that have the proximal portion of the flake/blade missing.

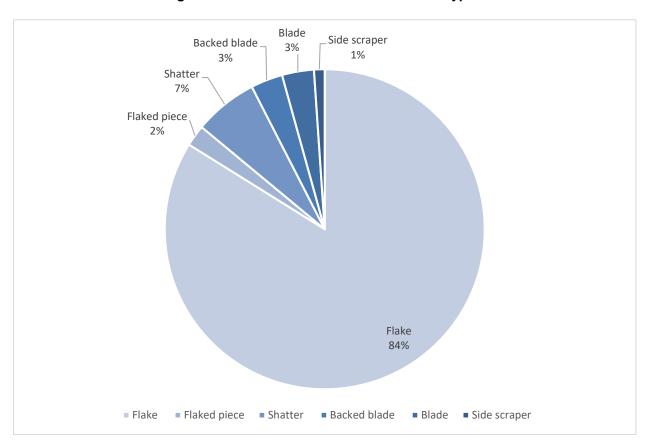
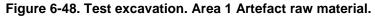


Figure 6-47. Test excavation. Area 1 artefact types.



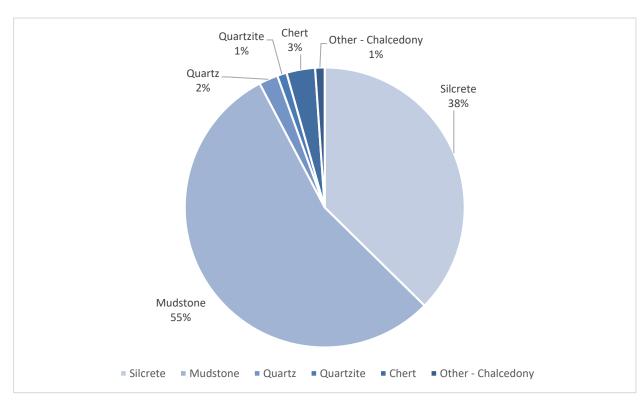


Figure 6-49. Test Excavation. Area 1 artefacts.







7. AREA 1 TR5 SQ3 SPIT 1.

8. AREA 1 TR5 SQ3 SPIT 1. DETAIL OF MUDSTONE SCRAPER.





9. AREA 1 TR5 SQ5 SPIT 1.

10. AREA 1 TR5 SQ5 SPIT 2.





11. AREA 1 TR5 SQ5 SPIT 2 BACKED BLADES.

12. AREA 1 TR5 SQ5 SPIT 2. DETAIL OF MUDSTONE BACKED BLADE.

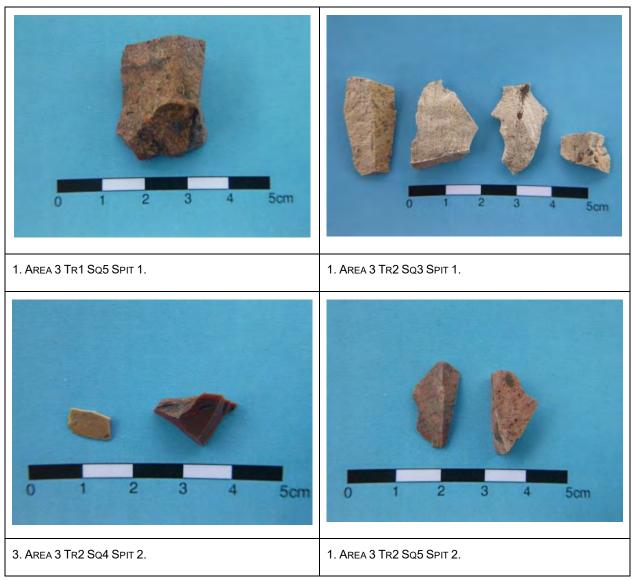
Area 2

No Aboriginal artefacts were recorded at Area 2. Some insignificant historic items (glass and ceramic fragments) were excavated, and these were passed on to Casey & Lowe for analysis (Casey and Lowe 2019: Section 3.9.1).

Area 3

Ten artefacts were recorded at Area 3; nine being unmodified flakes and the remaining being an unmodified blade (**Figure 6-50**). Silcrete and porcellanite were the most common materials (n=4 each) with two manufactured from mudstone. All artefacts were at a tertiary stage of reduction.

Figure 6-50. Test excavation. Area 3 artefacts.



Area 4

54 artefacts were recorded at Area 4 with the highest numbers of artefacts being recorded in Tr4 Sq4 (n=11) and Tr5 Sq1 (n=14). Across Area 4, 38 artefacts (70 per cent) of all artefacts were

silcrete with only 14 mudstone artefacts recorded and one each of quartz and volcanic sources (**Figure 6-51**). Of the 44 artefacts for which integrity was recorded, 18 were recorded as complete with the remainder (59 per cent) displaying a breakage of some sort: an equal number (n=11) are recorded as distal fragments, with 11 also recorded as proximal fragments.

Flakes were the most-common artefact type (**Figure 6-52**; n=26) and Area 4 recorded a high proportion of blades (n=9) and shatter (n=10). Compared with other test excavation areas, cores were more frequently recorded (n=2). One backed blade and one microlith was recorded (**Figure 6-53**). One anvil/hammerstone was also recorded in the same square and spit as a mudstone core (Tr1 Sq6 spit 3) (**Figure 6-53**).

Two cores were recorded. One was from silcrete and the other, mudstone, and both are multidirectional. Both cores had low portions of cortex remaining (less than 20 per cent).

The recorded silcrete backed blade was recorded as having steep and invasive retouch; and the silcrete microlith with steep and fine retouch.

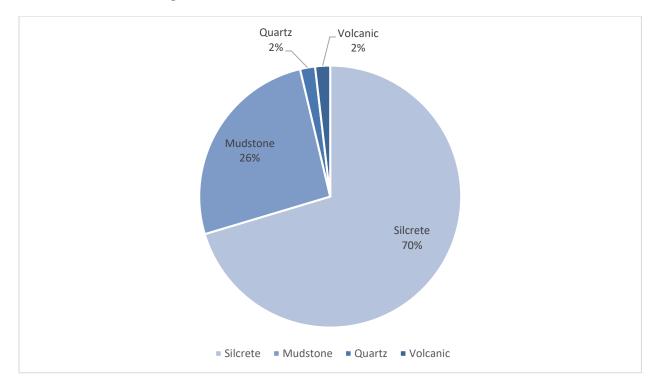


Figure 6-51. Test excavation. Area 4 artefact raw material.

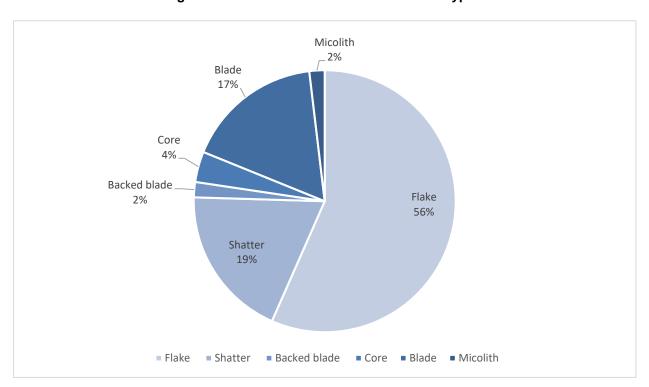
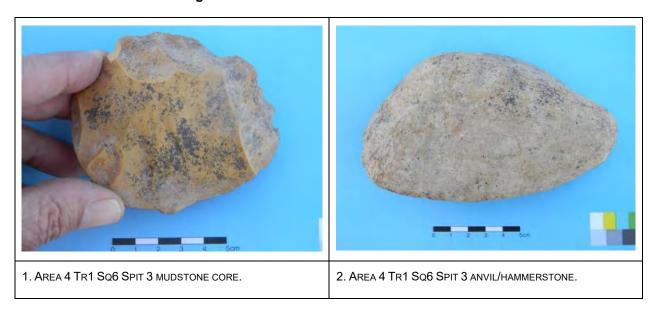


Figure 6-52. Test excavation. Area 4 artefact types.

Figure 6-53. Test excavation. Area 4 artefacts.







4. Area 4 Tr3 Sq6 Spit 2 detail of retouch.





5. AREA 4 TR4 SQ4 SPIT 2.

6. AREA 4 TR4 SQ4 SPIT 2 SILCRETE CORE.





7. AREA 4 TR4 SQ2 SPIT 3 MUDSTONE FLAKE.

 $8.\,Area\,4\,Tr4\,Sq8\,Spit\,2\,silcrete\,microlith\,and\,flake.$



<u>Area 5</u>

No artefacts were recorded at Area 5.

Area 6

Only four artefacts were recorded at Area 6; a broken silcrete blade; two distal fragments of mudstone flakes and a broken silcrete flake (**Figure 6-54**).

1. Area 6 Tr1 Sq1 Spit 3.

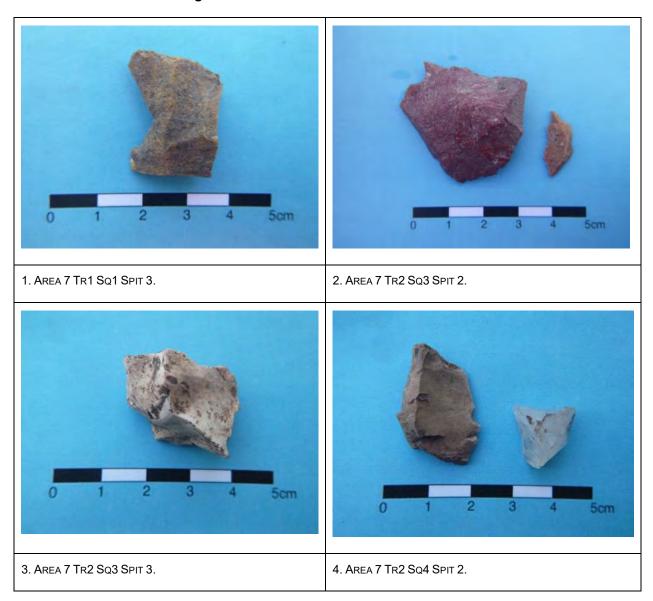
2. Area 6 Tr1 Sq2 Spit 1.

Figure 6-54. Test Excavation. Area 6 artefacts.

Area 7

Seven artefacts were recorded at Area 7; six being unmodified flakes along with one flaked piece. 57 per cent of artefacts were recorded as silcrete, followed by mudstone (29 per cent) and quartz (14 per cent or n=1) (**Figure 6-55**). All but one artefact was at a tertiary stage of reduction, with one flake with up to 50 percent cortex remaining present.

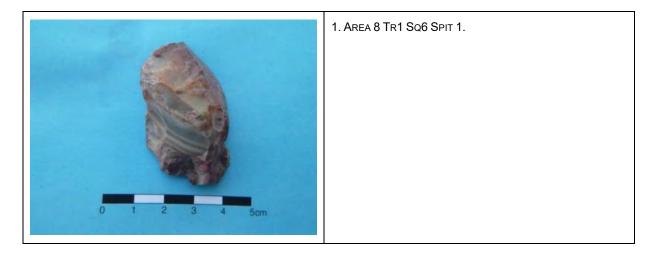
Figure 6-55. Test excavation. Area 7 artefacts.



Area 8

Only one artefact was recorded at Area 8; a mudstone flaked piece (Figure 6-56).

Figure 6-56. Test Excavation. Area 8 artefact.



Area 9

Only one artefact was recorded at Area 9; a complete mudstone flake (Figure 6-57).

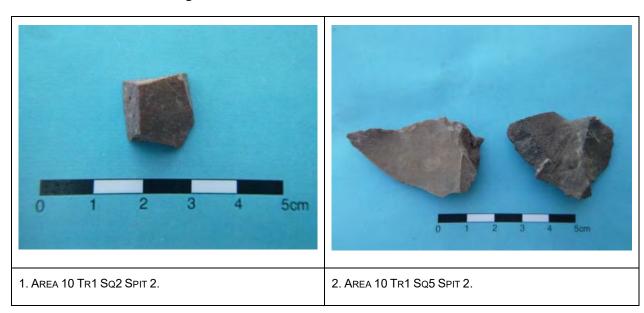
Figure 6-57. Test Excavation. Area 9 artefact.



Area 10

Three artefacts were recorded at Area 10; a piece of silcrete shatter; and two complete mudstone flakes (Figure 6-58).

Figure 6-58. Test Excavation. Area 10 artefacts.



<u> Area 11</u>

One artefact was recorded at Area 11; a broken silcrete flake (Figure 6-59).

1. Area 11 Tr1 SQ4 Spit 1.

Figure 6-59. Test excavation Area 11 artefacts.

Area 12

Six artefacts were recorded at Area 12; two broken and one complete silcrete flake; one broken and one complete mudstone flake and one complete chert flake (**Figure 6-60**). Some insignificant historic items (broken pieces of glass, ceramic and metal) were also excavated and were passed on to Casey and Lowe (2019) for analysis.

1. Area 12 Tr1 Sq2 Spit 2.

2. Area 12 Tr1 Sq2 Spit 2.

Figure 6-60. Test excavation Area 12 artefacts.



3. AREA 12 TR1 SQ5 SPIT 1.

A full artefact catalogue of all test excavation areas is presented in Appendix 6.

6.4.3 Conclusion

The results of the test excavation program have allowed for the classification of areas of subsurface deposits within the areas identified during the survey as having PAD. It has also resulted in the site extent of several sites being increased from the extent initially identified. Each excavation area is discussed below to highlight where the associated site extent of the relevant site has been amended.

Aboriginal Site Impact Recording Forms (ASIRF) have been submitted to AHIMS to update the status of the sites to 'partially destroyed'.

6.4.3.1 Area 1

The test excavation program at Area 1 targeted a broad spur landform adjacent to Bowmans Creek where three Aboriginal sites are located: Glendell North OS5, Glendell North OS6 and Bowmans Ck 7. It also tested a secondary terrace identified as a Glendell North PAD1, to the north of the spur.

Glendell North OS5

12 0.5 m by 0.5 m excavation squares were excavated nearby Glendell North OS5: a total of three-square metres. From this area of excavation, 13 artefacts were recovered; an average of 4.3 artefacts per square metre. The results of the test excavation program led to the extent of Glendell North OS5 being extended to the southeast. The area of subsurface deposits at Glendell North OS5 measures 75 m x 35 m and excludes the western edge of the spur where the surface artefacts are exposed as there is no A-Horizon soil present (**Figure 6-61**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the area of subsurface deposit highlighted.

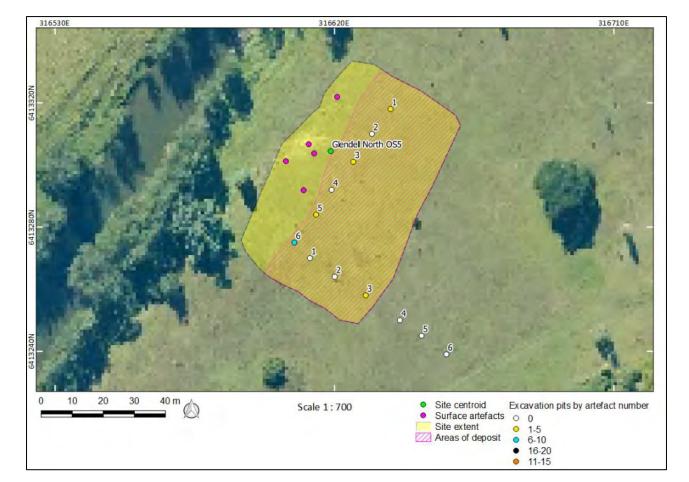


Figure 6-61. Area of subsurface deposit at Glendell North OS5.

Glendell North OS6

Six 0.5 m by 0.5 m excavation squares were excavated nearby Glendell North OS6: a total of 1.5 square metres. From this area of excavation, 53 artefacts were recovered; an average of 35.3 artefacts per square metre. The results of the test excavation program led to the extent of Glendell North OS6 being extended to the northeast. The area of subsurface deposits at Glendell North OS6 measures 75 m x 30 m and excludes the southwestern portion of the overall site extent which has been subject to high levels of erosion and retains no A-Horizon soil (**Figure 6-62**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a moderate density within the area of subsurface deposit highlighted.

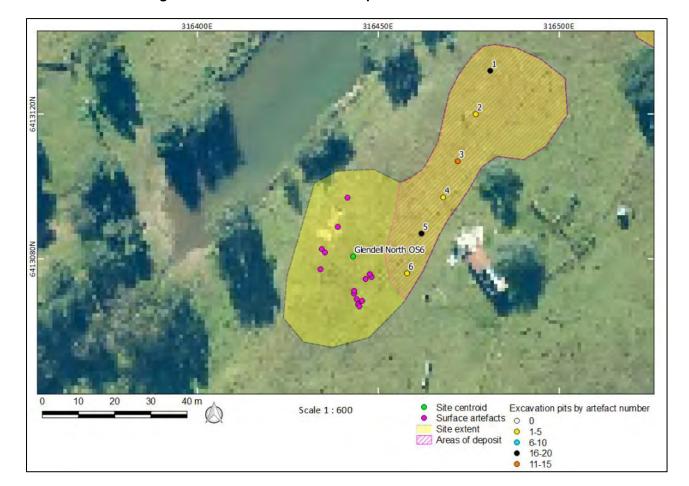


Figure 6-62. Area of subsurface deposit at Glendell North OS6.

Glendell North OS36

Six 0.5 m by 0.5 m excavation squares were excavated at the area identified formerly as Glendell North PAD1: a total of 1.5 square metres. From this area of excavation, three artefacts were recovered; an average of two artefacts per square metre. The results of the test excavation program led to the area of Glendell North PAD1 being re-defined as an artefact site, Glendell North OS36. The area of subsurface deposit at Glendell North OS36 includes the entirety of the site extent, measuring terrace measures 35 m x 30 m (**Figure 6-63**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the site extent.



Figure 6-63. Area of subsurface deposit at Glendell North OS36.

Bowmans Ck 7

Six 0.5 m by 0.5 m excavation squares were excavated nearby Bowmans Ck 7: a total of 1.5 square metres. From this area of excavation, 24 artefacts were recovered; an average of 16 artefacts per square metre. The presence of subsurface artefacts nearby Bowmans Ck 7 led to the extent of the site being increased to the north and west. The area of subsurface deposits at Bowmans Ck 7 measures 60 m x 40 m and includes the entirety of the site extent (**Figure 6-64**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a low-moderate density within the site extent.

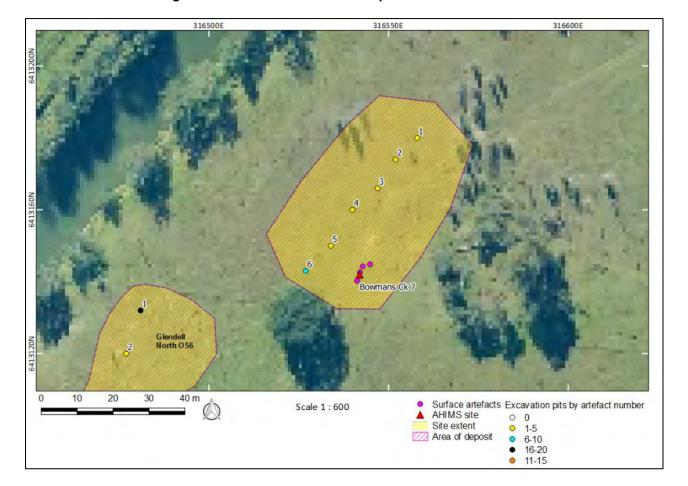


Figure 6-64. Area of subsurface deposit at Bowmans Ck 7.

6.4.3.2 Area 2

Only insignificant historic artefacts were recovered during the test excavation program at Area 2, as such, the area identified as a PAD is now redundant.

6.4.3.3 Area 3

12 0.5 m by 0.5 m excavation squares were excavated at the area surrounding York Creek 4: a total of three-square metres. From this area of excavation, 10 artefacts were recovered; an average of 3.3 artefacts per square metre. The presence of subsurface artefacts nearby York Creek 4 led to the boundary of the site being extended to the west. The area of subsurface deposits at York Creek 4 measures 45 m x 30 m and excludes eastern portions of the site extent which encompass the lower terrace and areas test on the upper terrace where no artefacts were recovered from the excavation squares (**Figure 6-65**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a low density within the area of subsurface deposit highlighted.

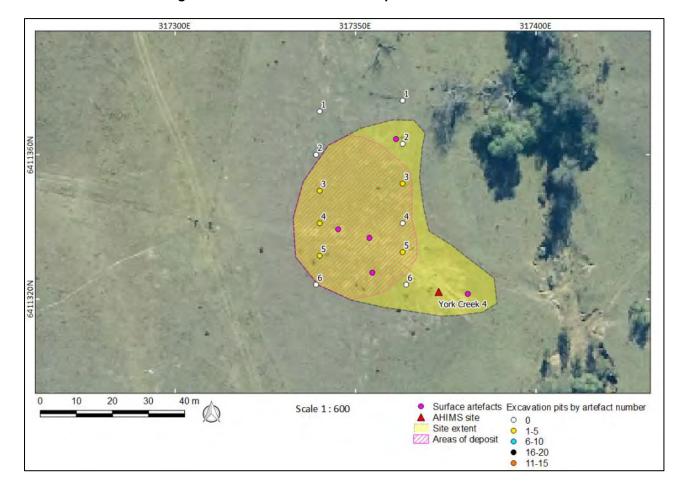


Figure 6-65. Area of subsurface deposit at York Creek 4.

6.4.3.4 Area 4

The test excavation program at Area 4 targeted the confluence of Bowmans and Yorks Creek and focussed on the upper terrace landform. Two previously recorded AHIMS sites, York Creek 7 and Yorks Creek 19 were recorded at Area 4, however, the test excavation resulted in an additional two sites, Glendell North OS34 and OS35 being recorded.

Glendell North OS34

15 0.5 m by 0.5 m excavation squares were at Glendell North OS34: a total of four-square metres. From this area of excavation, 25 artefacts were recovered; an average of 6.25 artefacts per square metre. The area of subsurface deposits at Glendell North OS34 measures 85 m x 40 m and excludes the northern portion of the overall site extent where no artefacts were identified during the subsurface investigations (**Figure 6-66**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a low density within the area of subsurface deposit highlighted.

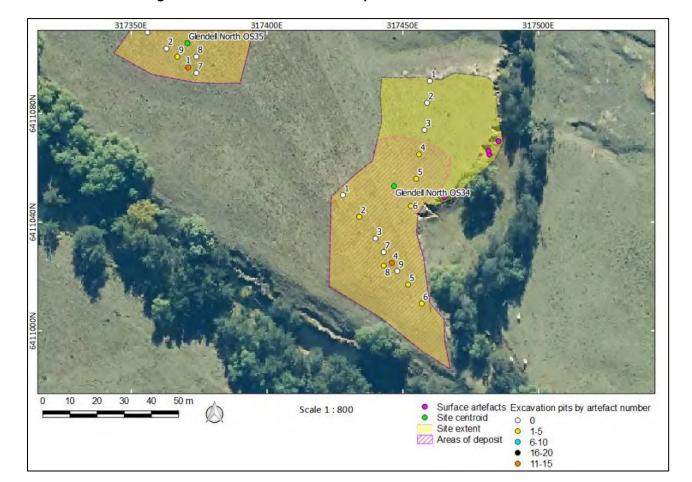


Figure 6-66. Area of subsurface deposit at Glendell North OS34.

Glendell North OS35

Nine 0.5 m by 0.5 m excavation squares were excavated at Glendell North OS35: a total of 2.25 square metres. From this area of excavation, 19 artefacts were recovered; an average of 8.4 artefacts per square metre. The area of subsurface deposits at Glendell North OS35 measures 50 m x 30 m and includes the entire site extent (**Figure 6-67**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a low density within the area of subsurface deposit highlighted.

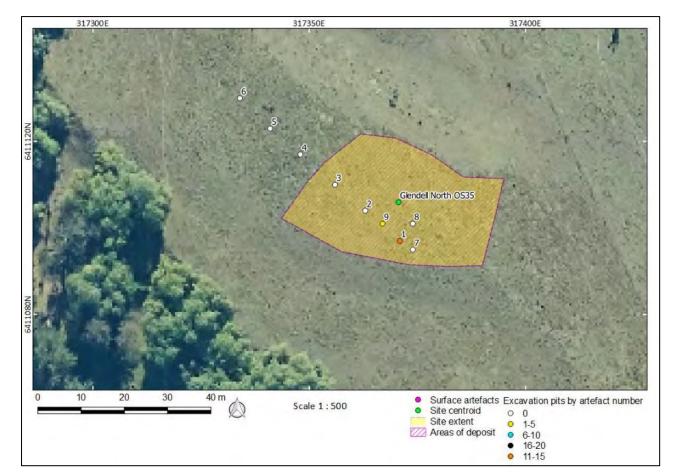


Figure 6-67. Area of subsurface deposit at Glendell North OS35.

York Creek 7

Six 0.5 m by 0.5 m excavation squares were excavated at York Creek 7: a total of 1.5 square metres. From this area of excavation, six artefacts were recovered; an average of four artefacts per square metre. The presence of subsurface artefacts nearby York Creek 7 allowed for the designated of the area of subsurface deposit. This area measures 80 m x 45 m and includes the entirety of the site extent (**Figure 6-68**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts within the area of subsurface deposit highlighted.

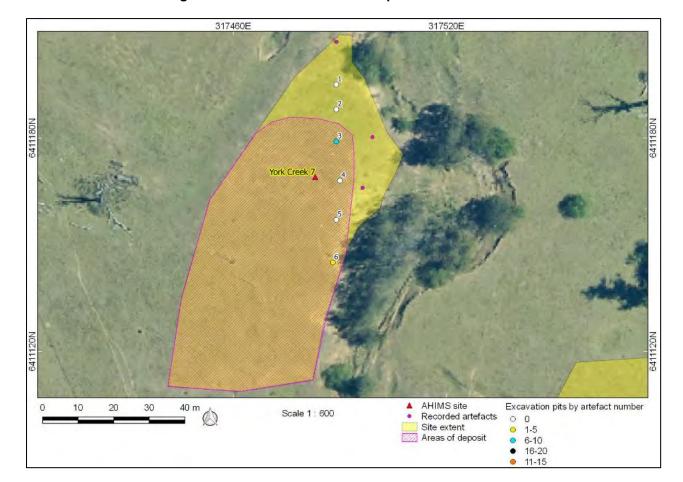


Figure 6-68. Area of subsurface deposit at York Creek 7.

Yorks Creek 19

Six 0.5 m by 0.5 m excavation squares were excavated to the south of York Creek 19: a total of 1.5 square metres. From this area of excavation, four artefacts were recovered; an average of 2.6 artefacts per square metre. The presence of subsurface artefacts nearby York Creek 19 allowed for the designated of the area of subsurface deposit. This area measures 60 m x 30 m and includes the entirety of the site extent (**Figure 6-69**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts within the area of subsurface deposit highlighted.

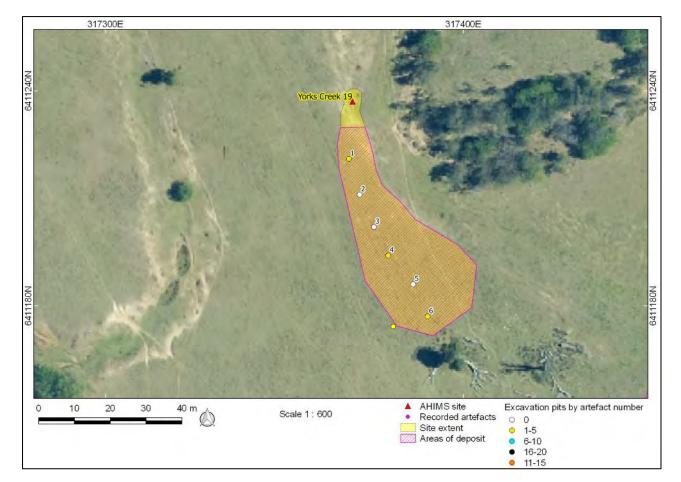


Figure 6-69. Area of subsurface deposit at Yorks Creek 19.

6.4.3.5 Area 5

No artefacts were recovered during the test excavation program at Area 5, as such, the area identified as a PAD is now redundant.

6.4.3.6 Area 6

Four 0.5 m by 0.5 m excavation squares were nearby to Glendell North OS16: a total of one square metre. From this area of excavation, four artefacts were recovered; an average of four artefacts per square metre. The area of subsurface deposits at Glendell North OS16 measures 20 m x 15 m and excludes the northern portion of the overall site extent where surface artefacts are present on B-Horizon soils (**Figure 6-70**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the area of subsurface deposit highlighted.

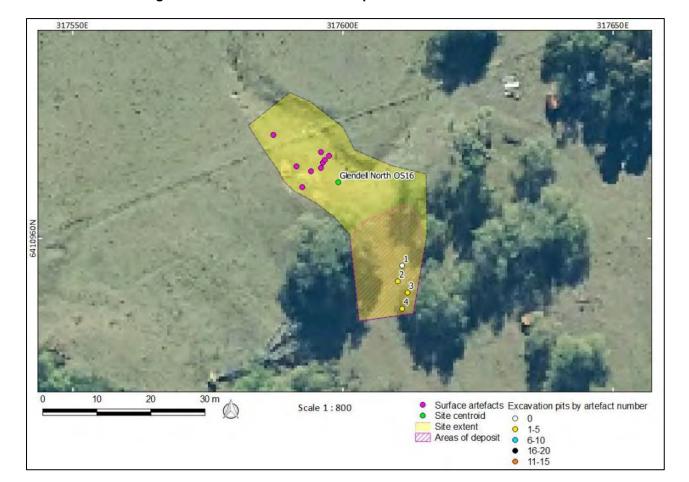


Figure 6-70. Area of subsurface deposit at Glendell North OS16.

6.4.3.7 Area 7

12 0.5 m by 0.5 m excavation squares were nearby to Glendell North OS19: a total of three-square metres. From this area of excavation, seven artefacts were recovered; an average of 2.3 artefacts per square metre. The area of subsurface deposits at Glendell North OS19 measures 55 m x 30 m and excludes the eastern portion of the overall site extent where high levels of ground surface disturbance were observed, including the foundations of a house (**Figure 6-71**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the area of subsurface deposit highlighted.

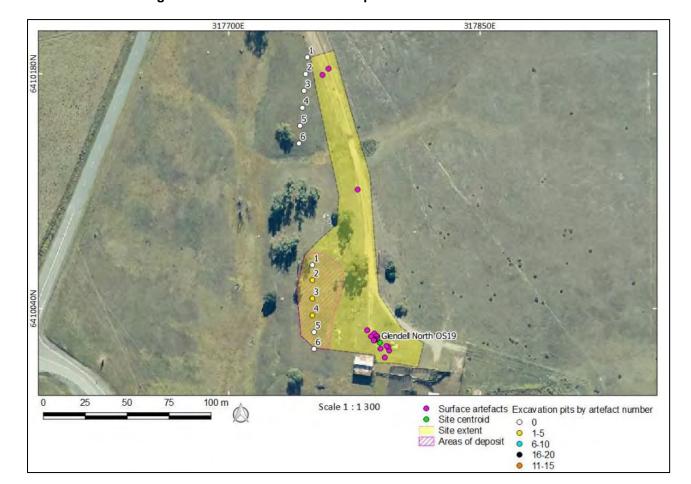


Figure 6-71. Area of subsurface deposit at Glendell North OS19.

6.4.3.8 Area 8

Six 0.5 m by 0.5 m excavation squares were excavated at G11 Glendell: a total of 1.5 square metres. From this area of excavation, one artefact was recovered; an average of 0.6 artefacts per square metre. The presence of subsurface artefacts nearby G11 Glendell allowed for the designated of the area of subsurface deposit. This area measures 45 m x 20 m and includes the central portion of the site extent (**Figure 6-72**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the area of subsurface deposit highlighted.

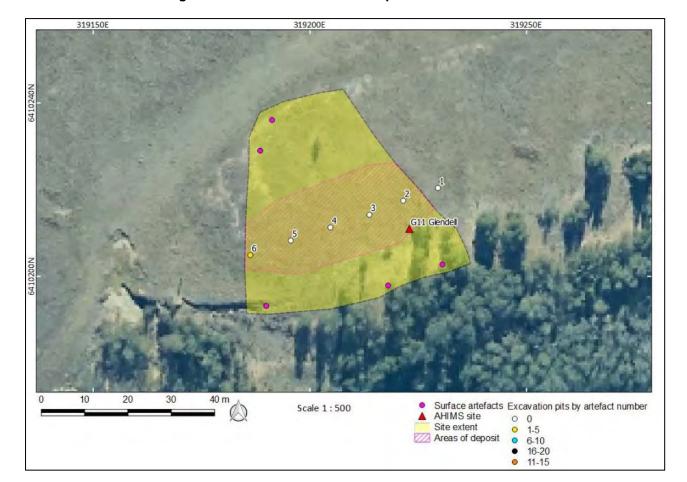


Figure 6-72. Area of subsurface deposit at G11 Glendell.

6.4.3.9 Area 9

Six 0.5 m by 0.5 m excavation squares were excavated at the area identified as having PAD at Area 9: a total of 1.5 square metres. From this area of excavation, one artefact was recovered; an average of one artefact per square metre. The results of the test excavation program led to the area of PAD being included as an isolated find, Glendell North IF26. The area of subsurface deposit at Glendell North IF26 is a five-metre radius around the artefact location (**Figure 6-73**). The site is now 'partially destroyed' but with the possibility of further subsurface artefacts at a very low density within site boundary.

It should be noted that the single artefact that prompted the re-designation of the PAD to GN IF26 has been salvaged by the test excavation program and is no longer in the landscape.

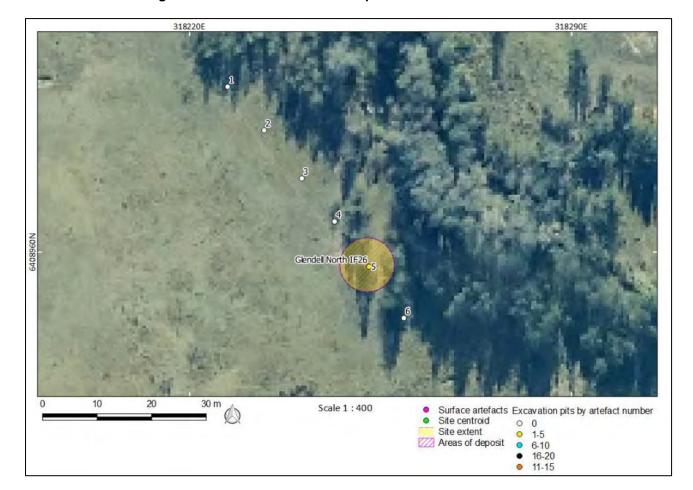


Figure 6-73. Area of subsurface deposit at Glendell North IF26.

6.4.3.10 Area 10

Six 0.5 m by 0.5 m excavation squares were excavated adjacent to Glendell North OS25: a total of 1.5 square metres. From this area of excavation, three artefacts were recovered; an average of two artefacts per square metre. The results of the test excavation program led to the extent of Glendell North OS25 being extended to the east and south. The area of subsurface deposits at Glendell North OS25 measures 35 m x 15 m and excludes the western portion that has been subject to high levels of erosion and retains no A-Horizon soil (**Figure 6-74**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the area of subsurface deposit highlighted.

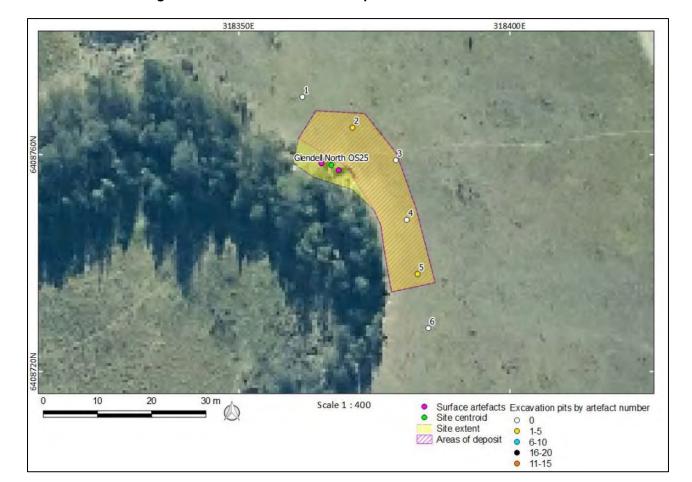


Figure 6-74. Area of subsurface deposit at Glendell North OS25.

6.4.3.11 Area 11

Six 0.5 m by 0.5 m excavation squares were excavated at York Creek 11: a total of 1.5 square metres. From this area of excavation, one artefact was recovered; an average of 0.6 artefacts per square metre. The area of subsurface deposits at York Creek 11 measures 20 m x 8 m and excludes the northern portion that has been subject where no subsurface artefacts were found. It also excludes the lower terrace landform along the creek line (**Figure 6-75**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the area of subsurface deposit highlighted.

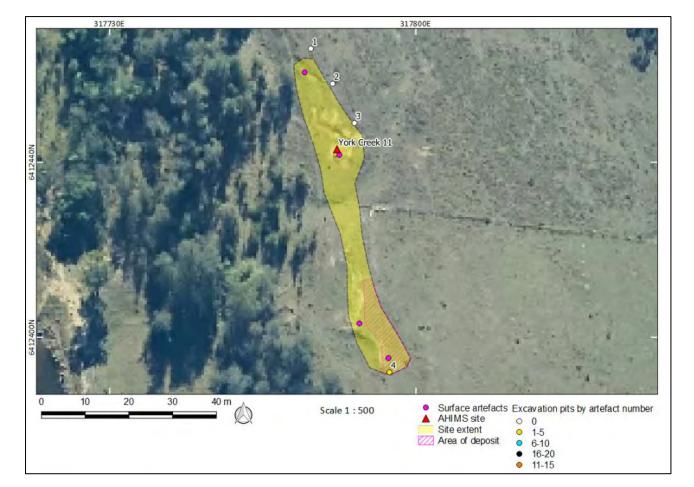


Figure 6-75. Area of subsurface deposit at York Creek 11.

6.4.3.12 Area 12

Six 0.5 m by 0.5 m excavation squares were excavated to the east of York Creek 18: a total of 1.5 square metres. From this area of excavation, six artefacts were recovered; an average of four artefacts per square metre. The results of the test excavation program have led York Creek 18 being re-designated from an isolated find to an artefact scatter. The area of subsurface deposits at York Creek 18 measures 50 m x 25 m and includes the entire site extent (**Figure 6-76**). The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a low density within the area of subsurface deposit highlighted.

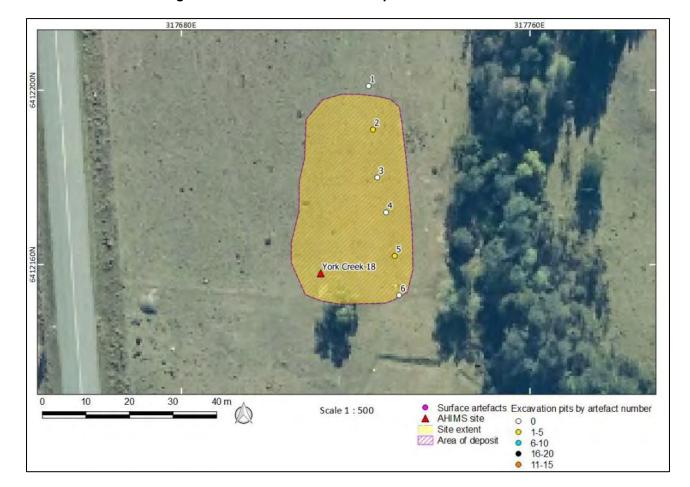


Figure 6-76. Area of subsurface deposit at York Creek 18.

6.5 HISTORIC HERITAGE ARCHAEOLOGICAL TEST EXCAVATION PROGRAM

Over the course of three weeks, Casey & Lowe completed a historic heritage archaeological test excavation program at select locations within the Additional Disturbance Area with a primary focus around the Ravensworth Homestead (**Figure 6-77**). Prior to the use of the excavator, the OzArk archaeologist and RAPs walked proposed access routes to the trenches to inspect for surface artefacts. The OzArk archaeologist and RAPs also inspected the ground surface of the proposed trenches prior to any ground surface disturbance.

Five additional Aboriginal sites were identified during the historic test excavation program including three isolated finds and two artefact scatters (Glendell North IF27 to IF19 and Glendell North OS37 and 38). All newly recorded sites were managed in accordance with Section 6.2.2 of the MOC ACHMP.

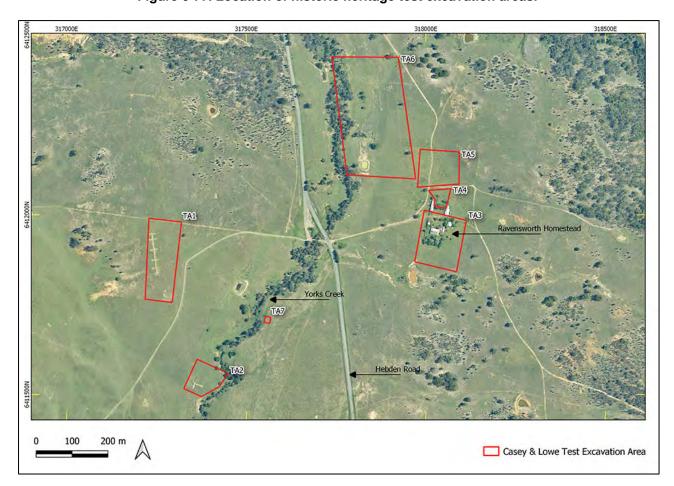


Figure 6-77. Location of historic heritage test excavation areas.

7 DISCUSSION

This section reviews the results of both the survey and test excavation components of the assessment and places the results in the context of previous research that has taken place in the area.

7.1 DISCUSSION OF SURVEY RESULTS

7.1.1 Surface survey summary

The survey recorded 69 sites consisting of 39 artefact scatters, 29 isolated finds and one scarred tree (**Section 5.4**).

In addition, the survey inspected 55 previously recorded sites that are located within or immediately adjacent to the survey area (**Section 5.5**).

Of the 124 sites that are discussed in this assessment, 91 are within or closely adjacent to the Additional Disturbance Area (**Section 8.3**). 52 of these sites are newly recorded and 39 are previously recorded.

Management recommendations for all sites discussed in this assessment are presented in **Section** 9.

7.1.2 Discussion

The review of the landscape and archaeological contexts of the Additional Disturbance Area enabled a predictive model for site location to be made (**Section 4.5**).

This model was based on a large amount of archaeological research that has occurred over 30 years within and adjacent to the Additional Disturbance Area (**Section 4.3** and **4.4**). This research indicated that the landforms of the Additional Disturbance Area would likely contain sites with the following characteristics:

- Sites are commonly open artefact scatters or isolated finds;
- Sites are generally of low density;
- Most sites are situated close to drainage lines;
- Archaeological material is densest within 100 m of a creek edge but continues at a lower density away from a creek;
- The most common raw materials were indurated mudstone and silcrete with smaller quantities of chert, siltstone, quartzite and quartz also identified;
- Flakes and flaked pieces accounted for the bulk of assemblages. Proportions of cores and backed blades are low;
- There is evidence of heat-treated artefacts; and

 Many recorded artefacts are characteristic of Small Tool Tradition (Bondaian) of the late Holocene.

Considering the distribution of sites recorded during the assessment, three factors were previously examined as determinants of site location: proximity to water (**Section 4.5.1**); previous land use as it effects Aboriginal site preservation (**Section 4.5.2**) and landform (**Section 4.5.4**). Each of these will be examined in turn. This analysis will concentrate on the 52 newly recorded sites that are within the Additional Disturbance Area.

Proximity to water

21 (or 39%) of the newly recorded sites are within 100 m of a named waterway, while an additional five sites (10%) are within 50 m of an unnamed drainage line (**Figure 7-1**). Therefore 49% of all newly recorded sites are within what would be regarded as close proximity to waterways. However, when a 200 m buffer is applied to all waterways (major and minor), 41 sites (or 80%) are located within the buffer.

Of the 10 newly recorded sites outside of the 200 m buffer around all waterways, six are isolated finds and the four artefact scatters (GN OS11 [Id 11], OS12 [Id 12], OS15 [Id 15] and OS31 [Id 31]) recorded three, two, six and 15 artefacts respectively. GN OS31 was recorded along an artificial bund created for drainage and therefore is within a highly modified environment where artefacts have been accumulated both by the previous earthworks, as well as by water movement depositing artefacts in the drainage feature. As such, this site is artificial and not a true reflection of a 'site' as such. Therefore, if the results from OS31 are discounted, all sites recorded further than 200 m from a waterway have an extremely low artefact density.

Conversely, two sites that recorded some of the highest artefact densities, GN OS34 (Id 34) and GN OS35 (Id 35) are located at the confluence of Yorks and Bowmans Creeks within 100 m of those waterways. The other site that recorded a high artefact density was GN OS19 (Id 19) that is located on a major terrace that overlooks Bowmans Creek, and while the site is further than 100 m from the creek, it is clearly associated with Bowmans Creek.

These results support the predictive model in that a major determinant for Aboriginal site location in the area is proximity to water.

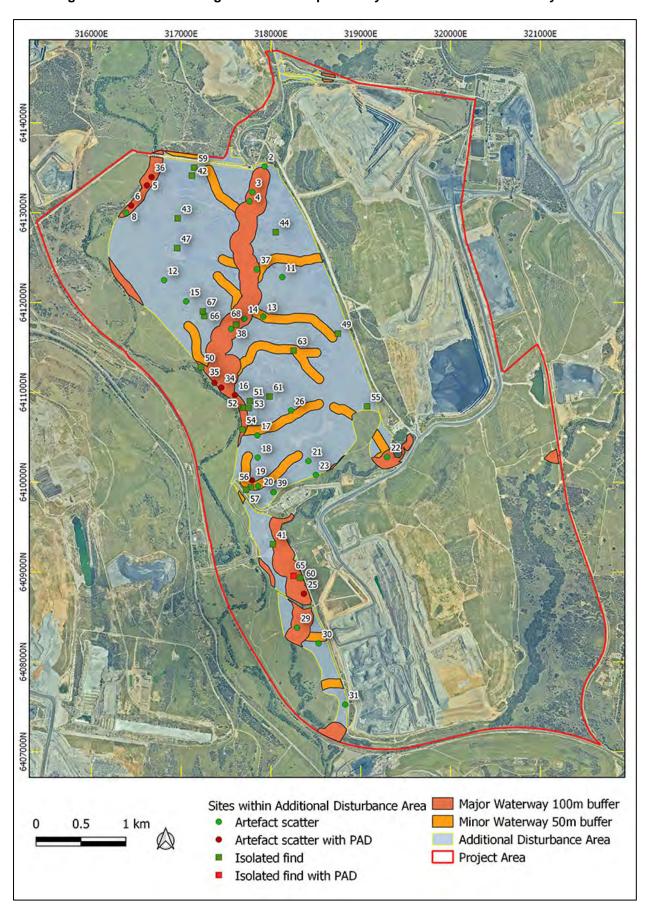


Figure 7-1. Aerial showing the relationship of newly recorded sites to waterway buffers.

Historic land uses

An examination of historic land uses within the Additional Disturbance Area supports the observations made in **Section 4.5.2** that the past agricultural use of the area has affected the Aboriginal site patterning seen today. As shown on **Figure 7-2**, the formerly cultivated river flats on the east bank of Bowmans Creek and the west bank of Swamp Creek failed to record any sites. A similar situation was noted in **Section 4.5.2** with regards to previously recorded sites. This would indicate that this long-term disturbance has probably had the effect of removing any evidence of Aboriginal occupation from these areas, had it existed.

Also noticeable on **Figure 7-2** is the paucity of sites in the centre-east of the Additional Disturbance Area. Again, as noted in **Section 4.5.2** with regards to previously recorded sites, this result is probably an interplay between these landforms being distant to water, but also as a product of soil loss from the more-elevated landforms following vegetation clearing.

These results support the predictive model in that historic land uses have a profound effect on the observed distribution of Aboriginal sites. Those landforms in degrading environments fail to record many sites, while landforms in aggrading environments, principally along waterways, may have sites both in their primary context, but also sites in a secondary context following their deposition in these areas by water movement.

Landform

33 sites (62%) are in flat/floodplain landforms, 15 (29%) are located in slope landforms, and four sites are located in ridge landforms (**Figure 7-3**). Of the 19 sites located in slope and ridge landforms, 13 (65%) are isolated finds. If GN OS31 is taken out of the calculations as it is a highly artificial site (see above under 'proximity to water'), the remaining six artefact scatters in slope and ridge landforms have an average artefact density of 3.6 artefacts; a low artefact density.

This result supports the predictive model that assumed most sites would be recorded in flat/floodplain landforms. As noted in **Section 4.5.4**, this is probably because waterways are associated with flat/floodplain landforms and, as noted above, sites are closely associated with waterways. This patterning is also influenced by the fact that historic land use has led to soil loss within slope and ridge landforms thereby removing sites from these locations and potentially depositing artefacts to form new 'sites' in flat/floodplain landforms.

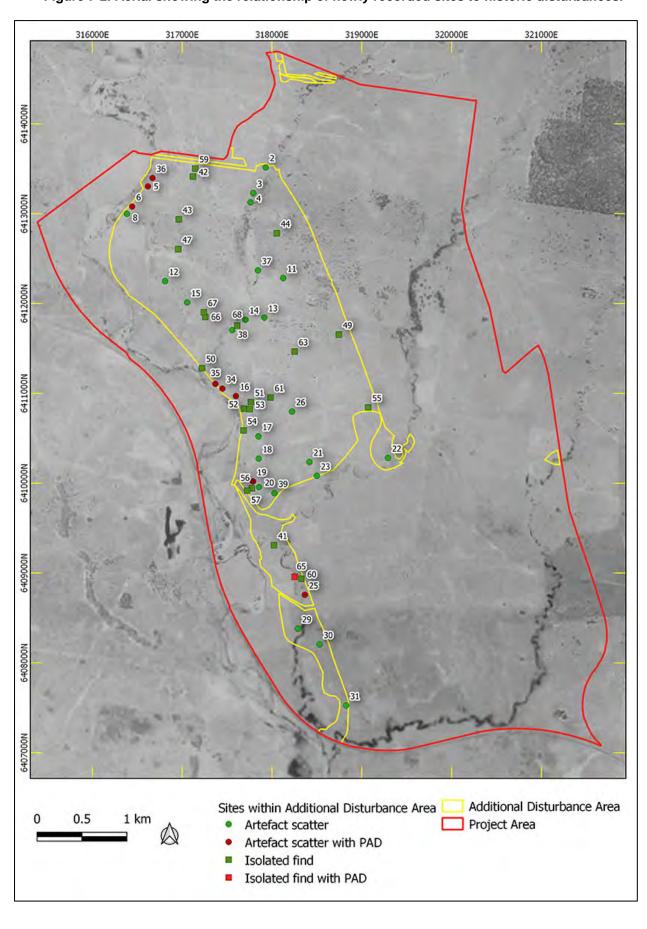


Figure 7-2. Aerial showing the relationship of newly recorded sites to historic disturbances.

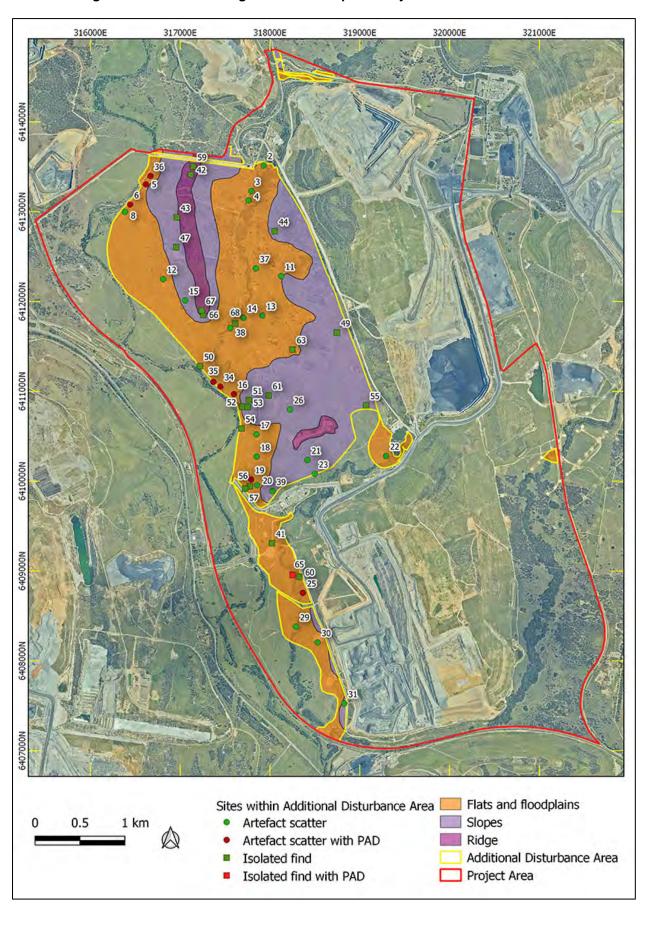


Figure 7-3. Aerial showing the relationship of newly recorded sites to landform.

In conclusion, the survey results indicate that the average site in the Additional Disturbance Area will be:

- A low-density artefact scatter of less than 10 artefacts;
- A surface manifestation only without a subsurface component;
- Comprised of unmodified flakes primarily manufactured from mudstone and silcrete sources;
- Located within flat landforms associated with a waterway; and
- Located in an environment displaying considerable disturbance from anthropomorphic or natural agencies.

These results tend to support the view that the Additional Disturbance Area, being largely confined to flat or gentle gradient landforms, has undone considerable disturbance during the historic phase of land use leading to the dissipation or removal of archaeological sites across the area.

The average artefact density for sites within the Additional Disturbance Area is 3.6 artefacts per site (198 artefacts across 52 artefact sites). However, other sites, such as G12 (37-3-0688), located on the western bank of Bowmans Creek and just outside the Additional Disturbance Area, recorded 100s of artefacts. This would indicate that the area did support large sites in the past. However, because site G12 is located within a slope and bench landform where the terrain is unsuitable for cultivation, it may mean that remnants of this site have survived whereas potentially similar sites on the eastern, more-level, bank of Bowmans Creek within the Additional Disturbance Area have been removed/dissipated by agricultural activities.

The results of the current assessment agree in most instances with the regional archaeological context that has been established following 30 years of research. In brief, the following characteristics can be examined:

- Distribution of sites: The regional model shows a strong correlation between site size and distance to reliable water with larger, more complex, sites being located near reliable water. The current assessment shows that the largest site recorded (GN OS6) was associated with Bowmans Creek. However, even this site, recording 67 artefacts from both surface and subsurface contexts, would not be regarded as a large or complex site. Similarly, GN OS34, located at the confluence of Yorks and Bowmans Creeks, only recorded 29 artefacts from surface and subsurface contexts; again, a relatively low artefact density. However, larger sites, such a G12, located outside of the Additional Disturbance Area, support the observation that large sites tend to be associated with more permanent water bodies, in this case, Bowmans Creek. Remaining sites located away from water and were correspondently of a low artefact density and perhaps represent a single event rather than a site that has been used for camping and tool making in the long-term.
- <u>Site type</u>: The regional and predictive model suggested that artefact scatters and isolated finds would be the most common site type recorded and this is supported by the survey results. As the Additional Disturbance Area was almost completely cleared in the past, scarred trees were not predicted to occur, however, one was recorded. Grinding groove sites

were not predicted and none were identified. Further, the minor crests and ridges contained no evidence of ceremonial sites, and if these had consisted of stone arrangements, it is likely they have been removed due to past land use.

Section 4.2 notes that the Additional Disturbance Area could contain evidence of Aboriginal resource sites, and/or burials, and/or conflict sites. No evidence of any of these site types was noticed during the assessment. The distribution of sites does not indicate that a particular area was being exploited for its resources and the uniformly thin soils across much of the Additional Disturbance Area, and the lack of sandy soils, precludes the presence of burials. No evidence of colonial conflict sites was noted during the assessment.

- Artefact density: As only low or low-moderate artefact densities were recorded; this result does not accord with the regional model that sites in landforms containing substantial lengths of creek lines will be of a higher density. This indicates that the long history of agricultural land use in the area has potentially removed evidence of high-density sites, dissipating them across the landscape or removing them entirely due to erosion and water movement. As previous researchers have suggested, areas such as Swamp, Yorks and Bettys Creeks could have been no more than seasonal foraging locations where trips rarely involved overnight stays. This would indicate that most of the stone tools would be also carried into but then, also, out of the Additional Disturbance Area to areas affording greater resources to support locations for larger base camps. It was assumed in the predictive model that Bowmans Creek may have supported more longer-term occupation and the location of sites such as G12 that recorded a moderate-high artefact density on the western bank of Bowmans Creek (outside of the Additional Disturbance Area) tends to support this theory. However, no such sites have been recorded in the Additional Disturbance Area where historic disturbances have been more intensive.
- <u>Types of raw material</u>: Regional studies show that the majority of sites will have a dominance of mudstone artefacts and a sizable minority of silcrete artefacts. Generally, the survey results agree with this model.
- Artefact type: Most artefacts recorded were unmodified flakes and this also accords with the
 regional model. While some backed blades, end scrapers and axe blanks were noted in the
 Additional Disturbance Area, their numbers were low, as was the frequency of cores and
 other specialist tools. Bearing in mind that many artefacts have been removed from the
 Additional Disturbance Area by, among other agencies, erosion, the sample remaining today
 is incomplete.

The features of representativeness, rarity and integrity of archaeological sites within the Additional Disturbance Area will now be discussed.

Representativeness: As seen above, the sites recorded during the survey are generally very representative of sites in the region, however, no high density or complex sites were recorded in the Additional Disturbance Area and this is an anomaly on a regional level for an area containing lengths of waterways that would have held permanent water for much of the year. In terms of raw materials available and artefact types, the results of the survey neatly complement the regional archaeological context.

Rarity: In the past sites such as the sites recorded in the Additional Disturbance Area would not have been rare and on a state-wide scale and low-density artefact scatters and isolated finds would remain the most common site type recorded. In the immediate vicinity of the Additional

Disturbance Area, however, there has been a large amount of archaeological salvage over the years that has removed many similar sites from the landscape. Although the sites recorded during this assessment are in no way remarkable, their presence alone, in albeit a much-modified landscape, remains a memory of the past in a landscape that is fast changing (or has changed). This raises the rarity of these remaining sites within the context of the greater Ravensworth area where mining has been concentrated.

<u>Integrity</u>: From the results of the survey, general site integrity is very low. As noted, the Additional Disturbance Area has been subject to intensive agricultural land use, as well as severe erosion in the past and much archaeological context has been lost: along with the A-Horizon soils at many locations. The majority of newly recorded sites were assessed to have no associated archaeological deposits and are therefore surface manifestations and possibly, on an individual artefact level, displaced.

7.2 DISCUSSION OF TEST EXCAVATION RESULTS

Section 6.4.2.8 provides a summary of the excavation assemblage at each of the 12 areas investigated. This section is to tie the test excavation program into some broader considerations of the data gained from the excavations.

No evidence of colonial conflict or skeletal remains was identified during the test excavation program.

7.2.1 Research questions

In **Section 6.2.2**, a number of research questions were posed for the test excavation program. These will be answered below.

- Do the results support previous findings that occupation appears denser along Yorks Creek when compared to Swamp Creek?
 - The findings are equivocal to this question as it seems that the sections of Yorks Creek and Swamp Creek within the Additional Disturbance Area both have very low artefact densities. Greater artefact densities were noted in areas associated with Bowmans Creek (Area 1) and at the confluence of Bowmans Creek and Yorks Creek (Area 4). However, all excavations along the main channel of both Yorks and Swamp Creeks recorded very few subsurface artefacts.
- Do elevated landforms associated with Bowmans Creek preserve subsurface archaeological deposits?
 - Yes, but in a variable manner. At both Area 1 and Area 4, the elevated terrace or spur landforms do preserve subsurface archaeological deposits, albeit at a low to moderate artefact density. However, at Area 7 located on a classic terrace landform on the eastern margin of the broad floodplain to Bowmans Creek, the subsurface investigations revealed a very low artefact count.

- Are additional archaeological features, such as hearths, present in the Additional Disturbance Area?
 - No, no archaeological stratigraphy or archaeological features such as hearths were recorded during the test excavation program.
- How do the findings in terms of raw material use compare to other investigations in the vicinity of the Additional Disturbance Area?
 - o In **Section 6.4.2.4** it was demonstrated that there are almost equal amounts of silcrete and mudstone artefacts in the excavation assemblage with a very small amount of other stone sources being represented. This patterning is identical, with slightly varying proportions between silcrete and mudstone, to most other excavations in upper Hunter Valley.

For example, during the MOCO Project test excavations undertaken in 2013 at site MOCO OS-4, 65 per cent of artefacts came from silcrete sources and 30 per cent came from mudstone sources. Other stone types such as quartz, quartzite, petrified wood and volcanics were at almost negligible numbers. The high silcrete count at MOCO OS-4 was attributable to the excavations encountering a knapping event based around a possible ground oven.

In 2017, further excavations took place at MOCO OS-4 as part of the MOCO Project salvage program (OzArk 2017f). In these excavations the majority of artefacts recorded come from either mudstone (69.8%) or silcrete (29.1%) sources. Very small numbers of artefacts from quartzite (1.1%) was recorded. This reversal in the proportions of silcrete to mudstone between the 2013 and the 2017 excavations shows the variabilities of data related to where pits are placed in an area with discrete knapping floors of both silcrete and mudstone materials.

At other (2005/2006) salvage programs along Bowmans, Swamp and Bettys Creeks the recorded raw materials were:

- Bettys Creek 10 (#37-3-0600; Umwelt 2013: 6.17). Mudstone (39.1%), followed by chert (26.3%), silcrete (22.3%), quartz (9.9%), quartzite (0.7%), silicified siltstone (0.7%), indeterminate (0.7%) and petrified wood (0.4%)
- Bettys Creek 9 (#37-3-0599; Umwelt 2013: 6.22). Silcrete (78.9%), followed by mudstone (10.5%), tuff (5.3%) and quartz (5.3%).
- Bettys Creek 2 (#37-3-0025; Umwelt 2013: 6.26). Mudstone (59.5%), followed by silcrete (33.7%), quartz (3.4%), silicified sandstone (1.3%), indeterminate (0.8%), tuff (0.3%), quartzite and chert (0.2%), silicified siltstone, chalcedony and volcanic (0.1%).
- Surface collection (Umwelt 2013: 6.9; 824 artefacts from 36 site areas associated with Bettys Creek, Bowmans Creek and Swamp Creek). Mudstone (58.5%), followed by silcrete (31.9 %) quartz (5.6%), tuff (1.1%), chert (0.7%), silicified siltstone (0.6%), quartzite (0.5%), silicified sandstone (0.5%), chalcedony (0.2%), volcanic (0.1%), petrified wood (0.1%), porcellanite (0.1%) and indeterminate (0.2%).

■ Grader scrapes (Umwelt 2013: 6. 43; 177 artefacts from 44 grader scrapes). Silcrete (46.3%), followed closely by mudstone (41.2%). The remaining 12.4% of the raw materials comprised quartz (4%), petrified wood (3.4%), volcanic (1.1%), indeterminate (1.1%), chert (0.6%), quartzite (0.6%), fine grained siliceous (0.6%), Hornfels (0.6%) and tuff (0.6%).

7.2.2 Research considerations

Section 6.3.2 provides some research considerations that need to be applied to any excavation. Some concluding remarks will be made in this section in reference to the considerations raised in **Section 6.3.2**.

Statistically useful sample size

152 0.5 m by 0.5 m excavation squares were excavated at 12 separate localities: a total of 38 square metres. From this area of excavation, 180 artefacts were recovered; an average of 4.7 artefacts per square metre or 1.18 artefacts per excavation square. This density of artefacts is extremely low and not robust enough for statistical analysis.

The area with the highest artefact concentration, Area 1, recorded 98 artefacts, while the second densest area, Area 4, recorded 54 artefacts. Combined, these two areas represent 84 per cent of the excavation assemblage, yet neither, in themselves, provide enough data in the form of artefact types, or differences in raw material, to meaningfully add to our knowledge concerning the archaeological context of the area.

Equally any analysis of vertical or horizontal distribution of artefacts is hampered by a lack of data. In terms of vertical distribution, no excavation square displayed archaeological stratigraphy and a clear majority of artefacts were confined to the two uppermost spits (**Section 6.4.2.1**). This allows limited opportunities to undertake a taphonomic analysis on how material has moved within the soil profile, and limited opportunities to study change in artefacts types or sizes through time.

It was also noted in **Section 6.4.2.1** that there was no discernible patterning in the horizontal distribution of artefacts. At Area 4, supplementary excavation squares were placed at a distance of 5 m from squares displaying a high artefact count. Yet none of these expansion squares indicated that the horizontal distribution of artefacts extended in any meaningful way from the squares where the original density was noted. While the cores, anvil, and backed blade make for an interesting corpus of artefact types, it would appear that these are isolated remnants without a spatial distribution which could be studied to understand more about the occupation patterns at the site.

Condition

Most of the excavation squares did not have overt evidence of disturbance, apart from Area 12 where historic items we recorded in one of the excavation squares. However, as most of the squares had what can be described as a very truncated A1-Horizon and a leached A2-Horizon, the implication is that the landscape has been subject to the stripping of the A1-Horizon and the

exposure of the A2-Horizon. The implicit conclusion is, therefore, that the landscape has undergone a high general disturbance from soil loss that has compromised the archaeological deposits across the Additional Disturbance Area. As such, the general condition of the archaeological landscape within the Additional Disturbance Area is assessed to be poor where a century and a half of poorly managed agricultural activities have resulted in soil loss and the inevitable disruption of any archaeological deposits that may have been present prior to the colonial occupation of the area.

7.3 RAP COMMENTS ON THE DRAFT AAIA

As part of the consultation process, all RAPs were sent a draft copy of this report for their consideration and comment. Full details of the consultation undertaken is set out in the accompanying ACHAR, as well as a record of all comments received in relation to the RAP review of the draft ACHAR and AAIA.

Only one response from Tocomwall specifically addressed an archaeological issue and this response will be discussed here:

After reviewing the report we concluded that it really did not offer any new knowledge for how the Aboriginal people used this part of the Hunter landscape. We were surprised that a study of this scale and duration offered nothing new. It seemed to just offer up the same conclusions of so many other reports for the area in terms of an increase in artefact numbers and density approaching water sources and the typical trends for raw materials for the area. Nothing else. The degree of reduction evident for many of the artefacts suggested that groups using the area were very mobile however there was no further analysis of this that might have provided some new insight or knowledge about the mobility of people in the area, or the reasons for what appears to be a high percentage of artefacts subjected to tertiary reduction. Generally a disappointing outcome from the perspective of learning something new for the area.

Tocomwall 13 November 2019

In light of this response, OzArk notes that the current study is just one in a corpus of studies that stretch back at least 40 years (**Section 4.3** and **4.4**). In their totality, these studies have established a very clear context for Aboriginal occupation in and near the Additional Disturbance Area.

The studies tend to indicate that the sites in the Yorks and Swamp Creek catchments are regarded as representative of occupational evidence in the small tributary valleys of the Hunter River (Resource Planning 1991: 5). Further, available evidence would indicate that Bettys Creek was more a node of occupation when compared to Swamp and Bowmans Creeks (Umwelt 2013); although this result is distorted by the lack of systematic investigation across all catchment areas, as well as variable levels of disturbance that tends to be greater adjacent to the larger waterways such as Bowmans Creek.

Large excavation programs such as that undertaken by Umwelt (2013) indicate that sites such as Bettys Creek 2, Bettys Creek 8 and Bettys Creek 10 retained a level of spatial integrity reflected by knapping events and raw material distribution patterns. Residue and use-wear studies indicate retooling, butchery and hafting were taking place at Bettys Creek 2 and Bettys Creek 10. These results clearly indicate that raw material reduction was taking place in landforms associated with Bettys Creek.

From the data provided in Umwelt 2013 Appendix 5, a majority of artefacts investigated during the Umwelt study were at a tertiary stage of reduction, and of those preserving cortex, most displayed less than 50 per cent cortex. This agrees with the findings from the Additional Disturbance Area where 80 per cent of all artefacts from the test excavation program were at a tertiary stage of reduction (Section 6.4.2.6).

The current investigation recorded an average artefact density for sites within the Additional Disturbance Area of 3.6 artefacts per site (**Section 7.1.2**) and the test excavation recorded an extremely low artefact density of 1.18 artefacts per excavation square (0.5 m by 0.5 m). This was noted to be insufficient to form a statistically useful sample size (**Section 7.1.2**).

With reference to the Tocomwall comments, OzArk agrees with the following statement because the correlation of data between the current investigation and previous investigations has been demonstrated in this AAIA and are supported by the results of the investigation:

It seemed to just offer up the same conclusions of so many other reports for the area in terms of an increase in artefact numbers and density approaching water sources and the typical trends for raw materials for the area.

Tocomwall also state:

The degree of reduction evident for many of the artefacts suggested that groups using the area were very mobile however there was no further analysis of this that might have provided some new insight or knowledge about the mobility of people in the area, or the reasons for what appears to be a high percentage of artefacts subjected to tertiary reduction.

OzArk do note in **Section 7.1.2** that:

As previous researchers have suggested, areas such as Swamp, Yorks and Bettys Creeks could have been no more than seasonal foraging locations where trips rarely involved overnight stays. This would indicate that most of the stone tools would be also carried into but then, also, out of the Additional Disturbance Area to areas affording greater resources to support locations for larger base camps.

This conclusion is supported by previous investigations in the area, as Umwelt note:

When the assemblages are viewed as accumulating over a 2200 year period, the low artefact numbers suggest that the assemblages reflect sporadic visitation over an extended period of time by small groups of Aboriginal people, most likely single family groups. Differences in the degree of artefact patination and weathering were seen to reflect a long period of highly sporadic visitation.

Umwelt 2013: 7:36

In conclusion, the data indicates that the landforms of the Additional Disturbance Area display a low artefact density; both in surface and subsurface contexts. While the small number of artefacts recorded do not constitute a statically robust sample size, it is clear that past use of the area was limited to sporadic and/or short-term visitations where primary reduction of stone tools was not taking place. While there is evidence in the area of tool maintenance and localised knapping events, the overwhelming impression is that the Swamp and Yorks Creek catchments were not used for extended camping events and that people must have moved into the Additional Disturbance Area from larger and more complex base camps that were located outside of the area, possibly in association with the Hunter River.

8 ASSESSMENT OF SIGNIFICANCE

8.1.1 Introduction

The appropriate management of cultural heritage items is usually determined on the basis of their assessed significance as well as the likely impacts of any proposed development. Social (cultural), scientific (archaeological), aesthetic and historical significance are identified as baseline elements of significance assessment, and it is through the combination of these elements that the overall cultural heritage values of a site, place or area are resolved.

In this AAIA, only the scientific values of the Additional Disturbance Area will be considered. The social, aesthetic and historical values of the Additional Disturbance Area will be discussed in the ACHAR to which this AAIA is an appendix.

Archaeological/Scientific Value

Assessing a site in this context involves placing it into a broader regional framework, as well as assessing the site's individual merits in view of current archaeological discourse. This type of value relates to the ability of a site to answer current research questions and is also based on a site's condition (integrity), content and representativeness.

The overriding aim of cultural heritage management is to preserve a representative sample of the archaeological resource. This will ensure that future research within the discipline can be based on a valid sample of the past. Establishing whether a site can contribute to current research also involves defining 'research potential' and 'representativeness'. Questions regularly asked when determining significance are: can this site contribute information that no other site can? Is this site representative of other sites in the region?

8.1.2 Background to the assessment of scientific significance

This assessment will use the following terms where appropriate:

- High scientific significance or high archaeological values;
- Moderate scientific significance or moderate archaeological values; and
- Low scientific significance or low archaeological values.

This hierarchy is used to categorise the archaeological landscape of the Additional Disturbance Area based, in this report, on the assessed scientific or archaeological values at a particular location.

This is not to say that the author is unaware of possible social / cultural, aesthetic and historical values at a particular location, but the assessment here is of the scientific values alone while the other values will be examined in the ACHAR.

In terms of scientific significance, locations will primarily be assessed on their ability to add reliable archaeological information which can further our understanding of the archaeology at a local and

regional level or a site type's rarity within the landscape. This assessment has been informed through surface observations/survey, subsurface archaeological testing and review of previous site-specific reports.

Considerations taken in this scientific assessment include an understanding that a part of the archaeological value of a place is the general community's association to that place. This is often distinct from the social, aesthetic and historical criteria used to assess heritage significance as it relates to a person's relationship to the archaeology of the place. For the Aboriginal participants on the survey, for example, an archaeological site was appreciated as much for its archaeological values as it was for its cultural values. A site displaying either many artefacts or a number of interesting artefacts would engender fascination and discussion on purely archaeological grounds (Where did people live / eat? How did they live? How did they use the artefact and what does it tell us about the people who made it?).

It is therefore understood that many Aboriginal people, or people generally interested in pre-history, would see the sites recorded in this assessment to have higher archaeological values than may be given in this assessment. However, this assessment has attempted to distinguish between an artefact scatter with potential to yield further information (moderate—high scientific significance) and an artefact scatter in an eroded context that would yield little meaningful further information (low scientific significance).

Incorporating research on the rarity, representativeness and integrity or condition of a site, along with the considerations outlined above, this assessment defines the following categories when assessing scientific significance:

High scientific significance

Locations displaying this value would include one or more of the following features:

- The location would contain known areas of undisturbed archaeological deposits that are likely to add significantly to our knowledge concerning Aboriginal archaeology in the region;
- The site would contain archaeological information to address complex research questions about the region;
- The site contains outstanding features that can be appreciated by non-specialists / enthusiasts; and
- The site type is rare in the region and / or in danger of becoming unrepresented in the region.

Moderate scientific significance

Locations displaying this value would include one or more of the following features:

 The location would contain areas of archaeological deposits, sometimes disturbed, that are likely to add to our knowledge about the Aboriginal archaeology of the local area only;

- The site would contain archaeological information to address general research questions about the region;
- The site contains features that would be appreciated by a specialist / enthusiast; and
- Portions of the site have been lost due to erosion or the landscape context of the site has been impacted.

Low scientific significance

Locations displaying this value would include one or more of the following features:

- The location may contain areas of archaeological deposits, but they are likely to be disturbed and any information gained would only address limited research questions;
- The site is largely displaced by erosion;
- The landscape context of the site has been heavily modified;
- The site exists in areas where A-Horizon soil loss is extensive; and
- The site contains features that would be difficult to interpret in a meaningful way.

8.2 ASSESSED SIGNIFICANCE OF THE RECORDED SITES

8.2.1 Newly recorded sites

69 new sites were recorded during the survey consisting of 39 artefact scatters, 29 isolated finds and one scarred tree. Of the artefact scatters, 32 sites recorded less than 10 artefacts and no site contained of more than 70 artefacts. At nine locations it was assessed that there are subsurface deposits: Glendell North OS5, Glendell North OS6, Glendell North OS16, Glendell North OS19, Glendell North OS25, Glendell North OS34, Glendell North OS35, Glendell North OS36 and Glendell North IF26. Only one of these sites was determined to have a moderate artefact density (Glendell North OS6). None of the recorded sites was remarkable in its manifestation; either in terms of the types of artefacts recorded, the raw material the artefacts were manufactured from or the density and nature of the surface artefact manifestation. The recorded sites are also very representative of artefact sites in the upper Hunter Valley both in terms of the types of artefacts recorded and the raw materials from which the artefacts were manufactured.

As a result, most newly recorded sites have a low scientific significance as they generally have:

- A low artefact density;
- No associated subsurface deposits;
- No remarkable features and are generally representative of other artefact sites in the upper Hunter Valley;
- A high likelihood of being in a secondary context; and

• A limited ability to inform on the nature and spatial extent of past Aboriginal occupation in the Additional Disturbance Area.

Table 8-1 lists the newly recorded sites and their associated scientific significance. **Table 8-1** also provides a justification for the significance assessment. Sites outside of the Additional Disturbance Area are shown with a blue shade.

Figure 5-3 shows the location of all newly recorded sites.

Table 8-1: Scientific significance of newly recorded sites.

ID	AHIMS ID	Site name	Site type	Potential for subsurface deposits	Scientific significance	Justification
1	37-3-1560	Glendell North OS1	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
2	37-3-1559	Glendell North OS2	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
3	37-3-1558	Glendell North OS3	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
4	37-3-1557	Glendell North OS4	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
5	37-3-1569	Glendell North OS5	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
6	37-3-1571	Glendell North OS6	Artefact scatter	Yes (moderate density)	Moderate	Moderate artefact density and high probability of further subsurface deposits present
7	37-3-1536	Glendell North OS7	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
8	37-3-1549	Glendell North OS8	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
9	37-3-1556	Glendell North OS9	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
10	37-3-1555	Glendell North OS10	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
11	37-3-1554	Glendell North OS11	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context

ID	AHIMS ID	Site name	Site type	Potential for subsurface deposits	Scientific significance	Justification
12	37-3-1553	Glendell North OS12	h OS12 Artefact scatter Nil Low		Low artefact density; lack of associated subsurface deposits; disturbed context	
13	37-3-1552	Glendell North OS13	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
14	37-3-1551	Glendell North OS14	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
15	37-3-1550	Glendell North OS15	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
16	37-3-1573	Glendell North OS16	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
17	37-3-1542	Glendell North OS17	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
18	37-3-1541	Glendell North OS18	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
19	37-3-1572	Glendell North OS19	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
20	37-3-1540	Glendell North OS20	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
21	37-3-1539	Glendell North OS21	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
22	37-3-1538	Glendell North OS22	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
23	37-3-1537	Glendell North OS23	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
24	37-3-1510	Glendell North OS24	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
25	37-3-1570	Glendell North OS25	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address

ID	AHIMS ID	Site name	Site type	Potential for subsurface deposits	Scientific significance	Justification
						limited research questions
26	37-3-1548	Glendell North OS26	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
27	37-3-1509	Glendell North OS27	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
28	37-3-1508	Glendell North OS28	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
29	37-3-1547	Glendell North OS29	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
30	37-3-1546	Glendell North OS30	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
31	37-3-1545	Glendell North OS31	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
32	37-3-1544	Glendell North OS32	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
33	37-3-1543	Glendell North OS33	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
34	37-3-1574	Glendell North OS34	Artefact scatter	Yes (low density)	Moderate	Low density with known subsurface deposits
35	37-3-1567	Glendell North OS35	Artefact scatter	Yes (low density)	Low-moderate	Low density with low density subsurface deposits
36	37-3-1568	Glendell North OS36	Artefact scatter	Yes (low density)	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
37	37-3-1562	Glendell North OS37	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
38	37-3-1565	Glendell North OS38	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
39	37-3-1576	Glendell North OS39	Artefact scatter	Nil	Low	Low artefact density; lack of associated subsurface deposits as no A-Horizon present
40	37-3-1535	Glendell North IF1	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits.

ID	AHIMS ID	Site name	Site type	Potential for subsurface deposits	Scientific significance	Justification
						Likely in a secondary context
41	37-3-1534	Glendell North IF2	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
42	37-3-1533	Glendell North IF3	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
43	37-3-1532	Glendell North IF4 Isolated find Nil Low		Isolated artefact without associated subsurface deposits. Likely in a secondary context		
44	37-3-1531	Glendell North IF5	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
45	37-3-1530	Glendell North IF6	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
46	37-3-1529	Glendell North IF7	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
47	37-3-1528	Glendell North IF8	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
48	37-3-1527	Glendell North IF9	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
49	37-3-1526	Glendell North IF10	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
50	37-3-1525	-1525 Glendell North IF11 Isolated find Nil Low		Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context	
51	37-3-1524	Glendell North IF12	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
52	37-3-1523	Glendell North IF13	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
53	37-3-1522	Glendell North IF14	Isolated find	Nil	Low	Isolated artefact without associated

ID	AHIMS ID	Site name	Site type	Potential for subsurface deposits	Scientific significance	Justification
						subsurface deposits. Likely in a secondary context
54	37-3-1521	Glendell North IF15	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
55	37-3-1520	Glendell North IF16	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
56	37-3-1519	Glendell North IF17	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
57	37-3-1518	Glendell North IF18	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
58	37-3-1517	Glendell North IF19	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
59	37-3-1515	Glendell North IF20	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
60	37-3-1514	Glendell North IF21	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
61	37-3-1516	Glendell North IF22	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
62	37-3-1513	Glendell North IF23	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
63	37-3-1512	Glendell North IF24	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
64	37-3-1511	Glendell North IF25	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
65	37-3-1566	Glendell North IF26	Isolated find	Yes (low density)	Low	Isolated subsurface artefact formerly present but now excavated during the test excavation program. Any information gained

ID	AHIMS ID	Site name	Site type	Potential for subsurface deposits	Scientific significance	Justification
						would only address limited research questions
66	37-3-1564	Glendell North IF27	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
67	37-3-1563	Glendell North IF28	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
68	37-3-1575	Glendell North IF29	Isolated find	Nil	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
69	37-3-1561	Glendell North ST1	Scarred tree	Nil	Moderate	Relatively rare site type within the Hunter Valley region

8.2.2 Previously recorded sites

There are 39 previously recorded sites within the Additional Disturbance Area. All these sites were re-assessed during the 2018 survey to determine their current condition and significance.

Table 8-2 lists the 39 previously recorded sites in the Additional Disturbance Area.

Figure 4-4 shows the location of the previously recorded and registered Aboriginal sites.

Table 8-2: Significance assessment of previously recorded sites.

ID	AHIMS	Site name	Site type	Scientific significance	Justification
70	37-3-0294	Site 2; (MORL2)	Artefact scatter	Low	Artefacts unable to be located
73	37-3-0469	Bowmans/Swamp Creek Trench 1	Artefact scatter	Moderate	Moderate artefact density and high probability of associated subsurface deposits however these will be in a disturbed context
75	37-3-0521	MO-IF1	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
76	37-3-0612	Bettys Creek 22	Isolated find	Low	Artefacts unable to be located
79	37-3-0689	G11 Glendell	Artefact scatter	Low	Low artefact density with low potential for further subsurface deposits
81	37-3-0744	York Creek 1	Artefact scatter	Low	Low artefact density; low potential for associated subsurface deposits; disturbed context
82	37-3-0745	York Creek 2	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; secondary context
83	37-3-0746	York Creek 3	Artefact scatter	Low	Low artefact density; low potential for associated subsurface deposits; disturbed context

ID	AHIMS	Site name	Site type	Scientific significance	Justification
84	37-3-0747	York Creek 4	Artefact scatter	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
85	37-3-0748	York Creek 5	Artefact scatter	Low	Low artefact density; low potential for associated subsurface deposits; disturbed context
86	37-3-0749	York Creek 6	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
87	37-3-0750	York Creek 7	Low-moderate	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
88	37-3-0751	York Creek 8	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
89	37-3-0752	York Creek 9	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; secondary context
90	37-3-0753	York Creek 10	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
91	37-3-0754	York Creek 11	Artefact scatter	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
92	37-3-0755	York Creek 12	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
93	37-3-0756	York Creek 13	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
94	37-3-0757	York Creek 14	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
95	37-3-0758	York Creek 15	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; likely in secondary context
96	37-3-0759	York Creek 16	Artefact scatter	Low	Low artefact density and lack of associated subsurface deposits
97	37-3-0760	York Creek 17	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
98	37-3-0761	York Creek 18	Artefact scatter	Low-moderate	Low density subsurface deposits present. Any information gained would only address limited research questions
99	37-3-0762	Bowmans Ck 6	Artefact scatter	Low	Low artefact density and lack of associated subsurface deposits
100	37-3-0763	Bowmans Ck 7	Artefact scatter	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions
101	37-3-0764	Bowmans Ck 8	Artefact scatter	Low	Artefacts unable to be located

ID	AHIMS	Site name	Site type	Scientific significance	Justification
102	37-3-0765	Bowmans Ck 9	Artefact scatter	Low	Low density scatter without associated subsurface deposits. Likely in a secondary context
103	37-3-0766	Bowmans Ck 10	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; secondary context
107	37-3-0773	Swamp Ck 10	Isolated find	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
109	37-3-1155	MT OWEN ISOLATED FIND2	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
110	37-3-1156	MT OWEN ISOLATED FIND1	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
111	37-3-1158	RPS DLW IF1	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
114	37-3-1198	MOCO OS-10	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context. Partially destroyed
115	37-3-1490	Swamp Creek IF-4	Isolated find	Low	Isolated find in a secondary context
116	37-3-1492	Swamp Creek IF-2	Isolated find	Low	Isolated find in a secondary context
117	37-3-1493	Swamp Creek IF-3	Isolated find	Low	Isolated find in a secondary context
118	37-3-1494	Swamp Creek IF-1	Isolated find	Low	Isolated artefact without associated subsurface deposits. Likely in a secondary context
122	37-3-1499	Swamp Creek-OS1	Artefact scatter	Low	Low artefact density; lack of associated subsurface deposits; disturbed context
124	37-3-1503	Yorks Creek 19	Artefact scatter	Low-moderate	Low density with known subsurface deposits. Any information gained would only address limited research questions

8.3 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROJECT

The preceding investigation has determined the following:

- 52 of the 69 newly recorded sites are within or in very close proximity to the Additional Disturbance Area; and
- 39 previously recorded sites are within the Additional Disturbance Area.

In total, 91 sites are located within the Additional Disturbance Area and will be impacted should the Project be approved. 55 of these sites are artefact scatters (15 of which have PAD) and 36 are isolated finds (one of which has PAD). In general, the artefact scatters have a low artefact density with most sites recording less than 10 artefacts.

Table 8-3 lists the 91 sites within the Additional Disturbance Area and **Figure 8-1** to **Figure 8-3** shows the location of the sites. The identifying IDs on **Figure 8-1** to **Figure 8-3** correspond to the

IDs in **Table 8-3**. Additionally, IDs with a yellow text buffer in **Figure 8-1** to **Figure 8-3** are newly recorded sites and IDs with a white text buffer are previously recorded sites. As shown in **Table 8-3**, most of the sites that will be impacted by the Project have a low scientific significance. 14 of these sites have either low–moderate or moderate scientific values due mostly to the potential presence of subsurface deposits.

Three newly recorded sites (Glendell North IF25, OS24 and OS27) were recorded outside of the Additional Disturbance Area within the DA 80_952 approved disturbed boundary for the Glendell Mine. As a result, these sites were salvaged on 12 November 2018 under the terms of Section 6.2.1.1 of the MOC ACHMP. All artefacts previously recorded, along with several newly identified, were successfully salvaged. Full details of the salvage are presented in **Appendix 3**.

These sites are not included in **Table 8-3** as they were located outside of the Additional Disturbance Area. The salvage of these sites does not alter the number of sites (n=91) that will be impacted should the Project be approved.

Table 8-3 shows that 89 sites will be totally impacted by the Project and two sites that will be partially impacted by the Project.

Table 8-3: All known sites within the Additional Disturbance Area.

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Scientific significance	Consequence of harm (Total/Partial/No Loss of Value)
2	37-3-1559	Glendell North OS2	317930	6413515	Artefact scatter	Low	Total loss of value
3	37-3-1558	Glendell North OS3	317792	6413230	Artefact scatter	Low	Total loss of value
4	37-3-1557	Glendell North OS4	317761	6413127	Artefact scatter	Low	Total loss of value
5	37-3-1569	Glendell North OS5	316619	6413304	Artefact scatter with PAD	Low-moderate	Total loss of value
6	37-3-1571	Glendell North OS6	316443	6413081	Artefact scatter with PAD	Moderate	Total loss of value
8	37-3-1549	Glendell North OS8	316386	6412999	Artefact scatter	Low	Total loss of value
11	37-3-1554	Glendell North OS11	318126	6412284	Artefact scatter	Low	Total loss of value
12	37-3-1553	Glendell North OS12	316810	6412250	Artefact scatter	Low	Total loss of value
13	37-3-1552	Glendell North OS13	317915	6411844	Artefact scatter	Low	Total loss of value
14	37-3-1551	Glendell North OS14	317705	6411820	Artefact scatter	Low	Total loss of value
15	37-3-1550	Glendell North OS15	317055	6412013	Artefact scatter	Low	Total loss of value
16	37-3-1573	Glendell North OS16	317599	6410970	Artefact scatter with PAD	Low-moderate	Total loss of value
17	37-3-1542	Glendell North OS17	317850	6410521	Artefact scatter	Low	Total loss of value
18	37-3-1541	Glendell North OS18	317852	6410274	Artefact scatter	Low	Total loss of value

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Scientific significance	Consequence of harm (Total/Partial/No Loss of Value)
19	37-3-1572	Glendell North OS19	317790	6410020	Artefact scatter with PAD	Low-moderate	Total loss of value
20	37-3-1540	Glendell North OS20	317856	6409957	Artefact scatter	Low	Total loss of value
21	37-3-1539	Glendell North OS21	318418	6410236	Artefact scatter	Low	Total loss of value
22	37-3-1538	Glendell North OS22	319293	6410281	Artefact scatter	Low	Total loss of value
23	37-3-1537	Glendell North OS23	318500	6410083	Artefact scatter	Low	Partial loss of value
25	37-3-1570	Glendell North OS25	318367	6408758	Artefact scatter with PAD	Low-moderate	Total loss of value
26	37-3-1548	Glendell North OS26	318224	6410798	Artefact scatter	Low	Total loss of value
29	37-3-1547	Glendell North OS29	318291	6408381	Artefact scatter	Low	Total loss of value
30	37-3-1546	Glendell North OS30	318530	6408206	Artefact scatter	Low	Total loss of value
31	37-3-1545	Glendell North OS31	318827	6407525	Artefact scatter	Low	Total loss of value
34	37-3-1574	Glendell North OS34	317447	6411053	Artefact scatter with PAD	Moderate	Total loss of value
35	37-3-1567	Glendell North OS35	317371	6411106	Artefact scatter with PAD	Low-moderate	Partial loss of value
36	37-3-1568	Glendell North OS36	316670	6413398	Artefact scatter with PAD	Low-moderate	Total loss of value
37	37-3-1562	Glendell North OS37	317843	6412369	Artefact scatter	Low	Total loss of value
38	37-3-1565	Glendell North OS38	317557	6411704	Artefact scatter	Low	Total loss of value
39	37-3-1576	Glendell North OS39	318028	6409888	Artefact scatter	Low	Total loss of value
41	37-3-1534	Glendell North IF2	317146	6413503	Isolated find	Low	Total loss of value
42	37-3-1533	Glendell North IF3	317120	6413414	Isolated find	Low	Total loss of value
43	37-3-1532	Glendell North IF4	316962	6412937	Isolated find	Low	Total loss of value
44	37-3-1531	Glendell North IF5	318054	6412783	Isolated find	Low	Total loss of value
47	37-3-1528	Glendell North IF8	316956	6412606	Isolated find	Low	Total loss of value
49	37-3-1526	Glendell North IF10	318745	6411655	Isolated find	Low	Total loss of value
50	37-3-1525	Glendell North IF11	317221	6411282	Isolated find	Low	Total loss of value
51	37-3-1524	Glendell North IF12	317765	6410903	Isolated find	Low	Total loss of value
52	37-3-1523	Glendell North IF13	317688	6410830	Isolated find	Low	Total loss of value
53	37-3-1522	Glendell North IF14	317752	6410825	Isolated find	Low	Total loss of value
54	37-3-1521	Glendell North IF15	317683	6410588	Isolated find	Low	Total loss of value

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Scientific significance	Consequence of harm (Total/Partial/No Loss of Value)
55	37-3-1520	Glendell North IF16	319072	6410845	Isolated find	Low	Total loss of value
56	37-3-1519	Glendell North IF17	317777	6409943	Isolated find	Low	Total loss of value
57	37-3-1518	Glendell North IF18	317723	6409918	Isolated find	Low	Total loss of value
59	37-3-1515	Glendell North IF20	318022	6409310	Isolated find	Low	Total loss of value
60	37-3-1514	Glendell North IF21	318328	6408936	Isolated find	Low	Total loss of value
61	37-3-1516	Glendell North IF22	317984	6410954	Isolated find	Low	Total loss of value
63	37-3-1512	Glendell North IF24	318253	6411466	Isolated find	Low	Total loss of value
65	37-3-1566	Glendell North IF26	318253	6408957	Isolated find with PAD	Low	Total loss of value
66	37-3-1564	Glendell North IF27	317260	6411851	Isolated find	Low	Total loss of value
67	37-3-1563	Glendell North IF28	317241	6411913	Isolated find	Low	Total loss of value
68	37-3-1575	Glendell North IF29	317613	6411755	Isolated find	Low	Total loss of value
70	37-3-0294	Site 2; (MORL2)	321168	6410327	Artefact scatter	Low	Total loss of value
73	37-3-0469	Bowmans/S wamp Creek Trench 1	318072	6409137	Artefact scatter with PAD	Moderate	Total loss of value
75	37-3-0521	MO-IF1	319123	6410319	Isolated find	Low	Total loss of value
76	37-3-0612	Bettys Creek 22	321138	6410296	Isolated find	Low	Total loss of value
79	37-3-0689	G11 Glendell	319223	6410211	Artefact scatter with PAD	Low	Total loss of value
81	37-3-0744	York Creek 1	317440	6411356	Artefact scatter	Low	Total loss of value
82	37-3-0745	York Creek 2	317577	6411112	Artefact scatter	Low	Total loss of value
83	37-3-0746	York Creek 3	317745	6411008	Artefact scatter	Low	Total loss of value
84	37-3-0747	York Creek 4	317373	6411322	Artefact scatter	Low-moderate	Total loss of value
85	37-3-0748	York Creek 5	317365	6411471	Artefact scatter	Low	Total loss of value
86	37-3-0749	York Creek 6	317501	6411813	Artefact scatter	Low	Total loss of value
87	37-3-0750	York Creek 7	317484	6412170	Artefact scatter with PAD	Low-moderate	Total loss of value
88	37-3-0751	York Creek 8	317496	6412805	Isolated find	Low	Total loss of value
89	37-3-0752	York Creek 9	317685	6411312	Artefact scatter	Low	Total loss of value
90	37-3-0753	York Creek 10	317865	6412266	Artefact scatter	Low	Total loss of value
91	37-3-0754	York Creek 11	317782	6412443	Artefact scatter with PAD	Low-moderate	Total loss of value

ID	AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Scientific significance	Consequence of harm (Total/Partial/No Loss of Value)
92	37-3-0755	York Creek 12	317846	6412581	Artefact scatter	Low	Total loss of value
93	37-3-0756	York Creek 13	318352	6411400	Artefact scatter	Low	Total loss of value
94	37-3-0757	York Creek 14	318417	6411813	Isolated find	Low	Total loss of value
95	37-3-0758	York Creek 15	317849	6411202	Artefact scatter	Low	Total loss of value
96	37-3-0759	York Creek 16	317827	6411497	Artefact scatter	Low	Total loss of value
97	37-3-0760	York Creek 17	317626	6412595	Isolated find	Low	Total loss of value
98	37-3-0761	York Creek 18	317712	6412158	Isolated find with PAD	Low-moderate	Total loss of value
99	37-3-0762	Bowmans Ck 6	317645	6410765	Artefact scatter	Low	Total loss of value
100	37-3-0763	Bowmans Ck 7	316542	6413142	Artefact scatter with PAD	Moderate	Total loss of value
101	37-3-0764	Bowmans Ck 8	317205	6412329	Artefact scatter	Low	Total loss of value
102	37-3-0765	Bowmans Ck 9	316878	6412410	Artefact scatter	Low	Total loss of value
103	37-3-0766	Bowmans Ck 10	316833	6412566	Artefact scatter	Low	Total loss of value
107	37-3-0773	Swamp Ck 10	319006	6411169	Isolated find	Low	Total loss of value
109	37-3-1155	MT OWEN ISOLATED FIND2	317854	6411236	Isolated find	Low	Total loss of value
110	37-3-1156	MT OWEN ISOLATED FIND1	318001	6410455	Isolated find	Low	Total loss of value
111	37-3-1158	RPS DLW IF1	317148	6412677	Isolated find	Low	Total loss of value
114	37-3-1198	MOCO OS- 10	317840	6409364	Artefact scatter	Low	Total loss of value
115	37-3-1490	Swamp Creek IF-4	318805	6407340	Isolated find	Low	Total loss of value
116	37-3-1492	Swamp Creek IF-2	318807	6407327	Isolated find	Low	Total loss of value
117	37-3-1493	Swamp Creek IF-3	318805	6407330	Isolated find	Low	Total loss of value
118	37-3-1494	Swamp Creek IF-1	318640	6407727	Isolated find	Low	Total loss of value
122	37-3-1499	Swamp Creek-OS1	318819	6407300	Artefact scatter	Low	Total loss of value
124	37-3-1503	Yorks Creek 19	317369	6411237	Artefact scatter with PAD	Low	Total loss of value

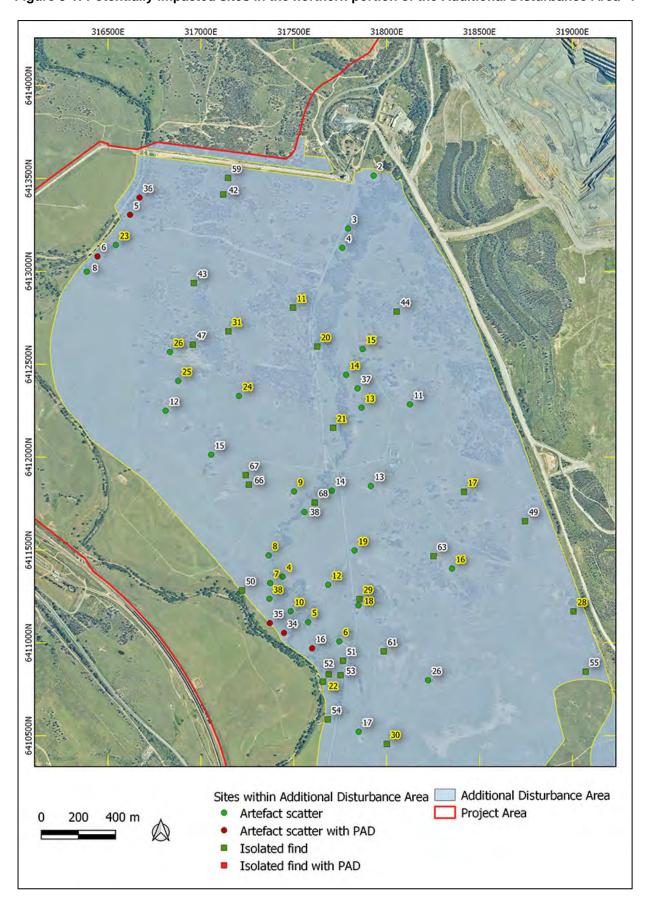


Figure 8-1: Potentially impacted sites in the northern portion of the Additional Disturbance Area¹⁰.

¹⁰ IDs with a yellow text buffer are newly recorded sites and IDs with a white text buffer are previously recorded sites.

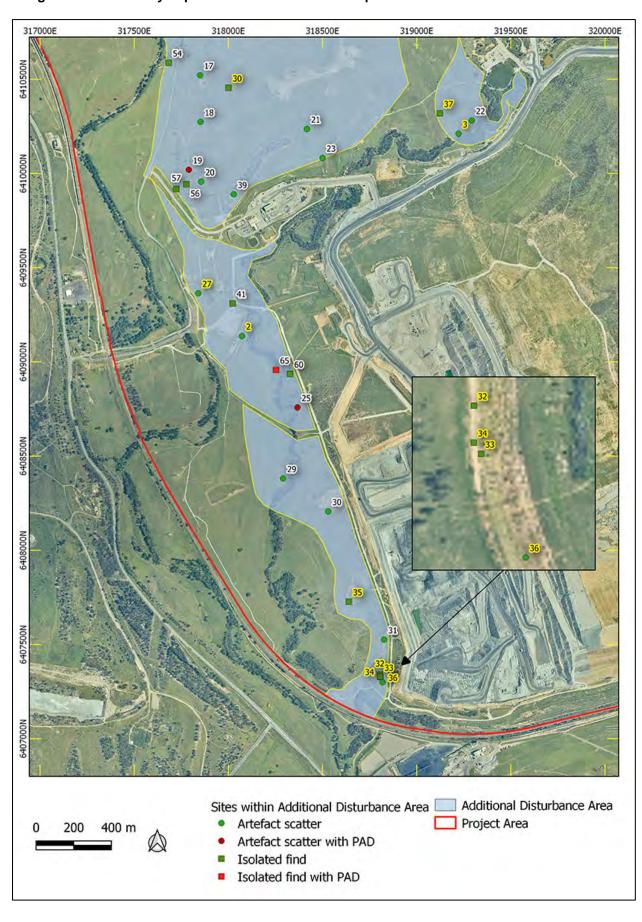


Figure 8-2: Potentially impacted sites in the southern portion of the Additional Disturbance Area.

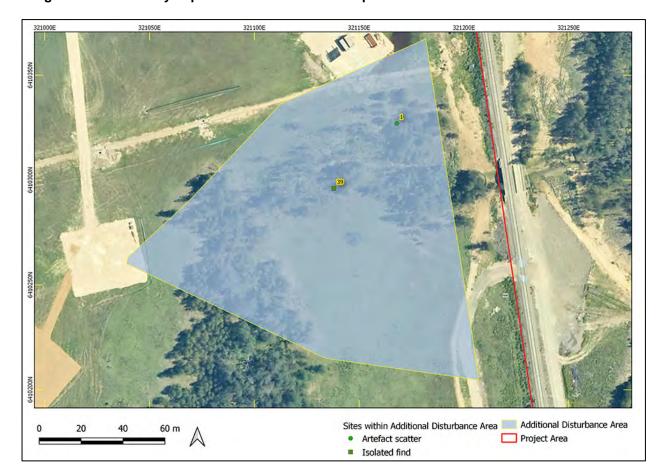


Figure 8-3: Potentially impacted sites in the eastern portion of the Additional Disturbance Area.

8.3.1 Ecologically sustainable development principles

The goal of ecologically sustainable development (ESD) is:

Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The Core Objectives of ESD are:

- To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- To provide for equity within and between generations; and
- To protect biological diversity and maintain essential ecological processes and life-support systems.

As such, the ESD principles have limited applicability to cultural heritage although the notion of intergenerational equity is relevant. This is understood to refer to future generations being able to enjoy, interact with and study aspects of cultural heritage that are available to current generations.

8.3.1.1 Applicability to the Project

The Project will result in impact to 91 recorded Aboriginal sites. How to quantify this loss of heritage value to future generations is difficult. To understand the overall impact to heritage values, an interplay between the nature and type of site, and its representativeness must be considered. Also, the cumulative harm of large-scale mining in the district must be considered.

While 91 sites sound like a large number, 97% of these sites are low density artefact scatters or isolated finds; and there are less than 500 artefacts associated with these sites. However, when added to the many sites that have been destroyed because of the existing MOC, let alone the hundreds more in the district from approved mining and infrastructure development impacts, the scale of the loss becomes more obvious. It is often stated that the piecemeal destruction of sites—project by project, modification by modification—mask the true nature of the cumulative impact. While this is true, it has also been noted in this report that the real harbinger of site destruction in the district is not mining but colonial agricultural practices and historical land use that have destroyed, dispersed or disturbed countless sites long before the local occurrence of mining.

Notwithstanding this observation, the current proposal to harm a further 91 sites cannot be summarily dismissed but needs to be acknowledged. While the sites themselves may be unremarkable in their manifestation, and while the site types are commonly represented across the district, their loss is a further diminution of the district's archaeological resource.

While this loss is palpable, most sites being destroyed have a very low artefact density and do not contain rare or unique features. Further, most have been previously disturbed, and the Project is certainly not harming any area that represents an undisturbed archaeological landscape.

While it is acknowledged that the loss of 91 sites is a diminution of inter-generational equity, the archaeological measures contained in this report (**Section 9**), and in the ACHAR that this AAIA accompanies, are designed to mitigate, as much as is possible, this loss of inter-generational equity.

9 Management and Mitigation: Aboriginal Heritage

9.1 GENERAL PRINCIPLES FOR THE MANAGEMENT OF ABORIGINAL SITES

This report will concentrate on the management of the archaeological values present within the Additional Disturbance Area, although given the cultural connection this archaeological landscape has for certain communities, an understanding of the RAPs cultural values in connection to the area is also embedded in the archaeological management recommendations that follow.

For example, from a purely archaeological perspective, much of the Additional Disturbance Area is so altered from the area's agricultural phase that further archaeological investigation would only be able to address very basic research questions (i.e. artefacts found on a dam wall are obviously displaced, and apart from saying that there were once artefacts in the area, they do not have the ability to tell researchers much more). As no meaningful archaeological information could be gained from these sites, a purely archaeological recommendation should be that no further investigation is justified.

However, the basis of the following proposed archaeological management will be to understand that, even if a site is diminished in its archaeological values, that its physical manifestation may still have cultural value to certain communities. Therefore, the task of the management recommendations in this report will be to frame research questions that will enable a thorough study of all the Additional Disturbance Area's remaining archaeological values: not only those locations displaying high archaeological values.

9.2 EXISTING ARCHAEOLOGICAL MANAGEMENT AT THE MOC

9.2.1 Background

The ACHMP is one of a series of Environmental Management Plans that together form the Environmental Management System for the MOC. Current and approved operations within the MOC include:

- Mount Owen North Pit;
- Ravensworth East (Bayswater North Pit); and
- Glendell Pit.

The ACHMP documents procedures for management for Aboriginal cultural heritage values within the approval area for Mount Owen and Ravensworth East (SSD-5850), incorporating the Glendell Mine (DA 80/952). A modification, 'MOCO MOD 1', of SSD-5850 was approved by the then Department of Planning and Environment in 2017 and approves the construction and operation of a water pipeline from Integra Underground to the MOC. A further modification, 'MOCO MOD 2' was approved by the Department of Planning, Industry and Environment (DPIE) in 2019 and allows access to an additional approximately 35 Mt of ROM coal from the North Pit and the extension of

the mine life by an additional six years (through to 2037). A modification, 'Glendell MOD 4', of DA 80/952 is currently being assessed. This modification would allow a minor extension to the Barrett Pit at the Glendell Mine.

The MOC incorporates several management areas set aside for their Aboriginal cultural and/or ecological values. The management areas include Yorks Creek VCA area, the Bettys Creek Habitat Management Area (HMA) and the Bowmans Creek and Swamp Creek landscape.

The MOC supports a project to study the archaeological values in non-impact areas. The study focuses on the AHIMS registered sites in the ACHMP area and involves survey to ground-truth the location and monitor the condition of all previously recorded sites. The aim of this survey is to recommend procedures to ensure that these sites are preserved in the landscape. In most cases, this preservation will involve fencing and signage, although if erosion threatens a site, broader erosion controls may be needed. The MOC has committed funding to review and monitor these sites, including remediation activities.

9.2.2 Aboriginal Party Consultation

The Glencore *Protocol for Aboriginal Cultural heritage – NSW* outlines the Glencore's policy of engagement with Aboriginal people in all aspects of cultural heritage assessment, reporting and conservation.

9.2.2.1 Aboriginal Cultural Heritage Working Group

The MOC Aboriginal Cultural Heritage Working Group (ACHWG) oversees the implementation of the ACHMP and actively contributes to the development of cultural heritage management options and recommendations for Aboriginal objects or places associated with the operation. This is achieved by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s);
- Providing for ongoing communication of information on mining operations and cultural heritage management;
- Providing advice on how to address community relationships; and
- Commenting on draft assessment reports and management plans before they are submitted to regulatory authorities.

The ACHWG comprises the following representatives:

- Two representatives of the Wonnarua Nation;
- Two representatives of the Plains Clans of the Wonnarua People;
- Two representatives of the Wanaruah Local Aboriginal Lands Council; and

 At least three representatives of the MOC who may be employees, or suitably qualified heritage professionals.

9.2.3 Protection measures for cultural heritage sites

The following general Aboriginal heritage management measures have been implemented at MOC:

- A significant area of the MOC has been previously surveyed by archaeologists and Aboriginal community groups;
- A geographic information system (GIS) database of Aboriginal sites has been established;
- MOC maintains an up to date mine plan which minimises mining in areas of high Aboriginal significance;
- Inclusion of an Aboriginal heritage section within the MOC site induction. This makes contractors aware of responsibilities under NPW Act and location of known sites;
- Pre-clearance surveys are undertaken prior to any ground disturbance through the Ground Disturbance Permit (GDP) process;
- Verification, photographic and site condition monitoring of Aboriginal sites takes place in areas outside approved disturbance areas; and
- Fencing of sites within management areas, including Yorks Creek VCA, Biodiversity Offset Areas and the Bettys Creek HMA and the Bowmans Creek and Swamp Creek landscape.

9.2.4 Discovery of new Aboriginal sites

In the event of discovery of new Aboriginal sites which are more than 50 m from previously recorded boundaries of Aboriginal sites, all work close to the discovery will cease and an area of 10 m around the site fenced with temporary construction fencing. An archaeologist and members of RAPs will be contacted to determine the significance of the Aboriginal objects(s) present. New sites will be registered in the AHIMS database.

9.2.4.1 Management of newly discovered sites within currently approved operations

Any new Aboriginal sites identified within the approved disturbance areas will be temporarily fenced as quickly as possible. Signage on the fencing is to state that the area is subject to environmental protection, where no ground disturbance is allowed, and will include relevant contact details for MOC staff. The minor impact to the ground surface during installation of fence posts is permissible only on condition that no soil is to be removed off site. The following procedure will be implemented for any newly identified sites:

- The site will be assessed by a qualified archaeologist and members of the RAPs;
- The site will be considered for fencing;
- The site location will be registered with AHIMS and a site card submitted;

- The site location will be entered on to the MOC GIS database;
- Depending on the Aboriginal cultural heritage values at the site and the degree of immediate threat to the site, the site will be salvaged according to the methodology in Section 6.2.1.1. and 6.2.1.2 of the MOC ACHMP;
- A brief report of the salvage will be produced to record the findings;
- On completion of the salvage at such sites, an AHIMS ASIRF will be completed (Section 7.2.3). Copies of the forms will be archived. Digital copies will be submitted to the AHIMS registrar soon after the completion of salvage fieldwork. The form will be lodged within a reasonable time of fieldwork completion and certainly within six months; and
- All artefacts salvaged will be stored in the artefact storage facility (MOC ACHMP Section 5.5).

9.2.4.2 Management of newly discovered sites outside of the currently approved operations

Any new Aboriginal site identified outside the approved disturbance areas will be managed in accordance with the following procedure:

- The site will be assessed by a qualified archaeologist and members of the RAPs;
- The site will be considered for fencing;
- The site location will be registered with AHIMS and a site card submitted;
- The site location will be entered on to the MOC GIS database;
- If the site contains Aboriginal objects of interest such as many artefacts or rare features such as a hearth that is located in an area of active and destructive erosion, the site may be subject to limited salvage excavation in accordance with the methodology set out in MOC ACHMP Section 6.2.1.2. The aim of any salvage undertaken in this instance would be to prevent the loss of information from ongoing erosion and will only be undertaken in extreme and obvious circumstances with the full consultation and participation of the RAPs;
- On the completion of salvage at such sites, an AHIMS ASIRF will be completed (see MOC ACHMP Section 7.2.3). Copies of the forms will be archived. Digital copies will be submitted to the AHIMS registrar soon after completion of salvage fieldwork. The form will be lodged within six months from the completion of fieldwork; and
- Outside of emergency situations as set out above, any impact to sites outside of the approved disturbance area will require an AHIP.

9.2.4.3 Human skeletal remains

In the event known or suspected Aboriginal skeletal remains are encountered during the course of development the following procedure will be followed:

 All work will cease immediately and an area of 10 m radius around the find will be cordoned off with temporary construction fencing;

- The find will be immediately reported to the work supervisor who will immediately advise the Environment and Community Manager, or another nominated senior staff member;
- MOC will promptly notify the police (as required for all human remains discoveries);
- MOC will contact BCD for advice on identification of the skeletal material as Aboriginal and management of the material; and
- If the remains are Aboriginal ancestral remains, the RAPs will be contacted within two
 working days and consultative arrangements will be made to discuss ongoing care of the
 remains, including advice on recommended forensic anthropologists.

9.3 MANAGEMENT OPTIONS

The management of any archaeological landscape must include the consideration of all available options and an evaluation of the viability of these options to achieve the best archaeological outcome.

In brief there are three main options available and the archaeological merits of each option will be discussed below.

9.3.1 Option A: Do Nothing

This option is a real possibility because if the Project is not approved then a 'do nothing' option will be followed probably with little more management of the archaeological landscape than is happening at present. A 'do nothing' option, in its purist sense, will mean no 'extra' management of the archaeological landscape.

Whilst no sites would be deliberately destroyed and would be captured as part of the existing site GIS database and GDP processes, this option will not stop the on-going natural deterioration of sites in the Additional Disturbance Area, and as a result, this option would contribute to the cumulative loss of sites in the region.

Option A makes a small contribution to intergenerational equity as, in theory, the landscape is preserved (albeit with on-going erosion) and would be available for future generations to visit.

However, all the Additional Disturbance Area is on MOC owned land. This does not allow, in the short term at least, for free access and use of any areas. Additionally, as discussed above, without management there will be a landscape surviving but one continuing to be denuded of A-Horizon soils and a landscape without, in all likelihood, many archaeological sites in good condition.

9.3.2 Option B: Modify project design to avoid harm

Another option that can be considered is that certain areas, now within the Additional Disturbance Area, could be excluded from the Project design and the areas conserved as archaeological / cultural zones.

However, no individual artefact scatter, or group of artefact scatters, within the Additional Disturbance Area was assessed as of high enough archaeological significance that would justify major design changes to avoid particular areas.

While it is possible in theory to avoid mining activity in certain areas, the following questions need to be borne in mind:

- What is being saved?
- Does the item have high enough social or archaeological values to justify saving?
- What is the long-term advantage of saving such an item?
- How will the item ultimately be managed and used?
- Would the benefit of doing these works from an archaeological perspective be outweighed by other archaeological mitigation strategies?

Given the nature of the current recordings (low-density artefact scatters), the past loss of archaeological landscape context and the impact of on-going erosion, it is difficult to justify major Project design changes on archaeological grounds alone.

Should Option B be followed, the Project would contribute less to the cumulative loss of sites in the region by permanently preserving a number of sites. The Project could also add to intergenerational equity by following Option B as the preserved areas would potentially be available, at some time when mining concludes, for future generations to use and enjoy.

Elsewhere in the main volume of the EIS, the rationale behind the need to mine or modify areas within the Additional Disturbance Area are discussed. Given the condition and context of the sites, the history of past impacts in their vicinity and their location in areas vital for the successful operation of the Project, the current assessment does not see an Option B approach for archaeological management as practical and therefore this option is not recommended.

9.3.3 Option C: No design change and mitigate archaeological impacts

If the Project is granted development consent in its current form, then there is likely impact to 91 Aboriginal sites within the Additional Disturbance Area.

Under the scenario of Project approval, Option C should be followed and the loss of archaeological value to the 91 impacted sites will be mitigated. This option would be carried out with the advice and involvement of the RAPs under the terms of an approved ACHMP. It would also follow all appropriate guidelines pertaining to the NPW Act. This option is also supported in Article 28 of *The Burra Charter* (Australia ICOMOS 2013) that reads:

Article 28. Disturbance of fabric

- 28.1 Disturbance of significant fabric for study, or to obtain evidence, should be minimised. Study of a place by any disturbance of the fabric, including archaeological excavation, should only be undertaken to provide data essential for decisions on the conservation of the place, or to obtain important evidence about to be lost or made inaccessible.
- 28.2 Investigation of a place which requires disturbance of the fabric, apart from that necessary to make decisions, may be appropriate provided that it is consistent with the policy for the place. Such investigation should be based on important research questions which have potential to substantially add knowledge, which cannot be answered in other ways and which minimises disturbance to the fabric.

The Burra Charter (2013) is the primary guideline policy document for the conservation and protection of Australian cultural heritage. According to the Burra Charter, the destruction of fabric is to be avoided although it is recognised that destruction of fabric is sometimes unavoidable. The Burra Charter recommends that mitigation studies be undertaken to offset the loss of fabric.

In the face of widespread disturbance, Option C is justified: "to obtain important evidence about to be lost or made inaccessible". This loss of fabric (i.e. archaeological sites) will be minimised in the sense that only areas within the Additional Disturbance Area will be investigated and all archaeological investigations will be framed within research questions that will allow as much information to be captured before the sites are further impacted by erosion and "lost" forever. The "policy" to oversee and control this "destruction of fabric" would be an ACHMP that would be developed in consultation with the RAPs following Project approval.

Option C contributes to the cumulative loss of sites from the region because the relatively large Additional Disturbance Area would be subject to archaeological salvage works. Option C also does not add substantially to intergenerational equity: apart from the fact that the salvage program, if conducted as described below, will capture further information about the archaeological landscape within the Additional Disturbance Area that will be available to future generations and scholars seeking information about the area.

Should the Project be approved in its present form, Option C will form the basis of the management recommendations that follow.

9.4 Management and Mitigation of Recorded Aboriginal Sites

9.4.1 Archaeological salvage

Because of the current and previous assessments, 91 sites have been recorded within the Additional Disturbance Area.

As listed in **Table 9-1**, the most common management strategy recommended on archaeological grounds alone is for the salvage of a site through the recording and collection of surface artefacts. This recommendation is made due to:

- The nature of the recorded sites (97% of sites are isolated finds, low-density artefact scatters with no associated subsurface deposits, or contain low-density subsurface deposits);
- Generally thin A-Horizon soils that preclude subsurface archaeological deposits;
- Generally high previous disturbance from a range of factors including erosion and land use practices; and
- The low archaeological values assigned to the sites.

Sites designated for surface artefact collection have a very limited ability to further inform the community about the history and culture of the area. While any potential research questions are limited, some information can nevertheless be gained.

Table 9-1 sets out the recommended archaeological management of all sites within or adjacent to the Additional Disturbance Area. The four sites highlighted with a blue shade include limited archaeological excavation as a management recommendation.

Table 9-1: Management recommendations for sites within the Additional Disturbance Area.

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
37-3-1559	Glendell North OS2	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1558	Glendell North OS3	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1557	Glendell North OS4	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1569	Glendell North OS5	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	No action required as no surface artefacts present
37-3-1571	Glendell North OS6	Artefact scatter with PAD	Moderate	Total	Moderate density artefact scatter with subsurface deposits	Mapping, description and collection of surface artefacts Archaeological excavation to gain a better understanding of the nature of deposits on the spur landform adjacent to Bowmans Creek (Section 9.5.2).
37-3-1549	Glendell North OS8	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
37-3-1554	Glendell North OS11	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1553	Glendell North OS12	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1552	Glendell North OS13	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1551	Glendell North OS14	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1550	Glendell North OS15	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1573	Glendell North OS16	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefact
37-3-1542	Glendell North OS17	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1541	Glendell North OS18	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1572	Glendell North OS19	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefact
37-3-1540	Glendell North OS20	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1539	Glendell North OS21	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1538	Glendell North OS22	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1537	Glendell North OS23	Artefact scatter	Low	Total (although only part of the site extent is within the Additional Disturbance Area, it is recommended that the entire site be salvaged)	Low density artefact scatter	Mapping, description and collection of surface artefact

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
37-3-1570	Glendell North OS25	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefact
37-3-1548	Glendell North OS26	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1547	Glendell North OS29	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1546	Glendell North OS30	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1545	Glendell North OS31	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1574	Glendell North OS34	Artefact scatter with PAD	Moderate	Total (although only part of the site extent is within the Additional Disturbance Area, it is recommended that the entire site be salvaged)	Low density artefact scatter with known subsurface deposits	Mapping, description and collection of surface artefacts Archaeological excavation to gain a better understanding of the nature of deposits associated with the confluence of Yorks and Bowmans Creek (Section 9.5.2).
37-3-1567	Glendell North OS35	Artefact scatter with PAD	Moderate	Total (although only part of the site extent is within the Additional Disturbance Area, it is recommended that the entire site be salvaged)	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	No action required as no surface artefacts present
37-3-1568	Glendell North OS36	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	No action required as no surface artefacts present
37-3-1562	Glendell North OS37	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1565	Glendell North OS38	Isolated find	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-1576	Glendell North OS39	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
37-3-1534	Glendell North IF2	Isolated find	Low	Total	Isolated artefact Mapping, description and collection of surface artefact	
37-3-1533	Glendell North IF3	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1532	Glendell North IF4	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1531	Glendell North IF5	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1528	Glendell North IF8	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1526	Glendell North IF10	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1525	Glendell North IF11	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1524	Glendell North IF12	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1523	Glendell North IF13	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1522	Glendell North IF14	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1521	Glendell North IF15	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1520	Glendell North IF16	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1519	Glendell North IF17	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1518	Glendell North IF18	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1515	Glendell North IF20	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1514	Glendell North IF21	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1516	Glendell North IF22	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1512	Glendell North IF24	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1566	Glendell North IF26	Isolated find with PAD	Low	Total	Isolated artefact with very low-density subsurface deposit Further archaeological	No action required as no surface artefacts present

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
					excavation deemed unwarranted due to very low density of subsurface artefacts	
37-3-1564	Glendell North IF27	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1563	Glendell North IF28	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1575	Glendell North IF29	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-0294	Site 2; (MORL2)	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-0469	Bowmans/Swamp Creek Trench 1	Artefact scatter with PAD	Moderate	Total (already partially destroyed)	Moderate density artefact scatter	Mapping, description and collection of surface artefact Archaeological excavation to gain a better understanding of the nature of deposits associated with Bowmans and Swamp Creek (Section 9.5.2).
37-3-0521	MO-IF1	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-0612	Bettys Creek 22	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-0689	G11 Glendell	Artefact scatter with PAD	Low	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefacts
37-3-0744	York Creek 1	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-0745	York Creek 2	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-0746	York Creek 3	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-0747	York Creek 4	Artefact scatter	Low - moderate	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of	Mapping, description and collection of surface artefacts

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
					subsurface artefacts	
37-3-0748	York Creek 5	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-0749	York Creek 6	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-0750	York Creek 7	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	No action required as no surface artefacts present
37-3-0751	York Creek 8	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-0752	York Creek 9	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-0753	York Creek 10	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-0754	York Creek 11	Artefact scatter with PAD	Low- moderate	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefacts
37-3-0755	York Creek 12	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-0756	York Creek 13	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-0757	York Creek 14	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-0758	York Creek 15	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-0759	York Creek 16	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefact
37-3-0760	York Creek 17	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-0761	York Creek 18	Artefact scatter with PAD	Low	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted	No action required as no surface artefacts present

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
					due to very low density of subsurface artefacts	
37-3-0762	Bowmans Ck 6	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-0763	Bowmans Ck 7	Artefact scatter with PAD	Moderate	Total	Moderate density artefact scatter with known subsurface deposits	Mapping, description and collection of surface artefacts Archaeological excavation to gain a better understanding of the nature of deposits on the spur landform adjacent to Bowmans Creek (Section 9.5.2).
37-3-0764	Bowmans Ck 8	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-0765	Bowmans Ck 9	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-0766	Bowmans Ck 10	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-0773	Swamp Ck 10	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1155	MT OWEN ISOLATED FIND2	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1156	MT OWEN ISOLATED FIND1	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1158	RPS DLW IF1	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1198	MOCO OS-10	Artefact scatter	Low	Total (already partially destroyed). Although only part of the site extent is within the Additional Disturbance Area, it is recommended that the entire site be salvaged.	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-1490	Swamp Creek IF-4	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1492	Swamp Creek IF-2	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1493	Swamp Creek IF-3	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact
37-3-1494	Swamp Creek IF-1	Isolated find	Low	Total	Isolated artefact	Mapping, description and collection of surface artefact

AHIMS ID	Site name	Site type	Scientific significance	Degree of harm	Comment	Management strategy
37-3-1499	Swamp Creek-OS1	Artefact scatter	Low	Total	Low density artefact scatter	Mapping, description and collection of surface artefacts
37-3-1503	Yorks Creek 19	Artefact scatter with PAD	Low - moderate	Total	Low density artefact scatter Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts	Mapping, description and collection of surface artefacts

9.4.2 Sites requiring specific management to prevent harm

There are three sites that are closely adjacent to the Additional Disturbance Area and may be unintentionally harmed by the Project unless specific management is undertaken to avoid impacts (**Table 9-2**). Due to their close proximity to proposed works, these sites are at greater risk of unintentional impact when compared to sites located further away (**Figure 9-1** to **Figure 9-3**). These sites should be permanently fenced and signed prior to works beginning to provide adequate protection.

It is noted that Glendell IF23 is located within the approved disturbance area for the Glendell Mine and can be salvaged according to Section 6.2.1.1 of the MOC ACHMP. If this is done prior to works associated with the Project commencing, then there is no requirement to protect the site as set out here.

Table 9-2: Sites requiring specific management to ensure conservation.

AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Scientific significance	Figure
37-3-0343	Mt Owen (1996) 1; MTO1;	318524	6414512	Artefact scatter	Low	Figure 9-1
37-3-1560	Glendell North OS1	316820	6413702	Artefact scatter	Low	Figure 9-2
37-3-1513	Glendell IF23	318833	6407204	Isolated find	Low	Figure 9-3

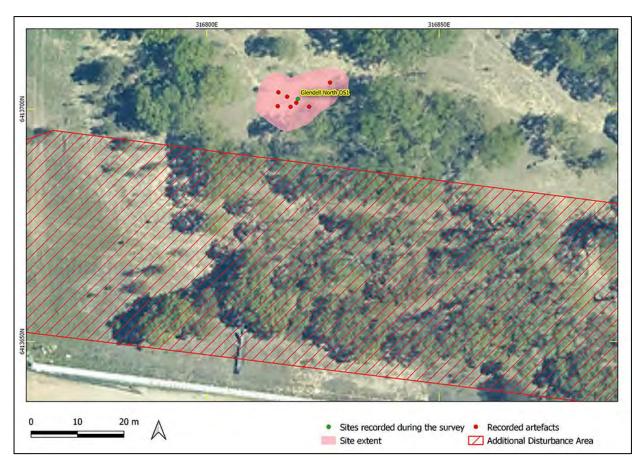


Figure 9-1: Aerial showing the location of Glendell North OS1



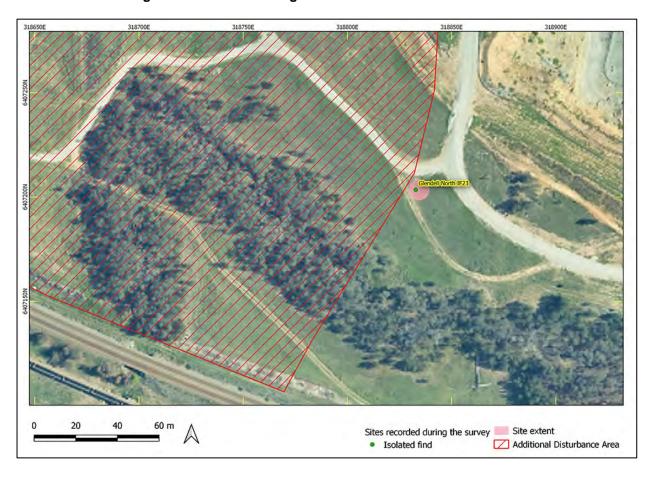




Figure 9-3: Aerial showing the location of 37-3-0343 (Mt Owen (1996) 1; MTO1;).

9.4.3 Sites located on LCO owned land west of Bowmans Creek

There are six new and seven previously recorded sites that are on land owned by LCO to the west of Bowmans Creek. These sites were within the survey area and were recorded or re-assessed during the survey, however, they are not within the Additional Disturbance Area. **Table 9-3** lists the sites and **Figure 9-4** shows the location and extent of these sites. To ensure that these sites are appropriately managed, GIS data and the site cards have been provided to LCO.

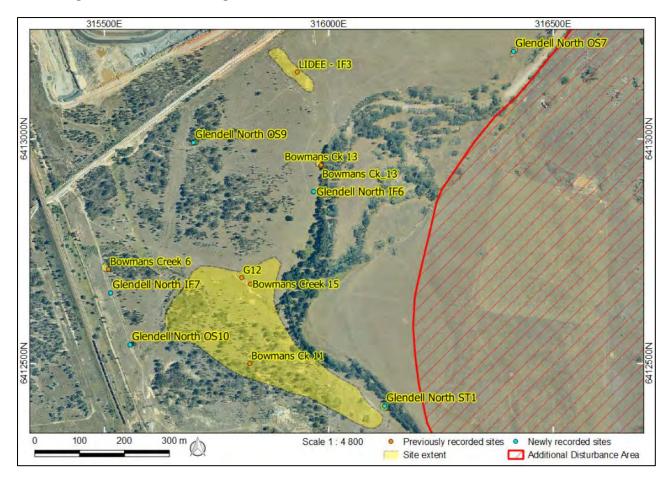
These sites are not at risk of impact from the Project. Therefore, there are no management recommendations provided here regarding these sites as they would be more appropriately managed under a revised LCO ACHMP.

AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Notes
37-3-0686	Bowmans Ck 13	315983	6412942	Artefact scatter	
37-3-0688	G12	315806	6412691	Artefact scatter	
37-3-0768	Bowmans Ck_13	315982	6412940	Artefact scatter	Duplicate of 37-3-0686
37-3-0770	Bowmans Ck 11	315824	6412493	Artefact scatter	Same site as 37-3-0688

Table 9-3: Sites located on LCO owned land to the west of Bowmans Creek.

AHIMS ID	Site name	GDA Zone 56 Easting	GDA Zone 56 Northing	Site type	Notes
37-3-0771	Bowmans Ck 15	315825	6412677	Artefact scatter	Same site as 37-3-0688
37-3-1166	LIDEE - IF3	315930	6413149	Artefact scatter	
37-3-1503	Yorks Creek 19	317369	6411237	Artefact scatter	
37-3-1536	Glendell North OS7	316412	6413195	Artefact scatter	
37-3-1556	Glendell North OS9	315698	6412992	Artefact scatter	
37-3-1555	Glendell North OS10	315557	6412542	Artefact scatter	
37-3-1530	Glendell North IF6	315966	6412883	Isolated find	
37-3-1529	Glendell North IF7	315514	6412657	Isolated find	
37-3-1561	Glendell North ST1	316124	6412405	Scarred tree	

Figure 9-4: Aerial showing the location of sites located to the west of Bowmans Creek.



9.4.4 Management of Bowmans Creek 16 (37-3-0772)

Bowmans Creek 16 is an engraving site etched into a low cliff on the western bank of Bowmans Creek (**Figure 9-5**). The site is within the Project Area, but outside of the Additional Disturbance Area (**Figure 9-6**).

The site is managed under the Ravensworth Operations ACHMP and this has included laser scans of the site on two occasions, most recently in 2019, to ensure the site's preservation in the landscape.

The shift of the confluence point of Yorks and Bowmans Creeks upstream as part of the Yorks Creek Realignment works will increase flows in Bowmans Creek at Bowmans Creek 16 relative to existing approved conditions. Increased peak flow velocities at this location may result in enhanced erosion.

The flood modelling results indicates that no significant changes to peak velocities are expected as a result of the Project under all flood scenarios modelled. The Project is therefore not expected to increase impacts on this site any more than would occur due to flow conditions associated with currently approved operations.

To ensure that the integrity of the site is maintained, the site should continue to be monitored as part of the annual monitoring program undertaken by Ravensworth Operations. The laser scan completed in 2019 should be regarded as a baseline with which to compare any future deterioration, and should any deterioration be noted, action should take place to assess the likely impact and to devise a solution in consultation with the Ravensworth Operations RAPs.

Figure 9-5: Photographs showing Bowmans Creek 16 in 2019.



1. View of Bowmans Creek 16 (arrow) on the west bank of Bowmans Creek.



2. Detail view of Bowmans Creek 16.



Figure 9-6: Aerial showing the location of Bowmans Creek 16.

9.4.5 Management of Glendell North ST1 (37-3-1561)

As Glendell North ST1 is a rare site type in the region, it is recommended that an arborist inspect the tree to provide an option on:

- Whether, in their specialist opinion, the scar has a cultural origin;
- Whether it is possible to determine the age of the scar; and
- Strategies for conserving the site in the landscape as the tree bearing the scar is dead.

9.4.6 Protocols related to the discovery of new sites

The protocols related to the discovery of any new Aboriginal sites contained in Sections 6.2.1 of the MOC ACHMP are deemed sufficient to cover this eventuality and will be implemented for the Project. The policy within the current ACHMP relating to new discoveries is set out in **Section 9.2.4** and these will be carried into the updated ACHMP.

9.4.7 Protocols related to the discovery of human skeletal material

Protocols related to the discovery of human skeletal material will be set out in the MOC ACHMP. However, the protocols contained in Section 6.1 of the current ACHMP are deemed sufficient to

cover this eventuality. These protocols are discussed in **Section 9.2.4.3** and these will be carried into the updated ACHMP.

9.4.8 Protocols for the conversation of sites outside the Additional Disturbance Area

Protocols related to the conservation of sites recorded outside of the Additional Disturbance Area will be set out in the approved ACHMP. However, the protocols regarding the quarterly site condition monitoring contained in Sections 3.5.2 and 3.5.3 of the current ACHMP are deemed sufficient to cover this eventuality. These protocols are discussed in **Section 9.2.3** and these will be carried into the updated ACHMP.

9.4.9 Care of salvaged artefacts

MOC has agreed to house all artefacts from the MOC at the Wollombi Brook Conservation Area artefact storage facility at the Bulga Coal Complex. This decision has been made in consultation with the ACHWG. This purpose-built facility will house artefacts from several Glencore mines in the Hunter Valley. All artefacts from the MOC will be stored in separate archive boxes to artefacts from other mine sites.

The materials will be retained at the artefact storage facility for the life of the mine unless otherwise approved by a Section 85 Care and Control Permit (NPW Act).

9.5 MANAGEMENT PROCESS

9.5.1 Archaeological salvage: surface artefact collection

<u>Research aim</u>: Is there any variation, on a macro level, in the distribution of certain artefact attributes such as raw material type and artefact type across the Additional Disturbance Area?

<u>Action</u>: To conduct an analysis of the raw materials and basic artefact features to determine whether there is site to site variation across the Additional Disturbance Area, particularly in sites located away from water.

<u>Aim</u>: Archaeological data obtained will allow a local level analysis of distribution patterns within the Additional Disturbance Area.

<u>Research Design</u>: All visible artefacts would be flagged in the field. On hand-held GIS units, the location, artefact class and artefact type will be catalogued in the field. A representative sample of artefacts and views of site and *in situ* artefacts will be photographed. When recorded, all artefacts from the surface of the site will be collected.

Stone artefact sites managed under this archaeological salvage will contribute to the research aim in that the sites will have surface artefacts mapped, catalogued, selectively photographed, collected and moved to a safe storage location situated at the Wollombi Brook Conservation Area.

It is envisioned that these investigations would include the following methodology although the final form of any investigation would be done in consultation with the RAPs as part of development of the updated ACHMP.

To fulfil the research aim, the following program is suggested:

- All visible artefacts at a site should be flagged in the field;
- The site should be photographed after flagging and before recording;
- All artefacts should have the following artefact information recorded:
 - o Location;
 - Artefact class:
 - Artefact type;
 - Size;
 - Reduction level;
 - o Raw Material; and
 - Notes.
- A selection of indicative and / or unusual artefacts from each site will be photographed;
- A sketch plan of the site will be completed should this help explain artefact distribution;
- Once all recording is complete, the artefacts will be collected with artefacts from each site being kept separate;
- Should the collection team encounter a human burial, all work should cease in the area and advice from authorities and RAPs (should the remains be Aboriginal) sought (see Section 9.2.4.3);
- The recording of the artefacts recovered will largely be completed in the field and this data would be incorporated into a report; and
- Analysis will attempt to answer the research aim which is to record a statistically valid artefact assemblage from across the Additional Disturbance Area to better understand inter-site variations.

9.5.2 Archaeological salvage: limited manual excavation

Although the test excavation program did not encounter subsurface deposits of conservation value, the excavations did record some discrete concentrations of artefacts. At a few locations, such as in Area 4 of the test excavation program, supplementary squares were excavated to determine the horizontal extent of these artefact concentrations. The limited manual excavation proposed here is to add further supplementary excavation squares next to, or near, known concentrations of artefacts

to confirm that the concentrations are indeed isolated and not part of a broader archaeological deposit.

At the sites recommended for subsurface excavation in **Table 9-1**, it is recommended that the surface collection of artefacts occur first (**Section 9.5.1**) followed by the manual excavation.

The sites where additional manual excavation is to take place are GN OS6, GN OS34, Bowmans Creek 7 and Bowmans/Swamp Ck Trench 1. The rationale for further excavation at these locations falls into two categories:

- GN OS6, GN OS34, Bowmans Creek 7: these sites were investigated during the test excavation program and recorded the higher artefact densities of the program. The aim of the additional excavation is therefore to confirm that the concentrations of artefacts at these sites are isolated occurrences and that they are not part of a broader archaeological site. In addition, it allows further archaeological understanding of the two areas displaying the greater archaeological sensitivity within the Additional Disturbance Area: the elevated spur along Bowmans Creek in the north of the Additional Disturbance Area (Area 1 in the test excavation program): GN OS6 and Bowmans Creek 7, and the confluence of Bowmans and Yorks Creek (Area 4 in the rest excavation program): GN OS34.
- Bowmans/Swamp Ck Trench 1 has been previously investigated (Section 4.4.2.1) and continues to show many surface artefacts. Although in an area of high general disturbance, further subsurface investigation is warranted to tie in with the 2001 investigations. It also provides a further opportunity to investigate the flat floodplain between Bowmans and Swamp Creeks in the southern portion of the Additional Disturbance Area.

The manual excavation at these locations should follow the following framework.

Archaeological Salvage: focused subsurface investigations

<u>Research Aim</u>: sites with low–moderate or moderate scientific significance. Are artefact concentrations isolated from each other or part of a broader archaeological deposit?

Action: To conduct targeted, limited archaeological excavations at the site.

<u>Aim</u>: Archaeological data obtained will provide further certainty on the nature of archaeological deposits within the Additional Disturbance Area.

Research Design: Adjacent to known artefact concentrations up to ten 0.5 m x 0.5 m excavation squares should be excavated. The excavation squares should be grouped to maximise information in one area. These squares, in 0.5 m x 0.5 m increments, could be expanded if finds or deposits indicate that it would be advantageous. Location details and a proposed methodology for subsurface investigations are given in **Table 9-1**. In the proposed salvage methodology, there are listed triggers that allow investigation to expand within a focused area.

The methodology for the possible salvage by manual excavation at these sites is as follows:

- All surface artefacts should be collected and moved to a place of safe-keeping under the
 methodology set out in Section 9.5.1. This is to ensure that the artefacts are not harmed
 during the following excavation process;
- The results of the artefact collection, and discussions between archaeologists and RAPs, will determine where further archaeological salvage is to take place within a given area. At sites GN OS6, GN OS34 and Bowmans Creek 7, this will examine areas around known concentrations of artefacts that were recorded in the test excavation program. At Bowmans/Swamp Ck Trench 1 it will be to examine the nature of remnant deposits in this landform. Previous investigations at Bowmans/Swamp Ck Trench 1 have shown that areas to the north of the trench are less disturbed and that surface artefacts appear more numerous towards the east. Therefore, it is recommended that a linear arrangement of excavation squares be utilised at Bowmans/Swamp Ck Trench 1 to more broadly examine the nature of the landform;
- A minimum of ten 0.5 m x 0.5 m excavation squares (2.5 square metres) would be excavated to culturally sterile soil levels within one investigation area. Should basal clays be too deep to be reasonably reached by manual excavation, the decision as to whether sufficient excavation has occurred will rest with the Excavation Director;
- The ten excavation squares could be grouped together or spaced at no more than 5 m apart.
 Thus a 45 m transect could be investigated, or a 2.5 square metre contiguous area excavated.
- Spits at each area would start in 5 cm increments although 10 cm increments could be used once it is established it is archaeologically prudent to do so;
- All deposits would be dry sieved at location;
- All recording will be done in the field in standard context sheets and the archaeologist will
 ensure that all necessary photographs, section drawings and soil analysis shall take place;
- A maximum area of 2.5 square metres shall be excavated at any one area unless deposits and finds warranted a further expansion (see below);
- The decision to expand from the initial two square metres shall be determined by the results
 of the ten 0.5 m by 0.5 m squares and would be done in consultation between the
 archaeologists and RAPs present. The final decision on whether expansion is desirable will
 rest with the Excavation Director;
- The grounds for expansion would include:
 - The complete excavation of a feature (such as a hearth) that may have been intersected by an excavation square; and
 - The complete excavation of a concentration of artefacts such as a knapping floor that may have been intersected by an excavation square.
- Any expansion beyond the 2.5 square metres would include areas totalling no more than 40% of the original area (i.e. an additional four 0.5 m x 0.5 m squares [one square metre] would be permissible);

- In what is assessed as an unlikely event, should excavations encounter high value archaeological deposits, it should be possible to even further expand the archaeological salvage at that location. Deposits or features that would characterise high value deposits include:
 - o Undisturbed deposits showing discernible archaeological stratigraphy;
 - Any exceptional finds (unusual materials, rare preservation, rare artefact type)
 believed to have archaeological context; and
 - o A high density of artefacts¹¹ (more than 60 per square metre) in undisturbed contexts.
- Should the excavations encounter a human burial, all work should cease in the area and advice from authorities and RAPs (should the remains be Aboriginal) sought (see Section 9.2.4.3);
- All excavated material (stone tools, bone, shell etc) will be fully analysed and a report of the findings prepared; and
- Analysis will attempt to answer the research aim which is to record a statistically valid artefact assemblage from the site to better understand intra-site variations.

-

¹¹ An artefact is defined here as being larger than 15 mm. Therefore, a concentration of small debitage or shatter would not constitute an 'artefact concentration' unless the archaeologist and RAPs present felt that this had archaeological merit.

10 Conclusion



Excavation underway at Area 7 overlooking the Bowmans Creek floodplain.

The fieldwork component of this assessment was undertaken by OzArk, RAPs and Wonnarua Knowledge Holders over the course of several weeks in April, May, September, October and November 2018. The survey, test excavation and historic heritage test excavation programs during this time involved 40 field days in total. The 15 days of historical heritage test excavation was directed by Casey & Lowe; although an OzArk archaeologist and two RAP representatives (which included a representative from the PCWP) were present during the excavations to manage any Aboriginal cultural heritage finds.

69 sites were recorded during this assessment consisting of:

- 39 artefact scatters;
- 29 isolated finds; and
- One scarred tree.

Of the artefact scatters, 32 sites recorded less than 10 artefacts and no site contained more than 70 artefacts. At nine locations it was assessed that there are subsurface deposits. One of these sites was determined to have a moderate artefact density (Glendell North OS6), however, none of the

recorded sites was remarkable in its manifestation; either in terms of the types of artefacts recorded, the raw material the artefacts were manufactured from or the density and nature of the surface artefact manifestation. The recorded sites are also very representative of artefact sites in the upper Hunter Valley both in terms of the types of artefacts recorded and the raw materials from which the artefacts were manufactured. The exception to this is the recording of GN ST1—a scarred tree—which is a rare site type in the upper Hunter Valley due to the widespread vegetation clearing that has taken place.

The results of the test excavation program were surprisingly sparse. 152 0.5 m by 0.5 m excavation squares were excavated at 12 separate localities: a total of 38 square metres. From this area of excavation, 180 artefacts were recovered; an average of 4.7 artefacts per square metre or 1.18 artefacts per excavation square. This density of artefacts is extremely low and only two excavation squares recorded greater than 15 artefacts.

No evidence of colonial conflict or skeletal remains was identified during the survey or test excavation programs. While the evidence of colonial conflict in the general area is known from written sources, nothing in the current archaeological assessment was able to corroborate or extend the scant information the written sources provide.

With regards to the Additional Disturbance Area that includes all areas not previously approved for disturbance where Project impacts are proposed:

- 52 of the 69 newly recorded sites are within or in very close proximity to the Additional Disturbance Area; and
- 39 previously recorded sites are within the Additional Disturbance Area.

In total, 91 sites are located within or very close to the Additional Disturbance Area and will be impacted should the Project be approved. 55 of these sites are artefact scatters (15 of which have PAD) and 36 are isolated finds (one of which has PAD). In general, the artefact scatters have a low artefact density with most sites recording less than 10 artefacts.

Undertaking an assessment of scientific significance for all sites within the Additional Disturbance Area shows that 84.6% of sites (n=77) have a low scientific significance as they are either isolated finds or low-density artefact scatters. Nine sites have low-moderate scientific significance, five sites have moderate scientific significance, and no sites have been assessed as having high scientific significance.

To manage and mitigate this impact, three main archaeological recommendations are made in this AAIA, although additional recommendations to mitigate the loss of cultural heritage are made in the ACHAR. The archaeological recommendations are:

To conserve all sites outside of the Additional Disturbance Area by extending the current site
monitoring and verification protocols contained in the MOC ACHMP (see Section 9.2.3);

- To undertake a collection and recording of all surface artefacts at all sites within the Additional Disturbance Area where there is a surface manifestation of artefacts (see Section 9.5.1); and
- To undertake limited manual archaeological excavation at four locations to confirm the nature of the archaeological deposits (see **Section 9.5.2**).

While it is acknowledged that the loss of 91 sites is a diminution of inter-generational equity, the archaeological measures contained in this report, and in the ACHAR that this AAIA accompanies, are designed to mitigate, as much as is possible, this loss of inter-generational equity.

REFERENCES

ACHM 2013	Australian Cultural Heritage Management (Victoria) Pty Limited. 2013. <i>Mount Owen Continued Operations Project. Aboriginal Cultural Heritage Assessment Report and Consultation Records. Volume 1.</i> Report for Mt Owen Pty Ltd.
Australia ICOMOS 2013	International Council on Monuments and Sites 2013. <i>The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance</i> , 2013.
AMBS 1997	Australian Museum Business Services. Archaeological test Excavations of Aboriginal Sites at Bettys Creek Mt Owen Mine, Hunter Valley, NSW. Vol. 1–4. Report for Mt Owen Mine, BHP Coal Australia.
BOM 2018	Bureau of Meteorology. 2016. <i>Summary statistics SINGLETON STP</i> . http://www.bom.gov.au/climate/averages/tables/cw_061397.shtml Accessed 23/10/18.
Brayshaw 1981	Brayshaw, H. 1981. Archaeological survey of Authorisation 89, proposed site of Bloomfield Collieries' Coal Mine at Rix's Creek, Singleton. Report to NSW NPWS.
Brayshaw 1982	Brayshaw, H. 1982. Additional Archaeological Information Relating to Glendell Open Cut Coal Mine at Ravensworth. Hunter Valley. Report for Croft & Associates Pty. Limited.
Brayshaw 1986	Brayshaw, H. 1986. Aborigines of the Hunter Valley: a study of colonial records. Scone and Hunter Historical Society: Scone.
Burke & Smith 2004	Burke, H. and Smith, C. 2004. <i>The Archaeologist's Field Handbook</i> , Blackwell, Oxford.
Burton et al. 1990	Burton, C., Koettig, M. and Thorp, W. 1990. <i>Regional study of Heritage significance, Central Lowlands, Hunter Valley Electricity Holdings</i> . Report to the Electricity Commission of NSW in three volumes. Volume 1: Overview and recommendations.
Clegg 1990	Clegg, F. Simple statistics: a course book for the social sciences. Cambridge University Press, Cambridge.
Dean-Jones 1992	Dean-Jones, P (Resource Planning Pty Ltd). <i>Archaeological Report Subsurface Analysis Swamp Creek, Mount Owen Mine Site</i> . Report to Hunter Valley Coal Corporation Pty.

DECCW 2010	Department of Environment, Climate Change and Water, Sydney (now OEH). Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.
DP&E 2016	Department of Planning and Environment. Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals.
Dyall 1982	Len Dyall. 1982. A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project. Report for ELCOMM.
EMM 2017	EMM Consulting Pty Limited. 2017. <i>Mt Owen Complex Aboriginal cultural heritage due diligence site inspection results (J17105) EL6594, EL8184, ML1629 and ML1415.</i>
EMM 2018	EMM Consulting Pty Limited. 2018. <i>Glendell North Exploration – Aboriginal cultural heritage due diligence site inspection results</i> . Report to Glendell.
ERM 1999	ERM. 1999. Ravensworth East Mine Environmental Impact Statement. Report for Peabody Resources Limited.
ERM 2002	ERM Pty Limited. 2002. Ravensworth East Archaeological Investigation. Report to Coal and Allied Pty Limited.
ERM 2004	ERM Environmental Resources Management Australia Pty Ltd. <i>Upper Hunter Valley Aboriginal Heritage Baseline Study</i> . Report Prepared for the Upper Hunter Aboriginal Heritage Trust.
Fawcett 1898	Fawcett, J.W. 1898. Notes on the customs and dialects of the Wonnah-ruah tribe. <i>Science of Man and Australasian Anthropological Journal</i> . 1(8):180-181.
Gapps 2018	Gapps, Stephen. The Sydney Wars. NewSouth Books.
GHD 2005	GHD (International) Pty Limited. 2005. <i>Proposed Coal Stockpile at Newpac No. 1 Colliery, Ravensworth. Environmental Impact Statement, Volume 1.</i> Report to Resource Pacific Ltd.
Haglund 1982	Haglund, L. 1982. <i>Archaeological Survey of Pikes Gully Colliery Area, Liddell, N.S.W.</i> Report for Longworth and McKenzie Pty. Limited.
Hiscock 1993	Hiscock, P. 1993. Bondaian Technology in the Hunter Valley, New South Wales, <i>Archaeology in Oceania</i> 28(1993): 65–76.
Hiscock and Mitchell 1993	Hiscock, P. and Mitchell, S. Stone artefact quarries and reduction sites in Australia: towards a type profile. <i>Australian Heritage Commission Technical Publications Series No.4</i> , Australian Government Publishing Service, Canberra.

Hughes 1981	Hughes, P.J. 1981 An Archaeological survey of the Bayswater No. 2 colliery proposed lease extension area, Muswellbrook and Hunter Valley. Unpublished report.
Hughes 1984	Hughes, P.J. 1984. NSW National Parks and Wildlife Service Hunter Valley Region Archaeological Project Stage 1. Volume 1. An overview of the archaeology of the Hunter Valley, its environmental setting and the impact of development. Report for the NSW National Parks and Wildlife Service.
Koettig 1990	Koettig, M. 1990. Camberwell Coal Project - Glennies Creek Supplementary Report on Aboriginal Sites. Report to Epps and Associates Pty Limited.
Kovac and Lawrie 1991	Kovac, M. and Lawrie, J.M. 1991. Soil Landscapes of the Singleton 1:250,000 Sheet, Soil Conservation Service of NSW, Sydney.
Leonard and Jones 1989	Leonard, R. D. and Jones, G. T. (eds) <i>Quantifying diversity in archaeology</i> . Cambridge University Press, Cambridge.
Mitchell 2002	Mitchell, P. 2002. Description for NSW (Mitchell) Landscapes Version 2. Department of Environment and Climate Change NSW.
Moore 2000	Moore, M.W. Technology of Hunter Valley microlith assemblages, New South Wales. <i>Australian Archaeology</i> 51.
NSW NPWS 2016	New South Wales National Parks and Wildlife Services. 2016. Sydney Basin - Landform. http://www.environment.nsw.gov.au/bioregions/SydneyBasin-Landform.htm Accessed 03/07/18.
NSW NPWS 2016 OEH 2011	- Landform. http://www.environment.nsw.gov.au/bioregions/SydneyBasin-
	 - Landform. http://www.environment.nsw.gov.au/bioregions/SydneyBasin-Landform.htm Accessed 03/07/18. Office of Environment and Heritage 2011. Guide to investigating, assessing
OEH 2011	 Landform. http://www.environment.nsw.gov.au/bioregions/SydneyBasin-Landform.htm Accessed 03/07/18. Office of Environment and Heritage 2011. Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW. OzArk Environmental & Heritage Management Pty Limited. 2013. Aboriginal Archaeological Values Assessment. Mount Owen Continued Operations.
OEH 2011 OzArk 2013	- Landform. http://www.environment.nsw.gov.au/bioregions/SydneyBasin-Landform.htm Accessed 03/07/18. Office of Environment and Heritage 2011. Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW. OzArk Environmental & Heritage Management Pty Limited. 2013. Aboriginal Archaeological Values Assessment. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd. OzArk Environmental & Heritage Management Pty Limited. 2015. Aboriginal Due Diligence Archaeological Assessment: Glendell Mine Proposed Light

OzArk 2017b	OzArk Environmental and Heritage Management. 2017. Aboriginal Due Diligence Archaeological Assessment: Mt Owen Complex: Glendell North Project. Bowmans, Swamp and Yorks Creeks: alluvium and biophysical strategic agricultural land verification and mapping. Report for Mt Owen Pty Ltd.
OzArk 2017c	OzArk Environmental and Heritage Management. 2017. Aboriginal Due Diligence Archaeological Assessment: Bowmans and Yorks Creeks Additional Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping. Report for Mt Owen Pty Ltd
OzArk 2017d	OzArk Environmental and Heritage Management. 2017. Aboriginal Desktop Due Diligence Archaeological Assessment: Bowmans and Yorks Creeks Additional Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping. Report for Mt Owen Pty Ltd.
OzArk 2017e	OzArk Environmental & Heritage Management Pty Limited. 2017. Aboriginal Archaeological Salvage Report. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd.
OzArk 2017f	OzArk Environmental & Heritage Management Pty Limited. 2017. <i>Aboriginal Cultural Heritage Salvage Report. Mount Owen Continued Operations</i> . Report for Mt Owen Pty Ltd.
OzArk 2018a	OzArk Environmental & Heritage Management Pty Limited. 2018. <i>Aboriginal Due Diligence Archaeological Assessment: Bowmans and Swamp Creeks: Alluvium Exploration Holes and Monitoring Boreholes</i> . Report for Mt Owen Pty Ltd.
OzArk 2018b	OzArk Environmental & Heritage Management Pty Limited. 2018. Aboriginal Due Diligence Archaeological Assessment: <i>Bowmans and Yorks Creeks: Additional biophysical strategic agricultural land verification and mapping.</i> Report for Mt Owen Pty Ltd.
Resource Planning 1991	Resource Planning Pty Limited. 1991. <i>Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales</i> . Report for Hunter Valley Coal Corporation Pty Limited.
Resource Planning 1993	Resource Planning Pty Limited. 1993. <i>Proposed Mt Owen Extension.</i> Archaeological survey of Bettys Creek. Report for Hunter Valley Coal Corporation Pty Limited.
Stern 1981	Stern, N. 1981. Salvage excavation and surface collection at Nine Mile Creek, Saxonvale Coal Mine, Hunter Valley. Report to the Central Engineering Division BHP, Sydney.

Tocomwall 2017	Tocomwall Pty Ltd. 2017. Hillcrest Aboriginal Cultural Values Assessment Report. Report to Glencore Coal Assets Australia.
Umwelt 2003	Umwelt (Australia) Pty Limited. 2003. Survey and Assessment of Impact on Aboriginal Cultural Heritage and Archaeological Values, Main Creek, Hunter Valley, NSW. Prepared for Glennies Creek Coal Management.
Umwelt 2004	Umwelt (Australia) Pty Limited. 2004. <i>Aboriginal Archaeological Assessment</i> - Glendell Open Cut Mine. Report to Glendell Joint Venture.
Umwelt 2007	Umwelt (Australia) Pty Limited. 2007. <i>Environmental Assessment for Modification of Glendell Mine Operations</i> (3 Volumes). Report for Xstrata Mt Owen Pty Limited.
Umwelt 2013	Umwelt (Australia) Pty Limited. 2013. Part 4 – Bettys Creek Salvage Program, Glendell Mine Surface and Subsurface Salvage under Section 90 Aboriginal Heritage Impact Permit #2267. Report for Xstrata Mount Owen.
Umwelt 2015	Umwelt (Australia) Pty Limited. 2015. Mount Owen Continued Operations Project Environmental Impact Statement.
Umwelt 2019	Umwelt Environmental & Social Consultants. 2019. <i>Biophysical Strategic Agricultural Land Verification Assessment</i> . Report to Glendell Tenements Pty Ltd.
White 1999	White E. From artefacts to the actions of people in prehistory: a behavioural study of the W2 stone artefact assemblage, Hunter Valley, NSW. Master of Philosophy Thesis, University of Sydney.

APPENDIX 1: SURVEY METHODOLOGY

The following survey methodology is the finalised document correct as of April 2018. Any project descriptions, impact areas etc. are as they were in April 2018; although these may have changed since that time.





ABORIGINAL CULTURAL HERITAGE SURVEY METHODOLOGY

GLENDELL CONTINUED OPERATIONS PROJECT Singleton LGA April 2018

Prepared by
OzArk Environmental & Heritage Management Pty Ltd
for
Umwelt Australia Pty Limited
on behalf of

Glendell Tenements Pty Ltd

OzArk EHM 145 Wingewarra St

(PO Box 2069) Dubbo NSW 2830

Phone: (02) 6882 0118 Fax: (02) 6882 0630 enquiry@ozarkehm.com.au www.ozarkehm.com.au

CONTENT	'S
1 INTRO	DDUCTION
1.1 Pr	oject Overview
1.2 Pr	oject Area
1.3 Co	onsultation on this methodology
2 ARCH	AEOLOGICAL CONTEXT1
2.1 Int	troduction
2.2 Ar	ntiquity of Aboriginal occupation1
2.3 Pr	evious assessments within or near the Project Area1
2.3.1	Glendell Mining Lease Area (Brayshaw 1982)1
2.3.2	A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station
	Project (Dyall 1982)1
2.3.3	Archaeological Survey of Pikes Gully Colliery Area, Liddell, NSW (Haglund 1982)1
2.3.4	Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales (Resource Planning 1991)
2.3,5	Proposed Mt Owen Extension. Archaeological survey of Bettys Creek (Resource Planning 1993)
2.3.6	Aboriginal Archaeological Assessment - Glendell Open Cut Mine (Umwelt 2004)1
2.3.7	Environmental Assessment for Modification of Glendell Mine Operations (Umwelt 2007)1
2.3.8	Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations (OzArk 2013)
2.3.9	Mount Owen Modification 2 (OzArk 2017e)1
2.3.10	Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping (OzArk 2017b, c & d)
2.3.11	Mt Owen Complex Aboriginal cultural heritage due diligence site inspection results -
	EL6594, EL8184, ML1629 and ML1415 (EMM 2017)2
2.4 Pr	evious salvage programs within or near the Project Area
2,4,1	Ravensworth East Archaeological Investigation (ERM 2002)
2.4.2	Glendell Project Area (Umwelt 2013)2
2,4.3	Archaeological Salvage. Liddell Coal Operations Development Modification 5 (OzArk 2015)
2.4.4	Mount Owen Continued Operations Project Salvage Program (OzArk 2017)
2.5 Ar	chaeological context: conclusion

-	OZAK ETWIDITIK	ental & Heritage Management
3	PREDICTIVE MODEL	29
3.1	Background	29
3,2	Settlement strategies	29
3.3	Past land use	30
3.4	Previously recorded sites	30
3.5	Landform modelling	31
3,6	Predictive model for the Project Area	33
3.7	Research questions	35
4	SURVEY METHODOLOGY	36
4.1	Assessment approach	
4.2	Background	
4.2		
4.2		
4.2		
REFER	RENCES	41
Figu		
	1-1, Location of the Project Area. 1-2. Key Project features.	
-	1-3: Aerial showing the Project Area and major drainage systems	
	1-4. The Project Area superimposed on a 1958 aerial image	
	2-1. Location of sites previously salvaged in the Project Area	
	3-1; Location of valid AHIMS sites within the Project Area	
-	4-1: Aerial showing areas of survey priority	
TABL	F6	
	1-1: Summary of Key Project Components	
	1-2, Registered Aboriginal Parties for the Project	
	1-3. RAP comments on the draft survey methodology	
	2-1: Artefact densities at sites recorded by Resource Planning 1991	
able :	2-2. Sites salvaged within the Project Area under Permit SZ323	2
	2-3. Sites within the Project Area salvaged under Consent #2267	
Table :	2-4. Details of sites within the Project Area salvaged under AHIP C0000623	25
Table :	2-5. Sites salvaged within the Project Area under SSD-5850	26
Aborigina	of Cultural Heritage Survey Methodology, Glendell Continued Operations Project.	Ď

OzArk Environmental & Hentage Management

INTRODUCTION

OzArk Environmental & Heritage Management Pty Limited (OzArk) has been engaged by Umwelt Australia Pty Limited (Umwelt) (the Client) on behalf of Glendell Tenements Pty Limited (Glendell) (the Proponent) to prepare a survey methodology for the Glendell Continued Operations Project (the Project). This methodology is in accordance with Stage 3 of the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (ACHCRs).

1.1 PROJECT OVERVIEW

The Mount Owen Complex (MOC), which includes the Project Area, is located within the Hunter Coalfields in the upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres (km) northwest of Singleton, 24 km southeast of Muswellbrook. The MOC is situated in the Singleton Local Government Area (LGA) (Figure 1-1).

The MOC includes approved open cut operations in three pit areas, the Bayswater North Pit and North Pit (both approved under the Mount Owen Continued Operations Project consent [SSD-5850]) and the Barrett Pit, approved under the Glendell Mine consent (DA 80/952). The MOC Coal Handling and Preparation Plant (CHPP) washes coal from all three pit areas. The water management system for the MOC is integrated, as well as being linked to the broader Glencore Greater Ravensworth Area Water and Tailings Scheme (GRAWTS). The MOC is approved to process up to 17 million tonnes per annum (Mtpa) run of mine (ROM) coal through the CHPP with production at each of the three pits approved as follows:

- Mount Owen (North Pit) up to 10 Mtpa;
- · Ravensworth East (Bayswater North Pit) up to 4 Mtpa; and
- . Glendell (Barrett Pit) up to 4.5 Mtpa.

The Project seeks to extend the life of Glendell Mine to 2043, with an increase in extraction rate over the life of the Project up to 10 Mtpa from the current approved 4.5 Mtpa.

Key aspects of the Project include the continuation of the Barrett Pit to the north, the realignment of Hebden Road, the diversion of Yorks Creek and relocation of Ravensworth Homestead (Figure 1-2). The major Project components are summarised in Table 1-1.

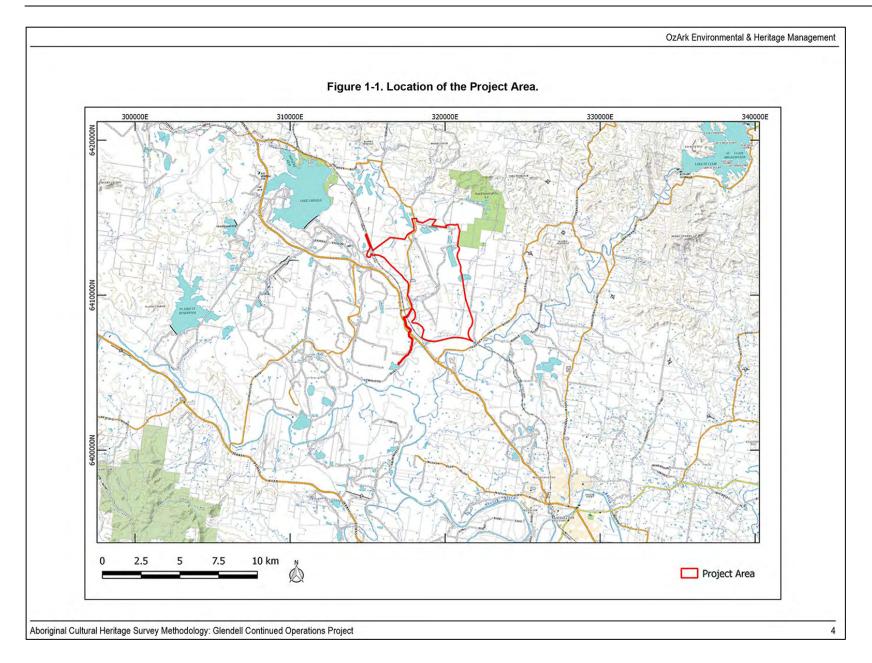
Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

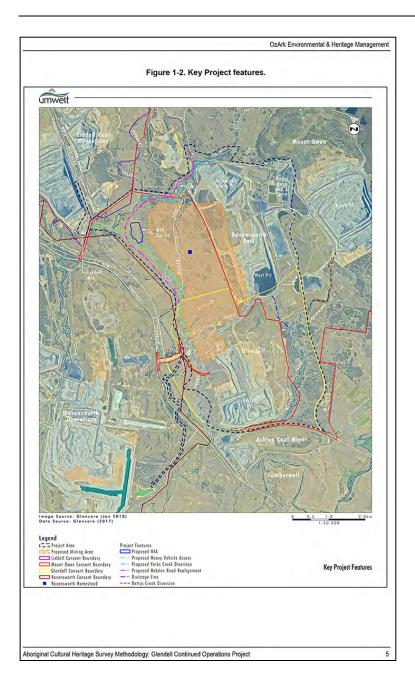
. .

	OzArk Environmental & Heritage Managemen
1	Fable 1-1: Summary of Key Project Components
Project Component	Description
Extraction limit	Overall increase in extraction rate from current approved 4.5 Mtpa up to 10 Mtpa. It is noted that this will ramp up over the life of the Project as mining operations progress further to the north and as operations at Mount Owen ramp down in accordance with current approvals.
Project life	Extension of the life of Glendell Mine to 2043 – this presents an extension of 19 years based on the current approved mine life.
Additional ROM extracted	Approximately 145 Mt.
Mining areas	Continuation of open cut mining to the north of the existing Glendell Mine.
Mining method	Open cut using excavator and truck.
Interactions with other mining operations	Continued integration with MOC in relation to coal handling and transport, water and tailings management, and surface infrastructure.
Key mine infrastructure	New mine infrastructure area (MIA) to be established or use of existing Liddell MIA. Construction of a heavy vehicle access road to the new MIA or the Liddell MIA.
Infrastructure relocations	Relocation of part of Hebden Road Relocation of sections of transmission lines and other utilities as required for mine progression.
Coal handling and processing (CHPP)	Use of existing MOC CHPP infrastructure in the current location. No change to approved CHPP throughput of up to 17 Mtpa ROM coal.
	Size and location of ROM and product stockpile areas will remain unchanged. Given that the current Mount Owen Continued Operations Project consent authorises the use of the CHPP and associated infrastructure to 2031 (2037 subject to MOD 2 currently under assessment) this Project will need to consider and seek approval for ongoing use of this infrastructure through to 2043.
Coal Transport	No increase in train movements of up to 1636 trains per year.
Equipment fleet	Use of existing and additional mining fleet to reflect increase in production and length of mine extension.
Water management System (WMS)	Extension of existing MOC WMS to Project Area and continued integration with regional water management scheme (GRAWTS).
Overburden, coarse reject and tailings management	Emplacement of overburden in-pit with areas up to 200 metres to provide variability in the final landform.
	Out-of-pit emplacement to assist with incorporation of natural landform design elements in final landform.
	Tailings emplacement within Ravensworth East (West Pit) and regional tailings management scheme (GRAWTS).
Creek Diversions	Diversion of part of Yorks Creek Swamp Creek catchment diverted to Bettys Creek in final landform.
Final void	No additional void in final landform although change in size and location of final void. Final void located to the north of approved Barrett Pit void.
Rehabilitation and final landform	Final landform to be in line with current design standards (e.g. incorporation of natural landform design elements) and regulator expectations for similar recent projects such as the Mount Owen Continued Operations Project and the United Wambo Project.

Project Component	Description
Norkforce	Operational workforce expected to increase as production rate increases but will remain within the current approved employment levels associated with MOC. Some short term increases in workforce associated with key infrastructure construction periods.
Operating hours	No change, 24 hours, 7 days per week.
Mine access	From the realigned Hebden Road.
Built heritage	Dismantling and relocation of Ravensworth Homestead to enable continued mine progression.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project





OzArk Environmental & Heritage Management

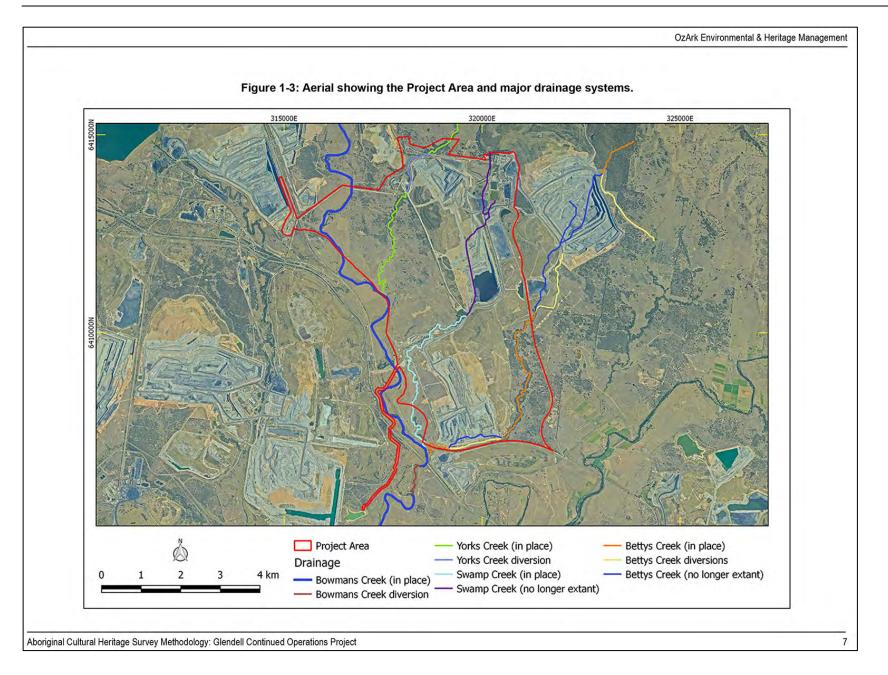
1.2 PROJECT AREA

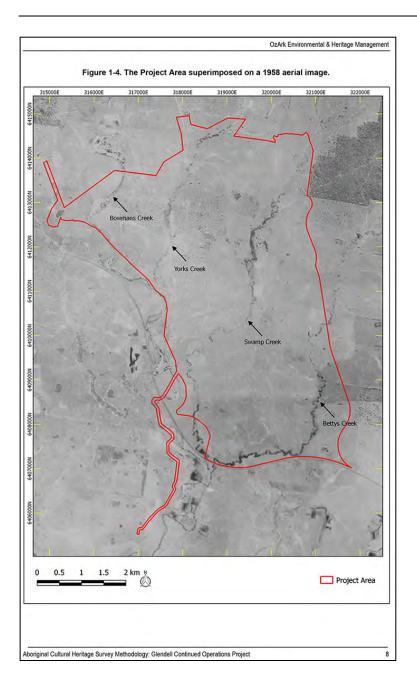
All proposed impacts related to construction and operation of the Project will be confined to the Project Area shown on Figure 1-3. The Project Area comprises approximately 2929 hectares (ha) the majority of which is already cleared or is approved for disturbance as part of existing approvals. A large proportion of the Project Area within MOC has been subject to salvage programs.

The topography of the Project Area is characterised by a number of low ridges with spurs and low to moderate gradient slopes. Lower topographic areas are associated with Bowmans, Swamp, Yorks and Bettys Creeks (Figure 1-3). The creek lines generally flow from the north to the south. Portions of Swamp, Yorks and Bettys Creek have been diverted and/or lost within the Project Area as a result approved mining activities. The Project Area also contains a number of unnamed tributaries associated with the previously listed creek lines which flow between the spurs. In the portions of the Project Area that are outside of approved mining areas, the topography is generally flat ranging between around 60 meters (m) above sea level to small rises that are around 140 m above sea level.

The Project Area has been subject to agricultural land uses, including intensive grazing and pasture improvement, as well as mine related activities. All woodland in the Project Area is regrowth and mature trees are very rare. Figure 1-4 shows the Project Area superimposed on an aerial photo dating from 1958. This shows the almost complete nature of the clearing across the Project Area and large areas of visible sheet wash erosion. Woodland regrowth tends to be thick stands of Casuarina along creek lines and open Eucalyptus woodland on slopes. Other extensive areas within the Project Area have been previously cleared and are still open grasslands currently used for cattle grazing.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.





1.3 CONSULTATION ON THIS METHODOLOGY

During December 2017 the Aboriginal Cultural Heritage Consultation Requirements for Proponents (ACHCRs) was initiated by Umwelt (Australia) on behalf of the Project. Undertaking Stage 1 of the ACHCRs resulted in 26 Registered Aboriginal Parties (RAPs) expressing an interest to be consulted regarding the Project (Table 1-2).

A draft of this survey methodology was sent to all RAPs on 19–20 February 2018 as part of Stages 2/3 of the ACHCRs. The 28 day consultation period for responses ended on 19 March 2018. At the conclusion of this period, four responses were received (Table 1-3). The responses of all RAPs were considered and noted but none necessitated an amendment of the survey methodology. Scott Franks (Tocomwall) was sent a reply stating that his concerns would be addressed in the Aboriginal Cultural Heritage Assessment that is being conducted concurrently with the Aboriginal Archaeology Impact Assessment that is the focus of the survey methodology.

Table 1-2. Registered Aboriginal Parties for the Project.

Name of individual/group	Contact name
Aboriginal Native Title Elders Consultants	John & Margaret Matthews
AGA Services	Ashley, Gregory & Adam Sampson
Allera French Trading	Aliera French
	Donna & George Sampson
Crimson-Rosie	Jeffery Matthews
Culturally Aware	Tracey Skene
D F T V Enterprises	Derrick Vale Sr
Didge Ngunawal	Paul Boyd & Lilly Carrol
Gomery Cultural Consultants	David Horton
Hunter Valley Cultural Surveying	Luke Hickey
Hunter Valley Environment Land & Mining Services	Des Hickey
JLC Cultural Services	Jenny-Lee Chambers
Lower Hunter Aboriginal Incorporated	Les Ahoy
Lower Hunter Wonnarua Council Inc.	Thomas Miller
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Carroll Johnson & Darleen Johnson-Carroll
Muragadi Heritage Indigenous Corporation	Jesse Carroll - Johnson
Smith Dhagaans Cultural group	Tim Smith
Ungocroo Aboriginal Corporation	Alan Paget & Sarah Hall
Valley ELM corp	Irene Ardler
Wallagan Cultural Services	Maree Waugh
Wanaruah Local Aboriginal Land Council	Noel Downs
Wattaka Wonnarua C.C. Service	Des Hickey
Wonn 1 Contracting (Kawul Pty Ltd)	Arthur Fletcher
Wonnarua Culture Heritage	Gordon Griffiths
Wonnarua Nation Aboriginal Corporation	Laurie Perry
Yarrawalk (a division of Tocomwall Pty Ltd). Tocomwall Pty Ltd on behalf of Scott Franks and Anor	Scott Franks

Aboriginal Cultural Hentage Survey Methodology: Glendell Continued Operations Project

O2Ark	Environmental	Q.	Heritage	м	ananament

10

Name of individual/group	Contact name
on behalf of the Plains Clan of the Wonnaru People NSD1680/2013	
Yinarr Cultural Services	Kathleen Steward Kinchela
7	Kevin Duncan

Table 1-3. RAP comments on the draft survey methodology.

Name of individual/group	Contact name	Response to the draft survey methodology
Culturally Aware	Tracey Skene	Email received from Tracey Skene: 20/2/18: Good evening Bridle, I have viewed methodology and familiar with the Survey location, at this point of time I have no concerns in regards to the proposed methodology Please keep me updated on the progress of the upcoming fieldwork and look forward to the next step of this Assessment. Thanks Tracey Skene
Lower Hunter Aboriginal Incorporated	Les Ahoy	Hi On behalf of LHAI J endorse the Glendell ACHA survey methodology with no further comments to add. Thank You David Ahoy
Yarrawalk (a division of Tocomwall Pty Ltd). Tocomwall Pty Ltd on behalf of Separation of the World Andro on the Wonnaru People MSD1680/2013	Scott Franks	Scott Franks responded via email 29/3/18 Sorry for the delay in responding to the comments I raised with you regarding the Ozark Methodology, in short, the proposed methodology simply has how (sic) value or worth in understanding my people's heritage, after reading the draft if was clear to me that know (sic) real background research has be done or any understanding of the cultural land scape or any of the more recent assessments that have been completed on adjoining mining operations owned by Glencore coal. The draft provides an isolated attempt to box in our heritage to a single location using a mining EL boundary, this type of assessment falls short of really giving our heritage a fair and real voice in any assessment process, I cannot support the approach as by its own design is it a science based assessment and clearly know real cultural assessment attached to it, this process fail very short of the current required approvals under the NPSW Acts (sic) for OEH.
	Kevin Duncan	Kevin Duncan responded via email 6/3/18 Hi Bridie Thank you for your invitation to be a party to the Glendell Operations project. As a Traditional stakeholder to our tribal lands throughout this region and our people having a long continuous connection these lands are always have been very special and sacred to our peoples. I'm adamant in my decision to not support any Mining projects on our lands it goes against everything that our Cultural moral spiritual beliefs in the preservation and protection of our lands I cannot allow or be a party to such destructive practices as it goes against everything war are as Aboriginal people. In saying this I vill like my comments to be noted as a registered stakeholder for this project and hope my comments are taken seriously and respectively in this decision. Thank you Kevin Duncan

OzArk Environmental & Hentage Management

2 ARCHAEOLOGICAL CONTEXT

2.1 INTRODUCTION

The Project Area is located in an area where the archaeological values are largely known due to the high amount of previous assessment either within the Project Area or in immediately adjacent landforms.

This survey methodology will limit itself to those studies that are directly applicable to the Project Area although the predictive model for site location will consider the broader archaeological context of the district.

2.2 ANTIQUITY OF ABORIGINAL OCCUPATION

The Aboriginal occupation of Australia begins prior to 40,000 BP (years before present) and possibly earlier than 50,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period, poor preservation of archaeological materials (particularly dateable organic materials) and significant coastline change over the past 18,000 years.

In 1986, Koettig undertook an archaeological survey approximately 6 km southeast of the Project Area between Glennies Creek and Singleton (cited in Umwelt 2003). Following that survey, Koettig carried out several excavations at six locations along Glennies Creek. Koettig considered artefacts found in Site SGCD 16 (about one metre deep in Unit B of on an old alluvial terrace) were 'markedly different' to artefacts recovered from the artefacts in Unit A. Her conclusion was formed on the basis of the raw material used, large number of cores, the large percentage of cortex remaining on artefacts and larger sizes of artefacts. Artefacts from Unit B were from volcanic rocks while those in Unit A were predominantly mudstone and silcrete. Later, a date of >20,200 BP was obtained from a hearth associated with the artefacts placing the site well into the Pleistocene.

2.3 PREVIOUS ASSESSMENTS WITHIN OR NEAR THE PROJECT AREA

There have been numerous archaeological investigations in the local area and a number within the Project Area itself. The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (Section 3). This section refers to archaeological investigations that were entirely or partially within the Project Area and Section 2.4 reviews the salvage programs that have taken place at the MOC.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

11

Aboriginal Cultural Heritage Survey Methodology, Glendell Continued Operations Project

2.3.1 Glendell Mining Lease Area (Brayshaw 1982)

The first survey to interact with the Project Area was by Helen Brayshaw in 1982 (Brayshaw 1982). Brayshaw's survey area included areas within the southern portions of the Project Area including the southern 6 km of Bettys Creek and 5 km of Bowmans Creek. As a result of this assessment, three open sites and two isolated artefacts were recorded. The three open sites (artefact scatters) were recorded as follows:

- Site A: Artefact Scatter. 30 m west of Bettys Creek, principally on the southern bank of a tributary. 43 artefacts were recorded, occurring at an average density of 1/17 square metres (m²). Raw materials present included indurated mudstone 75%, siltstone 2.5%, quartz 2.5% and silcrete 20%;
- Site B. Artefact scatter. On the western bank of Bettys Creek, about 300 m north of the main northern railway. Four flakes were found here at an average density of 1/30 m²; and
- Site C. Artefact scatter. East of a tributary of Bettys Creek about 200 m north of the confluence. Five artefacts recorded, occurring at an average density of 1/24 m².

2.3.2 A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project (Dyall 1982)

To the northwest of the Project Area, along the northern reaches of Bowmans Creek, Len Dyall (Dyall 1982) recorded 18 artefact scatters and two grinding groove sites. The artefact scatters were small with the exception of one that contained over 150 artefacts. One grinding groove site was suggestive of a seed processing location rather than for axe grinding. Both grinding groove sites are outside of the Project Area.

2.3.3 Archaeological Survey of Pikes Gully Colliery Area, Liddell, NSW (Haglund 1982)

In the same area of Bowmans Creek and to the northwest of the Project Area, Laila Hagland (Hagland 1982) recorded two artefact scatters:

- Site 1: Aboriginal stone artefacts were noted in a number of exposures within, and along, the edge of a river terrace west of Bowmans Creek. It was noted that the artefacts recorded varied in type, size range and density between the exposures. Small thin flakes and small, well-made artefacts such as bondi points were noted only close to the southern end. Artefact density appeared greater in this part. These observations may reflect real distribution trends, but may also result from the smaller and more shallow areas of exposure further north; and
- Site 2: Aboriginal stone artefacts were noted in two exposures along the northeast bank
 of Bowmans Creek, northwest of its junction with Stringybark Creek, and within a minor
 erosion gully on the slope above.

Aboriginal Cultural Heritage Survey Methodology Glendell Continued Operations Project

12

OzArk Environmental & Heritage Management

2.3.4 Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales (Resource Planning 1991)

In 1991 Resource Planning undertook a large assessment for the Mount Owen Coal Project that was focussed on Swamp and Yorks Creeks, located immediately north of the Project Area (Resource Planning 1991). This study included 25 km of drainage line (including left and right banks) along Swamp Creek and Yorks Creek. Traverses were also made across side slopes and along ridge lines. The survey area totalled 370 ha. 98 Aboriginal archaeological sites, ranging from isolated artefacts to dense concentrations of more than 100 pieces of flaked stone, were mapped and recorded. Table 2-1 presents the artefact densities recorded by Resource Planning and this shows clearly that Swamp Creek displays a lower artefact density when compared to Yorks Creek. In the case of Swamp Creek over 75% of sites were isolated finds or very low density artefact scatters while along Yorks Creek 54% of sites recorded over 50 artefacts at each site (a moderate artefact density). Resource Planning noted that the sites in the Swamp Creek catchment are regarded as an excellent representative assemblage of occupational evidence in the small tributary valleys of the Hunter River (Resource Planning 1991: 5). This report recommends, based on the survey evidence "that part of the Yorks Creek drainage line would be set aside as an archaeological conservation zone" (Resource Planning 1991: 5); a recommendation that was followed as the northern reaches of Yorks Creek are now within a permanent Voluntary Conservation Area (VCA). The Yorks Creek VCA is located outside the Project Area.

Table 2-1: Artefact densities at sites recorded by Resource Planning 1991.

Artefact Numbers	Swamp Creek (%)	Yorks Creek (%)
Isolated Artefact	27,6	9
<10 Flakes	50.0	18
10-20	14.5	18
20-50	6.6	27
50-100	1.3	18
>100		9

2.3.5 Proposed Mt Owen Extension, Archaeological survey of Bettys Creek (Resource Planning 1993)

In 1993 Matthew Barber, archaeologist with Resource Planning, surveyed areas along Bettys Creek: locations that are now within the current Mount Owen disturbance area to the northeast of the Project Area (Resource Planning 1993). The western boundary of Barber's survey area was defined by the drainage divide between Bettys Creek and Swamp Creek (now no longer extant but can be seen in historic aerial photographs (Figure 1-4). The southern boundary was formed by the proposed lease extension boundary. The proposed extension resulted in the disturbance of an additional 260 ha of land, including approximately 100 ha of the then Ravensworth State Forest.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

The survey recorded 39 archaeological sites, of which 34 were recorded in detail. It was found that the majority of sites were situated close to the drainage lines and that their location represented a verifiable distribution and was not a bias of survey coverage. It was, however, noted that erosion plays a vital role in the identification of sites. This is because, the report argued, the majority of sites are actually subsurface in origin.

All of the sites recorded were open artefact scatters although their content varied from one artefact to several hundred artefacts. The artefact types appear in the main to be the product of backed blade manufacture (Resource Planning 1993: 4). There were some sites, in the report's opinion, which had a high potential for further archaeological investigations due to their potential to contain subsurface deposits and the quantity of artefacts present. A number of artefacts revealed retouch, the majority of which were classed as part of the backed blade industry. As with other sites in the Swamp Creek area, and other parts of the Hunter Valley, the dominant raw material was indurated mudstone/tuff followed by silcrete.

2.3.6 Aboriginal Archaeological Assessment - Glendell Open Cut Mine (Umwelt 2004)

Umwelt conducted an Aboriginal Archaeological Assessment for the Glendell Open Cut Mine survey area involving survey during September, October and December 2001, as well as geomorphic investigations during May 2002.

The Glendell survey area incorporated sections of Bowmans Creek, Swamp Creek and Bettys Creek and included the southern portion of the Project Area, As part of the archaeological brief, a desk-top study and an in-field reconnaissance were undertaken with the aim of identifying areas within the Glendell survey area that contained Aboriginal resources. The resources sought for identification within the Glendell survey area included fresh water supplies, food and medicine plants, faunal prey species, stone suitable for implement manufacture, areas suitable for camping, areas that provided an extensive outlook, areas with major and minor creek confluences that had often been found to have Aboriginal camp sites and the terrain units that may have acted as pathways between resource locations.

The information compiled was then used to assist in the preparation of a predictive model related to the location and nature of sites within the then Glendell survey area. In addition, past land-use practices and geomorphic studies were used to determine areas where artefactual material may remain in a relatively undisturbed context. Geomorphic studies were also used to investigate a buried soil profile within the shared Bowmans Creek/Swamp Creek floodplain and to determine the likelihood of this soil profile containing artefactual material from the late Pleistocene to early Holocene periods.

As a result of the research it was concluded that the entire Glendell survey area would have supplied adequate resources for small groups of hunter-gatherers living a mobile lifestyle. Bowmans Creek was highlighted as an area that should have formed the focus of camping

Aboriginal Cultural Heritage Survey Methodology. Glendell Continued Operations Project

14

OzArk Environmental & Heritage Management

activities of longer duration, possibly by larger numbers of people, due to an increased abundance and reliability of the resource base.

Other areas, such as the lower western slopes adjacent to Bettys Creek were assessed as having attracted groups of people for short-term visits to harvest abundant seasonal foods. Bowmans Creek was therefore cited as likely to have the largest sites in terms of spatial extent and numbers of artefacts.

Such sites were predicted as likely to be found on the lower slopes, terraces and floodplains along Bowmans Creek, spreading further across the Bowmans Creek/Swamp Creek floodplain. Bettys Creek and Swamp Creek were listed as likely to have evidence of more sporadic and short-term use as overnight camping locations.

A pattern of site distribution was evident from the previously recorded sites in the locale with the majority of sites located along the watercourses (58%). More of these were associated with ephemeral tributaries (30%) than major creek lines and their associated floodplains and terraces (30%). A little more than half (54%) of the sites were within 30 m of the closest watercourse and 66% within 100 m. In relation to the slopes, sites were more commonly located on the foot slopes/lower slopes (18.5%), than the crest/upper slopes (16.6%) and mid slopes (8%).

A total of 37 previously unrecorded sites were located during the 2001 fieldwork survey of the Glendell survey area. The sites consisted of 30 artefact scatters, including one small quarry site with an associated artefact scatter, one scatter in an area with a buried soil profile and seven isolated finds. The Bowmans Creek 5 quarry site was recorded as having an associated artefact scatter as the majority of the artefacts in the site were manufactured from mudstone and silcrete rather than the quartz and quartzite materials available at the site.

The artefact scatter in the area with the buried soil profile (Bowmans Creek/Swamp Creek Trench) was located on the shared floodplain between Bowmans Creek and Swamp Creek. In this area a trench approximately 300 m in length was constructed during the 1980s to divert Swamp Creek into Bowmans Creek. At the time of the 2001 survey the trench was not connected to the creeks and it currently remains unconnected. The artefact scatter eroding from the A-Horizon of the floodplain was observed to be approximately one metre above the buried soil profile. This profile was later determined through geomorphic investigation to be of early Pleistocene to Tertiary age and did not contain any artefactual material (Mitchell 2002).

Artefact analysis of the salvage assemblage recorded:

- Flakes and broken flakes dominated the assemblage (78%), followed by flaked pieces (15%) and cores (3%). Within the flake category, 4% were retouched and half of the retouched flakes were backed. Heat shatter accounted for 3% of the artefacts;
- The mudstone and silcrete flakes were of similar size. Volcanic flakes were generally larger and heavier than flakes composed of other raw materials;

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

- Volcanic flakes had a significantly higher percentage of cortex than silcrete or mudstone, and mudstone artefacts had a higher percentage of cortex than silcrete;
- Silcrete artefacts had a higher overall rate of retouch than mudstone artefacts (8.2% and 6.3% respectively), and silcrete retouched artefacts were more likely to be backed than retouched mudstone artefacts; and
- A number of artefacts relating to post-European occupation of the area were also recovered, including fragments of glass and pottery. The location of this material closely correlated with concentrations of Aboriginal stone artefacts. Additionally, at least one Aboriginal artefact manufactured from glass was salvaged, suggesting that the area was used by Aboriginal people in the post-contact period.

2.3.7 Environmental Assessment for Modification of Glendell Mine Operations (Umwelt 2007)

In 2007 an Environmental Assessment was undertaken to modify the Glendell Mine Development Consent (DA 80/952) to enable the integration of Glendell Mine operations with the approved MOC operations and the implementation of a revised mine plan.

The assessment noted that a range of surveys of the Glendell Mine site had been undertaken to identify areas and sites of significance in relation to Aboriginal archaeology. Appendix 10 of the Environmental Assessment lists a number of sites that had been previously identified at the Glendell Mine site and have been salvaged in accordance with a permit from the then Department of Environment and Conservation. The assessment stated that the remaining sites within the Glendell Mine site will be protected and managed in accordance with an Aboriginal Heritage Management Plan developed for the site.

2.3.8 Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations (OzArk 2013)

The assessment area for the Mount Owen Continued Operations (MOCO) Project disturbance area covered approximately 500 ha with portions of the assessment area encompassing part of the southern portion of the Project Area.

Australian Cultural Heritage Management Pty Limited (ACHM) were engaged by Mount Owen to undertake Aboriginal community consultation for the MOCO Project and to author the Aboriginal Cultural Heritage Assessment Report (ACHAR) to which OzArk 2014 contributed (ACHM 2013). The ACHM report appeared as Appendix 13a (Parts 1 and 2) of the MOCO Project Environmental Impact Statement (EIS) (Umwelt 2015). ACHM 2013 contains the cultural, aesthetic and historic values of the area, while OzArk 2014 contains an examination of the scientific values of the area.

Aboriginal Cultural Heritage Survey Methodology. Glendell Continued Operations Project

16

OzArk Environmental & Hentage Management

2.3.8.1 Cultural values

ACHM 2013: 114 summarises the cultural values of the area in which the Project Area is located. What follows is an edited excerpt of the MOCO Project Statement of Significance (ACHM 2013; Section 5:10):

It is noted that the numerous Aboriginal stakeholders who participated in this cultural values assessment process hold values which relate to the wider Hunter Valley region generally, and less directly to the MOCO area specifically. However, one of the Knowledge Holder groups holds very strong values over the MOCO area. Other than the one group expressing strong connection to the MOCO area, there was very little other information presented in the disclosed material or values workshops which relates specifically to the MOCO area.

A common theme in many Aboriginal cultural heritage assessments is the proprietary interest members of the relevant Aboriginal communities hold in regard to the wider cultural landscape including archaeological sites or places within any given area. The project is no exception in this regard. Within the context of the current assessment, there are strong on-going connections to places created and used by ancestors alongside demonstrably strong interests in the manner in which those places are managed or harmed as a result of this project. These sentiments are not unique, and must certainly be considered in the overall assessment of the significance of the places in question. The connection to these places is noted as often being relatively unspecific and generally do not appear to relate to any surviving traditional knowledge or customary cultural practices, apart from one of the Knowledge Holder groups who express a strong connection to on-going cultural knowledge and customary lore in this location.

The cultural values expressed by the participants in this assessment have been consistent in voicing an over-arching concern for the wider landscape and criticism of the negative impact of mining on that landscape. Consistent in the material disclosed is a sense of 'outrage' and grief at the treatment of Aboriginal people since First Settlement (dispossession and genocide are mentioned repeatedly) through to more contemporary experiences (i.e. the Stolen Generation).

ACHM 2013: Section 5:10 concludes:

There is little doubt that the wider cultural landscape surrounding (and encompassing) the MOCO area is of high cultural and historical significance to Wonnarua people. The historical associations with early settlement, conflict, dispossession and survival are important, and the nature of the area as a surviving cultural landscape of significance to numerous members of the Wonnarua people makes this an area of

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

regional and national significance. The regional archaeological record is also of high regional significance. Overall, the cultural significance of the wider region is considered to be high, and requires considerable additional research to fully understand.

2.3,8,2 Scientific values

The archaeological survey for the MOCO Project took place over two weeks from 26 November 2012 to 7 December 2012. The archaeological test excavation program for the MOCO Project took place over one week from 11 March 2013 to 15 March 2013. In 2014, the proposed disturbance area for the MOCO Project was expanded slightly necessitating a further one day of survey that took place on 29 April 2014. The results of these investigations are detailed in OzArk 2014 and contained in Appendix 13b of the MOCO Project EIS (Umwelt 2015).

Results

Large portions of the MOCO Project (223 ha) had been subject to previous Aboriginal Heritage Impact Permits (AHIPs) with extensive areas having already undergone archaeological assessment and salvage. Within the disturbance area, 18 sites had already been salvaged by manual excavation and more expansive additional areas have been subject to grader scrapes to salvage subsurface artefacts. Over the years, both from within the disturbance area and from adjacent landforms, over 11,000 artefacts had already been recovered as a result of these programs.

As a result of the scientific values assessment for the MOCO Project, 39 Aboriginal sites were recorded; consisting of:

- 11 artefact scatters (37-3-1189 to 37-3-1199);
- 25 isolated finds (37-3-1170 to 37-3-1188 and 37-3-1212 to 37-3-1216); and
- Three extensions to previously recorded sites (Extension to site 37-3-0649, Extension to site 37-3-0611 and Extension to site 37-3-0600).

In addition, the disturbance area contained three previously recorded sites, 37-3-0611, 37-3-0985 (low density artefact scatters) and 37-3-0527 (isolated artefact). Thus, 42 sites were known to exist within or close to the disturbance area.

At two locations within the disturbance area, test excavations were carried out under the NSW Office of the Environment and Heritage (OEH) Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW. At one location (37-3-1191), no artefacts were recorded during the test excavations, while at the second location (37-3-1192), 114 artefacts were recorded, with over 80% coming from one discrete concentration. As a result, it was determined that 37-3-1191 is a displaced site with no associated archaeological deposits, while 37-3-1192 is

Aboriginal Cultural Heritage Survey Methodology Glendell Continued Operations Project

18

OzArk Environmental & Heritage Management

a low density artefact scatter along the banks of the 'eastern drainage' line with one known concentration of artefacts.

Three sites recorded during the survey, 37-3-1194, 37-3-1197 and 37-3-1198, remain partially extant in the Project Area.

Conclusion

Those archaeological sites in the disturbance area investigated revealed relatively sparse artefact concentrations in shallow and disturbed contexts. Archaeologically, all of the places located and/or identified conform to the Australian Small Tool Tradition¹, and most likely date to no more than the last 2,000 to 3,000 years.

The majority of the disturbance area had been subjected to varying degrees of land clearing and mining since first settlement, destroying the primary context of much of the physical cultural material present, and irretrievably altering the landscape itself.

Given the nature and extent of the archaeological sites identified, there was little additional knowledge which could be added to the archaeological record from any further investigation of this material. There is little probability for the presence of undisturbed and deeply stratified archaeological sites within the disturbance area.

In general, the archaeological sites in the MOCO disturbance area offered:

- Limited research potential in regard to regional and/or localised subsistence and resource procurement activities;
- · Limited research potential to address questions on stone tool technologies in the region;
- · Limited potential for radiometric dating methods to be applied to the sites;
- Limited research potential to address questions about the timing of the first occupation of this region of the Hunter Valley;
- Limited research potential to address questions about the timing of the Aboriginal settlement history of the Hunter Valley; and
- Limited potential to reveal further unique spatiotemporal patterning which would add to the archaeological record.

2.3.9 Mount Owen Modification 2 (OzArk 2017e)

OzArk was engaged by Umwelt, on behalf of Mt Owen Pty Limited to complete an Aboriginal Cultural Heritage Assessment Report for the Mount Owen Continued Operations Modification 2.

Aboriginal Cultural Heritage Survey Methodology, Glendell Continued Operations Project

¹ The Australian Small Tool Tradition (also sometimes referred to as 'Bondaian') is a term applied to the Holocene period Aboriginal tool kit, distinguishing it from the earlier Australian Core Tool and Scraper Tradition generally dated to the Pleistocene period.

The proposed modification disturbance area consisted of two portions: a smaller northern portion on both sides of, and south of, an existing diversion of Bettys Creek (Area A; approximately 9 ha); and a larger portion to the southeast of the current North Pit (Area B; approximately 37 ha). Both areas are to the east of the Project Area.

The fieldwork component of the assessment was undertaken by an OzArk archaeologist and representatives of Registered Aboriginal Parties (RAPs) and Wonnarua Knowledge Holder Groups on 31 August 2017.

No Aboriginal sites were recorded during the assessment. Further, no landform within the proposed disturbance area was seen as having potential to contain further, subsurface archaeological deposits due to the moderate level of disturbance across the proposed disturbance area and the generally thin soils.

MOCO IF-3 (37-3-1198) was the only valid previously-recorded site within the proposed disturbance area. This site was revisited during the site inspection, however, despite good areas of exposure, the artefact was unable to be located. One previously recorded site 37-3-0687 (MC-7) is located outside but close to the proposed disturbance area. This site may be harmed by future erosion stabilisation works along Main Creek and management recommendations regarding this site are made in OzArk 2017e.

2.3.10 Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping (OzArk 2017b, c & d)

In mid to late 2017 and early 2018, OzArk completed five archaeological due diligence assessments of over 100 soil test pit and groundwater monitoring bore locations surrounding Bowmans, Swamp and Yorks Creek for alluvium and Biophysical Strategic Agricultural Land verification and mapping assessments within the Project Area (OzArk 2017b, c & d). Over the five assessments, two new Aboriginal sites (Bowmans Creek 6 and Yorks Creek 19) were recorded and the extent of one previously recorded artefact scatter was updated (#37-3-0748; York Creek 5).

Bowmans Creek 6 was located on a lower slope landform adjacent to a tributary of Bowmans Creek. A total of 12 artefacts were identified, consisting largely of unmodified flakes, with one end scraper and core also recorded. Yorks Creek 19 consists of two flakes recorded on an upper terrace landform near the confluence of Bowmans and Yorks Creeks. In addition to this, one complete flake was recorded along a grazing track in close proximity to #37-3-0748. Given its location on the same upper terrace landform, the artefact was assessed as being an extension to site #37-3-0748. An additional seven artefacts were recorded eroding from the edge of the upper terrace. Site #37-3-0748 was also initially recorded as having potential archaeological deposit (PAD), although it was considered likely to be disturbed by cultivation. Recorded materials

Aboriginal Cultural Heritage Survey Methodology. Glendell Continued Operations Project

20

OzArk Environmental & Heritage Management

across the three sites were consistent with the predominate materials of the region being mudstone and silcrete, with a volcanic flake also recorded at Yorks Creek 19.

2.3.11 Mt Owen Complex Aboriginal cultural heritage due diligence site inspection results - EL6594, EL8184, ML1629 and ML1415 (EMM 2017)

EMM Consulting Pty Limited (EMM) was engaged to prepare an Aboriginal cultural heritage due diligence assessment for the proposed exploration program across the Project Area. As part of this exploration program, a total of 20 drill holes were proposed.

A field survey of proposed drill locations was undertaken by EMM on 23 May 2017 and no artefacts were identified within the areas of proposed exploration disturbance. In addition, the proposed locations are considered to have low archaeological potential. No additional measures have therefore been recommended in relation to heritage for the proposed drilling program.

2.4 PREVIOUS SALVAGE PROGRAMS WITHIN OR NEAR THE PROJECT AREA

2.4.1 Ravensworth East Archaeological Investigation (ERM 2002)

In 2002 ERM conducted archaeological excavations and salvage grader scrapes over areas of the Ravensworth East Mine under Permit SZ323. These investigates were located in the northeastern portion of the Project Area, in areas along the former course of Swamp Creek (ERM 2002) (Figure 2-1). Table 2-2 lists the six sites salvaged within the Project Area under the 2002 ERM program

Table 2-2. Sites salvaged within the Project Area under Permit SZ323.

AHIMS#	Site name
37-3-0399	Ravensworth 10
37-3-0398	Ravensworth 09
37-3-0400	Ravensworth 11
37-3-0401	Ravensworth 12
37-3-0402	Ravensworth 13
37-3-0403	Ravensworth 14

The combined geomorphological investigations undertaken by ERM highlighted the Swamp Creek valley as the key area likely to yield archaeological evidence of Aboriginal occupation within the ERM study area. However, these studies also showed that although buried land surfaces were apparent within the valley, evidence of Pleistocene Aboriginal occupation was unlikely to be recovered. Archaeological sampling of soil from these land surfaces failed to yield any archaeological material, confirming this view. In light of this, no further pursuit of Pleistocene archaeological deposits was undertaken within the scope of the excavation program.

The initial archaeological component of ERM's investigation, which included grader scrapes spread over three different landscapes across the valley, at varying distances from water sources,

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

yielded little archaeological evidence. Of the three grader scrapes, three artefacts were recovered over a total area of 560 m².

A low rise adjacent to the swampy meadow channel west of Swamp Creek in the vicinity of surface sites RE 12–14, revealed substantial archaeological material with several artefact concentrations located approximately 40 m to 60 m away from the channel. Test pit excavation yielded an artefact spread up-slope of the channel from approximately 10 m from the current channel edge, extending across the rise in all directions. A total of 87 artefacts were recovered from the 11 test pits. Over a combined excavated area of 11 m², this represents an artefact density of 7.9 artefacts/m². The largest artefact concentration (44 pieces or 50.57% of the total assemblage) was excavated from Test Pit 4 located on the peak of the rise. Without the Test Pit 4 artefact concentration, artefact density would have been substantially lower, at 4.3 artefacts/m², as the majority of test pits contained five artefacts or less. 82.75% of the assemblage was mudstone and 17.25% was silcrete.

Open excavation of the site complex RE 12–14 recovered a concentrated artefact scatter across the peak of the rise within the very shallow A-Horizon soil. Open excavation on this rise was proposed by Margrit Koettig (then at the NSW Department of Environment and Climate Change) to define the apparent spread of artefacts from TP4, and to further establish the nature of this subsurface deposit, specifically to investigate whether it contained hearths and identifiable activity areas. The open area excavation of 86 m² (including TP4) was conducted in July–August 2001 by ERM. 1,168 artefacts were excavated in the open excavation and the investigations revealed a continuation of artefacts over the low rise, rather than what was originally recorded as three individual surface sites. Within this scatter, several distinct areas of artefact concentration were recorded, all with quantities of associated charcoal and burnt earth. The assemblage comprised backed artefacts and associated manufacturing debitage, mostly of mudstone.

Seven raw materials were represented in the open excavation. Mudstone was the dominant raw material observed, accounting for almost 80% of the total artefact numbers. This mirrored the initial trend set in testing phase. Silcrete was the next most common material and comprised nearly 20% of the assemblage. The remainder of the artefacts (less than 2%) was produced from six other raw material types.

Five artefact types were identified in the assemblage. The majority of artefacts were whole flakes accounting for more than 50% of the assemblage with broken flakes (almost 30%) and flaked pieces (approximately 15%) making up much of the remaining assemblage numbers. All modified artefacts, consisting of cores and retouched flakes, made up just under 2% of the assemblage.

2.4.2 Glendell Project Area (Umwelt 2013)

Salvage of the Glendell project area was undertaken under National Parks and Wildlife Services (NPWS) section 90 Consent #2267 and formed Part 4 of the salvage program for the Bettys

Aboriginal Cultural Heritage Survey Methodology. Glendell Continued Operations Project

22

OzArk Environmental & Heritage Management

Creek valley (Figure 2-1). This archaeological salvage within the Glendell project area was conducted by Umwelt and the Aboriginal community between November 2005 and February 2006. Table 2-3 lists those sites within the Project Area that were salvaged under Consent #2267.

Table 2-3. Sites within the Project Area salvaged under Consent #2267.

AHIMS	site name	Salvage methodology
37-3-0599	Bettys Creek 9	Surface Collection with Subsurface Investigation (manual excavation)
37-3-0601	Bettys Creek 11	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0602	Bettys Creek 12	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0604	Bettys Creek 14	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0605	Bettys Creek 15	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0606	Bettys Creek 16	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0607	Bettys Creek 17	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0608	Bettys Creek 18	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0609	Bettys Creek 19	Surface Collection
37-3-0610	Bettys Creek 20	Surface Collection
37-3-0618	Swamp Creek 1	Surface Collection
37-3-0619	Swamp Creek 2	Surface Collection
37-3-0620	Swamp Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0621	Swamp Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0622	Swamp Creek 5	Surface Collection
37-3-0623	Swamp Creek 6	Surface Collection
37-3-0624	Swamp Creek 7	Surface Collection
37-3-0026	Glennies Creek Site B / Bettys Creek - B	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0625	Swamp Creek 8	Surface Collection
37-3-0027	Glennies Creek Site C / Bettys Creek - C	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0626	Swamp Creek 12	Surface Collection
37-3-0592	Bettys Creek 1	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0627	Swamp Creek 13	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0593	Bettys Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0773	Swamp Ck 10	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0594	Bettys Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0595	Bettys Creek 5	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0596	Bettys Creek 6	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0597	Bettys Creek 7	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0598	Bettys Creek 8	Surface Collection with Subsurface Investigation (grader scrapes)

A total of 2,713 artefacts were recovered from the Glendell project area salvage including 824 (30.6%) from the surface collection, 274 (10.1%) from Excavation 1 (Bettys Creek 10), 19 (0.7%) from Excavation 2 (Bettys Creek 9), 1,414 (52.1%) from Excavation 3 (Bettys Creek 2) and 177 (6.5%) from the grader scrapes. A total of 2,604 (96%) of the artefacts were recovered from the Bettys Creek catchment, 52 (1.9%) from the Bowmans Creek catchment and 57 (2.1%) from the Swamp Creek catchment.

Aboriginal Cultural Heritage Survey Methodology Glendell Continued Operations Project

Observations made from the surface collection assemblage are as follows:

- The highest number of artefacts were collected from Bettys Creek 14 (26.7% of the surface collection assemblage), followed by Bettys Creek 10 (19.5% of the assemblage);
- 60.6% of the artefacts were collected from lower slopes and floodplains associated with creek lines (56.7% from Bettys Creek; 3.3% from Swamp Creek and 0.7% from Bowmans Creek);
- Sites on low but elevated spurs in tributary confluences comprised 22.2% of the assemblage; ridge crests (7.5%), sites on lower slopes on tributary channels more than 150 m from the main creek channel (7.5%); mid slope sites (1.3%) and upper slopes (0.6%);
- The dominant artefact type was broken flakes (45%); followed by flakes (26.7%); flaked pieces (10.9%); retouched flakes (10%), cores (3.7%), heat shatter (3.4%) and grindstones (0.4%);
- A total of 31 cores were recovered from the surface collection. Of these, 21 were recovered from the Bettys Creek sites (17 from areas with tributary confluences with Bettys Creek); and
- Mudstone was dominant within the assemblage making up 58.5% of the artefacts, followed by silcrete (31.9%) with the remaining raw materials making up 9.6% of the total assemblage.

Excavation was targeted at Bettys Creek 2, Bettys Creek 9 and Bettys Creek 10 indicated the following:

- Bettys Creek 10 and Bettys Creek 2 retained a level of spatial integrity reflected by knapping events and raw material distribution patterns;
- · Bettys Creek 9 contained artefacts in a secondary context;
- · All three locations contained backed flakes;
- . A ground oven identified at Bettys Creek 2 had an absolute date of 2188+/-39 BP;
- It was possible to obtain one radiocarbon date of 3077±40 BP (calibrated-Wk-20912) from Square K Spit 3 of Excavation 3 within the Mount Owen Extension Area. The date was relative in nature as it belonged to a large piece of burnt wood that was associated with artefacts both above and below it. Thus the artefacts above it must be dated to later than 3077±40 BP and those below it to earlier:
- Broken flakes (45.7%) dominated the artefact assemblage, followed by flakes (38.7%);
- Bettys Creek 10 and Bettys Creek 2 were dominated by mudstone while Bettys Creek 9 was dominated by silcrete. Overall, mudstone was dominate (55.7%) over silcrete (32.3%);
- A small knapping event was evident at Bettys Creek 10, with greater amounts of knapping noted at Bettys Creek 2; and

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

24

OzArk Environmental & Heritage Management

 Core to flake ratios for Bettys Creek 10 were 1:28.7 and for Bettys Creek 2 were 1:27.4 suggesting knapping on site.

As a result of the Umwelt investigations outlined above, today's archaeological landscape, particularly along Bettys Creek, but also along Swamp Creek and Bowmans Creek in the vicinity of the Project Area, has been extensively studied.

2.4.3 Archaeological Salvage, Liddell Coal Operations Development Modification 5 (OzArk 2015)

OzArk was engaged by Liddell Coal Operations (LCO) to undertake the salvage of 15 Aboriginal archaeological sites for Development Modification 5 of DA 305-11-01 and was approved under Aboriginal Heritage Impact Permit (AHIP) #C0000623 (Figure 2-1). The salvage of the sites was undertaken on 28 January 2015 and 24 to 25 February 2015.

Artefacts were retrieved from seven of the 15 sites. A total of 46 artefacts were salvaged across all sites. The majority of the 46 artefacts recovered from the salvage were flakes (73.9%). Other artefact types included cores, flaked pieces, debitage, blades and a core fragment. Almost all artefacts were made from mudstone (56.5%) and silcrete (39.1%). Quartz and basalt artefacts were also present. Most artefacts were at a tertiary (65.2%) stage of reduction, with the rest secondary (34.8%). There were no artefacts at the primary stage of reduction.

The artefacts that were salvaged closely correspond to the regional context. The low proportion of formal tools (just one in 46) and the high percentage of flakes and debitage (76%) in the salvaged assemblage are typical of the region, but this is probably true in most sites across Australia. Mudstone has been recorded to be the most common raw material in the region, which was the case for the salvaged artefacts, and the other materials salvaged are also common.

Details of the two sites in this program that are within the Project Area are listed in Table 2-4.

Table 2-4. Details of sites within the Project Area salvaged under AHIP C0000623.

AHIMS#	Site name	Artefacts salvaged	Notes
37-3-0419	Rav 24 East	12	This site was salvaged by surface collection and grader-scrape salvage. The ground surface visibility (GSV) of 15% is based on pre-grader-scrape visibility. The grader-scrapes added an additional 20% GSV.
37-3-1152	LID 36	1	Rakes were used to remove wood chips from the ground and improve GSV.

2.4.4 Mount Owen Continued Operations Project Salvage Program (OzArk 2017)

In early 2017 the MOCO salvage program took place under the authority of the 2016 Mount Owen Complex Aboriginal Cultural Heritage Management Plan (ACHMP) (XMO SD PLN 0060). This program was completed in the approved disturbance areas associated with the MOCO Project (SSD-5850).

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project

This program included the collection of surface artefacts at 26 sites resulting in 163 artefacts being recorded (Figure 2-1). Included in the tally of 26 sites, were two sites where limited archaeological excavation took place resulting in a further 187 artefacts being recorded. An additional area on the east bank of Bowmans Creek proposed for impact by the new Hebden Road bridge was also subject to archaeological investigation by manual excavation but the area proved to be highly disturbed and no artefacts were recorded.

In addition, there were three sites that were unable to be salvaged, one as it was on land not owned by Mount Owen and two due to the fact that the area of the sites had previously been unintentionally impacted by mining activities². These unintentional impacts were self-reported to the OEH who issued an official caution to Mount Owen on 17 March 2016. Sites salvaged within the Project Area under SSD-5850 are listed in Table 2-5.

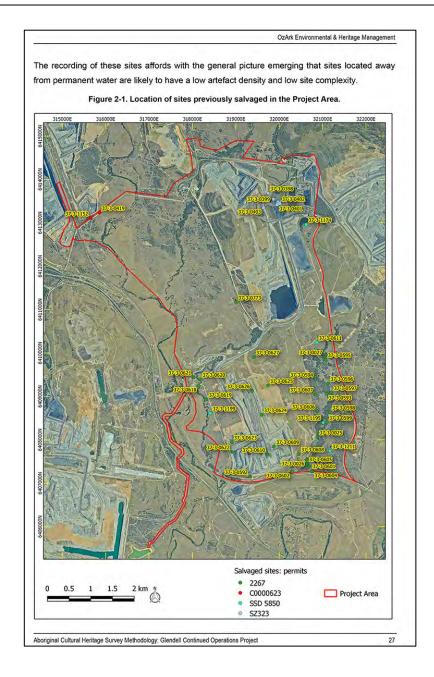
Table 2-5. Sites salvaged within the Project Area under SSD-5850.

Site ID	Site Name	Site Type	Number of Artefacts Salvaged	Salvage methodology
37-3-0611	Extension to Bettys Creek 21	Artefact Scatter	4	Surface collection only
37-3-1174	MOCO IF-5	Isolated Find	1	Surface collection only
37-3-1195	MOCO OS-7	Artefact Scatter	O	Surface collection only
37-3-1199	MOCO OS-11	Artefact Scatter	7	Surface collection only
37-3-1211	MOCO IF-18	Isolated Find	0	Surface collection only
	Bowmans Creek East Bank (Hebden Road)	PAD	0	Manual excavation.

Of all the sites investigated in the 2017 salvage program, 37-3-1192 recorded the highest artefact density with 71 surface artefacts (43.5% of all surface artefacts recorded during the salvage program) and 186 artefacts recorded in the excavation component of the program (constituting almost all of the artefacts recorded in the excavation component of the program). 37-3-1192 was located on an unnamed watercourse (termed the 'eastern drainage') approximately 2.5 km east of the Project Area. 37-3-1192 was located in area heavily affected by erosion and the investigation showed that while one concentration of artefacts remained *in situ*, the majority of the site had been displaced by the erosion.

Other sites that recorded more than 10 artefacts during the salvage program were 37-3-1191, 37-3-1197 and 37-3-1198. 37-3-1198 remain partially extant within the Project Area. All other sites recorded very low artefact numbers supporting the conclusion reached in OzArk 2014 that the remaining archaeological values at MOC consist of low density, often displaced, artefact scatters.

Abonginal Cultural Heritage Survey Methodology Glendell Continued Operations Project



² In addition, MOCO OS-3 was unintentionally partially impacted by mining activities and the remainder of this site was salvaged during the salvage program.

2.5 ARCHAEOLOGICAL CONTEXT: CONCLUSION

The extensive and long running archaeological investigations within and in close proximity to the Project Area indicate that:

- Stone artefact sites (isolated finds and artefact scatters) are the most commonly recorded site types in the area and that other site types, such as culturally modified trees, are very rare or non-existent;
- At the current state of knowledge, only stone artefact sites will be impacted by the Project.
 Other site types such as grinding grooves or the Bowmans Creek engraving site (Bowmans Ck 16, 37-3-0772) are located outside of the Project Area. In addition, the Yorks Creek VCA is located outside of the Project Area;
- Artefacts tend to associated only with the A-Horizon soil layers indicating a date in the Holocene period (i.e. 10,000 BP to the present);
- The predominant raw materials used for stone artefact manufacture are locally sourced mudstone and silcrete:
- Excavations generally reveal a low artefact density but some spatial patterning has been
 observed: principally concentrations of artefacts interpreted as 'knapping areas'. Other
 archaeological features such as hearths are rare;
- Sites tend to be associated with waterways and a discernible pattern has been observed whereby larger sites are associated with larger waterways offering permanent water supplies; and
- While all waterways have been equally studied, Yorks and Bettys Creeks appear to have attracted past Aboriginal occupation more often than Swamp Creek. Bowmans Creek would have been a major focus of past occupation but much of the evidence of this occupation has been removed by major channel migrations or intensive historical land use disturbances such as cultivation.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

28

OzArk Environmental & Hentage Management

3 PREDICTIVE MODEL

3.1 BACKGROUND

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rock shelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport; both over short and long time scales or (b) the historical impacts associated with the introduction of European farming practices including: grazing and cropping; land degradation associated with exotic pests such as goats and rabbits and the installation of farm related infrastructure including water-storage, utilities, roads, fences, stockyards and residential quarters. Scarred trees may survive for up to several hundred years but rarely beyond.

3.2 SETTLEMENT STRATEGIES

The large number of archaeological studies undertaken within, and in the vicinity of the Project Area provides information to obtain a sound understanding of the nature and distribution of archaeological sites within the area. Although there is some conjecture about the relationship between stream order, site numbers and densities, the general pattern is that the majority of sites are present within 30 m of watercourses (Dean-Jones 1992: 26–27; AMBS 1997: 29). Although sites are present in locations at a greater distance from water, these sites are limited in terms of both number and size, constituting a lower density scatter than is found along the creek lines (Dean-Jones 1992: 24; ERM 1999: 22–23). The majority of sites are small, with larger sites typically found in association with permanent watercourses. Reduced visibility has been proffered as an explanation for the higher number of sites and artefacts present along the more heavily eroded and less vegetated minor watercourses as compared to major creeks (Umwelt 2004: 7.7; ERM 1999: 84).

Aboriginal Cultural Heritage Survey Methodology: Glandell Continued Operations Project.

3.3 PAST LAND USE

Crucial for the preservation of archaeological deposits is the history of past land use in a particular area. In particular, the European history of the Hunter Valley lowlands, where the Project Area is located, is a stark example of historic land mismanagement leading to wide-spread erosion as the dispersible soils were exposed to rain. On Figure 1-4, for example, the wide-spread sheet wash erosion is noticeable; particularly on the slopes that once existed in the south of the Project Area. While this portion of the Project Area contained more-sloping landforms compared to other areas, it remains indicative of the soil loss that has occurred across the Project Area.

Bowmans, Swamp, Yorks and Bettys Creek have deeply incised channels that are most likely the result of European land-use practices (especially vegetation clearance and overgrazing) in the area and previous studies of the soil profiles exposed in the banks of Swamp, Yorks and Bettys Creeks indicate that these creeks formerly had shallow channels with a chain of ponds morphology (Umwelt 2004).

The drainage depressions and second and third order drainage lines within the Project Area have all been subject to varying degrees of gully erosion. In some areas, erosion has formed gullies up to two metres deep. These destabilised areas have generally also been affected by sheet erosion. Consequently, there has been extensive downslope and downstream movement of topsoil (A-Horizon) and any archaeological deposits it may have contained. With such widespread soil movement it is also important to remember that accumulations of artefacts that may be termed a 'site' today may have, in fact, been washed into that location during the historic period and bear no relationship to past Aboriginal occupation patterns in the area.

Cultivation has impacted the floodplains and terraces of the creek lines and much of the lower slope landforms within the Project Area (see Figure 1-4). Cultivation acts to redistribute artefacts both horizontally and vertically within the soil profile and ultimately destroys the integrity of artefact assemblages within the top 50 centimetres of the soil profile.

More recently, approved coal mining activities, has been the major source of impact within the landscape. Coal mining activities have resulted in the loss of a large portion of Swamp Creek, Bettys Creek and surrounding landforms.

3.4 PREVIOUSLY RECORDED SITES

Due to the history of archaeological investigation in the vicinity of the Project Area, there have been a number of sites recorded either within the Project Area, or in close proximity. 62 sites remain extant within the Project Area (Figure 3-1).

As discussed in Section 2 and below in Section 3.4, the results of previous investigations would suggest that:

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

30

OzArk Environmental & Heritage Management

- The most common site type will be stone artefact sites; either low density artefact scatters or isolated finds;
- Culturally modified trees will be extremely rare due to the level of historical clearing and the fact that they are a regionally rare site type;
- Grinding grooves will be unlikely to occur in the Project Area as the major creek lines have been subject to previous assessment and it would be expected that these site types would have already been recorded; and
- Other site types such as burials or stone arrangements will be very rare due to the longterm agricultural disturbances that have occurred in the Project Area.

3.5 LANDFORM MODELLING

In the portions of the Project Area that are outside of approved mining areas, the topography is generally flat ranging between around 60 m above sea level to small rises that are around 140 m above sea level. As such, while there are minor variations in the topography of the Project Area, these are not pronounced enough to be mapped in a way that is meaningful for the archaeological understanding of the Project Area.

Formerly, however, in areas that have been largely mined, the topography of the Project Area was comprised of a number of low, generally north—south trending ridges (elevation from 10 to 140 m) with east—west trending spurs and long slopes with a low to moderate gradient. Numerous drainage depressions flowed between each spur, forming first, second and third order ephemeral tributaries of Bowmans, Swamp, Yorks and Bettys Creeks (Figure 1-3).

Swamp, Yorks and Bettys Creeks are all tributaries of Bowmans Creek, which would have been the most reliable water source within the Project Area. The main channels of Swamp, Yorks and Bettys Creek and any associated swamps and billabongs would have provided semi-permanent water sources (Umwelt 2004). The tributary systems of these lower order streams (e.g. first and second order streams) would have only provided an ephemeral water source.

There are many minor creek confluences within the Project Area, however, the only major creek confluence in the Project Area is the confluence of Yorks and Bowmans Creek with the major confluences of both Swamp and Bettys Creek with Bowmans Creek in very close proximity, but to the south of the Project Area. All creeks within the Project Area have some floodplain development, however, only Bowmans Creek has a well-defined terrace sequence. Up to three terrace surfaces are associated with Bowmans Creek within the Project Area.

As such there are a variety of topographic features within the Project Area that would have encouraged past Aboriginal occupation; namely:

 The ridges and spurs would have provided good views along the creek valleys and would have been used as vantage points. However, as the Project Area is now largely devoid of

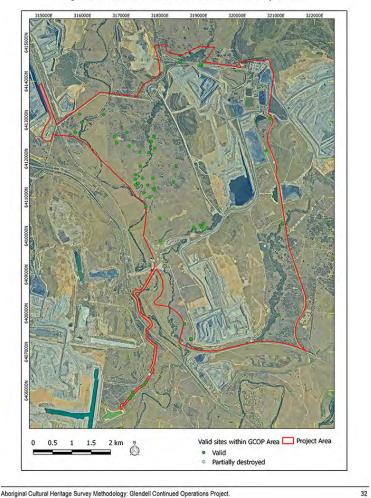
Aboriginal Cultural Hentage Survey Methodology: Glandell Continued Operations Project.

.31

crests, this landform feature will not influence the distribution or occurrence of archaeological sites in the Project Area.

 The landforms adjacent to Bowmans, Swamp, Yorks and Bettys Creeks have the capability of providing elevated landforms adjacent to water: landforms recognised in the area as having archaeological sensitivity. There is increased archaeological sensitivity at the confluence of Bowmans and Yorks Creeks.

Figure 3-1: Location of valid AHIMS sites within the Project Area.



OzArk Environmental & Heritage Management

3.6 PREDICTIVE MODEL FOR THE PROJECT AREA

- Isolated finds may be indicative of; random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or sub-surface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
 - As isolated finds can occur anywhere, particularly within disturbed contexts, it is
 predicted that this site type could be recorded within the Project Area. It is noted
 in Section 2.3 that isolated finds are commonly recorded in the vicinity of the
 Project Area.
- Open artefact scatters are here defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short or long term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools, but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

o This site type is likely to be located within landforms of a gentle gradient associated with the main channels of Bowmans, Swamp, Yorks and Bettys Creeks as these are likely to have been attractive camping areas. Smaller sites containing low density and low complexity assemblages are predicted near semi-permanent watercourses (Swamp, Yorks and Bettys Creeks), while the more permanent nature of Bowmans Creek suggests that this creek may have been the focus of more intensive (longer duration) camping which would have produced larger sites with higher density and more complex assemblages. Moderate to steeply sloping landforms are unlikely to have been utilised with lower gradient ridges and spurs being more attractive for camping. The lack of water in these elevated landforms would suggest, however, that camping would have been short-term and that sites would be smaller and contain low complexity assemblages. The high degree of impact from past agricultural practices along the floodplains i.e. cultivation, in the Project Area will probably mean that surface scatters and archaeological deposits are likely to have become displaced. It

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

would be expected that most sites located would date to the late Holocene (i.e. less than 4,000 years old), the age attributed to the A-Horizon artefact bearing deposits. Although Pleistocene sites contained within B-Horizon sediments may also occur, there have been only one or two instances of Pleistocene deposits being identified in the district and this must be considered a rare eventuality. It is noted that the Project Area already has a number of artefact scatters recorded by investigations over the years. This suggests that many of the larger sites have probably been previously recorded and that the Project Area will probably not record many more large sites.

- Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed as a consequence of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting or bark removal. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any particular example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently the distinction between European and Aboriginal scarred trees may not be clear.
 - Due to the near-total clearance of trees from within the Project Area (see Figure 1-4), this site type is not predicted to occur. It is also noted that this site type is very rare at a regional level due to historical tree clearance.
- Quarry sites and stone procurement sites typically consist of exposures of stone
 material where evidence for human collection, extraction and/or preliminary processing
 has survived. Typically these involve the extraction of siliceous or fine grained igneous
 and meta-sedimentary rock types for the manufacture of artefacts. The presence of
 quarry/extraction sites is dependent on the availability of suitable rock formations.
 - This site type could be recorded within the Project Area should suitable rock outcroppings be available. One quarry site, Bowmans Creek 5, is located within the Project Area to the north of Swamp Creek (see Section 2.3.7).
- <u>Burials</u> are generally found in soft sediments such as aeolian sand, alluvial silts and
 rock shelter deposits. In valley floor and plains contexts, burials may occur in locally
 elevated topographies rather than poorly drained sedimentary contexts. Burials are also
 known to have occurred on rocky hilltops in some limited areas. Burials are generally
 only visible where there has been some disturbance of sub-surface sediments or where
 some erosional process has exposed them.
 - Although it is possible that this site type could be found within the Project Area in the alluvial landforms, it is considered a rare site type especially given the disturbance that has occurred within the Project Area.

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

34

OzArk Environmental & Heritage Management

An examination of the landforms within the Project Area (Section 3.5) indicate that the northern portions of the Project Area is in a degrading environment where soils have been moved from the slopes towards the creek systems where aggrading landforms are evident. This would have the effect of displacing or impacting archaeological deposits had they existed in the north of the Project Area. Landforms adjacent to Bowmans Creek, in particular, are in an aggrading environment. This may mean that archaeological deposits may have become buried, or mixed with artefacts that have washed down from adjoining slopes.

3.7 RESEARCH QUESTIONS

A number of research questions can meaningfully be applied to the investigation of the Project Area. These research questions include:

- What resources were available to the Aboriginal people using the Project Area (food, stone and water)?
- How do the artefact assemblages from the sites along the slopes and ridge crests in the Project Area differ from sites that are located along Bowmans, Swamp, Bettys and Yorks Creeks?
- . What tasks were Aboriginal people undertaking at the sites?
- . Did the Aboriginal people use the Project Area at any particular time of the year?
- · Are there hearths in the area?
- If there are hearths, do they contain remains (animal/plant) that may indicate what people were cooking/eating?
- · Are there burials in the area?
- Is there evidence to suggest that Aboriginal people were using the area earlier than the mid to late Holocene?
- Can dates be obtained for the Aboriginal use of the area?
- · What resources were transported to the area and where?

The survey methodology set out in **Section 4** will be framed to help answer these questions; should sites of sufficient significance be encountered within the Project Area. However, based on the results of previous assessments and past disturbances, it not expected that the Project Area will contain sites of sufficient significance to help answer those research questions that require a robust data set.

Aboriginal Cultural Hentage Survey Methodology: Glandell Continued Operations Project.

4 SURVEY METHODOLOGY

4.1 ASSESSMENT APPROACH

The Aboriginal cultural heritage assessment of the Project Area will follow the Code of Practice for the Investigation of Aboriginal Objects in New South Wales (Code of Practice; DECCW 2010). The field inspection will follow the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH 2011).

4.2 BACKGROUND

The following archaeological methodology is based on the understanding that portions of the Project Area have been previously surveyed and, in some areas, salvaged as a result of past archaeological assessments and works related to mining approvals. There is, therefore, significant knowledge for much of the Project Area regarding the likelihood of further unidentified Aboriginal objects or sites. In addition, data from previous reports, site cards and permits can be used to interpret the landscape if ground surface visibility is poor to ensure that the archaeological characteristics of the Project Area are understood.

In addition, sizeable portions of the Project Area have been heavily modified by approved mining activities.

All survey will be undertaken with the assistance of RAP/Wonnarua Knowledge Holder representatives. Apart from their valuable experience in recognising and recording archaeological sites, the RAP/ Wonnarua Knowledge Holder representatives will be able to acquaint themselves with the Project Area in order to inform their cultural value assessment of the Project Area. Any cultural values relating to the Project Area will be captured by the OzArk archaeologist (if such information is provided during the survey) and included in the ACHAR to be prepared as part of the EIS for the Project.

4.2.1 Survey methodology

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004).

It should be noted that the aim of any archaeological survey is not to locate each and every artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within a Project Area are known. Therefore the aims of the survey will be to:

 Reinspect the location of all 62 previously recorded sites that remain within the landscape within the Project Area so that their current condition and scientific heritage values can be assessed:

Aboriginal Cultural Heritage Survey Methodology: Glandell Continued Operations Project.

36

OzArk Environmental & Heritage Management

- Conduct pedestrian transects across targeted landforms in the Project Area so that their archaeological potential can be determined;
- · Evaluate whether the predictive model set out in Section 3.6 is valid;
- Determine if the research questions set out in Section 3.7 can be answered;
- Determine if any portions of the Project Area require test excavation in order to understand the archaeological potential at a particular location;
- Undertake sufficient assessment in order to satisfy Sections 2.2, 2.4 (as it pertains to scientific values), 2.5, 2.6, and 2.7 in the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH 2011);
- Collecting sufficient data so that the results can be presented in an ACHAR as set out in Section 3 in the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH 2011); and
- Undertaking survey and record keeping to satisfy Requirements 1–13 of the Code of Practice.

It is envisioned that fieldwork for the survey would be completed in three weeks with two teams of surveyors consisting of two archaeologists and up to four RAP/Wonnarua Knowledge Holder representatives working concurrently for two weeks, and one team in the third week.

4.2.2 Survey zones

For the purposes of the archaeological survey, the Project Area has been divided into three zones of survey where differing levels of assessment will take place. These zones are set out in Sections 4.2.2.1 to 4.2.2.3.

Figure 4-1 shows a map displaying the various areas of survey priority ranging from areas so heavily modified that they do not require survey, areas of limited survey priority, and areas that warrant full survey. The proposed survey methodology in each area is as follows.

4.2.2.1 Area of high survey priority: 1,000 ha

This assessment area includes approximately 1,000 ha that is classified as 'high survey priority' on Figure 4-1. This constitutes approximately 34 per cent of the Project Area. In this area the major Project components such as the Barrett Pit continuation, the Hebden Road realignment, a potential new MIA, the heavy vehicle access road to the new MIA or Liddell MIA, and the diversion of Yorks Creek will be located (Section 1.1). Although a significant part of the high survey priority area has been subject to survey (over 10 years ago), much of this area is outside of land that has been systematically surveyed in the recent past.

This area includes approximately 2.5 km of Bowmans Creek, 3.5 km of Yorks Creek and 3.9 km of Swamp Creek; all drainage systems with known Aboriginal cultural heritage values. Although culturally modified trees will not be recorded (Section 3.6), this survey area includes the riparian

Aboriginal Cultural Heritage Survey Methodology: Glendell Continued Operations Project.

corridors of Bowmans, Yorks and Swamp Creek areas as disturbance is predicted to be lower in these areas.

Field survey will, wherever possible, be conducted in transects of 100 m intervals (with up to six surveyors spaced 10 m apart). If field conditions do not allow straight transects some areas may be investigated more opportunistically where exposures and/or vegetation allow. Areas of higher archaeological potential such as the banks of waterways such as Bowmans, Yorks, Swamp and Bettys Creeks will be fully inspected by pedestrian transects along both banks. This will ensure that this survey zone is systematically assessed.

If areas have significant levels of ground cover and pedestrian survey is considered by the archaeologist and RAP/Wonnarua Knowledge Holder representatives to yield no results, then assessment will be made, based in part on knowledge gained from past archaeological research in the area, of the potential of the area to have Aboriginal artefacts present.

It is noted that the historic Ravensworth homestead is located within this zone. A thorough inspection of the immediate grounds of this homestead will be undertaken so that the potential for the presence of Aboriginal sites and/or subsurface deposits will be determined. This determination will be taken into account should historic archaeological test excavations be required at some time in the future in areas immediately adjacent to the homestead and its outbuildings.

4.2.2.2 Area of low survey priority: 208 ha

This area contains generally flat landforms surrounding Bettys Creek (Figure 4-1). This area constitutes approximately 7 per cent of the Project Area.

This area has been extensively surveyed in the recent past, including more recently for the MOCO Project. As this area has been extensively surveyed, the archaeological characteristics of this area are largely known. In addition, the Project does not propose to disturb extensive areas within this portion of the Project Area. The only planned disturbance in this area is in the northern portion of the low survey priority area and is to enable the final landform to drain into Bettys Creek (Figure 1-2).

This area will not be inspected by formal transects but will focus on areas of exposure where archaeological material may be visible. Further definition of the Project Design may also narrow the survey area within this area.

Survey in this area will use the experience of the archaeologist and RAP/Wonnarua Knowledge Holder representatives to target areas that they feel will yield the best information. Survey will also be concentrated in the area where the final landform drainage is planned.

Aboriginal Cultural Heritage Survey Methodology. Glendell Continued Operations Project.

38

OzArk Environmental & Hentage Management

4.2.2.3 Area of modified landforms: 1,607 ha

This area has been highly modified by approved mining activities and includes open cut pits, waste emplacements, dams, buildings and other surface infrastructure (Figure 4-1). This constitutes approximately 55 per cent of the Project Area.

Due to the highly modified nature of these landforms, they are extremely unlikely to contain archaeological sites and no survey will take place in this area.

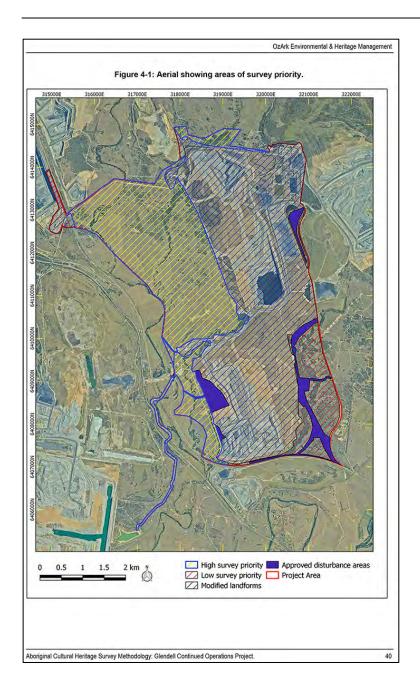
4.2.2.4 Approved disturbance areas: 110 ha

Small portions of land within the Project Area (approximately 110 ha or 4 per cent of the Project Area) are not included in any of the three zones described above as they are in areas where approval to disturb has been consented but the disturbance has not yet occurred (Figure 4-1). These approvals are either part of the Glendell Mine consent (DA 80/952) or the MOCO Project consent (SSD-5850). As these areas have been previously assessed and approval to disturb has already been consented, these areas will not be subject to survey.

4.2.3 Test excavation

It is possible that the survey may identify landforms where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, the test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.

Aboriginal Cultural Heritage Survey Methodology, Glendell Continued Operations Project.



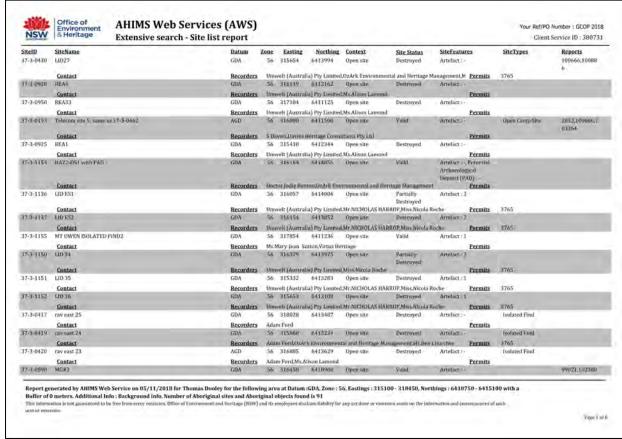
REFERENCES	
AMBS 1997	Australian Museum Business Services. 1997. Archaeological test Excavations of Aboriginal Sites at Bettys Creek Mt Owen Mine, Hunter Valley, NSW. Vol. 1–4. Report for Mt Owen Mine, BHP Coal Australia.
Burke & Smith 2004	Burke, H. and Smith, C. 2004. The Archaeologist's Field Handbook, Blackwell, Oxford.
Brayshaw 1982	Brayshaw, H. 1982. Additional Archaeological Information Relating to Glendell Open Cut Coal Mine at Ravensworth. Hunter Valley. Report for Croft & Associates Pty. Limited.
Dean-Jones 1992	Dean-Jones, P (Resource Planning Pty Ltd). 1992. Archaeological Report Subsurface Analysis Swamp Creek, Mount Owen Mine Site. Report to Hunter Valley Coal Corporation Pty.
DECCW 2010	DECCW. 2010. Code of Practice for the Investigation of Aboriginal Objects in New South Wales. Department of Environment, Climate Change and Water, Sydney.
Dyall 1982	Len Dyall. 1982. A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project. Report for ELCOMM.
EMM 2017	EMM Consulting Pty Limited. 2017. Mt Owen Complex Aboriginal cultural heritage due diligence site inspection results (J17105) EL6594, EL8184, ML1629 and ML1415.
ERM 1999	ERM. 1999. Ravensworth East Mine Environmental Impact Statement. Report for Peabody Resources Limited.
ERM 2002	ERM Pty Limited. 2002. Ravensworth East Archaeological Investigation. Report to Coal and Allied Pty Limited.
Haglund 1982	Hagland, L. 1982. Archaeological Survey of Pikes Gully Colliery Area, Liddell, N.S.W. Report for Longworth and McKenzie Pty. Limited.
Mitchell 2002	Mitchell, P. 2002. Aspects of the geomorphology of the Glendell Coal Lease, Ravensworth, Hunter Valley, NSW. In Umwelt 2013b: Appendix B.
OEH 2011	Office of Environment and Heritage. 2011. Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales. Department of Environment, Climate Change and Water, Sydney.
OzArk 2013	OzArk Environmental & Heritage Management Pty Limited, 2013. Aboriginal Archaeological Values Assessment. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd.

	OzArk Environmental & Heritage Management
OzArk 2015	OzArk Environmental & Heritage Management Pty Limited. 2015. Archaeological Salvage. Liddell Coal Operations Development Modification 5. Report for Liddell Coal Operations.
OzArk 2017	OzArk Environmental & Heritage Management Pty Limited. 2017. Aboriginal Archaeological Salvage Report. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd.
OzArk 2017b	OzArk Environmental and Heritage Management. 2017. Aboriginal Due Diligence Archaeological Assessment: Mt Owen Complex: Glendell North Project. Bowmans, Swamp and Yorks Creeks: alluvium and biophysical strategic agricultural land verification and mapping. Report for Mt Owen Pty Ltd.
OzArk 2017c	OzArk Environmental and Heritage Management. 2017. Aboriginal Due Diligence Archaeological Assessment: Bowmans and Yorks Creeks Additional Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping. Report for Mt Owen Pty Ltd
OzArk 2017d	OzArk Environmental and Heritage Management. 2017. Aboriginal Desktop Due Diligence Archaeological Assessment: Bowmans and Yorks Creeks Additional Alluvium and Biophysical Strategic Agricultural Land Verification and Mapping. Report for Mt Owen Pty Ltd.
OzArk 2017e	OzArk Environmental and Heritage Management. 2017. Aboriginal Cultural Heritage Assessment Report. Mount Owen Continued Operations Modification 2. Report for Umwelt (Australia) Pty Ltd on behalf of Mt Owen Pty Limited.
Resource Planning 1991	Resource Planning Pty Limited. 1991. Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales, Report for Hunter Valley Coal Corporation Pty Limited.
Resource Planning 1993	Resource Planning Pty Limited. 1993. Proposed Mt Owen Extension. Archaeological survey of Bettys Creek. Report for Hunter Valley Coal Corporation Pty Limited.
Umwelt 2003	Umwelt (Australia) Pty Limited. 2003. Survey and Assessment of Impact on Aboriginal Cultural Heritage and Archaeological Values, Main Creek, Hunter Valley, NSW. Prepared for Glennies Creek Coal Management.
Umwelt 2004	Umwelt (Australia) Pty Limited. 2004. Aboriginal Archaeological Assessment - Glendell Open Cut Mine. Report to Glendell Joint Venture.
	fethodology: Glendell Continued Operations Project. 42

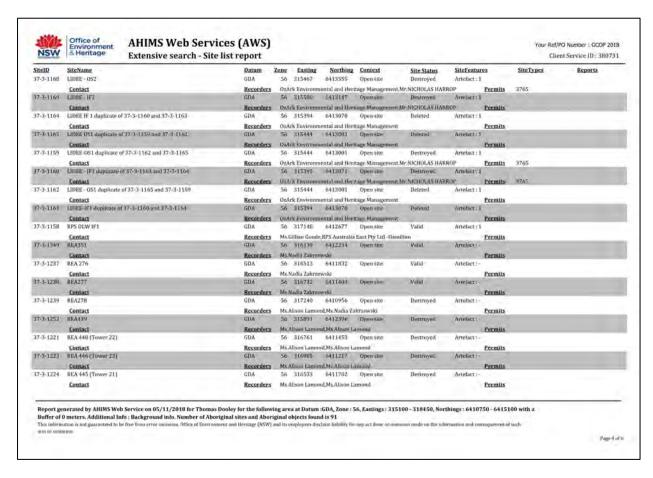
Aboriginal Archaeological Constraints Analysis. Report for Xstrata Mount Owen.
Aboriginal Archaeological Constraints Analysis. Report for Xstrata Mount Owen. Umwelt 2013 Umwelt (Australia) Pty Limited. 2013. Part 4 – Bettys Creek Salvage Program, Glendell Mine Surface and Subsurface Salvage under Section 90
Program, Glendell Mine Surface and Subsurface Salvage under Section 90

APPENDIX 2: AHIMS SEARCH RESULT

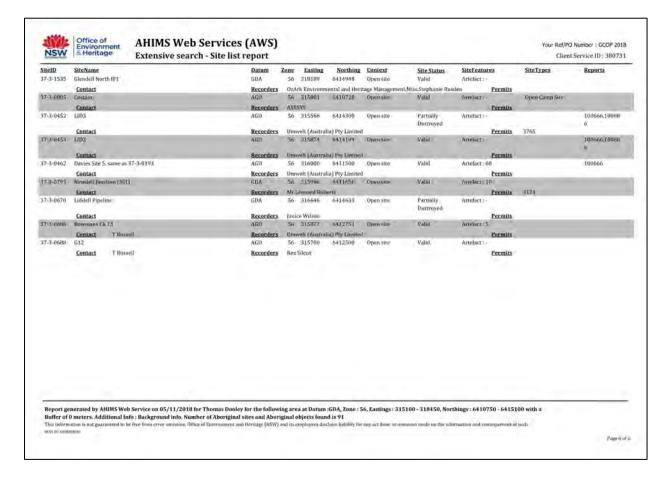
SiteID	SiteName	Datum 2	Zone Easting	Northing	Context	Site Status	SiteFeature	25	SiteTypes	Reports
	Contact	Recorders	David Gordon	فالتناف	10000			Permits	1982	
37-3-0642	Liddell Pipeline 1	GDA	56 316646	6414633	Open site	Destroyed	Artefact :-			100666
	Contact	Recorders	Janice Witson					Permits	2198	
37-3-0643	Bowmans Creek 1 PAD	AGD	56 316564	6414709	Opensite	Velial	Patential Archaeologi Deposit (PA			
	Contact S Scanlow	Recorders			-	.77		Permits	2213	
37-3-0756	York Creek 13	AGD	56 318246	6411209	Open site	Valid:	Artefacy: 2			
and the same	Contact	Becorders	Janice Wilson			- Trook		Permits		
37-3-0757	Yuck Creek 14	AGD	56 318311	6411622	Open site.	Valid	Artelact : 1			
-	Contact	Recorders	Janua Wilson					Permits		
37-3-075B	York Creek 15	AGD	56 317743	6411011	Open site	Valid.	Artefact: 7			102380
00000	Contact	Recorders	Janice Wilson		-			Permits		
17-3-0759	York Creek 16	AGU	56 317721	6411306	Open site	Valid.	Artifact 2			
	Contact	Recorders	Janice Wilson					Permits		
37-3-0760	Vorks Creek 17	GDA	56 317626	6412595	Open site	Valid	Artefact : 1			
	Contact	Recorders				e Management, Miss.		Permits		
37-3-0761	York Greek 10	AGD	56 317606	6411967	Open site	Valid	Artefact 1			
	Contact		Jansee Wilson			27.7		Permits -		111111
37-3-0762	Bowmans Ck o	GDA	56 317645	6410765	Opensite	Valid:	Artefact : 1			102380
	Contact	Recorders	Janice Wilson		WTT-07	20.00	-	Permits		
37-3-0763	Bownian Ck 7	GDA	56 31654Z	6413142	OpenAire	Valid	Artefact -			
	Contact	Recorders	Janice Wilson			200		Permits		
37-3-0764	Bowmans Ck 0	GDA	56 317205	6412329	Open site	Valid	Artefact 4			
	Contact	Recorders	Janice Wilson	*******	S	6.70		Permits		
37-3-0765	Howmans Ck ()	GDA	56 316070	6412410	Open site	Valid	Artefact 2			
37-3-0766	Bowmans Ck 10	Recorders GDA	56 316833	6412566	Acres de la	Valid	Artefact : 7	Permits		
37-3-070h				0412360	Open site	Value	AFTERIOR : 7	4		
37-3-0767	Contact Bowmans Ck 17	Recorders GDA	Janire Wilson 56 315581	6417437	Open erte	Valid	Arreface 2	Permits		103364
37-3-0707				D418032	Opencente	Valle.	mittenes:12			103250
37-3-076R	Contact Bowmans Ck, 13	Recorders GDA	So 315982	6412940	Open site	Valid	Artefact : 5	Permits		
17-1-07611				6412940	Open site	Vallet.		Washington.		
37-3-0760	Contact Bowmons Ck 14	Recorders	Janice Wilson 56 316413	6414370	Open site	Valid	Arimact : 1	Permits		
31-3-11/04			200 3000 850	111113111	Apenanc	y anni				
	Contact	Recorders	Janke Wilson					Permits		



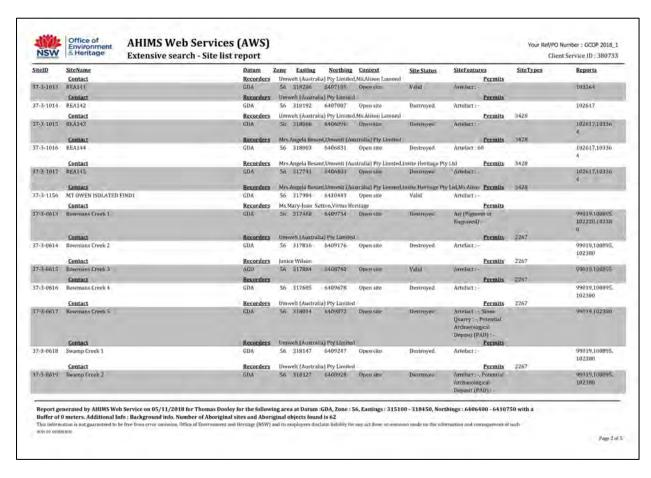
SiteID	SiteName	Datum	Z.c	ne Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-3-0770	Bowmans Ck 11	GDA		56 315824	6412493	Open site	Valid	Artefact : 50	100000	
	Contact	Recor	ters	lanice Wilson				Permits		
37-3-0771	Bowmany Ch 15	GDA		56 315825	6412677	Open size	Valid	Armiacr: 55		
	Contact	Recor	ters	haulce Wilson				Permits		
37-3-0772	Bowmans Ck 16	GDA		56 316359	6411406	Open site	Valid	Art (Pigment or Engraved) 1		
	Contact	Record		lanice Wilson		-		Permits		
37-3-0744	Yurk Creek I	AGD		56 317334	6411168	Djum site	Valid	Amelact:6		102380
	Contact	Record		Janice Wilson				Permits		
37-J-0745	York Creek 2:	AGD		56 317471	6410921	Open site:	Valid.	Artefact: 16		102300
	Contact	Recor		fanice Wilson	-		Visit in	Permits		
37-3-0746	Yark Greek 3	AGD		56 317639	6410817	Open stre	Valid	Artifact : 17		102380
	Contact	Recor		Janice Wilson		-	277	Permits		70000
37-3-0747	York Creek 4	AGD		56 317267	6411131	Open site	Valid -	Artefact: 12		102380
an Proposition	Contact	Recon		Janice Wilson	The state of the s	-	- University	Permits		
37-3-07411	York Creek 5	GDA		56 317365	6411470	Open site	Valid	Artefact : 16; Potential Archaeological Deposit (PAD) : -		
-	Contact	Recon						Stephanie Rus Permits		
37-3-0749	Yorks Creek 6	GDA		56 317468	6411773	Open site	Valid	Artefact 5		
	Contact	Recor				and the second second second second second		Stephanie Ruy Permits		
37-3-0750	Yark Creek 7	AGD		56 317378	6411979	Openalle	Valid	Artelact : 18		
	Contact	Recon		Linice Wilson			7/2/2	Permits		
37-3-0751	York Creek 8	AGD		56 317392	6411616	Open site	Valid	Artefact : 1		
10 C (100 C)	Contact	Recor		Janice Wilson	-	-	ir im	Permits		T Section 1
37-3-0752	York Creek 9	AGD		56 317579	6411121	Openate	Valid	Artefact: 6		102380
	Contact	Record	_	Jamice Wilson	FALTAGE	- No.	- back	Permits		
37-3-0753	York Creek 10	AGD		56 317759	6412075	Open size	Valid	Artefact:7		
37-d-0754	Vork Creek 1 ii	Record		56 ±17676	6412252	Opan line	Valid	Arrefact 29		
ar-#-tiro4					HATEGOR	Lipan ine	-Vallet -			
37-3-0755	Contact York Creek 12	Recorn AGD		56 317740	6412390	Open site	Valid	Actofact: 3		
37-3-9735	,				0412390	Appen site	vallu			
37-3-1166	Contact LIDEE - 1P3	Record GDA		Janice Wilson 56 315930	6413149	Opensing	Valid	Permits Arrelact: 1		
31.30.1100				C			- and			
	Contact	Record	IED .	OZACK ERVITORIS	ental and Heri	tage Management		Permits		



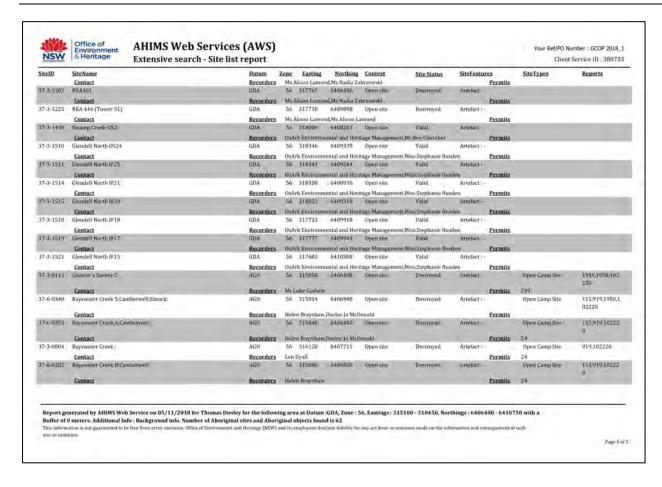
SiteID	SiteName		Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatur	es	SiteTypes	Reports
37-3-1506	Restriction applied. Pi						Open site	Not a Site				
	allins@environment	nswąjovani	Warnes	Marie	CONT PURISION	Toormirwell Pi	UTAX					
37-3-1502	Contact Bowmany Creek 6		Reconters GDA		315509	6412710	Open site	Valid	Arrefact :-	Permits .		
27.2.1302	Contact		Recorders					r Miss Philippa Sokol	Interesce.	Permits		
37-3-1503	Vories Creek 10		GDA	_	317369	0411237	Open site	Valid.	Artefact :-	Cermins		
	Contact		Recorders					n Miss.Philippa Sokol		Permits		
37-3-1512	Glendell North IF24		GDA		318253	6411466	Open site	Valid	Artefact :-	Cermina		
	Contact		Recorders				20	n.Miss Stephanie Ruse	len	Permits		
37-3-1516	Glendell North 1F22		GDA		317984	6410954	Open site	Valid	Artefact:-	Litter		
	Contact		Recorders					at.MinuStephanie Russ		Permits		
37-3-1522	Glendell North IF14		GDA		317752	6410825	Open site	Valid	Artefact :-	Camme		
	Contact		Recorders	OzA	rk Environm	ental and Heri	tage Managemen	t, Miss Stephanie Rusi	ten	Permits		
37-3-1523	Glendell North IF13		GDA		317608	6410830	Opensite	Valid	Arrefact:-			
	Contact		Recorders	DeA	k Environm	ental and Heri	ore Managemen	n, Miss Stephanie Busi	len.	Permits		
37-3-1524	Glendell North IF12		GDA		317765	6410903	Open site	Valid	Artelact :-			
	Contact		Recorders	OzA	rk Environm	entat and Heri	tage Managemen	t, Miss Stephanie Ruse	len	Permits		
37-3-1525	Glendell North IF1.1		GDA		317221	6411282	Open site	Valid	Arrefact:-			
	Contact		Recorders	UzA	rk Environm	ental and Heri	tage Managemen	rt. Miss Stephanie Ruse	len	Permits		
37-3-1527	Glendell North IF9		GDA		316545	6411891	Open site	Valid	Artefact :-	e-e-commission (
	Contact		Recorders	DzA	rk Environm	ental and Herr	tage Managemen	t.Miss.Stephanie Ruse	lon	Permits		
37-3-1528	Glendell North IFB		GDA	56	316956	641260€	Open size	Valid	Artelact:-			
	Contact		Reconlers	OXA	k Environm	ental and Hert	läge Mänagemen	d.MissStephanic Russ	len	Permits		
37-3 1529	Glendell North IF7		GDA	56	315514	6412657	Open site	Valid	Arrefact:-			
	Contact		Recorders	OzA	rk Environm	ental and Heri	tage Managemen	r.Miss.Stephanie Ruse	len	Permits		
37-3-1530	Gloridell North IF6		GDA	56	315966	641280)	Opensite	Valid	Arrelact :-			
	Contact		Recorders	OXA	ric Environm	ental and Heri	tage Managemen	it Miss-Stephante Rusa	ten	Permits		
37-3-1531	Glendell North IFS		GDA	56	318054	64127H3	Open size	Valid	Artefact :-			
	Contact		Recorders					rt, Miss Stephanie Russ		Permits		
47-4-1544	Glendell North IFA		GDA		31696Z	6412937	Open lite	Valid	Artofact :-			
2	Contact		Recorders					nt.MinnStephimie Russ		Permits		
37-3-1533	Glendell North IF3		GDA	56	317120	6413414	Open site	Valid	Artefact :-			
-	Contact		Recorders					t, Miss Stephanie Russ		Permits		
37-3/1534	Glendell North IF2		GDA		317146	6413503	Opensitie	Valid	Artelact:-			
	Contact		Recorders	DzA	ck Environm	ental and Heri	rage Managemen	n,MissStephanie Rusi	len-	Permits		



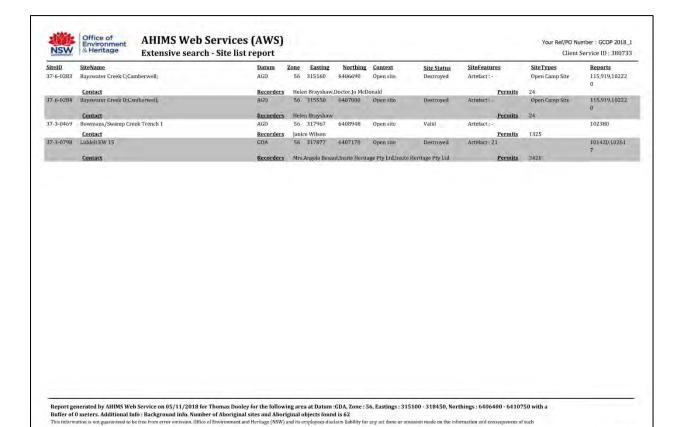
SiteID	SiteName	Datum	Zene	Easting	Northing	Context	Site Status	SiteFeatur	ties	SiteTypes	Reports
37-3-0390	Ravensworth Massacre	AGD		317000	6409000	Open site	Valid	Conflict;		Мазяакте	100865,10222 0.102380
37-3-0195	Contact MO-IP3	AGU AGU		drienne Hov 317569	6406217	Opensite	Destroyed	Arrefact:	Permits		102220,10261
	Contact	Recorders			Ms.Alison Liam			-	Permits	3429	
37-3-0558	Ashton EWA 96	AGD	56	317074	6410250	Upen site	Destroyed.	Artefact:			98163,102617
	Centact	Recorders			ison Lamond				Permits	3436	was and a second
37-3-0496	Ashton Brunkers Laue Kite	AGD	56	317811	6106514	Open site	Descriyed	Potential Archaeolog Deposit (P	pesi		101793,10261
	Contact	Recorders				The second secon	perations Limited.N			D428	
37-3-0960	REA58	GDA		317580	6410397	Open site	Valid	Artefact :-			103364
47-3-0974	Contact REA73	Recorders GDA		elt (Australi 817344	a) Pty Limited 6409979	Openside	Value	Arrelact :-	Permits		105364
10000414							Young	Withhert -			100364
37-3-0975	REA74	GDA GDA		317513	6409914	Open site	Valid:	Artefact :-	Permits		103360
	Centact	Recorders	-	100	a) Pty Limited				Permits		
37-3-0976	IIEA75	GDA		317484	6409831	Open size	Valid	Arrelatt:			103361
	Contact	Recorders	Umw	eli (Australi	a) Pty Limited				Permits		
37-1-0985	REARY	GDA	56	317742	6409391	Openlite	Destroyed	Artifact;-			103364
37-3-1005	Contact REA124	Recorders		elt (Austroli 317982	6408618	OzArk Environme Open size	valid Valid	danagement.M Artislact:-			
	Contact	Recorders	Umw	eli (Australi	a) Pty Limited				Permits		
37-3-0920	Ravensworth Underground Mine (RUM) Open Camp Site No. 1 with PAD	GDA	56	317298	6408018	Open site	Partially Destroyed	Artefact : 5 Potential Archaeoloj Deposit (P.	gical		103364
-	Contact	Recorders					eritage Managemen			3465	
37-3-1009	(EA13)	GDA		319000	6408174	Djum tite	Valid	Amenet:-			
37-3-1010	Centact REA132	GDA		217660	6407881	Open tita	Destroyed.	Artefact 1-	Permits		
37-3-1010	Contact	Recorders				Ms.Alison Lamond		Artenact :-	Permits		
37-3-1011	REALSS	GDA		317656	64076111	Open size	Valid	Artelect:	Leanne		103364
	Contact	Recorders	Umw	elt (Australi	a) Pty Limited	di di			Permits		
37-3-1012	REA140	GDA	56	317599	6407405	Open site	Destroyed	Artefact :-			



SiteID	SiteName		Zone	Easting	Northing	Context	Site Status	SiteFeatur		SiteTypes	Reports
37-3-0620	Contact Swamp Cruek 3	Recorders GDA		velt (Australi 318178	6409390	Open site	Destroyed	Arrefact : Archaeolog Deposit (P.	gcal	2267	99019,100895, 102380
	Contact	Recorders	Umv	velt (Australi	a) Pty Limited			Petroias G.	Permits	2267	
37-3-0621	Swamp.Creek *	GDA	56	310026	6409497	. Upon site	Dottroyed	Avtelact:			99019,100095.
	Marine .										102380
7-3-0588	Contact MG#1	Recorders AGD		317105	6410166	Open site	Destroyed	Artelacr:-	Permits	2267	99021,100689,
37-3-0300	NOW	300	30	317103	0410100	Open site:	pestayea	Mittalier -			102380,10310
_	Contact	Recorders				ounly HLA-Envir		-	Permits	1982,2727,2728	
37-3-0589	MG#2	GDA	56	316950	6410359	Open site	Valid	Artelect:-			99021.102300
	Contact	Recorders					d,MICCS)eplanty Bus		Permits	1982	
17-3-0591	Ravensworth RCUF PAD	AGU	56	315000	6409500	Open site	Valid	Potential Archaeolog Deposit (P.			102220
	Contact	Recorders	_					-	Permits	1982	
37-3-1187	M0CD IF-19	GDA		317195	0409045	Djun tile	Destroyed	Artefact: T			
W 71 4 1 1 1 1 1	Contact	Recorders					t.DzArk Environment				
37-3-1186	MOCO IF-20	GDA		317236	6408936	Open site	Destroyed	Artefact : I			
17-3-1199	MOCO OS-11	Recorders GDA		31ft413	ntal and Hern 6408614	Open site	t.OzArk Environment Destroyed	Actelent : 1	Permits		
11.301124	Contact	Recorders					it.OzArk Environment				
37-3-1284	REA394	GDA		317569	6407558	Open site	Destroyed	Artefact :-	Permis		
2 4 4500	Contact	Recorders	Med	lliano Camono	LMs Nadia Za	0.00	200000	B-(4)	Permits		
37-3-1285	REA395	GDA		317655	6407434	Open site	Dontroved	Arrenact:-			
	Contact	Recorders	Mad	dison Lamon	LMa Nadia Za	krzewski			Permits		
87-3-1248	REA443 (Tower 29)	GDA	56	317598	6409776	Dpen size	Destroyed	Artefact:-	-		
	Contact	Recorders	MsJ	lison Lamun	Ms.Alison La	mond			Permits		
17-3-1254	REA437	GDA	36-	117427	6406595	Open tire	Malid	Argelocu:			
	Contact	Recorders	_	ladia Záferon					Permits:		
17-3-1296	REA379	GDA		317976	6406781	Open site	Destroyed	Artefact :-			
	Contact	Recorders			f.Ms.Nadia Za		-		Permits		
37-3-1297	REA378	GDA		310134	6406942	Open size	Desiroyed	Arrelace:-			
2.2.1254	Contact	Recorders		***	LMs Nadia Za	- Street W. V.	Discounting	Autofore	Permits		
37-3-1253	REA438	GDA	56	317003	6410698	Open site	Destroyed	Artefact :-			



Page 5 of 5



NSW Office of Environment & Heritage **AHIMS Web Services (AWS)** Your Ref/PO Number : GCOP 2018_2 Extensive search - Site list report Client Service ID: 380735 SiteID SiteTypes Site Status 37-3-0584 56 321600 BC40 AGD 6412200 Open tite Arrefact :-37-3-0587 BC43 Permits Recorders 56 321600 6412200 Open size Armiact:-Destroyed *Contact Yorks Creek (Mt.Owen Mine) 2 37-3-0727 56 318980 6414200 Open site Valid: Arrefact: 12 100256 37-3-0207 HVCC 16 Mr.Barry Anderson 56 321295 6414649 Djuni Star Permits Artefact: Destroyed Open Camp Suo 2043.2206 Contact Rayensworth 10 Pam Dean-finnes 56 319865 6413543 Open site Artefact:-Destroyed. ERM Australia Pty Ltd- Sydney CBD 56 319743 6413684 Ope Contact Destroyed Artelact:-Located Find Recorders ERM Australia Pty Ltds Sydney CBD GDA 56 319972 6413482 Open 37/3-0401 Rayonawo ERM Australia Pty Ltd-Sydney CBD 56 319685 6413419 Open site Recorders orth 12 Dottroyed Arrefact: Open Camp Site 99221 Recorders ERM Australia Pty Ltd-Sydney CBD GDA 56 320014 6413444 Open si Contact Permits 37-3 0402 Raver 17-5-0403 Ravenswo Recorders ERM Australia Pty Ltd- Sydney CBD 56 319636 6413346 Open size orek 7.4 Destroyed Arrelace -Open Camp Site Contact Recorders ERM Australia Pty Ltd-Sydney CUD Permits 37-3-0404 Raver 56 3111969 6414024 Artefact: Isolated Find Contact 37-3-0405 Ravensworth east 3 Recorders Ms.Alison Nightingale Permits 56 318885 5414052 Oromston Asseluct: GDA Distriveril Onen Camp St Recorders Ms. Alison Nightingale Permits 37-3-0406 Ray east 6 GDA 56 319494 6413617 Open site Destroyed Arrefrict : tvolated Find Adam Ford.Adam Ford Recorders Permits Contact 37×3×0407 Kay past 7 56 319697 6413691 Dpmr-6iim Artelect: toplated and Destroyed Recorders Adam Ford Permits 37-3-0408 Ray east 8 56 319747 6413714 Open site Destroyed Artefact:-Isolated Find Adam Ford, Ms. Alison Nightingsie 56 319669 6412759 Open-lite 37-3-0409 Ray east 15 Recorders Permits Artelact :-Destroyed Open Camp Site Recorders Adam Ford GDA 56 320000 Contact 37-3-0410 ravensworth east 17 Permits 56 320000 6412975 Open site Destroyed Arrefact :-Isolated Find Recorders Ms.Alison Nightingale Report generated by AHIMS Web Service on 05/11/2018 for Thomas Dooley for the following area at Datum :GDA, Zone: 56, Eastings: 318450-321800, Northings: 6410750-6415100 with a Buffer of 0 meters. Additional Info: Background info, Number of Aboriginal Sites and Aboriginal objects found is 102.

This information is not guaranteed in the Per Form error ensists. Officer of Borringen (Story and Europhyee) discline liability for any act done or emission made no the information and consequences of such P-1 of 7

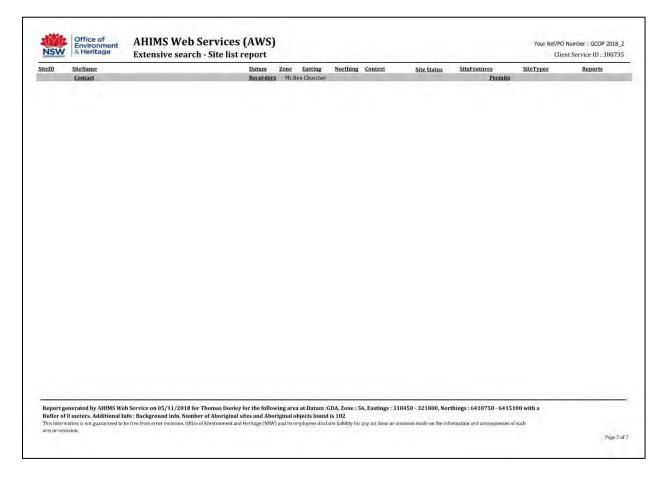
SiteID	SiteName		Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatu	res	SiteTypes	Reports
37-3-0411	rave eact 18		AGD		320703	6412019	Open site	Destroyed	Artelact :		Isolated Find	
	Contact		Recorders		n Ford					Permits		
37-3-0412	rav east 19		GDA		319996	6411762	Open site	Destroyed	Artefact:		Open Camp Site	
37-3-0413	Contact ray out 30		Recorders GDA		n Ford 310895	6414664	Open site	Dostroved	Arrefact)	Permits	Leolated Find	
103-0413						0414004	Open site	Dostroweo	Attenders-		Liolated Find	
37-3:0414	Contact ray east 29		Becorders		n Ford 319613	6414949	Dpen site	Destroyed	Artefact :	Permits	Isolated Find	
77-3-0414	Contact		Recorders		n Ford	DATAMA.	roban and	Destroyed	MINOREL.	Permits	Islander Pinn	
37-3-0415	ray oast 28		GDA		819447	6414764	Open size	Destroyed	Artelact :-	CYLINUS	Isolated Find	
2.2140	Contact		Recorders		n Ford	194100-1	- Jan Stor	a garray ave	and the second of	Permits	11,000,000,000	
37-3-0416	ray east 27		GDA	-1000	319348	6414679	Open (ité	Destroyed.	Artefact:		Isolated Find	
	Contact		Recorders	Ada	n Ford					Permits		
37-3-0418		26	GDA		319105	6414679	. Open site:	Distriyed	Arminet:		Isolared Finil	
	Contact		Recorders	Ada	n Ford					Permits		
37-3-0421	ray east 22		GDA	56	321124	6410757	Open site	Destroyed	Artefact :		Ixolated Find	
	Contact		Recorders	Ada	n Ford					Permits		
37-3 0422	Favorati Zil		GDA	56	320368	6412622	Dpen (in-	Destroyed	Artelact:		tentated Find	
	Contact		Recorders		n Ford					Permits		
37-3-0423	ray east 21		GDA	56	319725	6412579	Open site:	Destroyed	Artefact :-		Open Camp Site.	
	Contact		Recorders		n Ford					Permits		
37-3-0397	Rayensworth Loss	CI.	GDA		319502	6414409	Open stre	Destroyed	Artefact		Loolated Find	
	Contact		Recorders		Ilson Nightu			5077		Permits		
37-3-0394	Rayensworth East	1.4	AGD		318739	6413721	Open site	Vallet	Artefact:		Open Camp Site	
IN IN ANNAST	Contact		Recorders		llison Nighti		W		40.767	Permits	176-78-0	
17-9-0195	Ravensworth East	15	GDA		319275	6411510	Opensite	Destroyed	Arrefacta		Liolated Find	
	Contact		Recorders		dison Nighti		Contract of the Contract of th	Water	Artefact :	Permits		
37-3 0645	RC44a				321449	6410827	Open sire	Destroyed	Arteract :			
37-3-0657	Contact T 0C63	Russell	Recorders GDA		#21592	641 (166	Opensite	Destroyed	Arrelact :	Permits		
31-3-40037		W						mestrayed	Witnest:			
37-3-065B	RC64	Ausseil	Recorders GDA		321712	6411072	Open site	Destroyed	Artéfact :	Fermits		
11-1-1000		Russeil	Recorders			a) Pty Limited		brant by the	rustiact.	Permits		
37-3-0630	BC50	Missen	GDA		321407	5412896	Open site	Desiroyed	Arrefact :	remis		
	Contact		Recorders			a) Pty Limited				Permits	2131	
	Saltings.		ACCOUNTS.	32001	and threat the	at any caming				13tmm3		

SiteID	SiteName		Zone Easting	Northing		Site Status	SiteFeatur	es	SiteTypes	Reports
37-3-0631	BC49	GDA	56 321479	6412727	Open site	Destroyed	Artefact :-			
37-3-0632	Contact BC48	Recorders GDA	Umwelt (Austra 56 321664	6412602	Open site	Destroyed	Arrelact:-	Permits	2131	
07-2-11032	Contact		Umweli (Austra			Distroyed	vialifier:	Birmitte.	2131	
37-3-0633	DC47	GDA GDA	56 320913	6412387	Open site	Destroyed	Artefact :-	Permits	2131	
77-3-01032	Contact	Recorders	Umwelt (Austra			Danis Syric	THE STATE OF THE S	Permits	2131.	
37-3-0634	RC46	CDA	56 3Z1018	6413154	Diperration	Destroyed	Artefact:	LELIMIS	#101.	
	Contact	Recorders	Drawell (Austra	lat Pie Limited				Permits	2131	
37-3-0635	BC45	GDA	56 321020	6413369	Open site	Destroyed.	Artefact :-	COLINIA	****	
	Contact	Recorders	Umwelt (Austral	ia) Pty Limited				Permits	2131	
37-3-0219	(IVCC 20)	AGD	56 320970	6414690	Open stre	Valid.	Artelact:-		Upen Camp Site	2049.2206
	Contact	Recorders	Pam Deoro Jones					Permits	282	
37-3-0773	Swamp Cl _k 10	AGD	56 318900	6410978	Open site	Valid	Artelast:1			102380
	Contact	Recorders	Jamice Wilson					Permits		
87/3/1173	MOCO IF-4	GDA	56 320H49	0413041	Open site	Valid	Arrefact: I			
	Contact	Recorders				t.Mr.Ben Churcher		Permits		
37-3-1174	MOCO IF-5	GDA	56 320623	6412964	Open site	Destroyed	Artefact : 1			
	Centact	Recorders				t,OzArk Environment		Permits		
17-1-1175	MOCO IE-6	(IDA	56 330749	6412208	Open size	Valid	Arteloct			
27.1.1570	Contact Glendell North (F16	Recorders	56 319072	6410845		t.Mr.Ben Churcher Valid	Artèlact :-	Permits		
37-3-1520		GDA			Open (ité					
37-3-1526	Contact Glendell North IF10	Recorders GDA	56 31H745	6411658	Open site	1.Miss.Stephanie Ruse Valid	Arrelace:-	Permits		
or take	Contact	Recorders			4.000	Miss Stephanie Hua		Permits		
37-3-0295	Site 1.	GDA	56 320755	6412309	Open site	Destroyed	Artefact :-	CELIMIS	Open Camp Site	
	Contact	Recorders	Noeleen Curran.			a,e,y,		Permits	821	
37-3-0335		AGD	56 321670	6412250	Djurn size	Desiroyed	Artelact:	LSJJIIIS2	Open Camp Suo	
	Contact	Reconters	Mr Marthew Bar	ber				Permits.	1576.1762	
37-3-0343	Mt Owen (1996) L;MtO1;	AGD	56 318450	6414330	Open site:	Valid.	Artefact:-		Open Camp Site	
	Contact	Recorders	Ms.HII Rung					Permits		
37-3-0348	MI Dwen (1996) 11:	AGD	56 319260	54144110	Open site	Destroyed	Artefact :-		Open Camp Site	3569
	Contact	Recorders	Ms.IIII Ruig					Permits	1570	
37-3-0349	Mt Owen (1996) 10;	AGD	56 319377	6414420	Open site	Valid	Artefact:-		Isolated Find	3569
	Contact	Recorders	Ms.Jill Ruig					Permits	B57	

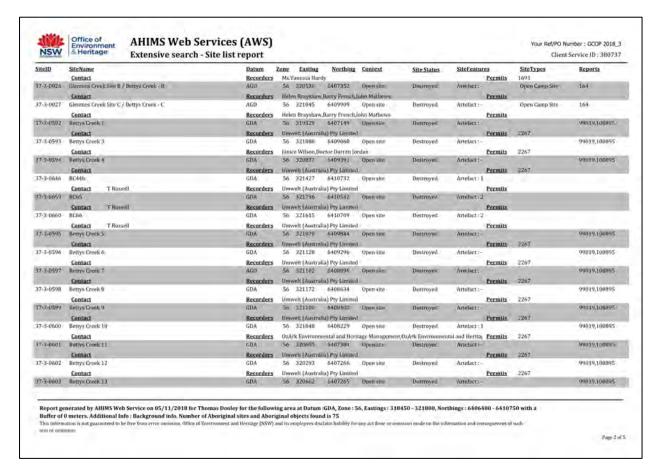
NSW	& Heritage	Extensive search - Site list report						_	39770	Service ID ; 38073
SiteID	SiteName	Datum	Zone East			Site Status	SiteFeatu	res	SiteTypes	Reports
37-3-0350	Mt Owen (1996) 9:	AGD	56 3196		Open site	Valid	Artelact :-		Open Camp Site	3569
37-3-0351	Contact	Recorders AGD	56 3191		floor sta	Destroyed	Artefact :-	Permits	857	3569
37+3-9351	Mt Owen (1996) 12:				Open site	Destroyed	Arrelact:-		Open Camp Site	3569
37-3-0152	Mr Owen (1996) 13:	Recorders AGD	Ms. Ruig 56 3192		Open site	Dustroved	Arrefact:	Permits	Open Camp Site	3569
III-A-O-MA	Contact	Recorders			Open sine	20millogra	Antonier	Permits	1570	3,00
37-3-0353	Mt Owen (1996) 15:	AGD	56 3194		Dpen site	Destroyed	Artefact :	Permits	Open Camp Site	3569
	Contact	Recorders			- Paris			Permits	1570	
37-3-0359	Mt Owen (1996).3:	AGD	56- 3197		Open size	Walid	Artelact:	LYLINGS	Open Camp Site	3569
	Contact	Recorders						Permits	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
37-3-0360	Mt Owen (1996), 2:	AGD	56 3189		Open site	Valid :	Arrefact :-		Isolated Find	3569
	Contact	Recorders	Ms.Jill Ruig					Permits		
37-3-0361	Mt Dwen (1996), 22,	GDA	56 3201		Open size.	Distrinyed	Armhet:		Open Camp Sur	3569
	Contact	Recorders	Ms jill Ruig					Permits	857	
37-3-0363	Mt Owen (1996), 26;	GDA	56 3199	25 6414989	Open site	Destroyed	Artefact :-		txolated Find	3569
	Contact	Recorders	Ms.lill Ruig					Permits	857	
37-3-0194	HVCC 1:	AGD	56 3203	55 6413489	Dpen tire	Destroyed	Artelact:		Open Camp Site	2043,2206
	Contact	Recorders	Pam Deany	innes.				Permits	360	
37-3-0195	HVCC 2:	AGD	56 3205	55 6413769	Open site:	Destroyed	Artefact :-		Isolated Find	2043,2206
	Contact	Recorders	Pam Dean-	lones				Permits	363	
37-3-0196	HVCC3:	AGD	56 3206	05 6413789	Open stre	Destroyed	Artefact :-		Open Camp Site	2043,2206
	Contact	Recorders						Permits	363	
37-3-0197	HVCC 4;	AGD	56 3205	35 6413869	Open site	Destroyed	Artefact:-		Open Camp Site	2043,2206
	Contact	Recorders						Permits	363	
17-3-019H	HVCC.50	AGD	56 3207		Open site	Destroyed	Arremet:		Open Camp Site	2043.2206
	Contact	Becorders						Permits	363	2010000
37-3-0199	HVCC 6:	AGIX	56 3209		Dpen site	Destroyed	Artefact :-		Isolated Find	2043,2206
G F WOOD	Contact	Recorders			Marin Street	No money of	American	Permits	363	2012 2202
37-3-0200	HVCC 85	AGO	56- 3213		Open site	Destroyed	Artelact		Isolated Find	2043,2306
37-3-0201	HVCC 9;	Recorders AGD	56 3214		Open sité	Destroyed	Artefact:-	Fermits	Open Camp Site	2043.2206
11-3-9201					open site	Destroyed	Attendet:-		363	2043,2200
37-3-0202	Contact HVCC 10:	Recorders AGD	56 3214	Annual Control of the	Open site	Desiroyed	Asseluct -	Permits	Open Camp Site	2043,2206
The state of	Contact		Pam Dean-		Jan Bross	practigue	311111111111111111111111111111111111111	Permits	363	2 a fortagene
	Commacs	RECORDETS	ram Deans	lomex-				Lecimos	303	

	SiteName		one Easting	Northing	Context	Site Status	SiteFeatur	es	SiteTypes	Reports
37-3-0207	HVCC 11/	GDA	56 321135	6414569	Open site	Destroyed	Arrefact :-		Open Camp Site	2043.2206
37-3-0204	Contact	Recorders GDA	Pam Dean-Jones	PARAFER	A	Printerson of S	Arrelact:-	Permits	363 Isolated Find	2043,2206
37-3-0204	UVCC 124		56 321185	6414569	Open site	Distroyed	Armiatt:-			2043,2206
37-3-0205	UVCC 13:	Recorders GDA	56 321325	6414609	Open site	Destroyed	Arrefact :-	Permits	Open Camp Site	2043,2206
37-3-0203	Contact	Recorders	Pam Dean-lones	0424003	-chemann.	Danisyeu	Withhirt !-	Permits	363	2070,2209
37-3-02D6	HVCC 15	GDA	56 3Z1585	6414234	Djum size	Destroyed	Artelact:	remins	Open Camp Sun	2043.2206
	Contact	Recorders	Pam Dean-Jimes					Permits	3611	
37-3-0208	HVCC 17;	AGD	36- 321245-	6414569	Open site	Destroyed.	Arrefact:-	Commo	Open Camp Site	2043,2206
	Contact	Recorders	Pam Dean-Jones					Permits	363	
37-3-0209	(IVCC 1ft)	AGD	56 321345	6414679	Open stre	Destroyed	Artelact:		Open Camp Site	2043.2200
	Contact	Recorders	Pam Dearofones					Permits	363	
37-3-0211	HVCC 20;	AGD	56 321600	6414690	Open site	Valid	Artelact:-		Open Camp Site	2043,2206
	Contact	Recorders	Pam Dean-Jones					Permits	363	
17-3-0212	HVCC21:	AGD	56 321520	6414650	Open site	Villid	Arrefacts -		Open Camp Site	2043.2206
	Contact	Becorders	Pam Hean-Jones					Permits	363	
37-3 0213	HVCC 22)	AGD	56 321550	6414600	Open site	Valid	Artefact:-		Open Camp Site	2043,2206
-	Centact	Recorders	Pam Dean-Junes	-	_		- Andrews	l'ermits :	363	24.007
17-3-0214	HVCC 23:	AGD	36 321290	6414900	Opensite	Valid.	Arteloci		Open Camp Site	2043,2206
	Contact	Recorders	Pam Denn-Jones			70.04		Permits	363	
37-3-0215	HVCC 24	AGD	56 321000	6414500	Open (ite	Valid	Artefact:-		Open Camp Site	2043.2206
37-3-0216	Contact	Recorders AGD	Pam Dean-Jones 56 321000	64145R0	Open size	Valid	Arrelace:-	Permits	363 Ivulared Find	-2043,2206
arramean.	Contact		Pam Dean-Joney	DALGOUN	Opension	Name :	Attender.	Permits	368	2013,2200
37-3-0217	HVCC 26:	AGD AGD	56 321100	6414540	Open site -	Valid	Artefact :-	Permus	Open Camp Site	2043,2206
	Contact	Recorders	Pam Dean-iones	0.72.72.10	. Shan and		rittings.	Permits	363	No. Inches
37-3-021H	HVCC 27	AGD	56 3Z1010	6414950	-Dimm-tite	Valid	Artefact:	Camina	Open Camp Sus	2043,2206
	Contact	Recorders	Pam Dear-limes					Permits.	368	
37-3-0220	HVCC 29;	AGD	56- 321000	5414760	Open site:	Valid	Artefact:-	CHANGE	Open Camp Site	2043,2206
	Contact	Recorders	Pam Dean-Jones					Permits	363	
	(IVCC 30)	AGD	56 320970	6414870	Open site	Valid	Artelact :-		Open Camp Site	2043,2206
37-3-0221	Contact	Recorders	Pam Dean-Jones					Permits	363	
17-3-0221	HVCC 37:	GDA	56 319965	6413410	Open site	Destroyed	Arrefact:-		Open Camp Sile	2043,2206
		Recorders	Pam Dean-Jones					Permits	363	

SiteName	Datum	Zone Easti	ng Northing	Context	Site Status	SiteFeatur	res	SiteTypes	Reports
HVCC 3IH	GDA	56 31995	6413399	Open site	Destroyed	Artelact :-		Open Camp Site	2043.2206
Contact						7.7.1	Permits	363	
HVCC 39;	GDA	56 31995	6413349	Open site	Destroyed	Artefact:-		Isolated Find	2043,2206
Contact	Recorders			_			Permits	363	
				Open site	Dottroyed	Arremeta-		The second second	2043,2206
						A	Permits		2012.000
				Dpen size	Destroyed	Artiefact:	30.00		2043,2206
				Years stee	Donosood	Antologica	Permits		2042 2202
				Their site	Destroyed	Viteraci :-			2043,2206
	- Henry			There ind	Distancial	Kathliani			2043.2206
				Open site	Describyen	Vitiguer:			2042/2500
				Ommelie	Danismurd	Washington.	Permits		2043,2206,102
Dreces.	Little 1	ad again	1913/07	- Open suc	Desirayed	Attitudents:		Lonnies Long	139
Contact	Recorders	Pany Dean-fo	nes				Permits	363	
HVCC 45;	GDA	56 32011	6413819	Open site	Destroyed	Artelact:		Open Camp Site	2043.2206.102 139
Centact	Recorders						Permits	363	
HVCC 451	GDA	56 32026	6414109	Open Size	Dantroyed	Argelact:-		Open Camp 500	2013,2206
Contact	Recorders						Permits	363	
				Open site	Destroyed	Artefact:-			2043,2206
				100		-			
				Opur stor	Desiroyed	Arminet:-			2043,2206
				Warran Island	No.	-			2012-2001
				Open site	Destroyed	Attenct:			2043,2206
				Description	Description	American		363	
				- Open-sae	Destroyer	Artwiner:-			
				Ones die	Personnel	Amelionis			
				rypen site	mestroyed	nitelact:			
				Open sine	Value	AVEGUACIO			
				Appendic	Tallu.	Mindact:-			
MOCO IF-24	GDA	56 31979		Open site	Valid	Artefact :-			
Contact	Recorders	Mr.Ben Chur					Permits		
M000 IF-25	GDA	56 31970		Opensite	Valid	Arrefact :-	LETHILS		
	(VVCC 3)	(VCC 3) (Contact Recorders Recorders (VCC 40)	WYCC 38	Contact	Open date				

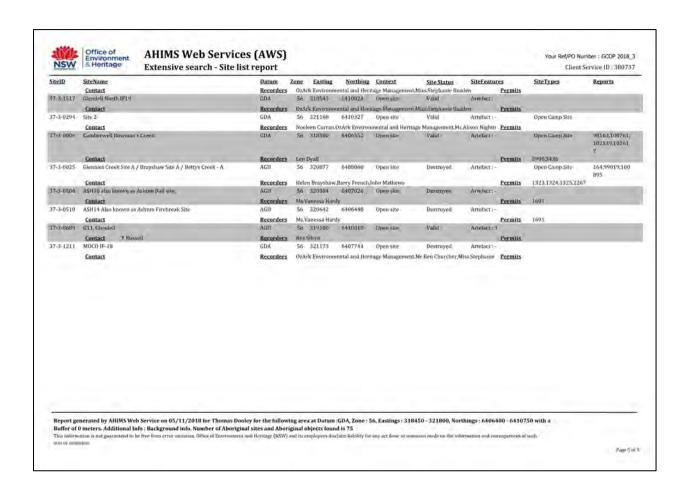


SiteID 37-3-0521	SiteName MO-IF1	Datum AGD	Zone Easting 56 319018	Northing 6410130	Context Open site	Site Status Valid	SiteFeatures Artefact :-		SiteTypes	Reports
37-3-9321	The second secon				347.2 (0.0)	Valid				
37-3-0494	Contact MO-IF2	Recorders AGD	ERM Australia Po 56 318955	6410076	Open site	Valid	Arrelact:-	ermits		
31-3-04-34	Contact	Recorders	EllM - Thornton	D419070	Openance	1 0000		ermiis		
37-3-050H	ASH12	AGD	56 320094	6406775	Open site	Destroyed	Arteract :-	ermus.		
	Contact	Recorders	Ms.Vanessa Haro		. den me	and the same of th		ermits	1691	
37-3-0509	ASHLY	AGIX	56 320104	6406518	Dipen-tire	Destroyed	Arielett:	STHITE	1091	
	Contact	Recorders	Ms.Vannasa Hara					ermits	1601	
37-3-0520	ASH24	AGD	56 320680	6406986	Open site	Destroyed	Artefact :-	O mus	1100	
	Contact	Recorders	Ms.Vanessa Hard		-2,511			ermits	1691	
37-3-0526	Ashton EWA 10	GDA	56 320252	6407135	Open site	Valid.	Artelact:-	Samuel .	1071	
	Contact	Recorders			200	donauement, Miss Ste		ermits		
37-3-0527	Ashton EWA 17	AGD	56 319974	6406963	Open site	Valid	Artefact:-	- Linux		98163
	Contact	Recorders	Dan Witter					ermits		
97-9-0528	Ashton Ridge Top site	AGD	56 320920	6406428	Opensite	Postroyed	Arrefact:	-Limba		98163
	Contact	Recorders	Day Writer				Pe	ermits	1601	
37-3-0530	Ashton EWA 25	AGD	56 319418	6406709	Open site	Destroyed	Art (Figment of Engraved) -			98163
	Contact	Recorders	Dan Witter				Pe	ermits	1691	
37-1-0531	Autton BWA 9	AGD	56 320294	6406305	Open site	Dontroyed	Artelact:-			98163
	Contact	Recorders	Dan Witter					ermits	1691	
37-3-0532	Ashton Slope site	AGD	56 320278	6406766	Open site	Destroyed	Artefact:			98163
	Contact	Recorders	Dan Witter					ermits	1691	
37-3-0497	ASHA also known as (Ashton Bridge Site)	AGU	56 310516	//(0652)	Opension	Descriyed	Arrefact:-			
	Contact	Recorders	My. Vanessa Haro	4				ermits	1691	
33-3-0004	(refer to 37-3-0498) ASH2	AGD	56 320916	6406359	Open site	Deleted	Artefact:-			
	Contact	Recorders	Ms.Vanessa Haro					ermits		
37-3-0498	ASH 2	AGD	56 320916	8406359	Dpm site	Destroyed	Amelact:-			
THE R LABOR	Contact	Recorders	Ms Vannsa Hare			0.01		ermits	1891	1001001010
37-3-0500	ASH4 Waterhole Site same as 37-3-0006	GDA	56 318500	6406552	Opensite	Valid	Artefact !-			102139,10261
_	Contact	Recorders	Len Dyall.Ma.Var					ermits		-
37-3-0505	ASH9 also known as (Ashion Tributary Site)	AGD	56 320650	A406758	Opur site	Destroyed	Artefact:-			
	Contact	Recorders	Mi-Vanessa Hari					ermits	1691	
37-3-0507	ASH11	AGD	56 320146	6406945	Open site	Destroyed	Arrefact :-			



SiteID	SiteName	7.17	Zone Easting Northing		Site Status	SiteFeatures	SiteTypes	Reports
37-3-0604	Bettys Creek 14	Recorders GDA	Mowelt (Australia) Pty Limited 56 320759 6407271	Open site	Destroyed	Permits Arrefact:-	2267	99019,100895
37-3-0004	The state of the s			Open sice	Destroyed		2267	33013/100932
37-3-0605	Bottys Greek 15	Recorders GDA	Umwelt (Australia) Pty Limited 56 320638 6407440	Open site	Dostroved	Artefact: I	2267	99019,100895
	Contact	Recorders	Limwelt (Australia) Ptv Limited	- September	2,500,000	Permits	2267	2000 11 40000000
37-3-0606	Bettys Creek To	GDA	56 320877 6408654	Dien site	Destroyed	Artefact :-	4497	99019.100895
	Contact	Recorders	(Imwelt (Australia) Pty Limited	7 (100 000		Permits	2267	
7-3-0607	Bettys Creek IT	GDA	56 320833 6409048	Open Site	Destenyed	Artefact:-	2201	99019/100895
	Contact	Recorders	Umwelt (Australia) Pty Limited			Permits	2267	
7-3-0608	Bettys Creek 1II	GDA	56 320455 6407668	Open litté	Destroyed	Artefact:-		99019,100095
	Contact	Recorders	Umwelt (Australia) Pty Limited			Permits	2267	
7-3-0609	Bettys Groek 19	AGD	56 319774 6407650	Open size	Designyed	Arrelact;	1	99019,100895
	Contact	Recorders	Umwelt (Australia) Pty Limited			Permits	2267	
7-3-0610	Bottys Creek 20	AGD	56 319625 6407469	Open site	Destroyed	Artefact :-		99019,100895
	Contact	Recorders	anice Wilson			Permits	2267	
57×3×0611	Hettys Creek 21	GDA	56 320865 6410243	Djum size	Destroyed	Artefact : 1		.99019
	Centact	Recorders	OzArk Environmental and Heri	age Management	OxArk Environment	at and Heritay Permits		
7-3-0612	Bettys Creek 22	AGD	56 321033 6410107	Open site:	Valid	Artefact:-		99019
	Contact	Recorders				Permits		
17-3-0622	Swamp Creek 5	GDA	56 210912 6407719	Open site	Destroyed	Artefact : II. Potential Archaeological Denosti (PAD) :-		99019.100095
	Contact	Recorders	Umwelt (Australia) Pty Limited			Permits	7267	
7-3-0623	Swamp Creek 6	GDA	56 319739 6409247	Open site	Destroyed	Artefact :-		99019,100895
	Contact	Recorders	Umwelt (Australia) Pty Limited			Permits	2267	
17/3/0624	Swamp Creek 7	AGD	56 319492 6400385	Upen site	Destroyed	Artelact :-		99019,100095
	Contact	Recorders	(finwell (Australia) Pty Limited			Permits	2267	
37-3-0625	Swamp Greek B	AGD	56 319634 6409058	Open site	Destroyed	Artefact : 1		99019,100895
	Contact	Recorders	Umwelt (Australia) Pty Limited			Permits	2267	
37-3-0626	Swamp Creek 12	AGD	56 319273 6408935	Open site	Doutcoyed	Artefact:-		99019,100095
	Contact	Recorders	Umwelt (Australia) Pty Limited		2777	Permits	2267	
37-3-0627	Swamp Greek 13	GDA	56 319417 6409904	Open site	Destroyed	Artefact :-		99019,100895
37-3-0660	Contact	Recorders	Umwelt (Australia) Pty Limited	Year of the	Valid	Permits	2267	
37-3-0000	Swamp Crock PAD	AGD	56 320150 6410475	Open site	Yana	Artefact:		
	Contact T Russell	Recorders	Umwelt (Australia) Pty Limited			Permits		

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatur	es	SiteTypes	Reports
37-3-1185	M0C0 IF-16	GDA	56	321445	6409885	Open site	Valid	Artefact : 1			
	Contact	Recorders				tage Management.0			Permits		
37-3-1186	MOCO (F-17	GDA		321066	6407957	Open size	Valid	Arrefact: 1			
	Contact	Recorder				inge Management M			Permits		
37-3-1193	MOCO 05-5	GDA	56	321276	6410179	Open site	Partially	Artefact : 1			
	Contact	Becorders	OzA	rk Environm	ental and Heri	tage Management,0		al and Heritay	Permits		
37-3-1194	MOCO OS-6	GDA	56	320718	6409739	Djum sire	Valid	Amelact:1			
	Contact	Recorders				inge Management.O			Permits		
37-3-1195	MOCO 05-7	GDA		321013	6408399	Open site	Destroyed	Artefact : 1			
NT T 14416	Contact	Recorders	_			tage Management.0			Permits		
37-3-1196	MOCO OS 8	GDA	30	321748	64010003	Open site	Partially Destroyed	Artelact: 1			
	Camtact	Recorders	OzA	rk Environm	ental and Heri	tage Management,0		al and Heritay	Permits		
37-3-1197	M0C0 05:9	GDA	56	320364	6407298	Open site:	Valid	Artefact : 1			
-	Contact	Recorders				tage Management.0			Permits		
37-3/1496		GDA		3111871	6410241	Open site	Valid	Artylact:-			
27.7.1407	Centact	Recorders				tage Management N		Arrefact !-	Permits.		
37-3-1497	2CK-11	GDA		319089	6410231	Open site	Valid				
37-3-1490	Contact Swamp Creek II-4	Recorders GDA		3111805	6407340	tage Management.M Open site	Valid.	Artelact :-	Permits		
	Contact	Recorders				tage Management,0			Permits		
37-3-1491	Swamp Creek IF-1	GDA		318640	6407727	Open site	Valid	Artefact :-	Latina		
	Contact	Recorders	OzA	rk Environm	ental and Heel	tage Management,N	tiss.Stephanie Rusi	den	Permits		
17-3-1492	Swamp Croek IF-2	GDA	56	110807	6407327	Open site	Valid	Artefact: -			
	Contact	Recorders				tage Monagement.0			Permits		
37-3-1493	Swamp Creek IF-3	GDA		3111805	6407330	Open site	Valid	Artefact:-			
37 J. 1499	Contact Swamp Creek-OS1	Recorders GDA		The Environm 31/1819	ental and Heri 6407299	Dpan Sire	7:Ark Environment Valid	Artelect:	Permits		
2/3-1111	Contact			2100-1		tage Management, M	1000	witeler	Honorite :		
37-3-150B	Glendeli North OSZ8	Recorders GDA		318611	640B397	Open site	Valid Valid	Artefact :-	Permits		
	Contact	Recorders				tage Management.M			Permits		
37-3-1509	Glendell North OS27	GDA		318588	A408562	Open size	Valid	Artefact:-			
100	Contact	Recorders	OzA	rk Environm	ental and Heri	tage Management A	tiss Stephanie Busi	len	Permits		
37-3-1513	Glendell North IF23	GDA	56	318833	6407204	Open site	Valid	Artefact :-			



APPENDIX 3: SALVAGE REPORT



Environmental and Heritage Management P/L

Silcrete scraper from Glendell North OS24 (Artefact 12).

ABORIGINAL CULTURAL HERITAGE SALVAGE REPORT

GLENDELL MINE
RAVENSWORTH, NSW
DECEMBER 2018

Report Prepared by

OzArk Environmental & Heritage Management Pty Ltd

for Mt Owen Pty Limited

OzArk EHM

145 Wingewarra St (PO Box 2069) Dubbo NSW 2830

Phone: (02) 6882 0118 Fax: (02) 6882 0630 enquiry@ozarkehm.com.au www.ozarkehm.com.au OzArk Environmental & Heritage Management

EXECUTIVE SUMMARY

Mt Owen Pty Ltd (Mt Owen) has commissioned OzArk Environmental & Heritage Management (OzArk) to undertake a collection of surface artefacts at three sites located within the Glendell Mine Approved Disturbance Area (DA 80/952).

The salvage program was undertaken by Ben Churcher, OzArk Principal Archaeologist, with the assistance of Aboriginal community member Maree Waugh on 12 November 2018.

As all three sites are located within the approved disturbance area for the Glendell Mine, salvage of the sites was undertaken according to Section 6.2.1.1 of the *Mt Owen Complex Aboriginal Cultural Heritage Management Plan* (ACHMP) (V4, XMO SD PLN 0060).

The three sites salvaged under the conditions of the ACHMP and documented here are:

- Glendell North Open Site 24 (GN OS24: 37-3-1510)
- Glendell North Open Site 24 (GN OS27: 37-3-1509)
- Glendell North Isolated Find 25 (GN IF25: 37-3-1511).

All sites are now listed with the Aboriginal Heritage Information Management System (AHIMS) as destroyed with no further management requirements. All salvaged artefacts are stored in a secure location at the Glendell Mine Administration Offices. When it is constructed during 2019, the artefacts, along with other artefacts from the Mt Owen Complex, will be stored at the Wollombi Brook Education and Keeping Place.

Aboriginal Cultural Heritage Salvage Report: Glendell Mine

OzArk Environmental & Heritage Management CONTENTS Executive Summary..... Introduction **FIGURES TABLES** Table 1: Glendell North OS24. Artefact attributes..... **PLATES** Plate 1: Photographs showing an overview and details of Glendell North OS24. 8 Aboriginal Cultural Heritage Salvage Report: Glendell Mine

OzArk Environmental & Heritage Management

1 Introduction

Introduction

Mt Owen Pty Ltd (Mt Owen) has commissioned OzArk Environmental & Heritage Management (OzArk) to undertake a collection of surface artefacts at three sites located within the Glendell Mine Approved Disturbance Area (DA 80/952).

These sites were recorded in April/May 2018 during field assessment for the Glendell North Continued Operations Project (GCOP; report forthcoming). While the area where the sites are located is outside of the Additional Disturbance Area for the GCOP, as this area is already approved for disturbance under the Glendell Mine approval (DA 80/952), the GCOP survey team assessed a buffer surrounding the GCOP Additional Disturbance Area to ensure that any Aboriginal sites located just beyond GCOP impacts would be known. It was within this buffer area that the three sites discussed in this report were recorded.

As all three sites are located within the approved disturbance area for the Glendell Mine, salvage of the sites was undertaken according to Section 6.2.1.1 of the *Mt Owen Complex Aboriginal Cultural Heritage Management Plan* (ACHMP) (V4, XMO SD PLN 0060).

The three sites salvaged under the conditions of the ACHMP and documented here are:

- Glendell North Open Site 24 (GN OS24: 37-3-1510)
- Glendell North Open Site 24 (GN OS27: 37-3-1509)
- Glendell North Isolated Find 25 (GN IF25: 37-3-1511).

The location of the three sites are shown on Figure 1.

The salvage program was undertaken by Ben Churcher, OzArk Principal Archaeologist, with the assistance of Aboriginal community member Maree Waugh on 12 November 2018. Melanie Dillon (Mt Owen Glendell Operations Environment and Community Officer) accompanied the salvage team.

Aboriginal Cultural Heritage Salvage Report: Glendell Mine





2 SALVAGE SURFACE COLLECTION RESULTS

The salvage program discussed here details the collection of surface artefacts at three sites only: GN OS24, GN OS27 and GN IF25. All sites are located in highly modified contexts; specifically a raised farm track, a dam wall and a top soil dump respectively. As such, all recorded artefacts are in secondary contexts and all sites have a low scientific significance. Despite the fact that all recorded artefacts are in a secondary context, it is assumed that they are representative of the artefacts formerly located in the flat floodplain of Swamp Creek.

Glendell North OS24 (37-3-1510)

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318346 N 6409339

Location of Site: 500 metres (m) east of Hebden Rd and 60 m southeast of Swamp Creek, Ravensworth. Located along a farm track that has been raised above the surrounding low-lying, probably swampy, landform; presumably using soil bulldozed from surrounding areas (Figure 2). The site is located on the floodplain of Swamp Creek along this artificial bund (Plate 1).

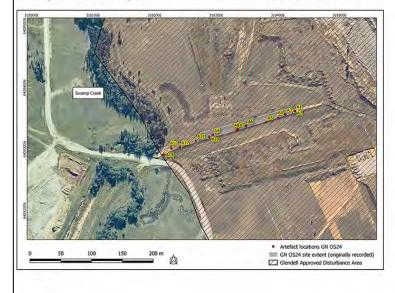
Aboriginal Cultural Heritage Salvage Report: Glendell Mine

OzArk Environmental & Heritage Management

Results of Salvage: Glendell North OS24 was recorded as a low-density artefact scatter comprising seven mudstone flakes. The 150 by 10 m extent of the site was defined by the area of exposure along the bund. Potential for the presence of further subsurface archaeological deposits at Glendell North OS24 was assessed as negligible as the site was recorded in a highly modified context.

The salvage recovered fourteen artefacts, including mudstone flakes and a silcrete endscraper. Artefacts were recorded outside of the original site extent but all were confined to the raised bund (Plate 1). All artefacts are in secondary context within a highly modified landform, however, it is assumed that the artefacts would have originated from the surrounding floodplain landform to Swamp Creek. As all artefacts are in a secondary context they have a low scientific value. The Aboriginal Site Impact Recording Form (ASIRF) for this site is included in Appendix 1.

Figure 1: Aerial showing location of Glendell North OS24 and the recovered artefacts.



Aboriginal Cultural Heritage Salvage Report: Glendell Mine

Table 1: Glendell North OS24. Artefact attributes.

Artefact #	Artefact type	Material	Integrity	Reduction	Size	Comments	
A1	Flake	Mudstone	Distal fragment	Tertiary	21x27x7mm		
A2	Flake	Mudstone	Complete	Tertiary	23x24x4mm		
A3	Flake	Mudstone	Proximal fragment	Tertiary	24x19x4mm		
A4	Flake	Mudstone	Distal fragment	Tertiary	11x17x3mm		
A5	Flake	Mudstone	Complete	Secondary	56x44x16mm		
A6	Flake	Mudstone	Distal fragment	Secondary	14x15x3mm		
A7	Flake	Mudstone	Complete	Secondary	33x27x9mm		
A8	Flake	Mudstone	Distal fragment	Tertiary	18x21x4mm		
A9	Flake	Mudstone	Complete	Tertiary	35x24x11mm		
A10	Flake	Mudstone	Complete	Secondary	28x31x10mm		
A11	Flake	Mudstone	Proximal Fragment	Tertiary	21x21x6mm		
A12	End Scraper	Silcrete	Complete	Tertiary	49mm	Irregular retouch to distal and marginal edge, steep and invasive.	
A13	Flake	Mudstone	Proximal fragment	Secondary	40x21x12mm		
A14	Flake	Mudstone	Complete	Secondary	63x43x21mm	Retouch to one margin.	

Glendell North OS27 (37-3-1509)

Site Type: Open artefact scatter

GPS Coordinates: GDA Zone 56 E 318588 N 6408562

Location of Site: 1.5 km north of Lemington Rd and 200 m east of Swamp Creek, Ravensworth. The site is located along the north-western edge of a dam on the dam wall in a modified location (Figure 3). The dam is located on a gentle-moderate gradient midslope (Plate 2).

<u>Description of Site</u>: Glendell North OS27 is a low-density artefact scatter comprising a mudstone flake and a silcrete flake. The 10 by 20 m extent of the site was defined by the area of exposure over the dam wall. Potential for the presence of subsurface archaeological deposits at Glendell North OS27 was assessed as nil as the site location is highly modified.

Salvage recovered the two artefacts originally recorded within the extent previously defined (Plate 2). These artefacts are in a secondary context and have a low scientific value. The ASIRF for this site is included in **Appendix 1**.

Aboriginal Cultural Heritage Salvage Report: Glendell Mine

OzArk Environmental & Heritage Management

Figure 2: Aerial showing location of Glendell North OS27 and the recovered artefacts.



Table 2: Glendell North OS27. Artefact attributes.

Artefact #	Artefact type	Material	Integrity	Reduction	Size 18x22x5mm	
A1	Flake	Mudstone	Medial fragment	Tertiary		
A2	Flake	Silcrete	Proximal fragment	Tertiary	25x33x5mm	

Glendell North IF25 (37-3-1511)

Site Type: Isolated find

GPS Coordinates: GDA Zone 56 E 318341 N 6409244

<u>Location of Site</u>: 1.2 km northeast of the New England Hwy and 150 m southeast of Swamp Creek, Ravensworth (**Figure 4**). The site is located on the upper floodplain of Swamp Creek in an area of stockpiled soil (**Plate 3**).

<u>Description of Site</u>: Glendell North IF25 was originally recorded as a single mudstone flake. The extent of the site was defined by a 5 m buffer around the artefact. Potential for the presence of further subsurface archaeological deposits at Glendell North IF25 was assessed as nil due to the highly modified nature of the site's location.

Aboriginal Cultural Heritage Salvage Report: Glendell Mine

Salvage recovered the artefact originally recorded, as well as an additional mudstone flake within the previously defined site extent (Table 3; Plate 3). These artefacts were recorded in secondary context in an area of extensive earthworks. The ASIRF for this site is included in Appendix 1.

Figure 3: Aerial showing location of Glendell North IF25 and the recovered artefacts.



Table 3: Glendell North IF25. Artefact attributes.

Artefact #	Artefact type	Material	Integrity	Reduction	Size
A1	Flake	Mudstone	Complete	Tertiary	29x13x9mm
A2	Flake	Mudstone	Complete	Tertiary	33x27x15mm

2.1 DISCUSSION

All artefacts previously recorded, along with several newly identified, were successfully salvaged from the three sites discussed here in accordance with the terms of Section 6.2.1.1 of the ACHMP.

As each of the sites were located in areas of heavy previous disturbance, the recovered artefacts are considered to be in secondary contexts with limited analytical potential. While all artefacts probably originated in the general area, the post-depositional movement of the artefacts

Aboriginal Cultural Heritage Salvage Report: Glendell Mine

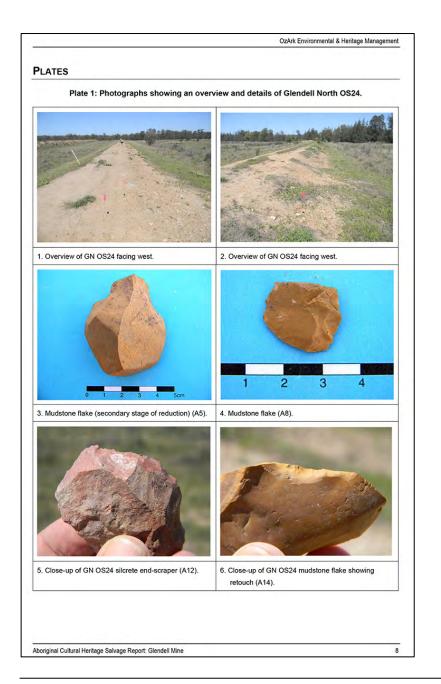
6

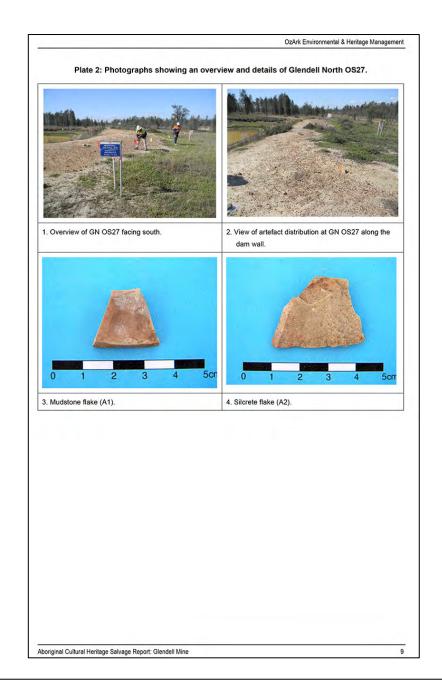
OzArk Environmental & Heritage Management

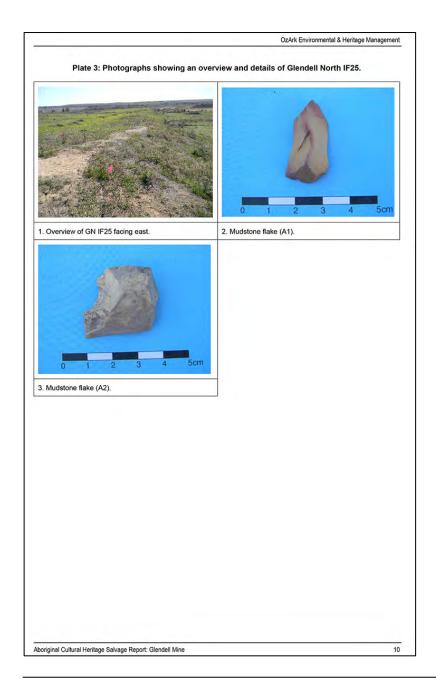
precludes them being able to meaningfully add to our knowledge of Aboriginal use or occupation of the area. As such, all sites have a low scientific value.

All sites are now listed with the Aboriginal Heritage Information Management System (AHIMS) as destroyed with no further management requirements. All salvaged artefacts are stored in a secure location at the Glendell Mine Administration Offices. When it is constructed during 2019, the artefacts, along with other artefacts from the Mt Owen Complex, will be stored at the Wollombi Brook Education and Keeping Place.

Aboriginal Cultural Heritage Salvage Report: Glendell Mine



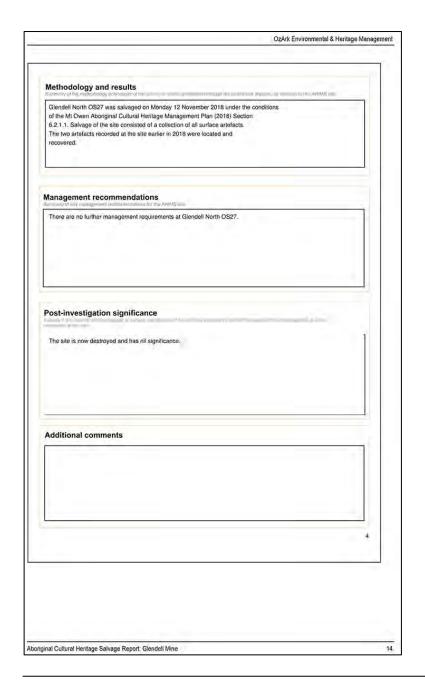


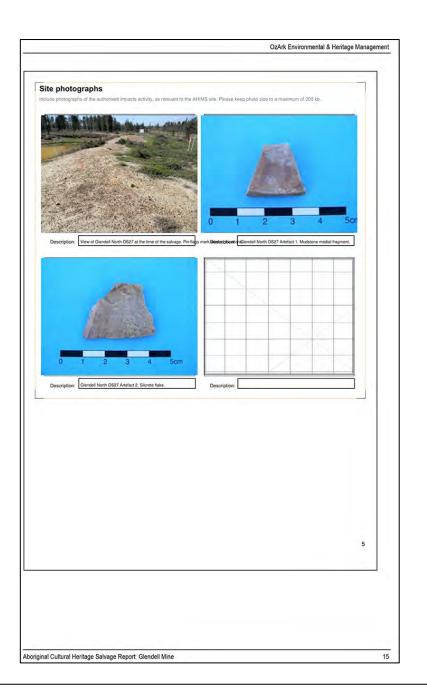


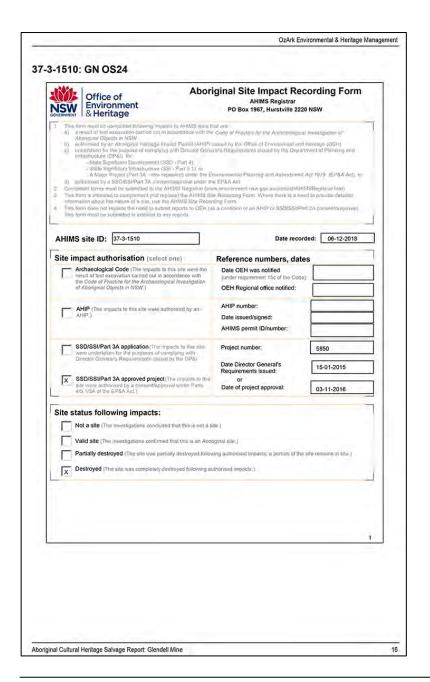


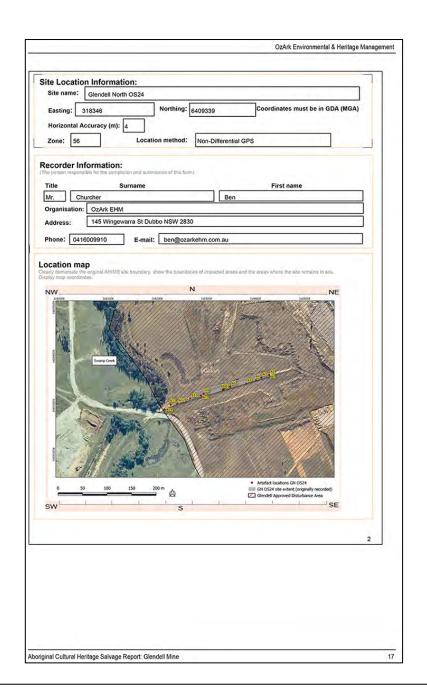
Site name	Glendell North OS27			
	1.		Constituents	ust be in GDA (MGA)
Easting:		orthing: 6408562	Coordinates in	lust be in GDA (MGA)
-	al Accuracy (m): 4	_		
Zone:	56 Location	method: Non-D	Differential GPS	
ecorder	Information:			
he person res	ponsible for the completion and submission	in of this form)		
Title	Surname		First nam	ie .
	Churcher on: OzArk EHM		Ben	
Address:	145 Wingewarra St Dubbo	NSW 2830		
_				
Phone:	0416009910 E-mail:	ben@ozarkehm.co	om.au	
		N I		, NE
sw	Reduced No.	N M Count No.		NE SE
sw	Removath Nat	To Control Mee		

ite contents information	open/closed site: Open Site condition: Disturbed	1
Features:	Scurred Trees Number of Length of Wildth of Scar Depth Regrowth Scar Length Scar Width feature(s) feature(s) (cm) (cm) (cm) (cm)	
1. Artelact Description:	sotions (m) extent (m) extent (m) From Species (m) Score Species	
ELLI TULL	care within a tigify distribud context and both have been milwod	
Features:	Scared Frees Number of Length of Width of Scar Dopth Regiowth Scar Length Soar Width of features (ed.) (cm) (cm) (cm) (cm)	
Description:	Star Species Species	
Features:	Scared Troos Number of Length of Width of Scar Depth Regioneth Scar Length Scar Width Number of feature(s) feature (s) Scar Depth Regioneth Scar Length Scar Width	
3. Description:	Number of Length of Wildri of Saar Depth Represent Saar Width features (single-seatest (m) extent (m) (cm) (cm) (cm) (cm) (cm) (cm) (cm)	
Features:	Number of Length of Wolth of Scar Dupth Regiowth Scar Length Scar Width features extent (m) extent (m) (on) (on) (on)	
Description:	Soir Tree shee Spaces	
eatures:	Number of Length of Width of Scar Dopth Regrent Scar Length Scar Width feature(s) feature(s) (eature(s) (eatur	
5. Description:	features voters (m) cotons (m) (cm) (cm) (cm) (cm)	
Other Site Glendali Nurth OS27 was recontate afte as located within the approve	ed as plan of the General Communal Operations Propect Sessionnerers in April May 2016. The disclosurous area for the General Mines (JA 80 90%).	
		3

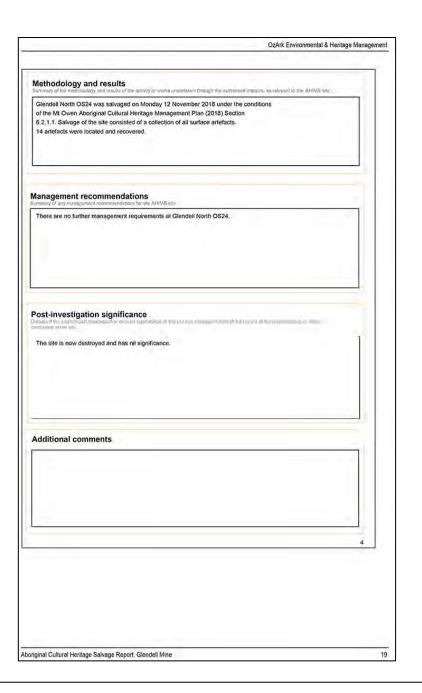


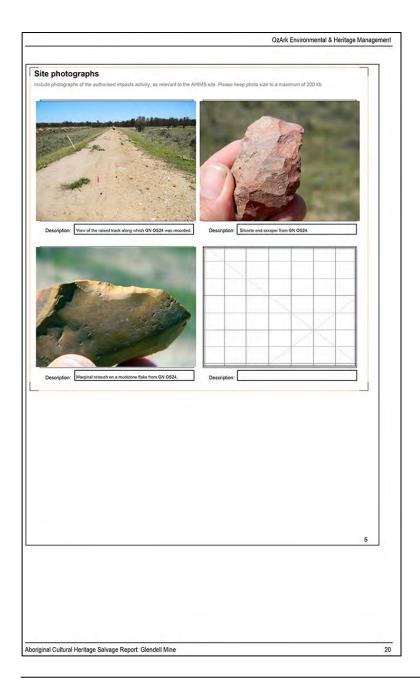


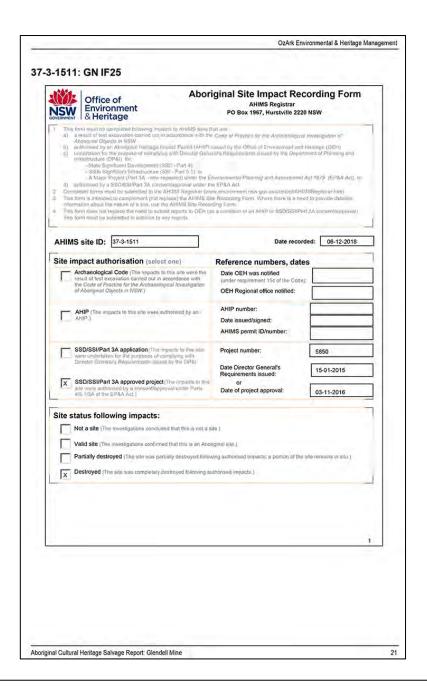




Features: 1. Artefact Description: 14 and facts booling on a form back that has been raised above to largely disturbed control and all have been moved post-dependent. Features: 2. Description: Features:	14 225	extent (m) 5 So Shi	r Depth Regrowth (cm) (cm) ar ppe sr writin a Scarr Corn (cm) (cm) Scarr Scarr	Scar Length (cm) Tree Species Sor Length (cm) Tree Species	Scar Width (cm) Scar Width (cm)
Anteleast Description: 14 anteleast Socialed on a form track that has been raised above the highly disturbed context and all have three moved post-deposition. Features: 2. Description:	4 225 he surrouncing low-lying land. Number of Length of feature(s)	Sociation Space All references in Which of feature (s) extent (m)	Scarre Scarre Depth Regrowth (cm) (cm)	Species ed Trees Scar Length (cm)	
Features: 2. Description:	Number of Length of feature(s)	Width of Spa feature (s) extent (m)	Scarn r Depth Regrowth (cm) (cm)	Scar Length (cm)	
2. Description:	Number of features (m)	extent (m) Sc.	r Depth Regrowth	Scar Length (cm)	
Description:		Scishi	ar pe	Tree Species	
Features:					
Features:					- F
	feature(s)	Width of Sca feature (s) extent (m)		Scar Length (cm)	Spar Width (cm)
3. Description:		Sea sha		Tree Species	
100					
Features:	Number of feature(s)	Width of Sca feature (s) extent (m)	Scarre r Depth Regrowth cm) (cm)	Scar Length (cm)	Scar Width (cm)
4. Description:		Sea she		Tree Species	
Features:	Number of Length of feature(s) extent (m)	Width of Sca feature (s) (extent (m)	Depth Regrowth	Scar Length (cm)	Scar Width (cm)
5. Description:		Sca		Tree Species	
					11
Other Site Glendell North OS24 was recorded as part of traffic:	he Glendell Cortinued Open area for the Glendell Mine (I	ations Project assess DA 80/952).	nent is Apolithay 2018	The	

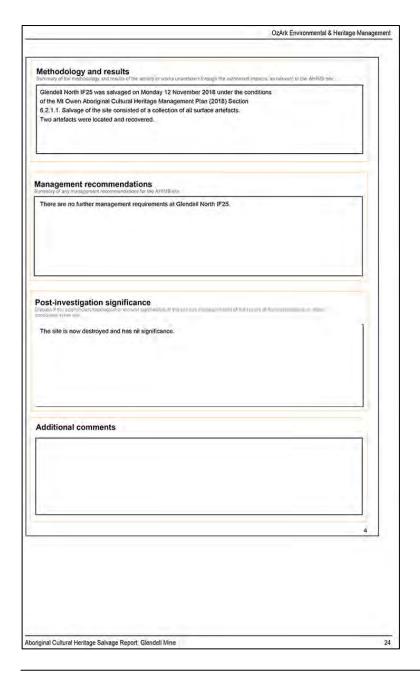


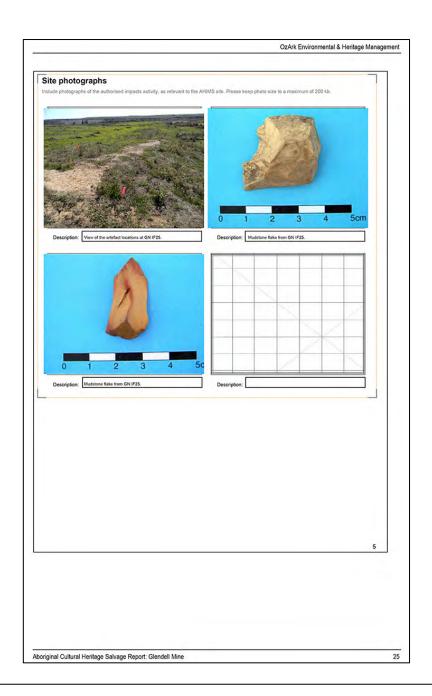




ne in GDA (MGA)
ins la sista.
NE
(F1) (1)
152995
97300
77777
/////
90000
9000
10140
1000
10.11
1/1923
90000
2220
00000
1////
2////
79479
(1090)
111793
11/2/2
5
>
bance Area
SE
2

te contents information	open/closed site: Open	Site condition: Disturbed
eatures:	Number of Length of Wight of feature(s) feature(s) extent (m) extent (m)	Scarred.Tress Scar Depth Regrowth Scar Length Scar Width (cm) (cm) (cm)
Artefact escription: Two artefacts located on a topooli stackpile. All art pool-deposition.	2 5 5	Soar Tree shape Species sen moved
eatures:	Number of Length of Wisth of restures (s) features extent (m) extent (m)	Scared Trees Scar Depth Regrowth Scar Length Scar Width (cm) (cm) (cm)
escription:		Scar Tree shape Species
eatures:	features feature(s) feature (s) extent (m) extent (m)	Scarped Trees Scar Depth Regiowth Scar Length Scar Width (cm) (cm) (cm) Scar Tree
escription:		Species Species
eatures:	feature(s) feature(s) extent(m) extent(m)	Scared Trees Scor Depth Regrowth Scar Length Scar Width (cm) (cm) (cm) (cm) Scar Scar Tree Species
eatures:	features extent (m) extent (m)	Scar Depth Regiowth Scar Length Scar Width (cm) (cm) (cm) (cm) (cm) Scar Scar Scar Scar Scar Scar Scar Scar
ther Site Sile of South 1925 was recent of the sile is located within the approve	nd as part of the Glendall Continued Operations Propert Jacob and deburbancy area for the Glendall Mine (DA 80/952).	Sourcest in Agnobility 2018. The





APPENDIX 4: SUPPLEMENTARY SITE LOCATION AND ARTEFACT PHOTOS





37-3-0469: VIEW ALONG TRENCH

37-3-0469: VIEW OF ARTEFACT DISTRIBUTION IN TRENCH





37-3-0768: VIEW OF EXPOSURE

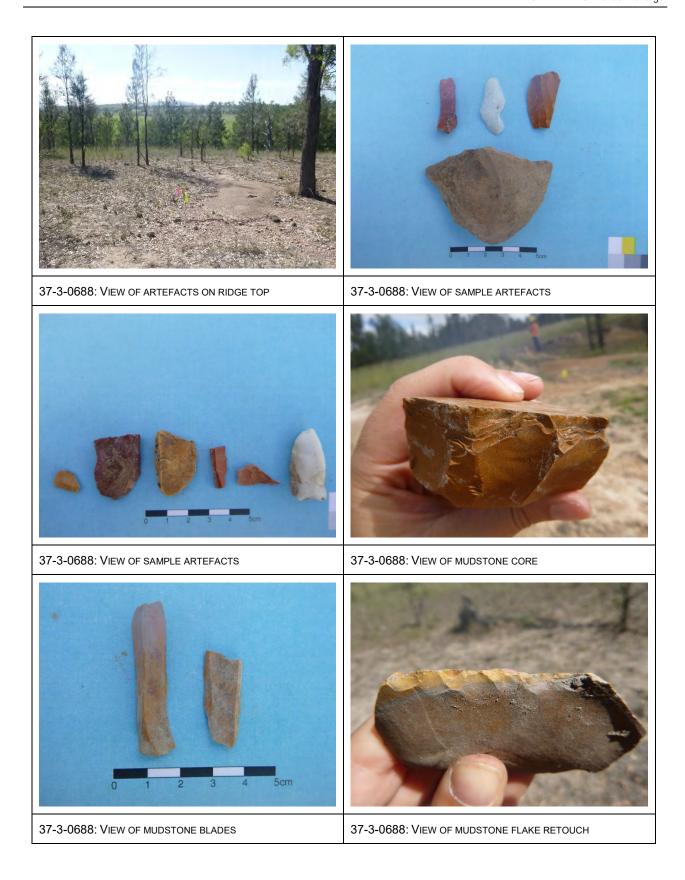
37-3-0768: VIEW OF SAMPLE SILCRETE AND MUDSTONE ARTEFACTS

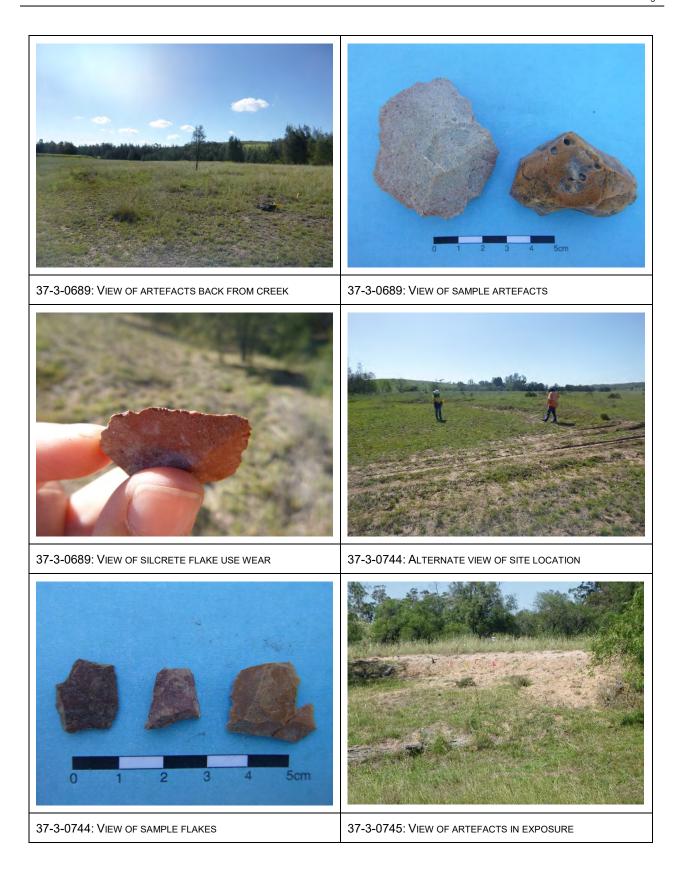




37-3-0768: VIEW OF SAMPLE SILCRETE ARTEFACTS

37-3-0688: VIEW OF ARTEFACTS WITHIN EROSIVE FEATURE

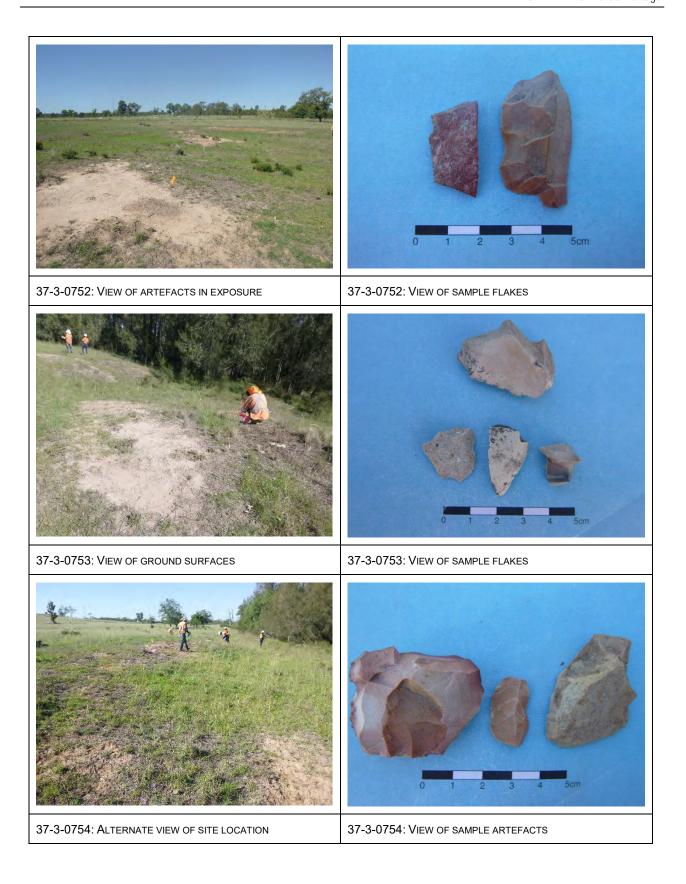




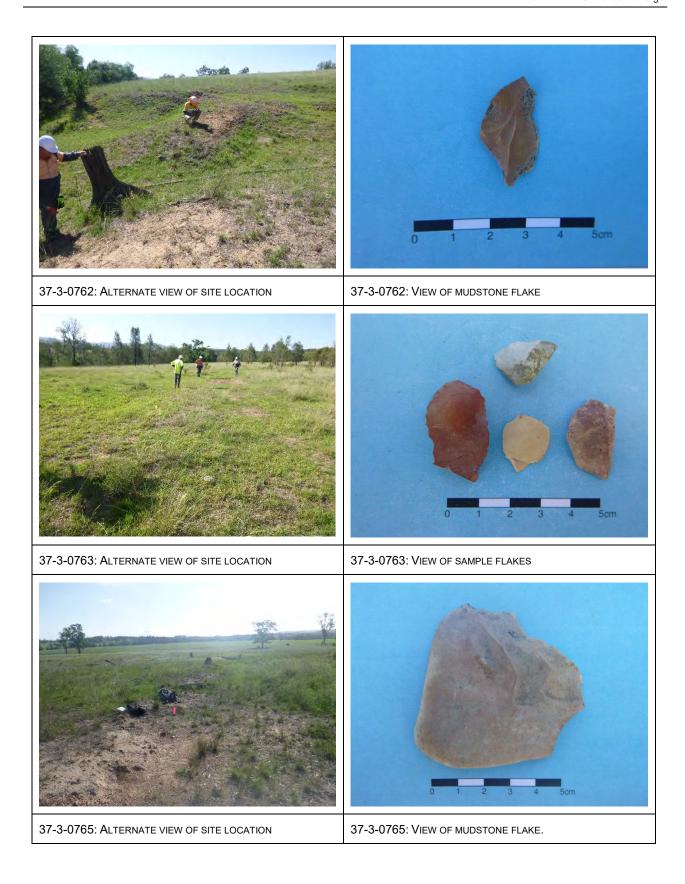






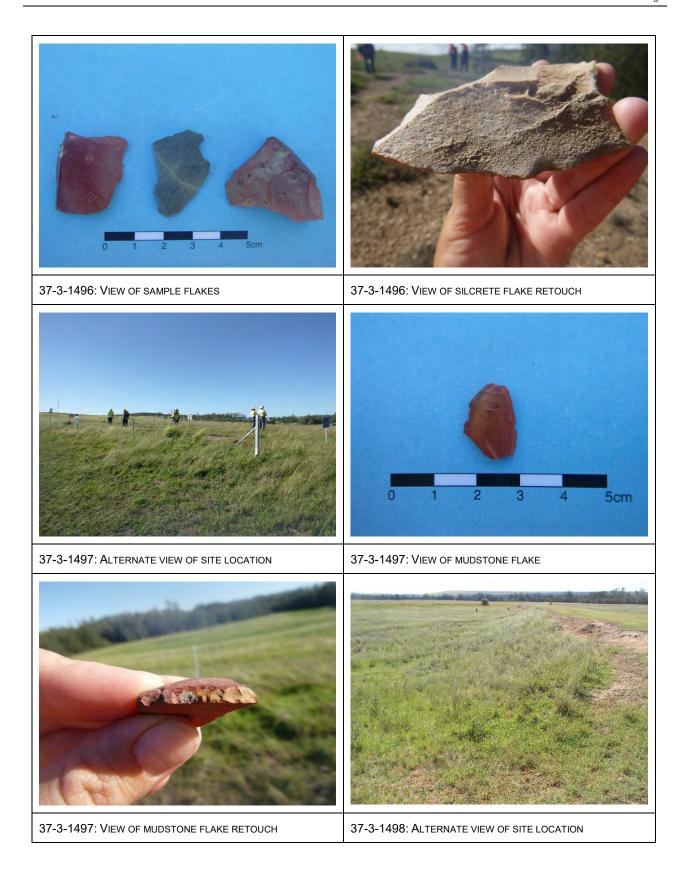
















0 1 2 3 4 5cm

37-3-1499: ALTERNATE VIEW OF SITE LOCATION



37-3-1499: VIEW OF SAMPLE FLAKES



37-3-1499: VIEW OF SAMPLE FLAKES



37-3-1502: ALTERNATE VIEW OF SITE LOCATION

37-3-1502: VIEW OF SAMPLE FLAKES



APPENDIX 5: TEST EXCAVATION METHODOLOGY

The following test excavation methodology is the finalised document correct as of August 2018. Any project descriptions, impact areas etc. are as they were in August 2018; although these may have changed since that time.





A VIEW OF ONE OF THE PROPOSED TEST EXCAVATION LOCATIONS ADJACENT TO BOWMANS CREEK IN THE NORTH OF THE PROJECT AREA.

ARCHAEOLOGICAL TEST EXCAVATION METHODOLOGY

Glendell Continued Operations Project
August 2018

PREPARED BY

OZARK ENVIRONMENTAL AND HERITAGE MANAGEMENT PTY LTD

FOR

UMWELT AUSTRALIA PTY LIMITED

ON BEHALF OF

MT OWEN PTY LTD

OzArk EHM

145 Wingewarra St (PO Box 2069) Dubbo NSW 2830

Phone: (02) 6882 0118 Fax: (02) 6882 0630 enquiry@ozarkehm.com.au www.ozarkehm.com.au

CONTENTS 1 Introduction 1 Code requirements for the Test Excavation Program.......4 Aboriginal community consultation 6 3 Archaeological Context 12 3.1.3 Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations 3.1.4 Archaeological Salvage. Liddell Coal Operations Development Modification 5 3.1.5 Mount Owen Continued Operations Project Salvage Program (OzArk 2017)...... 20 Proposed Methods 23 Predicative model 28 Research questions 28 4.4 Sampling Strategy 29 Glendell Continued Operations Project: Test Excavation Program Methodology

FIGURES

TABLES		
Figure 4-10: E	xample of placement for test excavation pits at Areas 5 & 6	36
Figure 4-9: De	etailed locations for the proposed test excavation program at Areas 9 & 10.	35
Figure 4-8: De	etailed locations for the proposed test excavation program at Area 8	35
Figure 4-7: De	etailed locations for the proposed test excavation program at Area 7	34
Figure 4-6: De	stailed locations for the proposed test excavation program at Areas 3 & 4	34
Figure 4-5; De	etailed locations for the proposed test excavation program at Areas 2, 11 &	123
Figure 4-4: De	etailed locations for the proposed test excavation program at Area 1	33
Figure 4-3: Lo	cation of the proposed test excavation program.	3
Figure 4-2. Ac	rial showing the type of sites within the Proposed Additional Disturbance A	rea. 26
Figure 4-1: As	erial showing sites within proximity to the Potential Additional Disturbance A	rea. 25
Disturbance A	rea	13
Figure 3-1. L	ocation of previously salvaged sites in the vicinity of the Potential Ad	ditiona
Figure 2-3. Th	e Potential Additional Disturbance Area overlain on a 1967 aerial image	1
Figure 2-2. Th	e Project Area showing major hydrological features	10
Figure 2-1. As	erial showing the Project Area and the Potential Additional Disturbance Area	a
Figure 1-1: Ke	ey Project features	

able 3-1, Sites salvaged within the Project Area under Permit SZ323	14
able 3-2. Sites within the Project Area salvaged under Consent #2267	15
able 3-3. Details of sites within the Project Area salvaged under AHIP C0000623	320
able 3-4. Sites salvaged within the Project Area under SSD-5850	21
able 4-1: Proposed areas for test excavation.	27
able 4-2: Previously recorded sites with PADs not included in the test excavation	program 27
able 4-3; Sampling methodology for text excavation program	31

Glendell Continued Operations Project: Test Excavation Program Methodology

OzArk Environmental & Heritage Management

1 INTRODUCTION

1.1 PREAMBLE

OzArk Environmental & Heritage Management (OzArk) would like to acknowledge the Traditional Owners of the area—the Wonnarua peoples—and pay respect to their cultural heritage, beliefs and continuing relationship with the land.

We pay respect to the Elders, both past and present, for they hold the memories, traditions, culture and hopes of Aboriginal people in the area.

This document sets out the proposed methodology for the test excavation program associated with the Glendell Continued Operations Project (the Project). Test excavation is an archaeological tool designed to help identify archaeological deposits of conservation value and to understand the nature and extent of the subsurface component of sites. The permissible actions undertaken during the test excavation program are governed by Section 3.1 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (Code of Practice). This clearly establishes that a test excavation program should sample a given area, rather than to completely excavate it, and that the program should be designed to answer specific archaeological questions rather that other, broader questions (see Requirement 17 Section 1.3).

The test excavation methodology for the Project was written by Ben Churcher (Principal Archaeologist, OzArk).

1.2 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The Glendell Mine is an open cut coal mine located at the Mount Owen Complex (MOC), within the Hunter Coalfields in the upper Hunter Valley of New South Wales (NSW). The Project Area is located approximately 20 kilometres (km) northwest of Singleton and 24 km southeast of Muswellbrook.

The Project seeks to extend the life of Glendell Mine to 2044, with an increase in extraction rate over the life of the Project up to 10 million tonnes per annum (Mtpa) from the current approved 4.5 Mtpa. The Project will extend the life of the existing operation providing for ongoing employment opportunities for the existing Glendell workforce (Figure 1-1).

Key aspects of the Project include the continuation of the Glendell Pit to the north, the realignment of Hebden Road, the diversion of Yorks Creek and relocation of Ravensworth Homestead.

The Project will impact on areas that have previously been impacted by mining and are approved for mining as well as up to an additional approximately 870 hectares (ha) of land that has not previously been impacted by mining (the Potential Additional Disturbance Area).

Glendell Continued Operations Project: Test Excavation Program Methodology

- 1

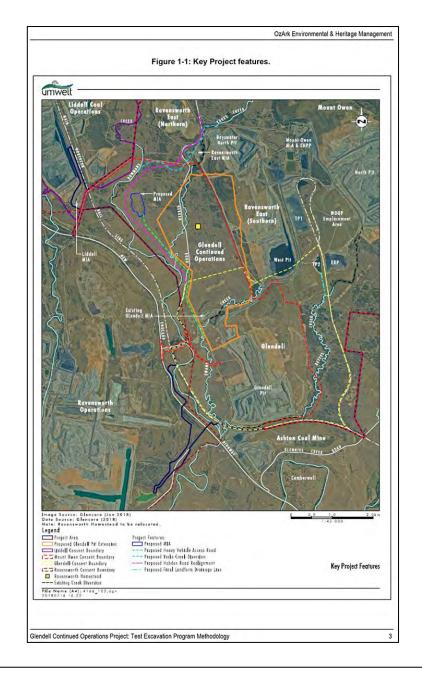
Umwelt Australia Pty Ltd (Umwelt) has been engaged by Mt Owen Pty Ltd on behalf of Glendell Tenements Pty Ltd (the proponent) to prepare an Environmental Impact Statement (EIS) for the Project which involves the development of an Aboriginal Archaeology Impact Assessment (AAIA).

As part of the AAIA, OzArk have been engaged to undertake the archaeological assessment of the areas that will be potentially impacted by the Project. The surface archaeological assessment has already been completed over the Potential Additional Disturbance Area during April and May 2018.

As a result of the surface archaeological assessment, 12 locations have been identified that require subsurface test excavation in order to determine the integrity and/or extent of sites recorded during the field assessment.

This document sets out the proposed methodology for the test excavation and follows the Code of Practice under Part 6 National Parks and Wildlife Act 1974 (NPW Act).

Additionally, test excavations related to historic heritage at the Ravensworth Homestead may also be required. There is potential for Aboriginal artefacts to be encountered in historic test excavations. The methodology for the historic test excavations will have policies relating to the potential of encountering Aboriginal artefacts and this methodology will be circulated separately to the Registered Aboriginal Parties (RAPs) for the Project once prepared.



1.3 CODE REQUIREMENTS FOR THE TEST EXCAVATION PROGRAM

The Code of Practice lists a number of requirements pertaining to test excavation. These requirements are enumerated below and further information pertaining to these requirements follow in subsequent sections of this document.

Requirement 14 (Test excavation which is not excluded from the definition of harm):

Sub-surface investigation will not be excluded from harm where they are carried out in the following areas:

- o in or within 50m of an area where burial sites are known or are likely to exist
- o in or within 50m of a declared Aboriginal place
- o in or within 50m of a rock shelter, shell midden or earth mound
- in areas known or suspected to be Aboriginal missions or previous Aboriginal reserves or institutes
- in areas known or suspected to be conflict or contact sites.
 - The test excavation locations are not located within the vicinity of the items listed under Requirement 14 of the Code.
 - It is noted, however, that the entirety of the test excavation program is taking place in an area where there is the potential for conflict or contact sites due to the program's location within the former Ravensworth Estate and its proximity to the Ravensworth Homestead where early contact (and potentially conflict) between Aboriginal people and settlers may have occurred. While there are no known specific conflict or contact sites within the immediate vicinity of the test excavation areas, should such sites come to light during the test excavation works, all archaeological testing under the Code of Practice will immediately cease at that location.
 - Further, the Secretary's Environmental Assessment Requirements (SEARs) for the Project (SSD 9349; issued 7 June 2018), indicate that test excavation is a required aspect of the Aboriginal cultural heritage assessment:
 - Office of Environment and Heritage (OEH) input into SEARs, Attachment A Point 6 (in part): "The Environmental Impact Assessment (EIS) must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in the Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation."
- Requirement 15a (Consultation): As the proposed archaeological test excavation
 program is part of the Project, consultation has been ongoing with the RAPs and has been
 completed to the stage described in subclause 80C (6) of the National Parks and Wildlife
 Regulation 2009 (NPW Regulation).

Glendell Continued Operations Project: Test Excavation Program Methodology

OzArk Environmental & Heritage Management

- Requirement 15b (Test excavation sampling strategy): This document sets out the proposed sampling strategy for the test excavation program.
- Requirement 15c (Notification):
 - the location of the proposed test excavation and the subject area.
 - This document sets out the proposed location of the test excavation program.
 - the name and contact details of the legal entity with overall responsibility for the project
 - Mt Owen Pty Limited, 642 Hebden Road, RAVENSWORTH NSW 2330
 - the name and contact details of the person who will be carrying out the test excavations where this is different to the legal entity with overall responsibility for the project.
 - OzArk Environmental & Heritage Management, 145 Wingewarra St, DUBBO NSW 2830
 - the proposed date of commencement, and estimated date of completion, of the test excavations.
 - Anticipated Commencement: 03/09/2018
 - Anticipated Completion: 21/09/2018

Weather permitting, the projected period for the excavation is up to 15 days.

- the location of the temporary storage location for any Aboriginal objects uncovered during the test excavations.
 - Aboriginal objects recovered during the excavations will be temporarily housed in a locked container at 21 Agnes Ave, CRESTWOOD, NSW, 2620 (OzArk branch office) for analysis. Following analysis the artefacts will be stored in accordance with the MOC Aboriginal Cultural Heritage Management Plan (MOC ACHMP) until such time as a Care Agreement is reached between an individual or organisation and the Office of Environment and Heritage (OEH). If no analysis is required (i.e. all analysis is completed in the field), the artefacts will be stored in accordance with the MOC ACHMP. Other objects, such as faunal or charcoal samples, may be sent to third party specialists for analysis.
- Requirement 16a (Test Excavation): The test excavation program will adhere to Requirement 16a of the Code as set out in this document (see Section 4.3).
- Requirement 16b (Objects recovered during test excavations): Aboriginal objects recovered during the excavations will be analysed at 21 Agnes Ave, CRESTWOOD, NSW, 2620 (OzArk branch office). When not being analysed, the objects will be temporarily stored in a locked container at 21 Agnes Ave, CRESTWOOD, NSW, 2620.
 Following analysis the objects will be stored according to the MOC ACHMP. If no analysis is required (i.e. all analysis is completed in the field), the artefacts will be immediately

Glendell Continued Operations Project: Test Excavation Program Methodology

stored according to the MOC ACHMP until such time as a Care Agreement is reached between an individual or organisation and OEH.

- Requirement 17 (When to stop test excavations): the test excavation program will adhere
 to the requirements set out in the Code: Any test excavation carried out under this
 requirement will cease when suspected human remains area encountered; or when
 enough information has been recovered to adequately characterise the objects present
 with regard to their nature and significance.
 - OzArk shall ensure that this Requirement is adhered to during the test excavation program. This will include ceasing work as soon as human skeletal material is noted and immediately notifying the police. If the skeletal material is determined to be Aboriginal, OEH will be immediately notified.

1.4 ABORIGINAL COMMUNITY CONSULTATION

A draft of this test excavation methodology was issued to all RAPs on 19 July 2018 for a 28 day review period closing on 17 August 2018.

From 31 July to 2 August 2018, during the review period for this document, a series of on-site meetings were held with RAPs to initiate discussions regarding the cultural values of the Potential Additional Disturbance Area. As part of these meetings, Ben Churcher, OzArk Principal Archaeologist, presented a summary of the results of the archaeological survey and introduced the methodology and location of the test excavation program. In addition, these meetings involved RAPs being shown various areas within the Potential Additional Disturbance Area where test excavation was planned to take place.

As a result of these meetings, only one specific comment from Luke Hickey was received regarding the test excavation methodology. This comment revolved around the spacing of the test excavation squares which were proposed to be spaced at 10 metre (m) intervals, while Luke felt this spacing was too wide and proposed a 5 m spacing. During discussion on this issue, it was agreed that small potential archaeological deposits (PADs) would be sampled by excavation squares at 5 m intervals; while larger PADs would be sampled at 10 m intervals so that a broad representation of the landform could be sampled.

As a result of Luke's concerns, Point 3 in Section 4.4 has been added to this document.

At the end of the 28 day review period, three further responses were received from RAPs. These responses are set out below. There was no requirement to amend the test excavation methodology as a result of these responses.

Ryan Johnson (Murra Bidgee Mullangari).

I have read the project information and draft test pitting methodology and endorse the recommendations made.

Glendell Continued Operations Project: Test Excavation Program Methodology

OzArk Environmental & Hentage Management

Jesse Carroll – Johnson (Muragadi Heritage Indigenous Corporation)

I have read the recommendations for the Glendell project and endorse the recommendations made by Ozark, if you require further details please contact.

Kevin Duncan

Yaama Bridie, Thank you for the results of the Draft Test Pitting Methodology for the Glendell Project. I as an Aboriginal Traditional Custodian of these areas strongly disapprove of Mining in our Traditional Lands as Mining has done much damage to our natural Environment and Cultural Space. For thousands of years these lands have been important places for our people. In the result of Mining across the Valley into Jerry's Plains the Land itself will never recover and thousands of years of Cultural History wiped forever. My words I know will probably not be recognised in context to my Human Right as an Indigenous person under United Nations Charter of Indigenous Peoples Rights which Australia is Signatory. So even in my protest to protect and preserve Culture that is older than the Pyramids themselves they will ultimately will be destroyed. This is my True expression of who I am as an Aboriginal Person and of my feelings for my Ancestral Home Lands. Sincerely Kevin Duncan Gomeroi, Wonnorua Awaba, Peoples

Glendell Continued Operations Project: Test Excavation Program Methodology

2 THE POTENTIAL ADDITIONAL DISTURBANCE AREA

Figure 2-1 shows the Project Area and the extent of the Potential Additional Disturbance Area.

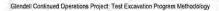
The majority of the Potential Additional Disturbance Area has been already cleared and includes flat landforms and associated lower and mid slope landforms associated with Bowmans, Yorks and Swamp Creeks (Figure 2-2). Historically the area has been intensively farmed leading to widespread vegetation loss and soil erosion (Figure 2-3).

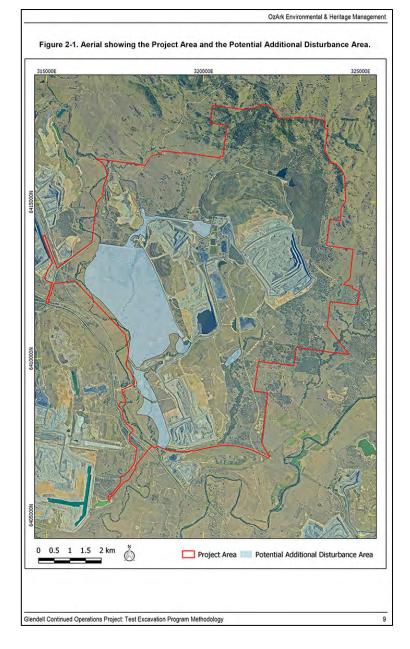
The region surrounding the Project Area is an area that holds high cultural value for Wonnarua people and the wider landscape surrounding the Project Area has deep meaning to Wonnarua people.

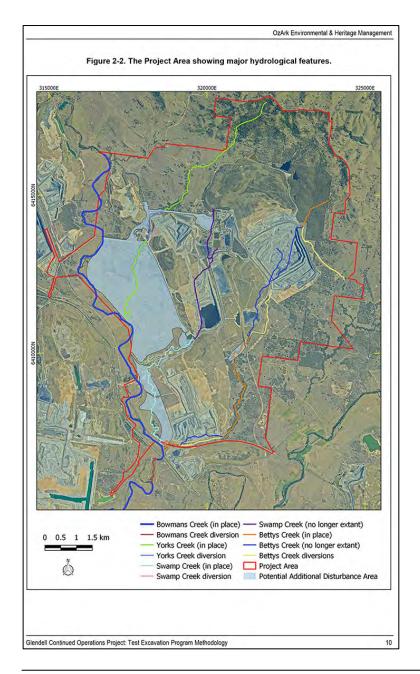
Many of the Aboriginal community are also deeply concerned about the existence of 'massacre sites' within the former Ravensworth Estate which includes the Potential Additional Disturbance Area. There is very little supporting historic evidence regarding the actual location of any such sites, despite this having been expressed strongly as 'stories' and cultural knowledge held by a knowledge holder for the area. All available evidence, however, indicates that the area is outside, and a number of kilometres from, the Project Area (ACHM 2013: 66–69).

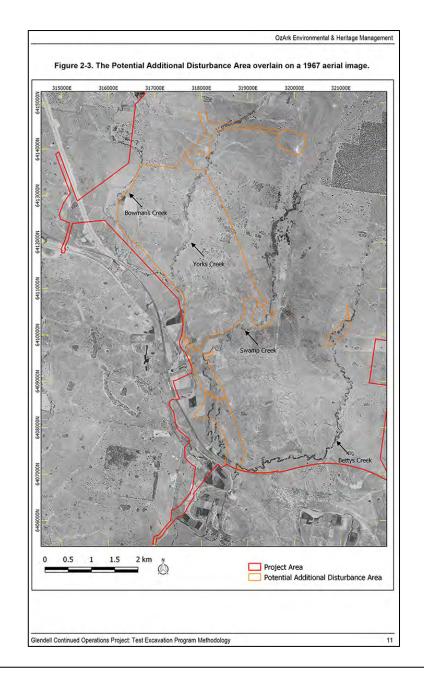
The wider cultural landscape surrounding the Project Area is of high cultural and historical significance to Wonnarua people. The historical associations with early settlement, conflict, dispossession and survival are important, and the area is seen as a significant surviving cultural landscape to numerous members of the Wonnarua people. Overall, the cultural significance of the wider region is considered to be high.

The landscape within the Potential Additional Disturbance Area is highly disturbed and fragmented, resulting in the fact that much of the natural landscape no longer exists as the history of agriculture and coal mining has irreversibly altered the landscape. With the remnant cultural landscape within the Potential Additional Disturbance Area having undergone considerable modification since European settlement, the Potential Additional Disturbance Area potentially has a lower cultural significance than the surrounding region. However, landscape features, such as creek lines, have often been cited as being of cultural importance and the Potential Additional Disturbance Area contains portions of Bowmans, Yorks and Swamp Creeks. These waterways would contribute and enhance the residual cultural landscape of the Potential Additional Disturbance Area.









3 ARCHAEOLOGICAL CONTEXT

3.1 PREVIOUS ARCHAEOLOGICAL STUDIES

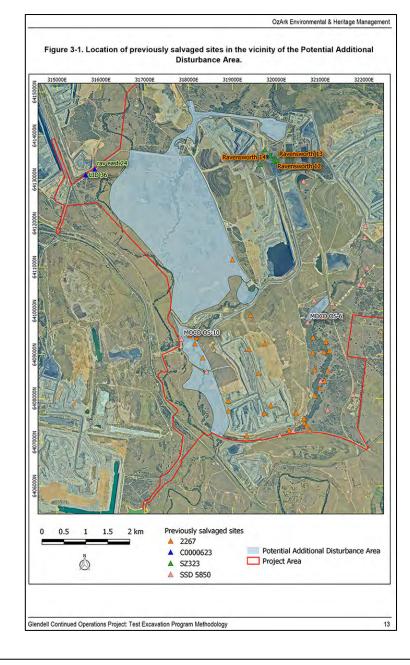
The Project Area has been subject to previous Aboriginal archaeological survey and assessment in the recent past resulting in the recording of multiple Aboriginal sites.

Based on current information from the OEH managed Aboriginal Heritage Information Management System (AHIMS) database, there have been a number of sites recorded either within the Potential Additional Disturbance Area, or in close proximity.

During the course of the survey all valid and partially valid sites were revisited and the majority recorded currently visible artefacts. At those sites where there were no visible surface artefacts, possible explanations include:

- The sites have a low artefact density and it is therefore easier to understand that a low number of artefacts could be obscured whereas larger, more-dense artefact sites would retain a surface manifestation
- The high degree of water movement in some areas that has probably removed artefacts from their find location. This reinforces how dynamic any landscape is and how difficult it is to re-locate low density sites after a passage of time.

There have been numerous archaeological investigations in the local area and a number within the Potential Additional Disturbance Area itself. The results of these investigations provide an archaeological context for the assessment and were used in the preparation of a predictive model of Aboriginal site location for the pedestrian survey. These studies were summarised in the Survey Methodology. For the purpose of the test excavation program, only the studies involving subsurface test excavation or salvage are summarised here.



Glendell Continued Operations Project: Test Excavation Program Methodology

3.1.1 Ravensworth East Archaeological Investigation (ERM 2002)

In 2002 ERM conducted archaeological excavations and salvage grader scrapes over areas of the Ravensworth East Mine under Permit SZ323. These investigates were located in the central portion of the Project Area, in areas along the former course of Swamp Creek (ERM 2002). The area where this work took place is now highly modified and outside of the Potential Additional Disturbance Area. Figure 3-1 lists the six sites salvaged within the Project Area under the 2002 ERM program. The location of these sites is shown on Figure 3-1.

Table 3-1. Sites salvaged within the Project Area under Permit SZ323.

AHIMS#	Site name
37-3-0399	Ravensworth 10
37-3-0398	Ravensworth 09
37-3-0400	Ravensworth 11
37-3-0401	Ravensworth 12
37-3-0402	Ravensworth 13
37-3-0403	Ravensworth 14

The combined geomorphological investigations undertaken by ERM highlighted the Swamp Creek valley as the key area likely to yield archaeological evidence of Aboriginal occupation within the ERM study area. However, these studies also showed that although buried land surfaces were apparent within the valley, evidence of Pleistocene Aboriginal occupation was unlikely to be recovered. Archaeological sampling of soil from these land surfaces failed to yield any archaeological material, confirming this view. In light of this, no further pursuit of Pleistocene archaeological deposits was undertaken within the scope of the excavation program.

The initial archaeological component of ERM's investigation, which included grader scrapes spread over three different landscapes across the valley, at varying distances from water sources, yielded little archaeological evidence. Of the three grader scrapes, three artefacts were recovered over a total area of 560 square metres (m²).

A low rise adjacent to the swampy meadow channel west of Swamp Creek in the vicinity of surface sites Ravensworth 12 to 14, revealed substantial archaeological material with several artefact concentrations located approximately 40 metres (m) to 60 m away from the channel. Test pit excavation yielded an artefact spread up-slope of the channel from approximately 10 m from the current channel edge, extending across the rise in all directions. A total of 87 artefacts were recovered from the 11 test pits. Over a combined excavated area of 11 m², this represents an artefact density of 7.9 artefacts/m². The largest artefact concentration (44 pieces or 50.57% of the total assemblage) was excavated from Test Pit 4 located on the peak of the rise. Without the Test Pit 4 artefact concentration, artefact density would have been substantially lower, at 4.3 artefacts/m², as the majority of test pits contained five artefacts or less. 82.75% of the assemblage was mudstone and 17.25% was silcrete.

Glendell Continued Operations Project: Test Excavation Program Methodology

14

OzArk Environmental & Heritage Management

Open excavation of the site complex Ravensworth 12–14 recovered a concentrated artefact scatter across the peak of the rise within the very shallow A-Horizon soil. Open excavation on this rise was proposed by Margrit Koettig (then at the NSW Department of Environment and Climate Change) to define the apparent spread of artefacts from TP4, and to further establish the nature of this subsurface deposit, specifically to investigate whether it contained hearths and identifiable activity areas. The open area excavation of 86 m² (including TP4) was conducted in July–August 2001 by ERM. 1,168 artefacts were excavated in the open excavation and the investigations revealed a continuation of artefacts over the low rise, rather than what was originally recorded as three individual surface sites. Within this scatter, several distinct areas of artefact concentration were recorded, all with quantities of associated charcoal and burnt earth. The assemblage comprised backed artefacts and associated manufacturing debitage, mostly of mudstone.

Seven raw materials were represented in the open excavation. Mudstone was the dominant raw material observed, accounting for almost 80% of the total artefact numbers. This mirrored the initial trend set in testing phase. Silcrete was the next most common material and comprised nearly 20% of the assemblage. The remainder of the artefacts (less than 2%) was produced from six other raw material types.

Five artefact types were identified in the assemblage. The majority of artefacts were whole flakes accounting for more than 50% of the assemblage with broken flakes (almost 30%) and flaked pieces (approximately 15%) making up much of the remaining assemblage numbers. All modified artefacts, consisting of cores and retouched flakes, made up just under 2% of the assemblage.

3.1.2 Glendell Project Area (Umwelt 2013)

Salvage of the Glendell project area was undertaken under National Parks and Wildlife Services (NPWS) section 90 Consent #2267 and formed Part 4 of the salvage program for the Bettys Creek valley. This archaeological salvage within the Glendell project area was conducted by Umwelt and the Aboriginal community between November 2005 and February 2006. Table 3-2 lists those sites within the Project Area that were salvaged under Consent #2267. The location of these sites is shown on Figure 3-1.

Table 3-2. Sites within the Project Area salvaged under Consent #2267.

AHIMS	site name	Salvage methodology
37-3-0599	Bettys Creek 9	Surface Collection with Subsurface Investigation (manual excavation)
37-3-0601	Bettys Creek 11	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0602	Bettys Creek 12	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0604	Bettys Creek 14	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0605	Bettys Creek 15	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0606	Bettys Creek 16	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0607	Bettys Creak 17	Surface Collection with Subsurface Investigation (grader scrapes)

Glendell Continued Operations Project: Test Excavation Program Methodology

AHIMS	site name	Salvage methodology
37-3-0608	Bettys Creek 18	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0609	Bettys Creek 19	Surface Collection
37-3-0610	Bettys Creek 20	Surface Collection
37-3-0618	Swamp Creek 1	Surface Collection
37-3-0619	Swamp Creek 2	Surface Collection
37-3-0620	Swamp Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0621	Swamp Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0622	Swamp Creek 5	Surface Collection
37-3-0623	Swamp Creek 6	Surface Collection
37-3-0624	Swamp Creek 7	Surface Collection
37-3-0026	Glennies Creek Site B / Bettys Creek - B	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0625	Swamp Creek 8	Surface Collection
7-3-0027	Glenniès Creek Site C / Bettys Creek - C	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0626	Swamp Creek 12	Surface Collection
37-3-0592	Bettys Creek 1	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0627	Swamp Creek 13	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0593	Bettys Creek 3	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0773	Swamp Ck 10	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0594	Bettys Creek 4	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0595	Bettys Creek 5	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0596	Bettys Creek 6	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0597	Bettys Creek 7	Surface Collection with Subsurface Investigation (grader scrapes)
37-3-0598	Bettys Creek 8	Surface Collection with Subsurface Investigation (grader scrapes)

A total of 2,713 artefacts were recovered from the Glendell project area salvage including 824 (30.6%) from the surface collection, 274 (10.1%) from Excavation 1 (Bettys Creek 10), 19 (0.7%) from Excavation 2 (Bettys Creek 9), 1,414 (52.1%) from Excavation 3 (Bettys Creek 2) and 177 (6.5%) from the grader scrapes. A total of 2,604 (96%) of the artefacts were recovered from the Bettys Creek catchment, 52 (1.9%) from the Bowmans Creek catchment and 57 (2.1%) from the Swamp Creek catchment.

Observations made from the surface collection assemblage were as follows:

- The highest number of artefacts were collected from Bettys Creek 14 (26.7% of the surface collection assemblage), followed by Bettys Creek 10 (19.5% of the assemblage)
- 60.6% of the artefacts were collected from lower slopes and floodplains associated with creek lines (56.7% from Bettys Creek; 3.3% from Swamp Creek and 0.7% from Bowmans Creek)
- Sites on low but elevated spurs in tributary confluences comprised 22.2% of the assemblage; ridge crests (7.5%); sites on lower slopes on tributary channels more than 150 m from the main creek channel (7.5%); mid slope sites (1.3%) and upper slopes (0.6%)

Glendell Continued Operations Project: Test Excavation Program Methodology

16

OzArk Environmental & Heritage Management

- The dominant artefact type was broken flakes (45%); followed by flakes (26.7%); flaked pieces (10.9%); retouched flakes (10%), cores (3.7%), heat shatter (3.4%) and grindstones (0.4%)
- A total of 31 cores were recovered from the surface collection. Of these, 21 were recovered from the Bettys Creek sites (17 from areas with tributary confluences with Bettys Creek)
- Mudstone was dominant within the assemblage making up 58.5% of the artefacts, followed by silcrete (31.9%) with the remaining raw materials making up 9.6% of the total assemblage.

Excavation was targeted at Bettys Creek 2, Bettys Creek 9 and Bettys Creek 10 indicated the following:

- Bettys Creek 10 and Bettys Creek 2 retained a level of spatial integrity reflected by knapping events and raw material distribution patterns
- . Bettys Creek 9 contained artefacts in a secondary context
- · All three locations contained backed flakes
- A ground oven identified at Bettys Creek 2 had an absolute date of 2188+/-39 BP (years before present)
- It was possible to obtain one radiocarbon date of 3077±40 BP (calibrated-Wk-20912) from Square K Spit 3 of Excavation 3 within the Mount Owen Extension Area. The date was relative in nature as it belonged to a large piece of burnt wood that was associated with artefacts both above and below it. Thus the artefacts above it must be dated to later than 3077±40 BP and those below it to earlier
- . Broken flakes (45.7%) dominated the artefact assemblage, followed by flakes (38.7%)
- Bettys Creek 10 and Bettys Creek 2 were dominated by mudstone while Bettys Creek
 9 was dominated by silcrete. Overall, mudstone was dominate (55.7%) over silcrete (32.3%)
- A small knapping event was evident at Bettys Creek 10, with greater amounts of knapping noted at Bettys Creek 2
- Core to flake ratios for Bettys Creek 10 were 1:28.7 and for Bettys Creek 2 were 1:27.4 suggesting knapping on site.

As a result of the Umwelt investigations outlined above, today's archaeological landscape, particularly along Bettys Creek, but also along Swamp Creek and Bowmans Creek in the vicinity of the Project Area, has been extensively studied.

Glendell Continued Operations Project: Test Excavation Program Methodology

3.1.3 Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations (OzArk 2013)

The assessment area for the Mount Owen Continued Operations (MOCO) Project disturbance area covered approximately 500 ha with portions of the assessment area encompassing part of the southern portion of the Potential Additional Disturbance Area.

Australian Cultural Heritage Management Pty Limited (ACHM) were engaged by MOC to undertake Aboriginal community consultation for the MOCO Project and to author the Aboriginal Cultural Heritage Assessment Report (ACHAR) to which OzArk 2014 contributed (ACHM 2013). The ACHM report appeared as Appendix 13a (Parts 1 and 2) of the MOCO Project Environmental Impact Statement (EIS) (Umwelt 2015). ACHM 2013 contains the cultural, aesthetic and historic values of the area, while OzArk 2014 contains an examination of the scientific values of the area.

The archaeological survey for the MOCO Project took place over two weeks from 26 November 2012 to 7 December 2012. The archaeological test excavation program for the MOCO Project took place over one week from 11 March 2013 to 15 March 2013. In 2014, the proposed disturbance area for the MOCO Project was expanded slightly necessitating a further one day of survey that took place on 29 April 2014. The results of these investigations are detailed in OzArk 2014 and contained in Appendix 13b of the MOCO Project EIS (Umwelt 2015).

Results

Large portions of the MOCO Project (223 ha) had been subject to previous Aboriginal Heritage Impact Permits (AHIPs) with extensive areas having already undergone archaeological assessment and salvage. Within the MOCO disturbance area, 18 sites had already been salvaged by manual excavation and more expansive additional areas have been subject to grader scrapes to salvage subsurface artefacts. Over the years, both from within the MOCO disturbance area and from adjacent landforms, over 11,000 artefacts had already been recovered as a result of these programs.

As a result of the scientific values assessment for the MOCO Project, 39 Aboriginal sites were recorded; consisting of:

- 11 artefact scatters (37-3-1189 to 37-3-1199)
- 25 isolated finds (37-3-1170 to 37-3-1188 and 37-3-1212 to 37-3-1216)
- Three extensions to previously recorded sites (Extension to site 37-3-0649, Extension to site 37-3-0611 and Extension to site 37-3-0600).

In addition, the MOCO disturbance area contained three previously recorded sites, 37-3-0611, 37-3-0985 (low density artefact scatters) and 37-3-0527 (isolated artefact). Thus, 42 sites were known to exist within or close to the MOCO disturbance area.

Glendell Continued Operations Project: Test Excavation Program Methodology

18

OzArk Environmental & Heritage Management

At two locations within the MOCO disturbance area, test excavations were carried out under the OEH Code of Practice. At one location (37-3-1191), no artefacts were recorded during the test excavations, while at the second location (37-3-1192), 114 artefacts were recorded, with over 80% coming from one discrete concentration. As a result, it was determined that 37-3-1191 is a displaced site with no associated archaeological deposits, while 37-3-1192 is a low density artefact scatter along the banks of the 'eastern drainage' line with one known concentration of artefacts.

Two sites recorded during the survey, 37-3-1194 and 37-3-1198, remain partially extant in the Potential Additional Disturbance Area.

Conclusion

Those archaeological sites in the disturbance area investigated revealed relatively sparse artefact concentrations in shallow and disturbed contexts. Archaeologically, all of the places located and/or identified conform to the Australian Small Tool Tradition¹, and most likely date to no more than the last 2,000 to 3,000 years.

The majority of the disturbance area had been subjected to varying degrees of land clearing and mining since first settlement, destroying the primary context of much of the physical cultural material present, and irretrievably altering the landscape itself.

Given the nature and extent of the archaeological sites identified, there was little additional knowledge which could be added to the archaeological record from any further investigation of this material. There is little probability for the presence of undisturbed and deeply stratified archaeological sites within the disturbance area.

In general, the archaeological sites in the MOCO disturbance area offered:

- Limited research potential in regard to regional and/or localised subsistence and resource procurement activities
- Limited research potential to address questions on stone tool technologies in the region
- · Limited potential for radiometric dating methods to be applied to the sites
- Limited research potential to address questions about the timing of the first occupation of this region of the Hunter Valley
- Limited research potential to address questions about the timing of the Aboriginal settlement history of the Hunter Valley
- Limited potential to reveal further unique spatiotemporal patterning which would add to the archaeological record.

Glendell Continued Operations Project: Test Excavation Program Methodology

¹ The Australian Small Tool Tradilion (also sometimes referred to as 'Bondaian') is a term applied to the Holocene period Aboriginal tool kit; distinguishing it from the earlier Australian Core Tool and Scraper Tradition generally dated to the Pleistocene period.

3.1.4 Archaeological Salvage, Liddell Coal Operations Development Modification 5 (OzArk 2015)

OzArk was engaged by Liddell Coal Operations (LCO) to undertake the salvage of 15 Aboriginal archaeological sites for Development Modification 5 of DA 305-11-01 and was approved under AHIP #C0000623. The salvage of the sites was undertaken on 28 January 2015 and 24 to 25 February 2015.

Artefacts were retrieved from seven of the 15 sites. A total of 46 artefacts were salvaged across all sites. The majority of the 46 artefacts recovered from the salvage were flakes (73.9%). Other artefact types included cores, flaked pieces, debitage, blades and a core fragment. Almost all artefacts were made from mudstone (56.5%) and silcrete (39.1%). Quartz and basalt artefacts were also present. Most artefacts were at a tertiary (65.2%) stage of reduction, with the rest secondary (34.8%). There were no artefacts at the primary stage of reduction.

The artefacts that were salvaged closely correspond to the regional context. The low proportion of formal tools (just one in 46) and the high percentage of flakes and debitage (76%) in the salvaged assemblage are typical of the region, but this is probably true in most sites across Australia. Mudstone has been recorded to be the most common raw material in the region, which was the case for the salvaged artefacts, and the other materials salvaged are also common.

Details of the two sites in this program that are near the Potential Additional Disturbance Area are listed in Table 3-3 and shown on Figure 3-1.

Table 3-3. Details of sites within the Project Area salvaged under AHIP C0000623.

AHIMS#	Site name	Artefacts salvaged	Notes
37-3-0419	Rav 24 East	12	This site was salvaged by surface collection and grader-scrape salvage. The ground surface visibility (GSV) of 15% is based on pre-grader-scrape visibility. The grader-scrapes added an additional 20% GSV.
37-3-1152	LID 36	1	Rakes were used to remove wood chips from the ground and improve GSV.

3.1.5 Mount Owen Continued Operations Project Salvage Program (OzArk 2017)

In early 2017 the MOCO salvage program took place under the authority of the 2016 MOC ACHMP (XMO SD PLN 0060). This program was completed in the approved disturbance areas associated with the MOCO Project (SSD-5850).

This program included the collection of surface artefacts at 26 sites resulting in 163 artefacts being recorded. Included in the tally of 26 sites, were two sites where limited archaeological excavation took place resulting in a further 187 artefacts being recorded. An additional area on the east bank of Bowmans Creek proposed for impact by the new Hebden Road Bridge was also subject to archaeological investigation by manual excavation but the area proved to be highly disturbed and no artefacts were recorded.

Glendell Continued Operations Project: Test Excavation Program Methodology

20

OzArk Environmental & Heritage Management

In addition, there were three sites that were unable to be salvaged, one as it was on land not owned by Mount Owen (37-3-0527) and two due to the fact that the area of the sites had previously been unintentionally impacted by mining activities (37-3-1171 and 37-3-1189)². These unintentional impacts were self-reported to the OEH who issued an official caution to MOC on 17 March 2016. Sites salvaged within the Project Area under SSD-5850 are listed in Table 3-4 and shown on Figure 3-1.

Table 3-4. Sites salvaged within the Project Area under SSD-5850.

Site ID	Site Name	Site Type	Number of Artefacts Salvaged	Salvage methodology
37-3-0527	Ashton EWA 17	Artefact scatter	N/A	Not salvaged (access)
37-3-0611	Bettys Creek 21	Artefact scatter	2	Surface collection and excavation
37-3-1170	MOCO IF-1	Isolated find	0	Surface collection
37-3-1171	MOCO IF-2	Isolated find	N/A	Not salvaged (previously destroyed)
37-3-1174	MOCO IF-5	Isolated find	1	Surface collection
37-3-1176	MOCO IF-7	Isolated find	0	Surface collection
37-3-1177	MOCO IF-8	Isolated find	0	Surface collection
37-3-1178	MOCO IF-9	Isolated find	1	Surface collection
37-3-1179	MOCO IF-10	Isolated find	0	Surface collection
37-3-1180	MOCO IF-11	Isolated find	2	Surface collection
37-3-1181	MOCO IF-12	Isolated find	1	Surface collection
37-3-1182	MOCO IF-13	Isolated find	2	Surface collection
37-3-1183	MOCO IF-14	Isolated find	3	Surface collection
37-3-1184	MOCO IF-15	Isolated find	2	Surface collection
37-3-1189	MOCO OS-1	Artefact scatter	N/A	Not salvaged (previously destroyed)
37-3-1190	MOCO OS-2	Artefact scatter	2	Surface collection
37-3-1191	MOCO OS-3	Artefact scatter	24	Surface collection
37-3-1192	MOCO OS-4	Artefact scatter	257	Surface collection and excavation
37-3-1193	MOCO OS-5	Artefact scatter	2	Surface collection
37-3-1194	MOCO OS-6	Artefact scatter	5	Surface collection
37-3-1195	MOCO OS-7	Artefact scatter	0	Surface collection
37-3-1196	MOCO QS-8	Artefact scatter	3	Surface collection
37-3-1197	Moco os-9	Artefact scatter	36	Surface collection
37-3-1198	MOCO OS-10	Artefact scatter	10	Surface collection
37-3-1199	MOCO OS-11	Artefact scatter	7	Surface collection
37-3-1211	MOCO IF-18	Isolated find	0	Surface collection
37-3-1212	MOCO IF-21	Isolated find	2	Surface collection
37-3-1213	MOCO IF-22	Isolated find	2	Surface collection

³ In addition, MOCO OS-3 was unintentionally partially impacted by mining activities and the remainder of this site was salvaged during the salvage program.

Glendell Continued Operations Project: Test Excavation Program Methodology

Site ID	Site Name	Site Type	Number of Artefacts Salvaged	Salvage methodology
	Bowmans Creek East Bank (Hebden Road)	Potential archaeological deposit (PAD)	0	Manual excavation.

Of all the sites investigated in the 2017 salvage program, 37-3-1192 (MOCO OS-4 located on an unnamed watercourse termed the 'eastern drainage') recorded the highest artefact density with 71 surface artefacts (43.5% of all surface artefacts recorded during the salvage program) and 186 artefacts recorded in the test excavation component of the program (constituting almost all of the artefacts recorded in the test excavation component of the program). 37-3-1192 was located in area heavily affected by erosion and the investigation showed that while one concentration of artefacts remained *in situ*, the majority of the site had been displaced by the erosion.

Other sites that recorded more than 10 artefacts during the salvage program were 37-3-1191, 37-3-1197 and 37-3-1198. 37-3-1194 and 37-3-1198 remain partially extant within the Potential Additional Disturbance Area. All other sites recorded very low artefact numbers supporting the conclusion reached in OzArk 2014 that the remaining archaeological values at MOC consist of low density, often displaced, artefact scatters.

The recording of these sites affords with the general picture emerging that sites located away from permanent water are likely to have a low artefact density and low site complexity.

OzArk Environmental & Heritage Management

4 PROPOSED METHODS

4.1 PURPOSE OF THE TEST EXCAVATION PROGRAM

The purpose of the test excavation program is to understand more completely the nature of the sub-surface material within the Potential Additional Disturbance Area. Data obtained from the test excavation program will inform the mitigation and management options in the forthcoming AAIA.

The aims are therefore to:

- Establish the extent and nature the of sub-surface archaeological deposits at a site or landform with archaeological potential
- Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the Potential Additional Disturbance
- Develop, in consultation with the RAPs, an informed management strategy for the site to assist in mitigating the proposed impacts.

As a result, locations initially considered for the test excavation program are limited to:

- · Areas identified during the pedestrian survey as having archaeological potential
- · Landforms which are relatively intact (i.e. not within disturbed contexts)
- Previously recorded sites which were potential archaeological deposits (PADs) or had PADs associated with them.

Excavations undertaken as per the Code do not require an AHIP under the NPW Act.

4.2 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The test excavation program follows an extensive program of surface survey that focused on the Potential Additional Disturbance Area rather than the Project Area as a whole. The Aboriginal heritage surface survey was undertaken by two teams on 9 to 20 April 2018, and by one team on 30 April to 1 May 2018 with each team consisting of two archaeologists and up to four RAPs. The assessment consisted of full pedestrian assessment of the Potential Additional Disturbance Area.

The results of the Aboriginal heritage assessment will be contained in the forthcoming AAIA that will provide full details of all sites recorded. As an overview, the pedestrian survey recorded 59 additional sites consisting of:

- 33 artefact scatters
- · 24 isolated finds
- One PAD

22

· One scarred tree.

Glendell Continued Operations Project: Test Excavation Program Methodology

15 of these sites are outside of the Potential Additional Disturbance Area, however, some are closely adjacent to the boundary of the Potential Additional Disturbance Area and will require further management.

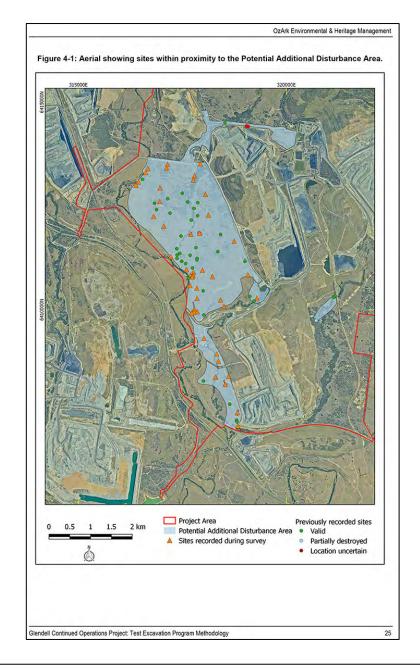
In addition, there are 43 previously recorded sites within or partially within the Potential Additional Disturbance Area. Of these, one site can no longer be reasonably located in the landscape. As such there are 42 known Aboriginal sites that have been previously recorded in the Potential Additional Disturbance Area.

Figure 4-1 illustrates the locations of all sites within proximity to the Potential Additional Disturbance Area and Figure 4-2 shows the site types recorded during the survey.

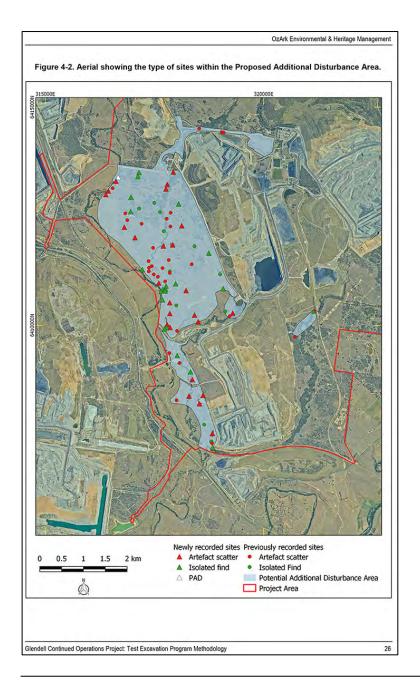
When previously and recently recorded sites are considered, there are 86 sites within the Potential Additional Disturbance Area. Three additional sites are technically outside of the Potential Additional Disturbance Area but are so closely adjacent that they should be treated as if they are inside of the Potential Additional Disturbance Area. However, one of these sites can no longer be reasonably located in the landscape and so there are an additional two known sites that may be harmed by the Project, As such, should the Project be approved in its current form, 88 known sites will be harmed.

The survey identified 12 areas where test excavation would provide a clearer picture of the subsurface archaeological potential. These areas, and the reasons why they have been selected are outlined in **Table 4-1**. The location of these 12 areas are shown on **Figure 4-3**.

There a number of previously recorded sites in the Potential Additional Disturbance Area where PADs are mentioned on the site card. However, not all of these sites will be investigated during the test excavation program and the reasons for their exclusion are outlined in Table 4-2.



Glendell Continued Operations Project: Test Excavation Program Methodology



OzArk Environmental & Heritage Management Table 4-1: Proposed areas for test excavation. Reason for test excavation Area Landform Area 1 A broad elevated spur running parallel to Bowmans A number of artefact scatters are located within the Area 2 A large level area that is elevated above Yorks Area also occupied by Ravensworth Homestead, Creek on its eastern bank, often an indicator of a prime occupational location. Areas 3 & 4 Landforms on western bank of Yorks Creek close to its confluence with Bowmans Creek. Appeared to have high archaeological potential during the survey. Areas 5 & 6 Elevated landforms on the eastern bank of Yorks Appeared to have high archaeological potential Creek close to its confluence with Bowmans Creek. during the survey. Area 7 Terrace overlooking the floodplain for Bowmans A number of surface artefacts were visible during Elevated landform between Swamp Creek and what appears to be an old channel for Swamp Creek. Area 8 Allows landforms in this portion of Swamp Creek to Areas 9 & 10 Two locations on either side of Swamp Creek. Chosen at random in order to test the nature of deposits along this portion of Swamp Creek. Allows the banks on either side of Yorks Creek to be tested, Includes AHIMS #37-3-0754 and #37-3-Areas 11 & 12 Centred on previously recorded sites where original recorders suggested PAD may be present. Table 4-2: Previously recorded sites with PADs not included in the test excavation program.

Site ID	Site name	GDA East	GDA North	Reason for not including in test excavation
37-3-0753	York Creek 10	317865	6412266	Disturbed location. No potential noted during survey.
37-3-0752	York Creek 9	317685	6411312	Disturbed location. No potential seen during survey.
37-3-0748	York Creek 5	317365	6411471	Low-medium archaeological significance. Better location being tested to south (Area 3).
37-3-0617	Bowmans Creek 5	318015	6409874	Disturbed location. No potential seen during survey.
37-3-0612	Bettys Creek 22	321138	6410296	Within what was once a swamp/pond? Low archaeologica potential.
37-3-0469	Bowmans/Swamp Creek Trench 1	318072	6409137	Highly disturbed and partially destroyed.
37-3-0766	Bowmans Ck 10	316833	6412566	Low archaeological values. Potential not visible at time of survey.
37-3-0764	Bowmans Ck 8	317205	6412329	Disturbance from buried pipeline. Will test nearby Bowmans Ck 7 (Area 1).
37-3-0762	Bowmans Ck 6	317645	6410765	Disturbed by cultivation. Other testing sites nearby.
37-3-0760	York Creek 17	317555	6411497	Disturbed location. No potential noted during survey.
37-3-0759	York Creek 16	317827	6411497	Disturbed location. No potential seen during survey.

Glendell Continued Operations Project: Test Excavation Program Methodology

4.3 RATIONALE BEHIND THE TEST EXCAVATION METHODOLOGY

4.3.1 Predicative model

The 2018 OzArk assessment of the Project Area has reached the following preliminary conclusions at this stage of the archaeological investigations:

- Stone artefact sites (isolated finds and artefact scatters) are the most commonly recorded site types in the area and that other site types, such as culturally modified trees, are very rare or non-existent
- Artefacts tend to associated only with the A-Horizon soil layers indicating a date in the Holocene period (i.e. 12,000 BP to the present)
- The predominant raw materials used for stone artefact manufacture are locally sourced mudstone and silcrete
- Excavations generally reveal a low artefact density but some spatial patterning has been
 observed: principally concentrations of artefacts interpreted as 'knapping areas'. Other
 archaeological features such as hearths are rare
- Sites tend to be associated with waterways and a discernible pattern has been observed whereby larger sites are associated with larger waterways offering permanent water supplies
- While all waterways have been equally studied, Yorks and Bettys Creeks appear to have attracted past Aboriginal occupation more often than Swamp Creek. Bowmans Creek would have been a major focus of past occupation but much of the evidence of this occupation has been removed by major channel migrations or intensive historical land use disturbances such as cultivation.

4.3.2 Research questions

While any test excavation program is limited in the level of research objectives it can achieve due to the restricted nature of the excavations, the test excavations for the Project will attempt to shed light on:

- Do the results support previous findings that occupation appears denser along Yorks Creek when compared to Swamp Creek?
- Do elevated landforms associated with Bowmans Creek preserve subsurface archaeological deposits?
- Are additional archaeological features, such as hearths, present in the Potential Additional Disturbance Area?
- How do the findings in terms of raw material use compare to other investigations in the vicinity of the Potential Additional Disturbance Area?

Glendell Continued Operations Project: Test Excavation Program Methodology

28

OzArk Environmental & Heritage Management

4.4 SAMPLING STRATEGY

The excavation program will be undertaken by archaeologists and representatives of RAPs and will include the following aspects:

- Twelve areas will be investigated by the test excavation program. Ten of these areas relate
 to newly identified PADs noted by OzArk during the pedestrian survey, and two are situated
 at previously recorded sites (AHIMS #37-3-0754 and #37-3-0761).
- The location for the proposed test excavation program is shown on Figure 4-3 and detailed locations of transects on Figure 4-4 to Figure 4-9.
- 3 Excavation squares will generally be spaced with a 10 m interval so that a broad representation of the landform will be obtained. However, should the PAD under investigation be small in size, the excavation squares will be excavated at a 5 m interval.
- 4. Prior to any excavation, the site will be recorded via digital photography.
- 5. A minimum of six 0.5 m x 0.5 m excavation squares in a straight 50 m transect will be excavated, although the methodology allows for additional squares to be excavated should the results indicate that this is warranted. The excavation squares will be positioned so as a valid sample of the impact area is obtained so that the archaeological values of the area can be characterised. Depending on the size of the investigation area, there may be only one transect or more. For specific methodology relating to each area, see Table 4-3.
- 6. Initial excavation squares will be excavated in 5 cm spits to determine whether archaeological stratigraphy is present. If not, spit size will be increased to 10 cm. If archaeological stratigraphy is present, this will be used rather than spits.
- The excavated material from all pits will be sieved on site using dry sieving through nested sieves of 6–8 millimetre (mm) and 2.5–3.5 mm mesh (which is considered to satisfy the 5 mm aperture wire-mesh sieve requirement).
- 8. Each excavator (by hand) will be responsible for sieving the deposit from their excavation square, retrieving the artefacts and, in conjunction with the supervising archaeologist, correctly recording their provenance. There could be some room for assistance with the sieving but a self-contained approach is preferable. Deposits will be sieved on to tarpaulins and the spoil used to backfill the excavation square.
- A standard excavation recording form will be used for each excavation square. Details will
 include; date, site recorder, spit number and depth, description of finds, description of soil,
 sketch plan of excavation (if relevant to show structure), end of spit levels, soil pH (when
 necessary or appropriate) and a bucket tally.

Glendell Continued Operations Project: Test Excavation Program Methodology

- 10. It is envisioned that the excavation crew will consist of an Excavation Director, two assistant archaeologists, and at least six cultural heritage field workers. The excavator of each excavation square, in conjunction with the supervising archaeologist, will be responsible for ensuring all forms are correctly completed. It will be the archaeologists' responsibility to perform all photographic tasks, undertake any planning and section drawing if required and to ensure that a correct location of each excavation square is maintained.
- 11. Given that the work will be reasonably physical, all persons participating on the test excavation program should be aware of this and be 'fit for work'.
- 12. If intact archaeological deposits or archaeological features are encountered, then additional archaeological excavation squares may be excavated to ensure documentation of any features and/or retrieval of artefacts and other relevant archaeological material. A feature would include a high density of artefacts within a square (such as in excess of 60 artefacts greater than 15 mm in size per m²), or a square containing rare or unusual artefacts (such as artefacts constructed from a stone type rarely represented in the area or less-common tool forms such as ground edge axes, hammerstones, etc.), or other signs of human occupation i.e. ground ovens/hearths or charcoal concentrations. Any expansion must adhere to Requirement 16 (5). Any expansion would only occur with the consent of the Excavation Director who will determine if an expansion is required to gain the appropriate scientific information.
- 13 Rather than expanding around an individual square as set out in Point 12, it is more likely that any expansion will involve setting out an additional transect at 90 degrees to a transect that has demonstrated significant and intact archaeological deposits. The perpendicular transect will be used to assist in determining the spatial spread of the subsurface deposits.
- 14. If appropriate (i.e. intact archaeological stratigraphy is recorded) section drawings will be completed for the appropriate excavation square(s). If no archaeological stratigraphy is recorded then digital photographs shall be taken of a representative section of each excavation square and a suitably representative drawing made of the excavation square section to show the soil profile.
- 15. Analysis of all excavated lithics will be made in order to determine the site's characteristics and to enable the site to be compared with other sites in the region. Analysis will also assist in determining what type of activities the Aboriginal people carried out at the site and their relationship with local resources (fauna, flora, water and stone). All artefacts will be analysed and selectively photographed. If charcoal from a secure stratigraphic context is obtained, it may be sent to a laboratory for Carbon 14 dating (subject to proponent's agreement).

Glendell Continued Operations Project: Test Excavation Program Methodology

30

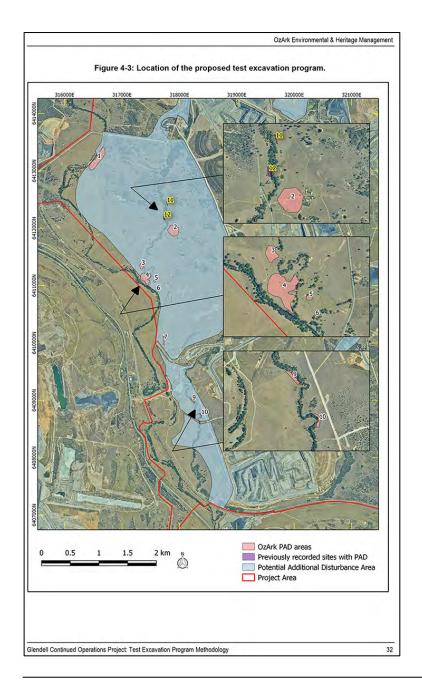
OzArk Environmental & Heritage Management

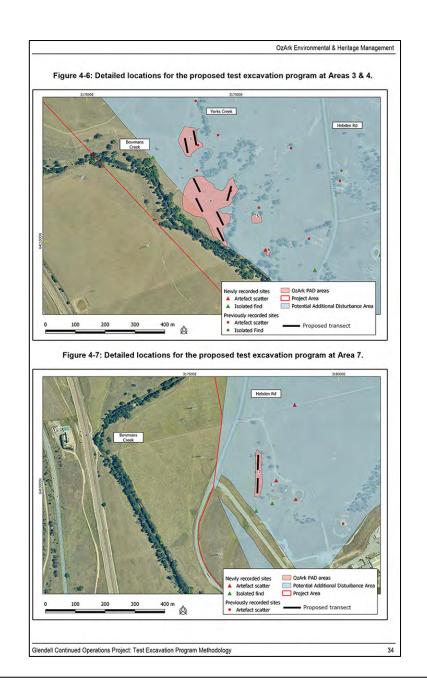
- 16. Select faunal remains, if recovered, will be analysed by a fauna specialist. Remnant shell and bone fragments may assist in determining what foods Aboriginal people may have eaten at the specific site and may elucidate possible foraging strategies. In conjunction with in situ stone tools, bone/shell fragments may also provide evidence of specific usage of stone tools for food processing.
- 17. Artefacts will remain in the care of OzArk until such time as the analysis is complete. Every effort will be made to analyse artefacts on-site to ensure that the artefacts do not have to leave the Project Area. However, in the case of large artefact numbers or artefacts requiring further research, it may be necessary to take artefacts off-site. If taken off-site, the artefacts would be the responsibility of OzArk and every effort would be made to return all artefacts to the MOC as quickly as is possible. At the completion of analysis (whether on-site or off-site) artefacts will be returned to the MOC where they will be kept as per the MOC ACHMP until Point 19 below is enacted.
- 18. The results of the test excavation program will inform the forthcoming AAIA. Excavation results will be used to advise further courses of action in relation to the management and mitigation options for the Project Area.
- Once all salvage activities for the Project Area are complete (should the Project be approved), artefacts will be amalgamated and managed as per the MOC ACHMP.

Table 4-3: Sampling methodology for text excavation program.

Area	Test excavation methodology
Area 1	5 x 50 m transects, with each 50 m transect separated by 50 m. Transects will be positioned running along the spur, parallel to Bowmans Creek. Area 1 includes an area of PAD recorded during the survey. Decisions on the suitability of expansion will depend on the results of the first five transects.
Area 2	4 x 50 m transects will be initially excavated to examine areas closet to Yorks Creek and a tributary to Yorks Creek located to the south of the PAD area. Decisions on whether to expand excavation will depend on results of the initial four transects.
Area 3	2 x 50 m transects will be excavated so entire PAD area is investigated.
Area 4	5 x 50 m transects will be excavated to investigate areas closest to Yorks Creek and Bowmans Creek, as well as landforms near the confluence of the two creeks.
Areas 5 & 6	These PADs are too small for an entire transect. Instead two sets of two conjoined 0.5 m x 0.5 m pits will initially investigate these areas (see Figure 4-10).
Area 7	2 x 50 m transects will be excavated running along the length of the terrace.
Area 8, 9, 10, 11 & 12	1 x 50 m transect excavated initially at each location.

Glendell Continued Operations Project: Test Excavation Program Methodology





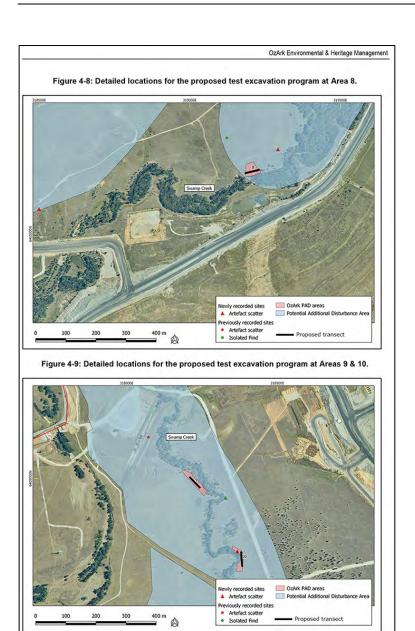


Figure 4-10: Example of placement for test excavation pits at Areas 5 & 6.



4.4.1 Sampling strategy compliance with the Code: Requirement 16

- 1 Test excavation units must be placed on a systematic grid appropriate to the scale of the area—either PAD or site—being investigated e.g. 10 m intervals, 20 m intervals, or other justifiable and regular spacing.
- The sampling strategy outlined in Section 4.4 complies with this requirement. As the Code
 of Practice allows excavation units to be grouped depending on a site's characteristics,
 the excavation strategy at Areas 6 and 7 complies with the Code of Practice so long as
 no more than 0.5% of the site is excavated.
- 2 Any test excavation point must be separated by at least 5 m.
 - The sampling strategy outlined in Section 4.4 complies with this requirement. It should be noted that while the initial transect will have 10 m intervals, the Code allows expansion around pits displaying notable concentrations of artefacts (i.e. more than 60 artefacts larger than 15 mm per m²) or archaeological features. These 'expansions' are limited to a maximum area of 3 m². It is also noted in Section 4.4 Point 3 that when PADs are small in area that a 5 m interval for the test excavation squares will be adapted.
- 3 Test excavations units must be excavated using hand tools only.
 - . The sampling strategy outlined in Section 4.4 complies with this requirement.
- 4 Test excavations must be excavated in 0.5 m x 0.5 m units.
 - The sampling strategy outlined in Section 4.4 complies with this requirement.
- 5 Test excavations units may be combined and excavated as necessary to understand the site characteristics, however:
- the maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3 m²:
 - The sampling strategy outlined in Section 4.4 complies with this requirement.
- the maximum surface area of all test excavation units must be no greater than 0.5% of the area—either PAD or site—being investigated.
 - The number and size of test excavations undertaken as part of this program will be managed to ensure that this requirements is satisfied.

Glendell Continued Operations Project: Test Excavation Program Methodology

36

Glendell Continued Operations Project: Test Excavation Program Methodology

- 6 Where the 0.5 m x 0.5 m excavation unit is greater than 0.5% of the area then point 5 (ii) (above) does not apply.
- Not applicable. As the potential archaeological deposits are spatially large, less than 0.5% of the known potential archaeological deposits dimensions will be investigated.
- 7 The first excavation unit must be excavated and documented in 5 cm spits at each area —either PAD or site—being investigated. Based on the evidence of the first excavation unit, 10 cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.
 - . Complies. See in Section 4.4 Point 6.
- 8 All material excavated from the test excavation units must be sieved using a 5 mm aperture wire-mesh sieve.
- . Complies, See in Section 4.4 Point 7.
- 9 Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.
 - This requirement will be fulfilled in the field and all excavation squares will be excavated to the B-Horizon basal clays. To ensure that, as suspected, these basal clays are culturally sterile, several deeper probes at each excavation area will be excavated into these clays to ensure that they are, in fact, culturally sterile. The decision as to where these deeper probes are placed will rest with the Excavation Director.
- 11 Photographic and scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects must be made for each single excavation point.
 - Complies. See in Section 4.4 Points 9, 10, 14, 15 and 16.
- 12 Test excavations units must be backfilled as soon as practicable.
- . Complies. See in Section 4.4 Point 8.
- 13 Following test excavation, an Aboriginal Site Impact Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each AHIMS site that has been the subject of test excavation in accordance with the requirements of the Code.
 - . It will be the responsibility of OzArk to ensure that this requirement is met.

Glendell Continued Operations Project: Test Excavation Program Methodology

5 REFERENCE	ces
ACHM 2013	Australian Cultural Heritage Management Pty Limited. Mount Owen Continued Operations Project. Aboriginal Cultural Heritage Assessment Report. Report to Mt Owen Pty Limited.
ERM 2002	ERM Pty Limited, 2002, Ravensworth East Archaeological Investigation. Report to Coal and Allied Pty Limited.
OEH 2011	Office of Environment and Heritage. 2011. Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales. Department of Environment, Climate Change and Water, Sydney.
OzArk 2013	OzArk Environmental & Heritage Management Pty Limited. 2013. Aboriginal Archaeological Values Assessment. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd.
OzArk 2015	OzArk Environmental & Heritage Management Pty Limited. 2015. Archaeological Salvage. Liddell Coal Operations Development Modification 5. Report for Liddell Coal Operations.
OzArk 2017	OzArk Environmental & Heritage Management Pty Limited. 2017. Aboriginal Archaeological Salvage Report. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW. Report for Mt Owen Pty Ltd.
Umwell 2013	Umwelt (Australia) Pty Limited. 2013. Part 4 – Bettys Creek Salvage Program, Glendell Mine Surface and Subsurface Salvage under Section 90 Aboriginal Heritage Impact Permil #2267. Report for Xstrata Mount Owen.

APPENDIX 6: TEST EXCAVATAGE CATALOGUE

Area	Transect	Square	Spit	Artefact type	Raw material	Integrity	Reduction	Size	Rotation	Platform type	Platform size	Termination type	Notes
1	1	1	2 (5-10cm)	F	MS	С	Т	4	Р	S	3	SH	
1	1	1	2 (5-10cm)	F	MS	MF	Т	2	ND	-	-	-	
1	1	3	3 (10-15cm)	F	MS	С	Т	4	Р	S	4	F	
1	1	5	1 (0-5cm)	F	S	С	S	4	Р	S	4	F	
1	1	6	2 (5-10cm)	F	MS	С	Т	2	R	S	2	SH	
1	1	6	3 (10-15cm)	F	MS	С	Р	3	ND	С	3	F	
1	1	6	3 (10-15cm)	F	MS	DF	Т	2	Р	-	-	SH	
1	1	6	3 (10-15cm)	F	S	С	S	1	ND	S	2	F	
1	1	6	3 (10-15cm)	F	MS	С	S	3	R	С	3	F	
1	1	6	3 (10-15cm)	F	MS	С	S	4	R	S	3	F	
1	1	6	3 (10-15cm)	S	PW		Т	2	-	-	-	-	
1	1	6	4 (15-20cm)	FP	MS	С	S	4	R	С	5	F	
1	2	3	3 (10-15cm)	F	MS	DF	Т	2	ND	-	-	F	
1	3	1	3 (20-30cm)	F	MS	LB	S	4	ND	S	2	F	
1	3	3	2 (5-10cm)	F	MS	DF	Т	2	ND	-	-	F	
1	3	3	3 (15-25cm)	F	S	С	Т	2	R	S	2	F	
1	4	1	2 (10-20cm)	F	MS	С	S	2	ND	S	2	F	
1	4	1	2 (10-20cm)	F	MS	С	Т	2	R	S	2	F	
1	4	1	2 (10-20cm)	F	MS	С	S	2	ND	S	2	F	
1	4	1	2 (10-20cm)	F	MS	С	Т	2	R	S	2	F	
1	4	2	2 (10-20cm)	F	MS	С	Т	3	R	S	2	F	
1	4	2	2 (10-20cm)	В	S	С	S	3	Р	S	2	F	
1	4	2	2 (10-20cm)	F	MS	С	Т	3	R	S	2	F	
1	4	2	2 (10-20cm)	В	S	С	S	3	Р	S	2	F	
1	4	3	3 (20-30cm)	F	MS	С	S	2	Р	С	2	F	Broken into two pieces
1	4	3	3 (20-30cm)	F	MS	С	S	2	Р	С	2	F	Broken into two pieces
1	4	4	1 (0-10cm)	S	MS		Т	2					
1	4	4	2 (10-20cm)	F	MS	С	Т	2	R	S	2	F	
1	4	4	2 (10-20cm)	F	MS	С	Т	2	R	S	2	F	

Area	Transect	Square	Spit	Artefact type	Raw material	Integrity	Reduction	Size	Rotation	Platform type	Platform size	Termination type	Notes
1	4	4	2 (10-20cm)	F	MS	LB	Т	3	Р	S	3	F	
1	4	4	2 (10-20cm)	FP	MS		Р	4	ND	S	4	F	
1	4	5	2 (10-20cm)	F	Q	С	Т	3	R	S	3	F	
1	4	6	1 (0-10cm)	F	S	DF	Т	4	R	-	-	F	
1	4	6	2 (10-20cm)	F	MS	С	S	2	Р	С	2	F	
1	4	6	2 (10-20cm)	F	MS	PF	Т	2	Р	С	3	-	
1	4	6	2 (10-20cm)	F	S	DF	Т	2	R	-	-	F	
1	4	6	2 (10-20cm)	ВВ	S	PF	Т	2	Р	S	2	-	
1	4	6	2 (10-20cm)	S	S		Т	2					
1	4	6	2 (10-20cm)	F	S	С	Т	4	Р	S	5	F	
1	4	6	3 (20-30cm)	F	MS	С	S	3	R	S	4	F	
1	5	1	1 (0-10cm)	F	S	PF	Т	2	Р	F	3		
1	5	1	1 (0-10cm)	F	S	С	Т	3	Р	S	3	SH	
1	5	1	1 (0-10cm)	F	S	С	Т	3	R	F	2	F	
1	5	1	1 (0-10cm)	F	MS	DF	Т	3	R			SH	
1	5	1	1 (0-10cm)	F	MS	С	Т	2	Р	S	3	F	
1	5	1	1 (0-10cm)	F	MS	DF	Т	2	ND			F	
1	5	1	1 (0-10cm)	F	С	С	Т	2	Р	S	2	SH	
1	5	1	1 (0-10cm)	F	S	DF	Т	2	Р			F	
1	5	1	1 (0-10cm)	F	S	PF	Т	2	Р	F	3		
1	5	1	1 (0-10cm)	F	S	С	Т	3	Р	S	3	SH	
1	5	1	1 (0-10cm)	F	S	С	Т	3	R	F	2	F	
1	5	1	1 (0-10cm)	F	MS	DF	Т	3	R			SH	
1	5	1	1 (0-10cm)	F	MS	С	Т	2	Р	S	3	F	
1	5	1	1 (0-10cm)	F	MS	DF	Т	2	ND			F	
1	5	1	1 (0-10cm)	F	С	С	Т	2	Р	S	2	SH	
1	5	1	1 (0-10cm)	F	S	DF	Т	2	Р			F	
1	5	1	2 (10-20cm)	F	MS	С	S	3	Р	S	2	F	
1	5	2	2 (10-20cm)	F	MS	С	Т	2	Р	S	2	SH	

Area	Transect	Square	Spit	Artefact type	Raw material	Integrity	Reduction	Size	Rotation	Platform type	Platform size	Termination type	Notes
1	5	2	2 (10-20cm)	F	MS	С	Т	2	ND	S	2	F	
1	5	2	2 (10-20cm)	S	MS		Т	3					
1	5	3	1 (0-10cm)	F	S	С	Р	2	Р	S	2	SH	
1	5	3	1 (0-10cm)	F	MS	С	Т	1	Р	Р	1	SH	
1	5	3	1 (0-10cm)	В	S	DF	Т	2	Р			F	
1	5	3	1 (0-10cm)	F	S	С	Т	4	R	S	3	F	
1	5	3	1 (0-10cm)	F	MS	С	Т	1	Р	S	2	F	
1	5	3	1 (0-10cm)	F	S	С	Т	2	Р	S	2	F	
1	5	3	1 (0-10cm)	F	MS	С	Т	1	Р	S	2	F	
1	5	3	1 (0-10cm)	S	S		Т	1					
1	5	3	1 (0-10cm)	F	S	MF	Т	2	ND				
1	5	3	1 (0-10cm)	F	MS	С	Т	3	Р	S	3	F	
1	5	3	1 (0-10cm)	SS	С		Т	4	R	F	5	F	
1	5	4	2 (10-20cm)	F	MS	С	Т	2	Р	S	3	F	
1	5	4	2 (10-20cm)	F	MS	С	Т	2	Р	S	2	F	
1	5	4	2 (10-20cm)	F	MS	С	Т	2	R	S	3	F	
1	5	4	2 (10-20cm)	F	MS	С	Т	2	Р	S	2	F	
1	5	5	1 (0-10cm)	F	S	С	Т	2	R	S	2	F	
1	5	5	1 (0-10cm)	F	S	PF	Т	2	Р	S	2		
1	5	5	1 (0-10cm)	F	S	DF	Т	2	Р			F	
1	5	5	1 (0-10cm)	F	S	С	Т	4	R	S	2	Р	
1	5	5	2 (10-20cm)	F	QZ	С	Т	3	Р	S	3	F	
1	5	5	2 (10-20cm)	F	S	С	Т	3	Р	S	3	F	
1	5	5	2 (10-20cm)	F	S	PF	Т	3	Р	S	4		
1	5	5	2 (10-20cm)	F	MS	С	S	3	R	S	5	F	
1	5	5	2 (10-20cm)	F	Q	С	Т	1	Р	S	2	F	
1	5	5	2 (10-20cm)	F	MS	С	S	2	R	С	2	F	
1	5	5	2 (10-20cm)	F	S	PF	Т	2	Р	S	2		
1	5	5	2 (10-20cm)	F	S	DF	Т	2	Р			F	

Area	Transect	Square	Spit	Artefact type	Raw material	Integrity	Reduction	Size	Rotation	Platform type	Platform size	Termination type	Notes
1	5	5	2 (10-20cm)	F	S	DF	Т	2	Р			F	
1	5	5	2 (10-20cm)	F	S	PF	Т	1	Р	S	2		
1	5	5	2 (10-20cm)	F	0	С	Т	2	R	S	3	F	Chalcedony
1	5	5	2 (10-20cm)	ВВ	MS	С	Т	2	Р	F	2	F	
1	5	5	2 (10-20cm)	ВВ	S	С	Т	3	Р	F	3	F	
1	5	6	1 (0-10cm)	F	MS	С	S	3	ND	S	4	F	
3	1	3	1 (0-10cm)	F	S	DF	Т	2	Р			F	
3	1	5	1 (0-10cm)	F	S	LB	Т	3	R	S	4	F	
3	2	3	1 (0-10cm)	В	0	С	Т	3	Р	S	3	F	Porcellanite
3	2	3	1 (0-10cm)	F	0	С	Т	3	R	S	2	F	Porcellanite
3	2	3	1 (0-10cm)	F	0	DF	Т	3	Р			F	Porcellanite
3	2	3	1 (0-10cm)	F	0	PF	Т	2	Р	S	3		Porcellanite
3	2	4	2 (10-20cm)	F	MS	MF	Т	1	ND				
3	2	4	2 (10-20cm)	F	MS	DF	Т	2	R			F	
3	2	5	2 (10-20cm)	F	S	С	Т	2	Р	S	2	F	
3	2	5	2 (10-20cm)	F	S	DF	Т	2	R			F	
4	1	1	2 (10-20cm)	F	S	С	Т	2	Р	S	2	F	
4	1	4	1 (0-10cm)	F	S	С	Т	1	Р	S	2	F	
4	1	6	3 (20-30cm)	С	MS	С	S	5	R				
4	1	6	3 (20-30cm)	АН	V	С	Р	6					
4	2	3	2 (10-20cm)	F	S	С	Т	4	R	S	4	F	
4	2	3	2 (10-20cm)	F	MS	PF	Т	4	Р	F	4		
4	2	3	2 (10-20cm)	F	MS	MF	Т	3	Р				
4	2	3	2 (10-20cm)	В	MS	PF	Т	2	Р	CR	3		
4	2	3	2 (10-20cm)	F	MS	MF	Т	2	Р				
4	2	3	2 (10-20cm)	S	S		Т	2					
4	3	4	2 (10-20cm)	С	S	С	S	4	R				
4	3	5	2 (10-20cm)	F	MS	DF	S	3	ND			F	
4	3	5	3 (20-30cm)	S	MS		Т	1					

Area	Transect	Square	Spit	Artefact type	Raw material	Integrity	Reduction	Size	Rotation	Platform type	Platform size	Termination type	Notes
4	3	6	2 (10-20cm)	ВВ	S	С	Т	4	Р				
4	3	6	5 (40-50cm)	F	S	С	Т	3	Р	S	2	F	
4	4	2	3 (20-30cm)	F	MS	С	S	3	R	F	5	F	
4	4	4	1 (0-10cm)	S	S		T	1					
4	4	4	1 (0-10cm)	В	S	PF	Т	2	Р	S	3		
4	4	4	2 (10-20cm)	F	S	PF	Т	3	Р	S	Р		
4	4	4	2 (10-20cm)	В	S	MF	Т	2	Р			F	
4	4	4	2 (10-20cm)	F	S	DF	T	2	Р				
4	4	4	2 (10-20cm)	F	S	С	Т	2	Р	S	3	F	
4	4	4	2 (10-20cm)	S	MS		T	2					
4	4	4	2 (10-20cm)	F	S	PF	T	2	R			F	
4	4	4	2 (10-20cm)	S	MS		T	1					
4	4	4	2 (10-20cm)	F	MS	DF	Р	2	ND			F	
4	4	4	3 (20-30cm)	S	S		Т	1					
4	4	5	2 (10-20cm)	В	S	PF	T	2	Р	S	2		
4	4	5	2 (10-20cm)	В	S	DF	Т	2	Р			F	
4	4	5	3 (20-30cm)	F	S	С	Т	1	Р	S	3	F	
4	4	6	2 (10-20cm)	F	S	DF	Т	3	Р			F	
4	4	6	4 (30-40cm)	S	MS		Т	1					
4	4	8	2 (10-20cm)	М	S	С	Т	2	Р				
4	4	8	2 (10-20cm)	F	S	С	S	3	Р	S	2	F	
4	4	8	3 (10-20cm)	S	Q		Т	2					
4	5	1	1 (0-10cm)	F	S	DF	Т	3	Р			F	
4	5	1	2 (10-20cm)	В	S	DF	Т	3	Р			F	
4	5	1	2 (10-20cm)	F	S	С	Т	1	ND	F	4	F	
4	5	1	2 (10-20cm)	В	S	MF	Т	2	Р				
4	5	1	2 (10-20cm)	F	S	С	Т	3	Р	CR	3	F	
4	5	1	2 (10-20cm)	F	S	PF	Т	2	Р	S	3		
4	5	1	2 (10-20cm)	F	S	PF	Т	2	R	CR	4		

Area	Transect	Square	Spit	Artefact type	Raw material	Integrity	Reduction	Size	Rotation	Platform type	Platform size	Termination type	Notes
4	5	1	2 (10-20cm)	F	S	С	Т	2	Р	S	2	F	
4	5	1	2 (10-20cm)	S	S		Т	2					
4	5	1	2 (10-20cm)	В	S	DF	Т	2	Р			F	
4	5	1	2 (10-20cm)	F	S	PF	Т	1	ND	S	3		
4	5	1	2 (10-20cm)	F	S	С	Т	1	ND	S	1	F	
4	5	1	2 (10-20cm)	В	S	DF	Т	2	Р			F	
4	5	1	2 (10-20cm)	F	S	PF	Т	1	ND	F	2		
4	5	9	1 (0-10cm)	S	S		S	3					
4	5	9	3 (20-30cm)	F	S	PF	Т	2	Р	S	2		
4	5	9	3 (20-30cm)	F	MS	DF	S	2	Р			F	
4	5	9	3 (20-30cm)	F	MS	С	S	2	Р	С	2	F	
4	5	9	4 (30-40cm)	F	S	DF	Т	2	Р			F	
6	1	1	3 (10-15cm)	В	S	MF	Т	2	Р				
6	1	2	4 (15-20cm)	F	MS	DF	Т	1	ND			F	
6	1	3	1 (0-5cm)	F	MS	DF	Т	2	Р			F	
6	1	4	2 (5-10cm)	F	S	PF	Т	1	ND	S	2		
7	2	1	3 (20-30cm)	F	S	MF	Т	3	Р				
7	2	2	3 (20-30cm)	F	S	PF	Т	2	Р	F	2		
7	2	3	1 (0-10cm)	FP	MS		Т	3	R	S	4	F	
7	2	3	2 (10-20cm)	F	S	С	S	4	R	S	3	F	
7	2	3	2 (10-20cm)	F	S	С	Т	2	R	Р	1	F	
7	2	4	2 (10-20cm)	F	MS	С	Т	3	Р	S	3	F	
7	2	4	2 (10-20cm)	F	Q	DF	Т	2	ND			F	
8	1	6	1 (0-10cm)	FP	MS		S	4	R	S	5	F	
9	1	5	2 (10-20cm)	F	MS	С	S	2	Р	S	2	F	
10	1	2	2 (10-20cm)	S	S		Т	2					
10	1	5	2 (10-20cm)	F	MS	С	Т	4	Р	S	5	F	
10	1	5	2 (10-20cm)	F	MS	С	Т	4	Р	S	3	SH	
11	1	4	1 (0-10cm)	F	S	DF	Т	2	R			F	

Area	Transect	Square	Spit	Artefact type	Raw material	Integrity	Reduction	Size	Rotation	Platform type	Platform size	Termination type	Notes
12	1	2	1 (0-10cm)	F	MS	С	Т	2	Р	S	2	F	
12	1	2	1 (0-10cm)	F	S	DF	Т	1	NA			F	
12	1	2	2 (10-20cm)	F	MS	DF	Т	1	R			F	
12	1	2	2 (10-20cm)	F	S	MF	Т	2	Р				
12	1	2	2 (10-20cm)	F	S	С	S	3	R	S	4	F	
12	1	5	1 (0-10cm)	F	С	С	S	3	Р	С	4	F	

Appendix E PCWP Cultural Values Report

P18-0089 Page | **250**

ABN: 13 137 694 618







GLENDELL ABORIGINAL CULTURAL VALUES ASSESSMENT REPORT

Company | Glencore Coal Assets Australia

Contact Brad Sneddon

Date 25/06/2020



Contents

1	Intr	oduction	8
	1.1	Background	8
	1.2	Document Purpose	9
	1.3	Aims and Objectives	9
	1.4	Limitations of Study	11
	1.5	Study Area	12
	1.6	Report Format and Authorship	14
2	The	Plains Clans of the Wonnarua Peoples	
	2.1	Who are the Plains Clans of the Wonnarua People (PCWP)?	
	2.2	The Traditional Lands of the Wonnarua People	
	2.3	An introduction to the Heads of Families of the PCWP	
	2.3.		
	2.3.		
	2.3.	Rob Lester	19
3	Hist	orical Sources	21
	3.1	A Brief History of Contact and Post-Contact Settlement in Wonnarua Country	21
	3.2	Historical Accounts of Wonnarua People	31
	3.3	Cultural Practices	32
	3.4	Subsistence Strategies	34
	3.5	Material Culture	35
4	Lan	dscape Context	37
	4.1	Overview	
	4.2	Geomorphology	37
	4.2.	1 Historical Accounts of the Hunter Valley Landscape	38
	4.2.	The Hunter River Valley: Post-Contact Changes	40
	4.2.	3 Geomorphic Expectations	41
	4.2.	Comparative Study: Terrace Development on Widden Brook, Upper Hunter Vall	ey,
	NSV	V 42	
	4.3	Geomorphology of the Hunter Valley: Discussion	45
	4.3.	1 Landscape Archaeology and Cultural Significance	45
5	Hu	nter Gatherer Studies	50
	5.1	Aboriginal Hunter-Gatherers: an introduction	50
	5.2	Tangible and Intangible Aboriginal Cultural Heritage	50
	5.3	Cultural Landscapes and Intangible Sites	51
6	Doc	umenting the PCWP Cultural Values for the Project Area	53
	6.1	Introduction	53
	6.2	A Holistic Approach	54
	6.3	Cultural values	57



	6.4	PCWP Consultation and Participation	58
7	Rec	ognising the PCWP Values in the Project Area: Results	59
	7.1	Introduction	
	7.2	Historical values	59
	7.2.	1 Social values	61
	7.2.	2 Spiritual values	61
	7.2.	3 Biami and the creation of Wonnarua Country	61
	7.2.	4 Lizard Mountain	65
	7.2.	5 Biami and Sentinel Mountain	65
	7.2.	6 Tiddilick the Frog	66
	7.2.	7 The 'Hairy Men and Other Leery People	67
	7.2.	8 Totems and Taboos	69
	7.2.	9 Ceremonial places and pathways	69
	7.2.	10 The Bulga Bora Ground	72
	7.2.	11 The Gold Ochre Site	74
	7.3	Cultural Mapping of the Cultural Landscape	75
	7.4	Landscape and Environmental Context	78
	7.4.	1 Background	78
	7.4.	2 Geology and Topography	78
	The	remaining undisturbed landscape of the study area consists of low undulating hills and	ow
	rise	s on Permian Wittingham Coal Measures. Slopes range from 3 - 10% (locally to 20%) wit	h
	loca	ıl relief from 20 - 90 m, and elevation from 30 - 280 m. Along Bowman's Creek consists o	f
	Qua	ternary alluvial sand, silt and clay derived from Permian sediments of Wittingham Coal	
	Mea	asures (OEH 2018)	78
	7.4.	3 The Hunter Valley Region	78
	7.5	Predictive Modelling for the Hunter Valley Based on Previous Archaeological Studies	80
8	Sigi	nificance Assessment	83
	8.1	Introduction	83
	8.2	Aesthetic values	83
	8.2.	1 Positive Aesthetic Values	83
	8.2.	Negative Aesthetic Values	84
	8.2.	3 Individual Artefacts	84
	8.2.	4 Artefact Scatters	84
	8.3	Archaeological Values	85
	8.4	The Cultural Values of the PCWP in the Study Area: A Synthesis	86
	8.4.	An Overview Statement of Cultural Value	87
	8.5	Summary Statements of Value Relative to Burra Charter Criteria	89
	8.5.		
	8.5.	2 Summary Statement of Social Value	90
	8.5.	Summary Statement of Aesthetic Value	90
	8.5.		
	8.5.	·	



8.6	P	ossible Mitigation Measures: The PCWP Viewpoint91
8.7	D	viscussion and Recommendations92
9 E	Biblio	graphy93
10	ΔP	PENDIX 1106
10	AP	PENDIX 1100
Tabl	e of	Figures
		eneral Map showing the Location of the Study Area within the Hunter Valley (source agery 2019)
Figure	e 2: Lo	ocation of the PCWP Traditional Country (Source NNTT 2014)
Figure	e 3: C	harlie Franks (Photograph courtesy Charlie Franks)19
		aria Stocks in the arms of her mother Barbara Foot c. 1962. (Photograph: courtesy Maria
		obert Lester
		of the appropriated lands dedicated to Sir John Barrow by Robert Dixon 184122
		epresentative cross-sections for each terrace sequence on Widden Brook. Cross-sections
		len terrace sequence include interpretational changes based on a revised chronology
		eetham 2010)
		ustrated phases of floodplain abandonment and terrace development for the Baramul,
		d Kewarra sequences on Widden Brook (source Cheetham 2010: 115)44
		buried soil on the New England Tablelands: red arrow pointing to the dark grey deposit e light brown overburden
		Example of a buried soil, Redbank Creek, Hunter Valley, NSW. Scale is 2m. The blue
		narcate the buried soil, the red arrow the overburden47
		An example of an entrenched creek illustrating erosion, Redbank Creek, Hunter Valley,
		e is 2m
		An artefact scatter exposed through erosion, Hunter Valley, NSW. This reflects geomorphic
		rather than human behavior. Such locations should be considered 'lag gravels' rather than
		ical sites. Pink flags represent surface artefacts. Scale is 2m48 A schematic diagram of the structural elements of landscape and the variable trajectories
		ne that manifest as places(s) in the present (from Cotter 2009: xxiv)
		Biami the Creator, Milbrodale, Hunter Valley, NSW
		Sacred Lizard Mountain: Little Biami, a creation being, placed a giant Lizard (Wirramin
Kooai	ran) to	sleep on the mountain between Broke and Cessnock to warn all others to stay out of
		lands
Figure	e 16: I	Mary Franks. c. 1980s photographed near the giant form of Tiddilick the Frog, Wollombi. n courtesy Alma Franks
		I courtesy Aima Franks
		chell
Figure	e 18: (Ceremonial and song lines, as reported by Mr Franks 2015, and recorded in Tocomwall
		showing some key regional Aboriginal aspects, places and sites. Source: Scott Franks
		mwall 2013, with GML 2015 (Map Source OSM Contributors)
		A copy of the drawing Mathews (1893: 356) produced of a figure he describes as 'The
		niamai, or Devil Devil or whatever the image represents' as published in the Journal of the ety of NSW80
Noyal	JUCK	5ty 01 145vv00



Prepared by	Will Moon
Approved by	Scott Franks
Version	1.1
Date	25/06/2020





Australian People Power Can Stop This Destruction in Its Tracks, NOW.

outlines are a very rough sketches of where bloody big holes will be left for all our grandchildren as their legacy from us, to them, to fix. We need to tighten the belt and make the mining companies fix them or we fix them. It is not, our grandchildren's problem, it is

The PCWP Aboriginal Corporation Inc 8700

PCWP Native Title Claim Group

24th June 2020 Glendell Continued Operations Ravensworth

PCWP Observations.

The PCWP Aboriginal corporation ICN 7800 is established under that Aboriginal Councils & Association Act 1976 to ensure the Wonnarua People could legally represent the Wonnarua Peoples descendants of the Hunter Valley regarding their traditional Homelands within the Hunter Valley. The PCWP is the only ORIC registered Aboriginal association that has a legal function to represent the Wonnarua people should any future Native Title Claims be successful. The PCWP is currently managing an agreement as an outcome between a JV agreement between Yancoal & Glencore

The PCWP has taken the time to prepare a cultural heritage assessment for the proposed Glendale continue coal operation at Ravensworth in the Hunter Valley NSW. Part of the PCWP assessment was to document the massacres of our people and the hostilities brought to bear on our people by the European settlers that came to the area Namely.

- Dr Bowman (The Ravensworth Estate, The Ravensworth Homestead)
- Captain Lethbridge (the estate adjacent to the Bowman Estate)

The assessment completed by the mining operations consultants demonstrated a disproportionate assessment that did not go to identify the traditional owners for that area, the Wonnarua people. Instead it was designed to allow any Aboriginal person to be consulted and comment and those comments and statements were never interrogated or veited. As a result, that assessment documents a clear separation from any real attempt to properly record the ethnographical evidence of the Wonnarua people. The assessment also demonstrates a disproportionate interpretation of Aboriginal understanding verses a non-Aboriginal understanding.

The PCWP have completed an assessment which tries to allow our voices to be heard in a way that a government agency can properly consider the findings contained in the PCWP assessment. The PCWP do not have in house Aboriginal staff with the appropriate qualifications and skills to compile our response which results in the PCWP assessment lacking real cultural feelings and empathy that could be in a position to demonstrate and lack of intergenerational equity and benefit for the PCWP.



The PCWP have taken the time to consider our recommendations for the Glendell Continued Operations and feel the only way we could support the project approval is if there is a real and tangible outcome for the PCWP. The PCWP have supported Gleneore mining operations in the past but have continually raised concern with the level of destruction of our lands. The approval being sought for the Glendell Continued Operations contains within it a travelling stock reserves that will remain intact and be land locked by the approval of the operation. That TSR will in effect be an island with controlled borders. Allowing the approval will prevent the rights of the PCWP to test native title on that parcel of land. The NSW Government should consider its obligations with granting approvals to mining that allow a trigger to not deal with TSR access and section 29 applications.

The current Glendell mining operation footprint will impact on a track of land that contains hallowed ground of the Wonnarua People and vital materials that have culturally significant value to the PCWP for ongoing culture protection and practices of our lore and customs. The PCWP states that the area in question was, and is a landscape that clearly records inland wars waged upon our people covering a large area of the massacre of our people and as such should be treated as a sacred site.

Kind regards

Robert J. Lester Family Head, and

Chairperson PCWP Aboriginal Corporation Inc 8700

Above are the homelands of one of the World's oldest surviving cultures, in Australia, it is. The Womania-People's Mother Earth, in the Hunter Valley. NSW her heart is being appeal out by greedy international companies, where most of the profits, are sent offshore. Condained by Australian Peoples Elected Politician's Aboriginal people are only 2.5 to 3.0 percent of the union's papulation, we cannot stop this short-sighted planning. But YOU CAN. All elected Governments know, full well, the royalthies that come from coal, make little difference in the averall State and/or Federal Government budgets, yet will, the elected governments appear to be another to think past the next election circle, what about the burden we are all placing on all our grandchildren.

Is this really the future, that our trien and women have fought and died for, for us to create burdens for future generations; NO IT'S BLOODY NOT. Look at what is replacing all those fertile growing and grassing limits that Sydney once relied on, to feed the peoples of Sydney, and it won't be long before Sydney will again be looking for good lands to grow food and grazing-stock. But after all the Cont havegame, where is a going to be grown, for grazing stock, for meat, IN A BLOODY BIG HOLE? That our puliticians left for our grandchildren as a legacy. I think not

Our generation must say, stop now a not 50 years a down the track, we are well and truly past that point. We must reli the politicians, now to tell the numing industry to start filling the holes now. Or, back your swages, and get on their takes. But leave all the earth moving equipment behind so we can use it to fix your sandafrom to not Country and also there must be a guaranteed commitment from their shareholders to an ongoing commitment of funding towards regular maintenance of all equipment to be provided, until the must landscapping fortprint is. completed as alose to original landscape as possible for closure and/or capping. If the reliabilitated is not done to a point where mother earth can pick up where the mining stops, there will be a BLOODY BIG HOLE, that will take hundreds if not thousands, of years to fill, with minister, and what will be the impact then, for fature generations of our grandchildren, as saline creeps into the water tables.



1 Introduction

1.1 Background

As Registered Native Title Claimants the Plains Clans of the Wonnarua People (PCWP) acknowledges the ongoing responsibilities and obligations of their rightful custodianship especially in regard to the preservation, maintenance and renewal of the Aboriginal cultural landscape values in, and knowledge(s) of Wonnarua Country and the transfer of these values and knowledge(s) to future generations.

As traditional custodians of Wonnarua Country the PCWP are only too well aware of the loss of places, items and natural resource use areas of cultural importance to Wonnarua people that have, and continue to occur across the Hunter Valley. Without dispute this is a function of land use changes that have occurred since the commencement of European settlement in the Hunter Valley, in or about the early to mid-1820s. In recent decades the scale of loss has increased as a result of the expansion of coal mining and related infrastructure development across the Valley. During this time members of the PCWP have actively involved themselves in Aboriginal archaeological survey and assessment of resource and infrastructure development projects with a view to fulfilling their responsibilities and obligations to their traditional lands. It has sometimes been a difficult task as it usually involves Aboriginal archaeological site clearance and salvage works that have resulted in the, albeit permitted¹, destruction of Aboriginal objects and sites throughout the Hunter Valley. Moreover disproportionate emphasis on the investigation and protection of items and places of Aboriginal archaeological significance has also been problematic for the PCWP, who have attempted to articulate other tangible and intangible cultural values within 'their country' without recognition or support². It remains of concern to the PCWP that there is no current regulatory requirement for a proponent to consult with the Aboriginal community regarding their values unless a tangible Aboriginal object is identified within the proposed development area and it is considered likely to be subject to harm or impact by the proposed development activities.

Despite these limitations the PCWP continues to participate wherever possible in Aboriginal cultural heritage projects and development works of likely impact to Aboriginal cultural resources within Wonnarua country. The identification and assessment of the Aboriginal cultural values for the Glendell Continued Operations project area - (hereafter referred to as 'the project' or 'the study area') is one such project in which the PCWP has engaged. This project reflects the ongoing support of Glencore Coal Assets Australia (Glencore) in actively seeking and allowing the PCWP scope to identify more than the Aboriginal archaeological values of the Project.

Glencore will circulate this report to other interested Aboriginal community members and will seek their feedback on values from their own perspective, informed by the archaeological, historical and

¹ In the terms of an Aboriginal Heritage Impact Permit (AHIP) authorised under the Part 6 (Section 90) provisions of the *National Parks and Wildlife Act 1974*.

² The L and E Court actions of PCWP member Mr Robert Lester being pertinent (i.e. Lester vs Aston Coal Pty Ltd and Anor, 2011).



cultural information contained in this report, which will be collated and become an appendix to this report.

1.2 Document Purpose

Tocomwall Pty Ltd (Tocomwall) has been engaged by Glencore to undertake a cultural values assessment of the project from the perspective of the PCWP. The intent is to provide Glencore with information regarding PCWP specific cultural values identified in the lands and creek systems of the project. However, cultural values as they apply to cultural landscapes are not necessarily restricted to a particular geographic location and necessarily, the cultural assessment includes a wider geographical focus than the project area.

Tocomwall is committed to the principles and practices of cultural heritage assessment and management outlined in the Burra Charter (ICOMOS Australia, 1999) hence the more specific purpose of this document is to identify and report the following Aboriginal cultural heritage values of the Project in so far as they are articulated by the PCWP:

- Aesthetic values (where applicable at the individual site/local area and/or landscape scale);
- Social values (including traditional, contemporary, spiritual and secular values);
- Scientific values (including the archaeological, as well as the environmental values as they
 apply and inform the archaeological context); and
- Historic values.

The latter may include values derived from archival records that have an association with Aboriginal individuals or groups of importance at the local and/or State level. These may include direct testimony (oral histories) derived from PCWP members associated with historic events or factors that have affected and influenced Aboriginal knowledge of and engagement with the project. In so far as these values are to be identified and reported by Tocomwall, the purpose of this document is also to ensure that it is both a stand-alone account of the cultural values of the PCWP in the project that meets all the requirements and expectations of the PCWP (and Tocomwall) with respect to issues of confidentiality and intellectual property. An ancillary function for the document is to allow the findings and recommendations to be integrated into the ACHAR and hence be available for scrutiny as part of the project approvals process. The objective is to provide Glencore with a balanced and informative cultural values assessment report to guide any future land management of the study area.

1.3 Aims and Objectives

The aim of the following report is to present a PCWP perspective of the study area and its environs from a cultural perspective. However, in order to inform the study with regards to the PCWP cultural perspective, it is also necessary to review archaeological, historical and environmental data to provide a scientific background to compliment the cultural assessment. The purpose of this document will be to weld these perspectives and present a common thread that incorporates both viewpoints.

As important and fundamental as the cultural perspective is to assessing the significance of cultural values of Aboriginal people with respect to their 'Country', it cannot be done in isolation from the



paradigms that are used by regulatory bodies and heritage professionals particularly during an approvals process. In fact, one of the primary objectives of this document is to illustrate the importance of the cultural perspective, but at the same time to acknowledge the 'scientific' evidence in order to provide an interpretative platform that heritage professionals and regulatory bodies can use to assess *both* cultural and scientific values in tandem. These two aspects — cultural and scientific significance — cannot be assessed in isolation. Furthermore, cultural values evolve, hence the importance of growing the scientific database and continually informing and updating the cultural values. Therefore, there is a requirement for holistic archaeological approaches that incorporate landscape histories via the earth sciences and chronometric techniques, Quaternary methods that encapsulate aspects like climate and vegetation change or hydrological regimes, historical methods to investigate Contact and post-Contact accounts of Aboriginal people and anthropological perspectives to provide human behavioural ecological models based on ethnographic assessments of hunter-gatherer societies in order to aid in the interpretation of archaeological patterning.

The following aims of this assessment are:

- 1. To undertake a cultural values assessment of the Glendell Continued Operations project area from the perspective of the PCWP that is:
 - I. Compliant with the requirements of the *National Parks and Wildlife Act 1974* (NPW Act);
 - II. Consistent with the *Guide to investigating, assessing and reporting on Aboriginal* cultural heritage in NSW (OEH, 2011); and
 - III. Complimentary to the NSW Minerals Industry *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (NSWMC, 2010).
- To conduct this PCWP specific cultural values assessment in accord with the requirements of the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010a), especially as a stand-alone contribution to Stage 3, whereby information about cultural significance is exclusively derived and determined from the perspective of the PCWP.
- 3. To use the information obtained from this heritage assessment of the Project area and to consult with PCWP family representatives to prepare a report that outlines the PCWP specific cultural heritage values of the Project area, that evaluates the cultural significance of items and places within the Project, in light of these values.
- 4. To contextualise the cultural values identified and their significance with respect to the archaeological (scientific) values and complying with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010).
- 5. To make recommendations that enable the cultural values and cultural considerations determined through the abovementioned PCWP specific cultural values assessment process to inform the protection and management of cultural heritage values within the project area.



6. Glencore will circulate this report to other interested Aboriginal community members and will undertake a workshop process to seek their feedback on values from their perspective, which will become an appendix to this report.

The following seven primary project tasks were identified as necessary to achieve these aims:

- I. Consultation with PCWP members in alignment with regulatory requirements, policy standards and approved consultation guidelines;
- II. Undertake a field assessment of the study area with the view to understand the nature of the physical environment and to identify the full range of PCWP specific cultural values within it;
- III. Archival research and other desktop review as required to ensure appropriate understanding of the ethnographic, environmental and historical land use contexts of the Project;
- IV. Documentation of oral histories and/or other commentaries from PCWP members relating to the cultural values of the study area;
- V. Description or mapping of the cultural values of the study area in context of the surrounding landscape;
- VI. Synthesis of the PCWP cultural values and determination of the significance of items, places, natural resources and/or landscapes of the study area in accordance with accepted significance criteria; and
- VII. Articulation of management options for the identified Aboriginal cultural values and resources within the study area. These options are expected to address such aspects as land management and conservation of those Aboriginal cultural values from the perspective of the PCWP whose cultural heritage it is.

Upon completion of this report, it is expected that it will be a baseline study that can be used to inform the future management of both cultural and biodiversity values across the study area.

1.4 Limitations of Study

Tocomwall recognises that for the cultural values of the PCWP to be identified and assessed, it is necessary to provide sufficient biophysical and sociocultural data relating to the study area so that there is a context for the values described. The document is further limited to the use of this material only for characterisation of those parameters of relevance to the specific articulation of the cultural values of the PCWP.

The document will also be used to inform Glencore's intended process to collate the values of other interested Aboriginal stakeholders as they relate to the Glendell Continued Operations Project Area.

This document reports the methods used and the outcomes from the PCWP to record and evaluate its own cultural values for the purposes of managing, conserving and promoting those values in the long-term. To the extent that information from previous Cultural Heritage Assessments (CHA) was undertaken to document the PCWP values in Wonnarua Country (Tocomwall 2012; 2013; 2016; 2017) is relevant, it has been included here, sometimes with limited or no alteration. This is



purposeful and a result of the fact that the cultural heritage values the PCWP hold in the project area are those from the same physical, spiritual and perceptual realms as those derived from previous study areas. Likewise, the PCWP is a recognised native title claimant group, with verifiable cultural connections to Wonnarua Country that derive from genealogical links that are constant as to people and places of storied reference.

Preparation of this document has been challenging. The majority of this challenge has related to (a) the need to gather and collate disparate sources of evidence, (b) time-pressures arising from PCWP involvement in activities focused on protecting their cultural heritage from other mine and infrastructure related developments; and (c) the variable availability of key informants. Overall these have had impact on the timeliness of reporting. With regard to this issue Tocomwall acknowledges the flexibility and patience demonstrated by Glencore in enabling this document and its primary goal of comprehensively documenting the PCWP cultural values in the project, to be realised. Tim Walls and Bradly Snedden are acknowledged for their commitment to supporting the delivery of a document reflective of the depth of cultural knowledge and value of the PCWP in the project area.

1.5 **Study Area**

Tocomwall has been engaged to prepare a cultural values assessment of the Glendell Continued Operations Project Area. The study area includes the Glendell Continued Operations Project area. The study area is located approximately 20 kilometres (km) north-west of Singleton, 24 km southeast of Muswellbrook, in the Hunter Valley of New South Wales.



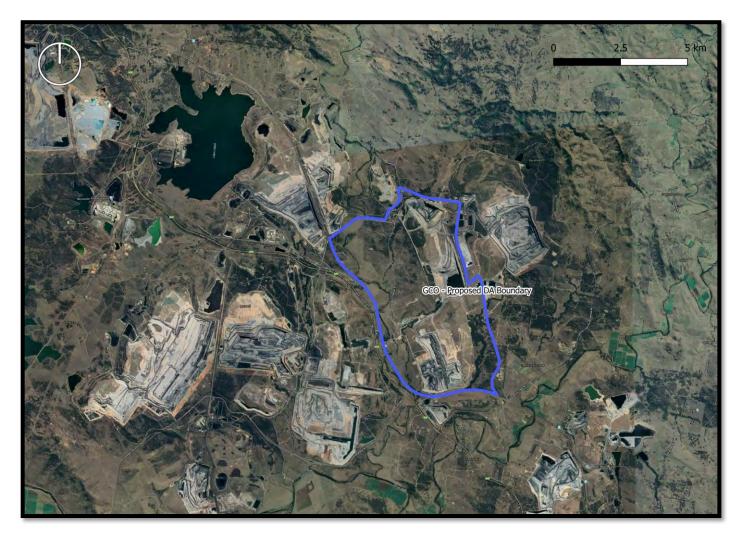


Figure 1: General Map showing the Location of the Study Area within the Hunter Valley (source Google Imagery 2019)



Report Format and Authorship 1.6

The document is presented in a conventional report format so as to facilitate its inclusion in any future management of the study area. Though mindful of meeting PCWP protocols with regard to the sharing of information about Wonnarua country, wherever practicable the document has sought to adhere to the reporting conventions outlined in the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH, 2011a). The language of the report is styled so as to enable it to be subject to agency review. It is not language targeted at the broader membership of the PCWP but has been subject to editing and evaluation by the respective Heads of Family of the PCWP.

This report has been prepared by Will Moon (Tocomwall). The cultural values used in this report have come from various testimonies and interviews with the PCWP heads of family Charlie Franks, Maria Stocks, Robert Lester and Rhonda Ward, with additional information from Danny and Scott Franks.

The report was reviewed by Scott Franks and the Heads of the PCWP families.



2 The Plains Clans of the Wonnarua Peoples

2.1 Who are the Plains Clans of the Wonnarua People (PCWP)?

The PCWP are a registered Native Title Claimant group with extended familial or clan links to the hills and plains of the central and upper Hunter Valley. The PCWP assert that these clan links provide a continuity of connection with the Hunter Valley that extends back to the time at or before first sovereignty. This connection is based on well-established societal norms including the recognition of spiritual beings and places, rights and responsibility in 'Country' and the hunting, gathering and sharing of resources within the boundaries of 'Wonnarua' country. The PCWP recognises apical ancestors namely 'Mary' the mother of Matilda Smith (nee Hughes) as providing the traditional and continuing genealogical links to their claimant lands. The absence of further apical ancestors with both traditional and continuing links to Wonnarua country within the claimant group is readily attributed to issues associated with the first contact and later engagements of the PCWP with European settlers including:

- The active military suppression of the Wonnarua in the 1820s (see Gollan 1993; Millis 1994);
- Health issues including susceptibility to introduced diseases such as smallpox as well as inherent factors like high infant mortality rates (Le Maistre 1996);
- The decline in access to habitable areas due to alienation of land by white settlers and reduction in food resources as native animals were culled to increase the stocking rates of domestic animals (Threlkeld c. 1828-1846; Noble N.D);
- The need to cohabit on pastoral properties, or to move off country and into fringe camps and / or Aboriginal Reserves (Noble N.D); and the
- Resistance to actions of the settler community to try and Christianise the Wonnarua people and devalue their customary ways (Lester 2012).

2.2 The Traditional Lands of the Wonnarua People

Ethnographic accounts and anthropological notes written in the mid-to late 19th century indicate that the traditional territory of the Wonnarua extended over a two thousand square mile area of land that included the Hunter River and all its tributaries from within ten miles of Maitland to the apex of the Liverpool Ranges (e.g. Miller 1886, Fawcett 1898a; 1898b). This is the territory within which the PCWP claim Native Title interest (Figure 9). The early European records describe the smaller social and/or family groups of the Wonnarua with reference to the place names of the areas in which they gathered and/or were to be found (Le Maistre 1996). Thus for example, those Aboriginals first noted in the diary entries of John Brown (Brown c.1825) as being within the vicinity of Glendon Estate later became known as the 'Glendon Blacks'; those within the area about Singleton were described as the 'natives of Patrick Plains' (Le Maistre 1996); and those near Wollombi as the 'Wollombi blacks' (e.g. by Breton 1834: 219). These are of course colonial attributions of names to apparent community aggregations that may or may not have accurately reflected the kinship units and group ranges that existed at this time within Wonnarua society.



Hence in the 1826 Sydney newspaper reportage of an attack by Aboriginals on Captain Lethbridge's Station, Bridgman (to the north east of the project area) the following description was supplied:

'The Mountain Blacks, in the neighbourhood of Glenny's Creek [sic], in one of the more remote districts of Hunter's River, have again not only been troublesome, but also evinced a spirit of revenge...(The Sydney Gazette and New South Wales Advertiser, Saturday 9 September 1826).'

In this case the choice of naming the Aboriginal group involved as either 'Mountain Blacks' or "Glennys Creek Blacks" appears quite arbitrary. It is an attribution of geographic association that shows no comprehension of the likelihood that for the Aboriginal party involved the entire course of "Glenny's Creek", from its more mountainous headwaters to its lower floodplain adjoining the Hunter River, was part of their traditional home base and resource range.



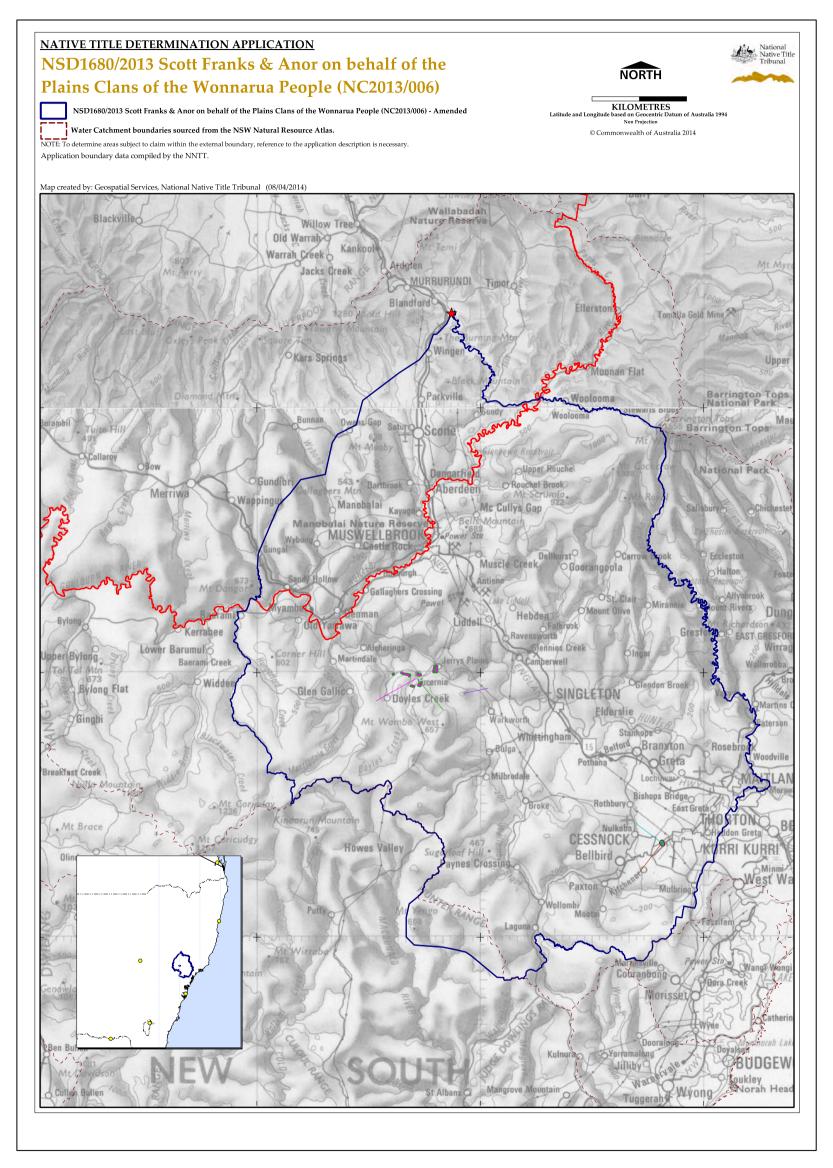


Figure 2: Location of the PCWP Traditional Country (Source NNTT 2014)



2.3 An introduction to the Heads of Families of the PCWP

In the context of the agreed terms of an advertised meeting held in 2010 to consider authorisation and lodgement of the PCWP's first Native Title Claim, the descendants of Mary Shoe confirmed that the PCWP would follow customary lore with respect to the rights and responsibilities of individuals to speak for family. This would ensure continuance of customary practices and ensure that decisions regarding matters of cultural heritage within the country of the PCWP were determined by the right family group(s). It was also expected to ensure that each family group had a voice in the process. Systems of silent voting and/or 'show of hands' mechanisms for decision making were flatly rejected as being in no way representative of the traditional rites, lores and customs of the PCWP. As Maria Stocks (2012: para. 4) explains it:

'The lores and customs of our family groups were not voted upon but were handed down, usually by the passing of an elder. It was usually a man's role to be the Head of Family but if for whatever reason a male person didn't accept the responsibility it would be transferred 'down the line'. My mother Barbara Foot was our family Elder and spokesperson as she had been the 'next in line' upon the passing of her father. In this way the Head of Family role was handed down to me. I accepted the role from my mother and I am now the Elder and spokesperson for our family.'

At this initial authorisation meeting - having agreed to customary lore mechanisms - three family lines were identified from within the descendant group of the apical ancestor Mary Shoe, and 'Heads of Family' for each family line were established. It was also re-affirmed that the 'right to speak' was (and forever is) handed down by each 'Head of Family' to the next in line. Moreover, once this transference of rights and responsibilities has occurred within a family (by whatever happenstance) it is accepted and never challenged. It is only ill-health, death and/or by an agreement from the Head of Family to pass on his/her role and responsibility to another individual that allows for the transference of such rights. Within the current Claimant group the three Heads of Family named below have been identified. Notably whilst Charlie Franks remains the recognised Head of Family for the Franks/Smith Family Line, by verbal agreement he has ceded his role to negotiate on behalf of the Franks Family to his younger brother Scott.

2.3.1 Charlie Franks

Charlie Franks: Was born in 1963, the eldest son of Alma and Claude Franks of Mt Olive. He has three brothers (Malcolm, Scott and Thomas) and two sisters (Ann and Mary). His paternal grandmother Sarah Ann Smith was a Wonnarua woman. She was born at Falbrook near the village of Camberwell, in 1894. In 1914, Sarah married Charles Henry Franks. Her father, William "Billy" Smith was born at Sydenham in 1858, the son of James Smith a non- Aboriginal labourer and Matilda Hughes an Aboriginal woman who was born in about 1832. In turn, Matilda was the daughter of Joseph Hughes a brick maker and Mary Shoe an Aboriginal woman who was born in about 1800. James Smith and Matilda Hughes were married in the St Clements Anglican Church at Falbrook in 1856 (Source: Franks 2012 and Charlie Franks 2012.)



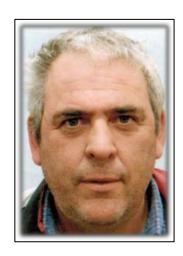


Figure 3: Charlie Franks (Photograph courtesy Charlie Franks)

2.3.2 Maria Stocks

Maria Stocks: Maria was born in 1961 and has lived in the Singleton district all her life. She is a mother of six children (Melissa, Douglas, Miranda, Brittany, Jeremiah and Annastasia) and a grandmother to six. She is a proud Wonnarua woman who has always known of and been told about her Aboriginal heritage. Her Aboriginality derives from the ancestral line of her mother Barbara Foot (nee Smith) born in Singleton in 1937, the eldest daughter of Alma Mabel Lester and James 'Leslie' Smith who, in turn, were both descendants of Matilda Hughes (Source: Stocks 2012).



Figure 4: Maria Stocks in the arms of her mother Barbara Foot c. 1962. (Photograph: courtesy Maria Stocks).

2.3.3 Rob Lester

Rob Lester: Is a 68 year old father of four and grandfather of six. He was born in Paddington Sydney but is joined directly to his birth right country of Wonnarua lands through the ancestral bloodline of his paternal grandfather, Edward Robert "Bob" Lester. His grandfather was born at Bridgman, Patrick Plains in 1893, the son of Mary Anne Smith and Edward Lester. Mary Anne Smith was the daughter of Matilda Hughes, a Wonnarua woman who herself was born at Patrick Plains in 1832. Rob also claims an historical connection to Wonnarua lands through his paternal grandmother Ada Waters/Miller who was the grand-daughter of Sarah Madoo. As Rob explains it, Sarah Madoo his great great-grandmother was a Worimi person, born on the Allyn River at Eccleston in 1847, then moving from Eccleston to Singleton in later years (Source: Lester 2012).





Figure 5: Robert Lester.



3 Historical Sources

3.1 A Brief History of Contact and Post-Contact Settlement in Wonnarua Country

The first permanent settlement in the Hunter Valley was a penal settlement, which was established in 1804 at the mouth of the Hunter River and was then known as the Coal River. At this time, the population of the settlement consisted only of the military garrison, convicts and civilian officials and the only transport between this settlement and Sydney was by water (Karskens 1985). Convicts were employed in coal mining, timber getting, lime-burning and labouring in the penal settlement and its wharves. The lands in the region of the Hunter River were initially closed to free settlement and the resources therein were reserved for the use or the profit of the Government (Wood 1972). Nevertheless by 1812 some small-farms had been established and a few well-behaved convicts occupied grants at Patterson's and Wallis Plains (Maitland).

In 1819 John Howe, a grazier and constable at Windsor, located the first overland route between Windsor and Jerrys Plains in the Upper Hunter (Karskens 1985). This route passed through the area occupied by the current village of Bulga, it being the first place reached by Howe, Singleton, Thorley and others in leaving the ranges (Eather 1921). A second expedition led by Howe in 1820 followed a slightly different route and it was this later route that was officially opened to the public in 1823 as it rapidly developed as the main thoroughfare for travelling stock from the northern districts of New South Wales (Karskens 1985; Eather 1921). Soon after, when Cunningham traversed the route, he described it in less than glowing terms maintaining that it was:

'A rugged bridle track over a mountain ridge called Bulga, quite unfit to take an empty cart by (Cunningham 1827: 75).'

Despite the difficult and circuitous nature of the route identified by Howe in 1820, he was subsequently granted land at Jerrys Plains for his discovery of the Bulga Road (Karskens 1985). Thus began the alienation of Wonnarua land. In March 1821 there were just 21 settlers in the Hunter Valley including John Howe and Benjamin Singleton. Within four years this had increased ten-fold to 283 settlers spread along the river as far as Segenhoe in the north, creating a farming district second only to the district of the Cumberland Plains (Karskens 1985: 23). During the period from 1823-1827 approximately 25% of the land available along the Hunter was converted to freehold title by Crown grant (Robinson and Burley 1962).





Figure 6: Section of map titled 'This map of the colony of New South Wales exhibiting the situation and extent of the appropriated lands dedicated to Sir John Barrow by Robert Dixon 1841.

By the mid-1820s, Sydney's maritime economy was sufficiently developed to provide reliable and regular shipping and communications between the Hunter and Sydney. Consequently, from the beginning of European settlement of the Hunter, Wonnarua people faced a more developed and established colonial world than their Aboriginal neighbours faced earlier in Sydney and the Coal River. The Hunter was within a long night's steaming and was in easy reach of Sydney, so far as settlers were concerned (Karskens 1985). New South Wales population had grown through natural increase and immigration to provide a free labour market. The convict assignment system also provided labour. The growth in numbers of 'native born' in the colony (this phrase is used to refer to the locally born children of Europeans in NSW and not indigenous people who were usually referred to as the native blacks) meant there was no shortage of labour and therefore few opportunities for Aboriginal people, unless they had relevant skills and local knowledge valued by settlers. Capital was available for new areas and land-based ventures supporting extensive farming activities in the Hunter (Le Maistre 1996).

Likewise, the growing population of Sydney provided a market for produce. As a result, European settlers rapidly displaced Wonnarua people on the Hunter River. Aboriginal people's resources were seriously depleted immediately and the Wonnarua people experienced harsh times. The records indicate that at first Aboriginal people fought literally to be able to continue some of their life habits and resorted to predatory behaviour to protect access to water and food (Le Maistre 1996).

In 1826 district magistrate Robert Scott (who with his brother Helenus received a grant of 2000 acres at Glendon which he commenced to occupy in c. 1823), reported to the Governor outlining Aboriginal aggression within the area of his jurisdiction over a 10 month period (Le Maistre 1996:34). According to his report Wiradjuri people (i.e. the 'Mudgee Blacks') cooperated with the Wonnarua at



the Wollombi Brook - deep in the territory of the antecedents of the PCWP - despite earlier conflict between the two groups. The cooperative effort of these two tribal groups, including the significant penetration of the Wiradjuri within Wonnarua territory was to combat a common enemy: the settlers (Le Maistre 1996).

Robert Scott also took a deposition from George Claris, assigned servant, working as a hut keeper for Mr Howe on 25 March 1827 that demonstrated the cooperative stance of the Aboriginal groups within the Hunter Valley against the settlers at this time:

'Tuesday last natives assembled, including Bit of Bread carrying a poisoned spear and threatening vengeance for accusing him wrongfully — King Jerry told me that if Bit of Bread was hurt by the white men that he would assemble a thousand Black fellows and spear every white man they fell in with, that the Soldiers were all gone away, that they were not afraid and desired me to inform white men at the plains so. One showed me how they surround the huts of the settlers and with a frying pan handle how they would spear us through the Slabs of the Hut, being in an unprotected state we gave them Bread, Milk and Tobacco but they would not be satisfied and I am confident that had it not been for the two strong men that we persuaded to stop, Death would have been the result (NSW State Records5/1161; Le Maistre 1996: 54).'

The challenging mood of the colonial frontier and the particular circumstances faced by the Wonnarua was captured and editorialised in the Sydney Press, at this time:

'Three blacks at Hunter's River have been shot, it appears, by the mounted police. We hope it is true, that they were all shot in the act of running away. But still we think their keepers ought to be severely punished for giving them the opportunity to run, and thereby cause their slaughter to be an act of justifiable homicide. There ought to be a solemn investigation. The laws of England will not justify a constable in killing a thief, if by any other means he might have secured him. A constable or a horse patrol is not to be careless about securing a prisoner, and say to himself, "it's no matter—if he attempts to run, I'll shoot him." The Australian says, that two of the natives slipped their ropes and would not return, even though the horse patrol kindly requested them so to do; and therefore they shot them! Now, we suppose when they were shot, the distance at which these carrion crows were winged, could not have exceeded 100 yards. Amid yet the Australian editor, a barrister, a humane English lawyer says, with the most revolting flippancy, "They", the poor blacks, "were hailed by the party, but ineffectually and, as the "police men saw no means of securing their prisoners " alive, they deemed it advisable to secure them dead "and so they fired upon them and shot them, and shot them dead too!!!" Again, gentle reader. "Another black native, who had committed depredations on a stock-man of Mr McIntyres, was also taken, and also shot by the mounted police. When the fellow approached the river, in the way to Wallis's Plains, he slipped the rope and took to his heels, intending to take to the river —just us he reached the banks of the river, he received a ball, which was considered the only measure capable of arresting his flight, and which proved fatal. He was shot dead, and thus secured!!! (The Monitor, September 1, 1826).'



The settlement of the Hunter Valley occurred over a relatively short timeframe. From March of 1822 to November of 1826. Dangar (1828:127-128) reported on the 'extraordinary advances in settlement' that were being made by the colony along the Hunter River. Dangar (1828:127-128) describes an:

'amazing extent of 372,144 acres were appropriated by settlers; 132,164 acres were allotted for church and school purposes, to which may be added 100,000 acres were surveyed and not appropriated; making altogether 604,305 acres. In this division of the country, occupying upwards of 150 miles along the river, which, in 1822 possessed little more than it's Aboriginal inhabitants.'

The land along the valley that was cleared for farming by the settlers for orchards and grazing, and together with the introduction of sheep and cattle; restrictions to access to the land; fencing, and the hunting practices of the Europeans, meant that the traditional hunting and foraging grounds along the hunter were being taken from the Aboriginal traditional owners (Dunn 2015:190-191). It is likely that as the traditional lands of the local Aboriginal people were being quickly appropriated and hunting and foraging grounds lost, the Aboriginal people would have needed to develop strategies to help prevent further loss of their lands, and alternative ways to obtain food to survive.

Reports of attacks upon European colonisers were being reported in the upper Hunter Valley in 1825. On the 10th of November 1825 The Australian newspaper reported a murder of a Mr Greig at the District of Patricks Plain on the Hunter River, as well as the spearing of two stockmen in the area by a group of Aboriginal people, that included people from the Bathurst area, likely to have been Wiradjiri.

Connor (2002:64) describes Greig, who had a property near the junction of the Hunter and Goulburn Rivers as trying to block Aboriginal access to the land. This demonstrated a complete disregard for the people trying to access their traditional lands, resources and hunting grounds. It is perhaps not surprising that when Greig was absent a group of warriors attacked his farm in October 1825, killing his cousin Robert, and his convict servant.

Scott and Macleod described the tribe that committed the murders of Greig and his shepherd as having retreated into the mountains with the 'Wallumbi Natives.' There, another person was killed and a man named Robinson wounded on the Laycock's station at Bootty (Watson et al.1914:610-614).

Scott and Macleod (Watson et al.1914:611) reported that the military were sent from Windsor to pursue the group and when they encountered a group of Aboriginal people they fired upon them. There is no mention of an attempt to confirm that this was the same group, or to understand or determine the causes or reason for the initial conflicts, nor is there any mention of the numbers killed by the military during this encounter.

A military party was also sent from Newcastle (Watson et al.1914:611). When the news of the deaths reached Newcastle, a military party of ten men, plus some 'bush constables' were dispatched to protect the settlers in the Patricks Plains area (The Australian 10 November 1825).



In May 1826 in a letter from Magistrate William Ogilvie to Captain Allman (Ogilvie letter to Allman 17 May 1826), Ogilvie describes a raid on the Forbes property at Edenglassy where huts were raided for items, and a man returning to the property with the bullocks was speared in the back. The injured man was sent off to hospital and Ogilvie did not consider that the injuries were life threatening.

Ogilvie then received a message from Mrs Pike from the nearby property of John Pike who was feeling alarmed by the presence of a large group of Aboriginal people in the area. Ogilvie immediately went to the property and found that 'they had been about in great numbers' and had removed items from the men's huts and taken them to the mountains. Ogilvie followed them into the mountains and found them on 'rocky heights' above them where, if they had wanted to, they could have easily made an escape or could have mounted a defence. Ogilvie entered into discussion and negotiations with a man he knew in the group and he secured their agreement to return the items, which they made good on this commitment the following day. Ogilvie's communication reflects his understanding that there was a natural tendency for the local Aboriginal people to take things that had been found to be left unattended. Ogilvie found that by entering into respectful dialogue there was a cooperative and non-violent response, something many of the other colonisers seem to have been incapable of both comprehending and putting into practice. Ogilvie concludes his letter requesting that 'a small party of mounted Police' be stationed in the neighbourhood as a 'means of preventing much mischief.'

On the 15th of June 1826 a letter from Captain Allman (Allman letter to Lowe 15 June 1826) gives instruction for Lieutenant Lowe of the 40th Regiment, who was at the time in command of the mounted police, to 'act immediately if and as the occasion may require' in response to the request from the Magistrate William Ogilvie. On the 18th of June 1826 Lieutenant Lowe responded back to Captain Allman on his return to Wallis Plains indicating he had apprehended one of the men involved in the spearing of the government man that was working for Forbes (Lowe letter to Allman 1826). They captured an Aboriginal man named Billy whom they believed had been involved in the attacks and he was sent to jail in Newcastle (Watson et al.1914:611).

Lowe (Lowe letter to Allman 18 June 1826) then refers to intelligence that he has received in relation to the murder of two government men working at Dr Bowmans. Lowe communicates to Allman his intention to go to Bowmans station with the mounted police and that he has requested reinforcements from Wallis Plains. Bowman's station includes the area that is the Glendell project area. The land was appropriated from the Wonnarua around 1825. Dangar (1828:18) shows James Bowman as the grantee and owner of one purchased lot and two lots obtained via grants in the Liddell Parish. A number of conflicts occurred both on and around the Bowman property during 1826.

A stockman and a watchman were killed a couple of days apart on Dr Bowman's station, and then the same group, according to Scott and Macleod, attempted to pillage James Chilcott's house, leading to a struggle between Chilcott and a man named Cato. Two fencers working for Bowman were then attacked and left with significant injuries (Watson et al.1914:611).

The mounted Police arrived and under Lowe's command, captured a man whom they believed had been involved in the killing of the watchman on the Bowman property and he was reported by Scott



and Macleod as being shot. Soon after three other Aboriginal men were taken and shot, and two apprehended and sent to Newcastle jail (Watson et al.1914:611). The despatches do not indicate that there was any attempt to investigate or to determine the cause of the attacks. Following the report of the killing of the Aboriginal men whilst in the custody of Lowe, Governor Darling (Watson et al.1914: 623) requested an investigation into the deaths by the magistrates in the area including Scott, Webber and Close. Darling, in his despatch to Earl Bathurst on the 6th October 1826 considered the 'massacre of prisoners in cold blood' as unjustifiable. The investigation was carried out by Scott and Close, and Allman assisting with the examination due to the absence of Webber (Watson et al.1914: 624).

It is hard to believe that the investigation would have proceeded without some level of bias. The magistrates, and mounted police were all working in the common interest of the colonisers and removing any threats to them. The investigation only sought the depositions of the mounted police involved in the deaths and a landowner. The deposition of John Larnarch indicates that one of the Aboriginal men was taken to where the fencers had been attacked on the Bowman property. Larnarch indicated that the man was shot while attempting to escape and then the body was hung up by the men working on the Bowman farm in order to create fear in the Aboriginal people. Each of the deponents interviewed claimed that each of the three men were shot in the act of escaping. If this was the case, why hadn't each of these men been better secured, particularly after the first attempted escape? The depositions of Privates John Lee and James Fielding both indicate that the men escaped after freeing themselves from their cords, however Fielding goes on to say that they freed themselves by biting through their cords (Watson et al.1914: 626-628). This raises the question, if they were being accompanied as prisoners by the Mounted Police, how could it not have been noticed that these men were chewing through their cords? Secondly if their hands had been secured behind their backs it would not have been possible to chew through the cords. So why weren't their hands secured behind their backs, particularly after the first attempted escape? Even within a what appears to be a biased investigation, the depositions provide a weak case for the killing of the men on the basis that they freed themselves from their ropes and attempted to escape.

Darling found the investigation to be completely inadequate and a second investigation was carried out by Allman, Close and Webber, which proved to be even more lacking than the initial investigation (Millis 1992:63-64). Another investigation was then undertaken by the Acting Attorney General Moore which sought understand the circumstances around the death of the Aboriginal man named Jackey Jackey (or Jerry) whilst in custody. Jackey Jackey had been captured on account of his supposed involvement in the killings at the Bowman station. Moore noted during his investigation that there was a 'general fear in the neighbourhood of anyone acknowledging what they knew.' One witness under examination, Robertson, refused to answer any questions in relation to his dealings with Lieutenant Lowe. Due to the unwillingness of people to speak at Wallis Plains, Moore eventually left, hoping to gain information at Newcastle (Watson et al. 1914:400-403).

The deposition of William Salisbury on the 15th of January 1827 describes how a captured Aboriginal man was taken and tied to a tree near the Government House at Wallis Plains and was immediately shot by the soldiers in the company of Lieutenant Lowe. Lowe being in charge would have given the orders. Thomas Farnham was also witness to the shooting of Jackey Jackey, and William Constantine



assisted with burial (Chaves 2007:134; Dunn 2015:218). Lowe was eventually put on trial for the murder of Jackey Jackey, but rather than focus on whether Lowe was or was not guilty of the murder, the defence used a ploy to discredit the three witnesses characters and successfully obtained a not guilty verdict from a jury composed of seven retired military men (Chaves 2007:137). The witness accounts clearly show that Lowe was willing the kill Aboriginal people in custody whom he believed were guilty of offences. The men that were killed on or near Bowman's station were most likely killed in a similar fashion under Lowes command. The depositions claiming that they were shot whilst trying to escape after chewing through their ropes seems fascicle.

Following the capture and killing of the Aboriginal men near Bowman's station, Scott and Macleod then report that a large group of warriors arrived at the Ogilvie property (Merton) seeking retribution for the incorrect capture of a man named Jerry, who was later released when the error had been realised. The men that the warriors sought were not present and Mrs Ogilvie was able to defuse the situation. In Mrs Bundock's memoirs of the Honourable E.D.S Ogilvie, the son of William Ogilvie, E.D.S Ogilvie described his recollection as a boy of how Jerry was incorrectly captured:

'the soldiers had persuaded some of the Blacks to come to Merton under pretence of seeking guides to go after the bushrangers, but when the Blacks came they seized two of them (our Chief Jerry and another man) believing that this Jerry was a murderer of the same name for whom a reward was offered (Bundock 1896).'

The type of trickery employed by the military is likely to have led to deep mistrust of the soldiers and may well have led to bloodshed if they had been present the day that the warriors came to Merton.

Following this, an attack occurred at the Lethbridge Farm where a hut (the Alcorn Hut) was attacked resulting in the death of two, and the wounding of two occupants. Scott and Macleod's (Watson et al. 1914:610-614) letter suggests that the attacks might have been orchestrated, though whether it was the same group of warriors that went to the Ogilvie property is uncertain. Scott and Macleod's account of the events indicate that shortly after some nearby huts were pillaged. The Mounted Police then went in pursuit of the Aboriginal group but were unable to locate them. Two days later a party comprised of a magistrate (Scott), five military, four Europeans and four Aboriginal people went on pursuit of the group that had attacked the Lethbridge Farm and came upon them resulting in two Aboriginal people being killed, a number wounded, and an Aboriginal woman taken prisoner. One European was speared in the face (Watson et al.1914:610-615). The Australian newspaper at the time reported that 18 Aboriginal people had been killed (Millis 1992:58). After this, a further conflict occurred at Bowman's station between the fencers and Aboriginal people whereby the fencers opened fire on the approaching group resulting in the wounding of one Aboriginal person (Watson et al.1914:610-615).

The government despatches communicate the European colonial perspective on the events that were occurring in the Hunter Valley. Even in this one-sided perspective there are indications that beneath the surface of how the events were being reported, the European colonisers were implicit in the conflicts that were occurring. These were not simply unprovoked attacks.



In Governor Darling's letter to under secretary Hay in September 1826 regarding the outrages committed in the Hunter Valley, including the conflict at the Bowman and Lethbridge farms, Darling (Watson et al.1914:574-575) states:

'You will be aware by my former Correspondence that I have always considered that the Natives have been aggrieved by the Stock Men, which, I am satisfied, has alone prevented a good understanding being established with them.'

Governor Darling to Earl Bathurst 6th October 1826 Despatch 75 (Watson et al.1914: 608):

'But I fear the conduct of the Natives has not been altogether unprovoked; and, being strict observers of the Law of retaliation, I am informed that they never fail to exact blood for blood.'

Magistrates Scott and Macleod reported in October 1826 to the Colonial Secretary that the disturbances in the upper Hunter began with food and clothing being forcibly taken from the Onus station at Wollumbi Brook. This was followed the theft of maize from the Little's and Intyre's farms. Other robberies had occurred from the road heading away from James Bowman's property (Watson et al.1914:610-614). Food and clothing were items that were important for survival and their theft suggests that there was a need for these items. As the colonisers appropriated the lands along the Hunter Valley from the Wonnarua, including the important hunting and foraging grounds, the displacement and restrictions of access of people to their traditional hunting and foraging grounds would have restricted the Wonnarua from obtaining the resources that they needed to survive. What the colonisers viewed as theft by the Wonnarua, the Wonnarua may have viewed as taking what was theirs in order to survive.

Some of the encounters that were also likely to inflame tensions between the colonisers and the Wonnarua leading to retribution, included the dispossession of lands, beating people, sexual violence against women, and abduction of underage girls (Dunn 2015:230-233). There was no justice for Aboriginal people during the early period of colonisation. The British did not consider that the Aboriginal people could be put on trial because they did not understand the British Law (Connor 2002:58), and they could not be used as witnesses in the trials of Europeans that may have committed crimes against them because they were not Christians and therefore could not take the oath. An example of the type justice that replaced the European justice system as applied to the Aboriginal people can be gleaned from Governor John Hunter's suggestion in 1799 when Corporal Peter Farrell arrested an Aboriginal man names Charlie for raids on farms, that instead of making an arrest, he should have shot the man (Connor 2002:58).

Wilkes (1845:186) assessment of the Aboriginal circumstance when visiting New South Wales as part to the United States Exploring Expedition was that when the Aboriginal people felt that they had been unfairly treated by the white colonisers, they would sometimes spear the livestock, 'and it is said upon good authority, that not a few of the whites, even of the better class, will, when they can do so with impunity, retaliate in the blood of these wretched natives; and it is to be regretted that they are not very scrupulous in distinguishing the guilty from the innocent.' Within 5 years of the initial reports of the Aboriginal thefts by Scott and Macleod in 1826, Mitchell (1838:20) described in 1831 at Segenhoe that 'the natives have almost all disappeared from the valley of Hunter.'



In the oral tradition of the PCWP - and in historical reviews of the colonial record (Gollan 1993; Millis 1994) - the declaration of martial law, the dispatching of troops and the punitive expeditions conducted by members of the mounted police resulted in many massacres of Wonnarua people at this time. Ultimately this crushed the resistance and led to a massive decrease in the numbers of Wonnarua people in the Upper Hunter.

The Wonnarua response to displacement from their land, including the concomitant reduction in quantity and access to traditional food resources, as well as the apparent military suppression, was not uniform. Among the Wonnarua some individuals and family groups, including antecedents of the PCWP, clung to their Aboriginal ways. Others entered the white economy in their youth and adjusted many of their life habits while still strongly identifying as Aboriginal. Writing in a collection of missionary papers, Reverend Boodle (1874) observed remnant members of the Wonnarua that he had encountered at Muswellbrook at the end of the 1840s, noting that this group maintained much of its cultural independence:

'Occasionally in a long bush ride, a few might be overtaken (with their hatchet, boomerang and waddy stuck in their girdle), with a lump or two of fat twisted among the curls of their hair, and perhaps their gins, or wives, following, carrying by the tail the newly killed opossums. The clothing of the men was sometimes a striped shirt, sometimes a blanket given by Government, sometimes nothing but their girdle. The women usually wore a blanket or opossum rug, unless some white woman had given them a gown (Reverend Boodle 1874: 160-161).'

Yet not all the Wonnarua remained culturally independent even in the first generation after European settlement. Reverend Boodle (1874) also provides some comment on those that were among the first absorbed into European working habits:

'There are always individuals among the tribes who will, with more or less regularity, join themselves to the white man, tend or wash sheep, act as stockmen (for they are very fond of riding), work about a house or garden, reap, or take part in many of the other occupations of civilised life (Reverend Boodle, 1874:158).'

Young Aboriginal men found employment locally when there was a strong exodus to the gold fields and local vacancies occurred for young men. George Boyle White, Surveyor and resident of Singleton and Maitland, mentions several employers of Aboriginal boys in his journals (Le Maistre 1996: 65). Some members of the PCWP also recollect that their great grandparents were stockmen, drovers and timber-getters working on various properties across the Hunter and beyond (e.g. Stocks 2012; Charlie Franks *pers com. 2012*).

By the 1860s government reserves were becoming increasingly common throughout New South Wales as a way to control the movement of Aboriginal people. In 1893 St Clair Mission, was declared a Government Reserve (McGuigan 1983). This mission was located at Carrowbrook, a village lying between Muswellbrook and Singleton (Noble n.d). Though situated in the territory of the Wonnarua,



residents of the Mission were drawn from neighbouring tribes including the Worimi, Awabakal, and Darkinjung (Gray 2010). In 1905 the St Clair Mission came under the control of the Aborigines Inland Mission (AIM), an organisation founded by Baptist missionary Retta Dixon (Blyton et al 2004). A year later she assisted in the establishment of a female orphanage for Aboriginal girls in George Street Singleton and a second mission at Redbournberry on the banks of the Hunter River (Gray 2010).

St Clair operated as a Mission until 1918 when it was taken over by the Aborigines Protection Board and was renamed Mount Olive Reserve. At his time the Aboriginal people were subjected to the absolute control of the newly appointed Station Manager and many people were removed from Mount Olive for failing to adhere to the strictly imposed rules (Blyton et al 2004). As a result the number of people living on the Reserve declined and by 1923 it was closed to Aboriginal people. For the period that St Clair Mission – Mt Olive Reserve operated, a further dissolution and dismantling of traditional Aboriginal lifeways occurred. At this time Aboriginal children were removed from their families (See Stocks 2012); others sort to avoid the strictures of the management regimes and/or missionary efforts to Christianise their children by moving away from Wonnarua country (Lester 2012). When doing so links to the Wonnarua Lands were still maintained through regular visits with extended family and clan and by maintenance of oral history that was handed down from generation to generation.

For much of the first half of the twentieth century, the economic activity of the Singleton LGA was based on rural industries such as dairying, beef cattle production, vegetable and fodder farming (Robinson and Burley 1962). Members of the PCWP who retained residence in the area found work as Dingo bounty hunters, rabbit trappers, farmers, orchardists, timber getters and/or as cooks and cleaners (Franks 2012, Stocks 2012; Ward 2012). To some extent relationships developed between the PCWP and the local farming community that enabled some continuance of access to traditional lands. From the 1960s with the advent of open cut methods for mining coal the large deposits of steaming coal found close to the surface in the Singleton LGA became viable exploitable resources. Hence from about the mid-seventies more than ten major open cut coalmines commenced operation. Major ancillary infrastructure developments were also completed at this time, including the Liddell and Bayswater Power Stations (HLA-Envirosciences 2007). These resulted in the destruction and removal of a significant number of Aboriginal sites throughout the Hunter.

In summary then it is clear that the post-colonial history of the Wonnarua, as elsewhere for Aboriginal groups throughout Australia (e.g. Morris 1994; Kijas 2009) is one of significant social dislocation, marginalisation and dispossession from tribal lands. Yet Wonnarua people have maintained a long and continuing attachment to the area about the central and upper Hunter Valley. Members of the PCWP are the contemporary generation of Aboriginal people whose ancestors were Wonnarua. Based on their descent from Wonnarua ancestors, who owned and occupied the Hunter Valley area at the time of sovereignty, the PCWP identify as traditional owners. For them, they and their ancestors have been associated with the area since time immemorial. The PCWP's continuity of association is demonstrated through oral, archival and anthropological evidence from the time of contact through the generations to the present day. Current members of the PCWP collectively assert that the lands of the central and upper Hunter Valley are the lands of their parents, their grandparents and great grandparents.



3.2 Historical Accounts of Wonnarua People

During the very early explorations into the Hunter by Europeans, the Wonnarua kept their distance: observations made by Paterson's (1801) party investigating the Lower Hunter in 1801 indicate that Aborigines were present. On the basis of the many canoes he saw, Barralier (1802: 81) assumed there were "great numbers" of Aborigines in the area. Barralier (*ibid*) noted a young native looking for the roots of ferns; he also discovered part of a net along a creek bank, along with evidence of a fire and in the stream the remains of a weir. Allen Cunningham during his travels in the period 1823-25 remarked on seeing evidence of Aborigines, but not actually observing individuals (in Brayshaw 1987). Felton Mathew saw a group of 60 individuals camped along the banks of the Wollombi Brook in 1830: he later returned to visit the camp of Aborigines, which was located not far from Broke. Mathew's (in Brayshaw 1987) also remarked that the men, women and children he saw were "...highly loathsome from dirt and starvation..." The influence of European occupation would have had a detrimental effect on the community before records were started. Some of the earliest official population figures came from the register of Aborigines taken at various stations during the annual distribution of blankets. Records of this nature were not totally reliable as some groups or individuals would not make an appearance to collect and others were thought to turn up at multiple stations (Brayshaw 1987).

By the 1840's some of the Wonnarua still kept to their social groups but there were individuals who will join themselves to the white men, tend or wash sheep, act as stockman, work about a house or garden or neap or take work in many of the other occupations of civilised life (Le Maistre, N.D: 158). From the beginning of European settlement, Aborigines were initially used as interpreters and for finding resources such as food and water (Blyton 2012). Their intimate knowledge of the landscape helped in early exploration into and around the Hunter region (*ibid*). John Howe utilised the expertise of two Aboriginal guides, Myles and Mullaboy from the Sydney region. Contributions by the guides from the Hunter extended well beyond the boundaries of the region: heroic deeds by Galmara (aka Jacky Jacky) and Harry Brown - both from the Hunter - were involved in major exploratory expeditions. Edgar Beale wrote of Galmara, who was the sole survivor of an attack on his party (Blyton 2012). Galmara was honoured for his allegiance to the group and presented with a silver breast plate in recognition of his assistance and accomplishments (*ibid*).

The Wonnarua persisted through the trials of the European invasion: they were thought to be almost extinct due to infanticide, debauchery, diseases, exposure and starvation (Miller 1886). There were still remnant tribes travelling and hunting in the Upper Hunter and at least one nearby Aboriginal held onto his old lifestyle: Cutt Muttan lived in a rock shelter in Wollombi up until his death in 1868 (Le Maistre N.D). Others that survived were absorbed into European society or survived by clinging to the fringes of settlements. There are two Aboriginal progenitors that the majority of Wonnarua claimants trace their family histories to: Sarah Madoo (or Waters) is the main progenitor who lived in Singleton and married a half-caste, Henry Waters. Her death certificate and descendant's accounts of their life establish Sarah's history, but the records and accounts have large time gaps and record her in several places at one time and married to different men. It was very common for Aboriginals in the past to use the same European name and even change it over time.



Cultural Practices

Early anthropological observations described the Wonnarua as being intensely religious and constrained by strictly enforced laws (Ridley 1864; Fawcett 1898a). Likewise tribal boundaries were well-defined and understood both by the Wonnarua and by neighbouring tribes such that:

'So strictly were all rights and privileges understood, that for one tribe to enter into the district in pursuit of game was considered an offence of great magnitude and a good ground for a hostile meeting. They had no permanent settlements but roamed around from one place to place within their tribal district in pursuit of game and fish, which was their chief sustenance, making periodically of the same camping grounds, generation after generation, unless some special cause operated to induce them to abandon them. In choosing the site, proximity to fresh water was one essential, some food supply a second, whilst a vantage ground in case of an attack from an enemy was a third important item (Fawcett 1898a: 152).'

One early observation of Aboriginal tribal interactions within the Hunter River area suggests that confrontation or 'hostile meetings' between them involved ritualised dress and took place according to strict codes of behaviour that enabled no one to be harmed despite spears, boomerangs and waddies being involved:

'There was a large fight in the neighbouring mountains between the tribes of Port Stephens and Hunter's River. Remembering the old proverb, "Those who in quarrels interpose," and supposing there would be a good deal of blood spilt on the occasion I had no particular fancy to visit the scene of action. The army under king Bungaree I met proceeding to the field with all the ferocity that dabs of pipe-clay and smears of red-ochre could produce. They were armed with spears, bommarings, and waddies, and from their erect and frowning front seemed sensible of the high emprise in which they were embarked, and impressed the passing stranger with ideas of blood and slaughter. On observing us, his majesty and several of his staff defiled to where we stood, and condescended to ask for a bit of tobacco! The next day, instead of hearing of long lists of killed and wounded, it turned out that nobody was hurt, but that every precaution had been taken to enable them to "fight another day." (The New Monthly Magazine 1828: 241).'

This same observer also described how for the Wonnarua mourning and remembrance of the dead was also governed by strict protocols:

'One old black was plastered nearly all over with pipe-clay, and cut a grotesque figure, not unlike "Moon" in the masquerade. He had lost his wife—and this is their deep mourning. I asked what his jin's name was, when he very plaintively replied, "What for, massa, you make me cry?" It appears that a black's name is never mentioned after death; and any of the family or tribe bearing the name of the deceased, are forthwith christened afresh, in order that no fond remembrance may be cherished of their loss (The New Monthly Magazine 1828: 241).'



Societal restrictions were also placed upon the Wonnarua with respect to the consumption of certain foods. Fawcett describes elements of these restrictions as follows:

'They had laws regarding the use of food which were very imperative. The young of both sexes were prohibited from eating certain sorts of flesh, and many animals and birds were tabooed to both youths and females at different periods of life. Previous to the passing of the ceremonies of the bora by which the boys were initiated into manhood, their food was like that of the women confined to female animals, and those only of special kinds. Flying foxes were esteemed great delicacies, and the dingo was reserved for the use of the older men only. Emu and black snakes were also reserved for special individuals and seasons. (Fawcett 1898a: 152).'

The antecedents of the PCWP also practiced complex ceremonial rites. Individuals were subject to one group of rites at about the age of sixteen when ceremonies took place that involved having a front tooth knocked out, the septum of the nose pierced and the painful operation of being scarred on the back, shoulders, stomach and occasionally the legs (Miller 1886: 353). This latter scarring provided the necessary indication of 'status' and kinship with the clan group. Also at about the same age the males were made young men with many 'secret ceremonies' (Fawcett 1898a, 1898b). In his manuscript titled 'The History of Bulga near Singleton N.S.W. from 1820 to 1921' long term resident of the Bulga District, Mr A.N. Eather provides his recollection of the commencement process undertaken for a ceremony that initiates or 'Boombats' known to him some 50 years prior (i.e. about 1870s) were to attend:

'We had some young blacks in my house, fifty years ago, and the older blacks would come to us, and ask us to allow these lads off for a time to be made "boombat". Sometimes the boys would be away for the best part of a year. Sometimes the old men would bring back the boys in short time, saying that things were not ready for the Bora, that the other blacks were slow in coming up, and so forth, and that the ceremonies could not go on then; but usually all the men, the lads, and the "jins" went off together to the appointed place of meeting. At night time wherever they camped, several of the men would go off in different directions and make frightsome noises all around, scaring the "jins" almost out of their wits, and awing the boys. Thus matters would go on until they reached the big camp of assembly (Eather, c. 1921).'

Aboriginal Law also seems to have maintained harmonious relationships between Wonnarua and Awabakal people (an Aboriginal language and/or tribal group associated with lands at the mouth of the Hunter River) that allowed for reciprocity in the use of resources. Percy Haslam, a modern ethnographer associated with the University of Newcastle believed for example, that the Wonnarua were allowed once a year to move through Awabakal territory to the sea to get marine food and salt. He also noted that:

'As depicted in a cave painting near Wollombi; the Awabakal always invited the Wonnarua to feasts when whales became stranded on Newcastle or Lake Macquarie beaches (Aboriginal History in the Hunter Region, Newcastle University Archives A6712(iv); Le Maistre 1996: 35).'



3.4 Subsistence Strategies

Traditional life for the ancestors of the PCWP was structured around a schedule of social interaction designed to take advantage of seasonal availability of resources (Brayshaw 1966; 1986). Though subject to seasonal extremes of drought and flood, there was both an abundance and diversity of plant and animal life within Wonnarua territory. Fawcett notes for example that:

'For food they ate kangaroos, wallabies, bandicoots, kangaroo rats, opossums, rats, emus, snakes, lizards, fish, caterpillars, grubs, lava of wasps and other insects, etc., and other animals, birds, reptiles, etc., found in their district. They used also a variety of bush fruits and roots, one of the latter being that of the water lily (1898a: 152).'

Robert Miller (1886), who lived in the Hunter River district for some time from at least the 1840s, also confirms that the kangaroo and emu were usual foods of the Wonnarua, as were a number of reptiles, and a variety of roots including those of the water lily. Fawcett (*ibid*: 153) remarked that animals were sometimes caught by means of nets, which were useful in wooded areas, but also by means of a fire regime where sections of the landscape were burnt to create favourable conditions attracting the game and improving the accessibility. Wild Turkeys and many other waterfowl as well as bandicoots, long-nosed potoroo, native cat, fruit bats, wonga wonga were also found to be part of their diet (Albrecht 2000). They would climb trees using an axe (Grant 1803: 158) to chop possums, other small animals and honey from logs and trees.

Honey from two varieties of native bees (Gunson 1974:67, 124) was eaten and was also mixed with water to form a drink (Breton 1835: 195; Dawson 1830: 60; Scott 1929: 34-35). Several fish species, eels and freshwater shellfish were consumed and mentioned by some of the early explorers (Koettig and Hughes 1983). There is very little evidence of the types of vegetation that were exploited by the Wonnarua: roots, yams, berries and other fruits are thought to have been part of their diet. Berries and fruits were also noted as being consumed by the Wonnarua when in season (The New Monthly Magazine 1828).

An account from Mathew on the 11th of February 1830 demonstrates the potential carrying capacity of a parcel of land in Broke:

'There were about 60 men, women and children. I remained with them for about an hour, and saw them retire for the night, each party or family kindling its own separate fire apart from the others. The place they were encamped in was a romantic spot on the bank of the Wollombi (Mathew 1832).'

Much like colonists around Wollombi Brook who undertook terrace farming, vegetable cultivation was adopted as a form of sustainable agriculture along many tributaries found within the perimeters of the PCWP's claimant area. The farming of yams and water lilly tubers was a significant staple in everyday diets. As stated by Scott '...in the more fertile spots by the sides of brooks, there was a species of yam, the root of which was eaten by Aboriginals (1929)' and Backhouse 'These stems are roasted, and eaten by the Aborigines, the blacks also roast the roots, and make them into a sort of cake, which they eat cold...(1843: 399).' Hunting and gathering methods can ultimately be defined as strategic.



3.5 Material Culture

The traditional clothing of the Wonnarua is described as being a roughly cured opossum-skin cloak, worn with a girdle of opossum hair next to the skin although on 'gala occasions' they also anointed people with a mixture of red ochre and fat (The New Monthly Magazine, 1828; Miller, 1886). Miller also points out that the Wonnarua had various other personal effects including:

'...ordinary spears, woomera, shields, and war boomerangs, and also the boomerang which returns when thrown into a flight of duck and other birds with very good results. They also had bags made of platted swamp grass; koolaman or wooden bowls, two or three feet long, for holding water at the camp; tomohawks of hard dark coloured stone, which were first chipped and then ground to an edge; knives made of flint for cutting up meat, and also chips with which they skinned animals (Miller, 1886:353).'

They lived in bark mia-miams, which were shelters made of bark where each individual shelter had its own fire (Miller 1886). Cunningham remarked on the use of bark in the construction of the shelters: tree bark from the *Melaleuca Quinquenervia* was cut as whole sheets from the trunk and heated with fire to flatten out (Eyre 1859 in Brayshaw 1987). Bark was also used in the construction of canoes: Threlkeld wrote of their manufacture, where the ends were tied with vine cord that was also tied down the centre line so the canoe would hold its shape (in Brayshaw 1987). The shank bone of a kangaroo was ground to a point and made the holes for the vine, where the grass tree gum was melted over the stitching and holes to seal it (*ibid*). The bark of the cabbage-tree formed the thread used to repair the canoes (Threlkeld in Gunson 1974: 191), with the bark of the Kurrajong tree being used to tie the ends of the canoe. The Kurrajong tree was also used for making fishing lines, nets, bags and binding spear shafts (Scott 1929: 40; 43; Barralier 1802:82). The effects of the Aboriginals also included three types of spears, wommera, shields and two types boomerangs (Miller 1886). Threlkeld (1826 in Gunson 1974:67) also described the manufacture of the spears:

- Fishing Spear: was made from the stem of the grass tree, with four pieces of hard wood on the end that were about two feet long that were fastened with bark thread and covered with grass tree gum. Small wedges were affixed between the hardened wood ends; the hard wood ends were charred and bone barbs attached at ends. The total length of the spears was about 8 feet long;
- Hunting spear: this was made in the same way except only one hard wood end was attached, making a total length of 14-18 feet;
- War spear: this was also similar to the hunting spear but had the addition of sharp quartz flakes stuck along the hard wood joint on one side resembling teeth on a saw.

There is evidence that spears were traded between the coastal tribes and the inland tribes (Dawson 1830 in Scott 1929). For example, Threlkeld (1826) had an Aboriginal assistant that went to the mountains to trade the spears he had manufactured in exchange for possum fur cord. Most large game were killed with spears and/or captured with nets. Spear throwers (Wommera's) were used to open seafood, disembowel possums and split a piece of rotten wood to obtain grubs (Threlkeld in Gunson 1974: 68). Threlkeld also witnessed '...waddies being thrown at bandicoots at short range and were also used in battle...(quoted in Gunson 1974: 68).' The same source also described a



heavier club referred to as a "nulla nulla" which was a mushroom shaped club with a flattish circular head. Miller (1986) described the two types of boomerangs: there was a war boomerangs that did not return also one that did return that was considered to be partly used as a toy or in hunting.

Women were described as carrying a hard wood yam stick they used for daily foraging, which was sometimes used during altercations: it was also considered a status symbol (Brayshaw 1987). Barrallier quoted in Ebsworth (1826: 79) describes how the women of the group make string from bark and in Ebsworth's words '...they twist and roll the bark in a curious manner with the palm of the hand upon the leg; with the string they forms nets of curious workmanship. In some the meshes are very small and neat, the whole knit without a knot, excepting at its completion...' These nets were observed along the banks in Wonnarua country.



4 Landscape Context

4.1 Overview

Prior to European settlement, Aboriginal hunter-gatherers had achieved a balance with nature in regard to their lifeways. Whereas fire has always been present in the Australian landscape, the use of firestick farming increased the frequency and geographical impact of burning in the landscape (Dodson and Mooney, 2002; Dodson et al 1994; Prosser 1990). Although natural erosion was always present in landscapes, no matter how stable, it was a relatively isolated occurrence in different landforms. The coming of Europeans and their unsuitable land management practices created an imbalance that is still being felt in the Australian landscape. Examples such as logging, tilling of soils, construction and subsequent urbanisation caused and continues to cause soils and sediments to erode from upper and middle slopes and 'blanket' lower slopes and choke up creeks and rivers with these eroded deposits. In other areas, deforestation caused water to flow off slopes at increased rates and many 'chains-of-ponds' that only flooded during extreme rainfall events subsequently became entrenched channels and/or caused creek and river channels to migrate considerable distances. Considerations of these landscape processes is fundamental in not only identifying the location of archaeological sites, but in reducing the risk of impacting upon archaeological deposits during the course of construction: for example, during bulk earth works.

This section provides a comparative overview of the landscape context of the Hunter Valley in general.

4.2 Geomorphology

The landscape of the Hunter Valley has previously been described as:

'For about the last 10 000 years or so (a period known as the Holocene) the landscape of the Upper Hunter and the resources available to its Aboriginal inhabitants would have been very much like they were in the late 1700s In summary, the undulating country and the flood plains were lightly timbered (predominantly with Iron Bark Gum and Box) and well grassed. In contrast, the banks of the major rivers (including the Hunter and the Goulburn) and the large creeks were thickly treed, especially with 'swamp-oaks'. The larger tributary creeks were only shallowly incised (if at all) and were described as having 'grassy or swampy meadows' and 'chains of ponds'. The larger ponds/billabongs would have provided a permanent or semi-permanent source of water and provided a range of aquatic plant and animal foods and other resources. Except during severe droughts there would have been abundant large and small game including kangaroos, wallabies, emus and wild turkeys (bustards), as well as a host of smaller animals and birds. (ERM 2004: 7-8).'

This provides us with a starting point in how to begin looking at the landscape history of the Hunter valley and ultimately, how it informs a cultural values assessment. From an archaeological settlement pattern perspective, the key conclusions to draw from the above paragraph are:



- Major watercourses such as rivers were incised and as we shall see later included terrace systems;
- The deposition of valley sediments in mid to lower catchments; and
- The larger tributary creeks were only shallowly incised and more often than not, were actually 'grassy or swampy meadows' and 'chains of ponds.

These three points are somewhat at odds with the archaeological predictive models that have been formulated by archaeologists. The following discussion will introduce more detail in relation to the geomorphology of the Hunter Valley and specifically, how it affects the archaeological visibility and subsequently influences our perceptions of Aboriginal settlement patterns of the study area.

4.2.1 Historical Accounts of the Hunter Valley Landscape

The Hunter Valley experienced a greater rate of change due to European settlement compared to Sydney and Newcastle, due to its close proximity to Sydney and it being easily accessible thanks to its rivers and tributaries. With a growing European population and the increasing demand for resources, the Hunter Valley was a desirable location admired for the lush nutrient rich alluvial soils fringing the tributaries, and luxuriant grazing pastures for livestock and tall cedar trees skirting the higher terraces of the valley. Within a short timeframe, the Wonnarua had to deal with the rapid procurement of their resources and the manipulation of the environment by the Europeans causing a loss of their flora and fauna staples.

John Howe was one of the first explorers to venture into the Hunter region, first arriving near Doyle's Creek in 1819. He observed valleys of grassland and rich alluvial soils that he presumed were ideal for agriculture and cattle/sheep grazing. As he headed south toward Jerrys Plains, the open grasslands with sparse tree cover continued as he travelled along the river. Governor Macquarie was informed of the fine timber of the higher reaches of the valley and the fine green grass of the lower elevations. Henry Dangar was a surveyor and was appointed to the position to survey the landscape of New South Wales. He mapped out the river and creek/pond systems and the generalised geology and vegetation profiles of the Hunter Region. In 1824 his field notes describe the Lemmington area near Warkworth as having tolerable second class forest land made up of small Box Gums and Iron Bark, growing on stiff (presumably clay?) soils (Field book 221). Heading south on the left bank of Wollombi Brook, near the junction of the Hunter River, he also noted light alluvial soils along the waterways with a tributary mapped as a chain-of-ponds. The second-class forest continued on undulating terrain and was described as thinly wooded (Field book 220). Peter Cunningham (1826), upon entering the Hunter also described the large plains of grassland with few trees '..not often a 12 to the acre.. (1827: 156).' Breton (1835: 122) described the path of the tributaries higher up in the valleys, which drained down from the Sandstone escarpments, as vegetated by thick scrub and vine brushes that were difficult to penetrate.

The waterways above Jerrys Plains were said to contain a great number of Perch in 1819 by John Howe (in Campbell 1928:239). Henry Dangar (in Brayshaw 1987) refers to waters of the Parish of Liddell as being impregnated with saline matter: this almost certainly refers to Saltwater. Erosion gullies were rarely referenced by the early settlers and explorers in the period between 1800-1840, therefore Dean-Jones and Mitchell (1993) concluded that headwater streams were stable and well grassed, or



rock cut, shallow channels, which were only subject to occasional flow. This scenario changed with the rapid settlement of the valley.

Henry Dangar noted the extraordinary advances in settlement of the region between 1822 and 1825, with division of the country occupying 150 miles along the river. By 1825 more land was owned by the new settlers and the original Aboriginal inhabitants became increasingly disenfranchised from their traditional lands (Blyton 2012). The invasion by the European settlers changed the distribution of vegetation, with increasing landscape instability as a result of the logging of the forested areas around the higher elevations and the clearing of the brush around the understorey and along the tributaries for agriculture and pastoral farming. Aboriginal dependence of the Hunter River for many staples meant that the Wonnarua suffered severely when the Europeans settled: they immediately lost access to water and the raw materials in the river and on the banks. They also lost their game to the intruders who chased kangaroos in hunts to reduce competition for their introduced grazing animals; shellfish and fish populations also declined. Breton (1833) wrote that he only noted 16 kangaroos, in contrast to a previous visit to the area when they had numbered in the hundreds. The loss of fish for protein and the loss of managed plains for game hunting and seed gathering destroyed long established hunting and gathering practices of the Aboriginal community (Le Maistre 1996). This exclusion and alteration of the landscape by the Europeans brought them into conflict with the local Wonnarua People (Blyton 2012).

The necessity for inhabitants to adopt agricultural practices off fertile waterfronts through the Hunter Valley signalled the demise of the Wonnarua Peoples traditional way of hunting and gathering. Early settlers were known to take up parcels of land during the opening of the valley in 1831. This is based on three determining factors: the capacity for a tributary to carry fertile sediments that can be used for agricultural purposes; the seasonal affects such as evaporation due to intensification of summer radiation which ultimately drains watercourses leaving aggregated sedimentation left to create terraces and chains of ponds; and of course, the availability of fresh potable water for the irrigation of crops.

Initial settlement by Europeans was centred on waterways. This is demonstrated in an exert from Mitchell:

'...the selection of farmland depends solely on the direction of streams, for it is only in the bed of watercourses, that any ponds can be found during dry seasons. The formation of reservoir's has not yet been resorted to, although the accidental largeness of ponds left in such channels has frequently determined settlers in their choice of a homestead, when by a little labour, a pond equally good might have been made in other parts, which would select from the want of water... (Mitchell 1831-1832).'

The availability of wide-open spaces, rich in fertile soils suitable for agricultural purposes were also described on the land inhabited by Blaxland:

'Portions of the surface near Mr. Blaxland's establishment, bore that peculiar, undulating character which appears in the southern districts, where it closely resembles furrows, and is termed ploughed ground. This appearance usually indicates a good soil, which is either of a red or very dark colour, and in which small portions of trap-rock, but more frequently



concretions of indurated marl, are found. Coal appears in the bed and banks of the Wollombi, near Mr. Blaxland's station, and at no great distance from his farm is a salt spring, also in the bed of this brook. The waters in the lesser tributaries, on the north bank of the river Hunter, become brackish when the current ceases. In that part of the bed of this river, which is nearest to the Wollombi (or to Wambo rather) I found an augitic rock, consisting of a mixture of felspar and augite.. (Mitchell 1838).'

The fire stick farming technique was adopted, amongst other reasons, to introduce specific species of brushes whilst inevitably it attractive to large game such as kangaroos. Instances of large burn areas utilized for hunting methods are easily identified as having fertile and rich sediments with a low count of mature timbers.

"...the last two hours through a fine country thinly timbered, and for the last hour many acres without a tree on it. One spot, I think, exceeds 50 acres without a tree on it, and a very fine ground. The land on both sides is very fine, and a great part of it may be cultivated without felling a tree. Even the high land is well clothed with grass and lightly timbered, though most thicker than the low ground. The grass on the low ground equals a meadow in England, and will throw as a good swatch (ibid).'

Mitchell had also made similar observations when he travelled through Broke, Warkworth and Ravensworth, the latter directly relevant to the Glendell study area:

'We found the country across which we rode very much parched from the want of rain. The grass was everywhere yellow, or burnt up, and in many parts on fire; so that the smoke which arose from it obscured the sun, and added sensibility to the heat of the atmosphere (Mitchell 1838).'

Without doubt, early European observations reflected on the fertility of the lands of the Hunter Valley. Importantly, the hydrology of the river systems and creeks has changed considerably since European land management practices were introduced. Many creeklines, including those of the study area, were clearly a series of chains-of-ponds rather than entrenched channels. Although this is generally not the case today.

4.2.2 The Hunter River Valley: Post-Contact Changes

The late 18th and early 19th Century European settlement of Australia initiated catastrophic changes to the morphology of landforms due to inappropriate land management practices (Brooks and Brierley 1997; 2000; Erskine 1994; Haworth et al 1999; Gale and Haworth 2002; Olley and Wasson 2003; Prosser et al 2001). Clearance, tilling, intensive grazing and increasing development of infrastructure and buildings initiated widespread mobilisation and redistribution of soil and sediment mantles, river metamorphosis³ (sensu Schumm 1969; see also Erskine 1986),

³ Processes promoting disturbance that can instigate major and incessant morphological changes over large areas within very short time frames in sensitive landscapes.



desertification and rising salinity (Brooks and Brierley 1997; 2000; Erskine 1994; Haworth et al 1999; Gale and Haworth 2002; Olley and Wasson 2003; Prosser et al 2001) in contrast to pre-Contact stability, dating back for example some 2,000 years in rivers (e.g Nanson and Doyle 1999).

Prior to colonisation by Europeans, the Upper Hunter River exhibited characteristics typical of a passively meandering gravel-bed river of moderate sinuosity and relatively uniform channel width (Hoyle et al 2008). Studies using archival records, parish maps, aerial photography and floodplain sedimentology have documented marked changes in channel morphology post-dating the settlement of the area by Europeans in the 1820's (*ibid*). At Singleton for example, the Hunter River is four times its pre-Contact width (Gardiner 1991). However, studies by Hoyle et al (2008) on the Upper reaches suggest that the first 70 years of settlement did little to change the channel morphology of the Hunter (in contrast to the Middle and Lower Hunter reaches). Based on Parish maps, channel morphology and realignment did not occur until the period between 1918 and 1938, with a second phase of stability between 1938 and 1955 until the 1:100 year flood of 1955 which again initiated channel morphology changes (*ibid: 14-15*). In other words, changes to river channel morphology and depositional regimes are not constant but require certain thresholds to be breached in order to re-activate river metamorphosis.

In summary, the post-Contact period has seen unparalleled channel changes to the Hunter River and other waterways in the Valley. Much of this change is the result of the removal of riparian vegetation, logging and the impacts of stock (Brierley et al 2005; Brooks et al 2003; Hoyle et al 2008). The entrenchment of creek systems has enhanced the geomorphic effectiveness of floods, since floods of higher magnitude are contained within enlarged channels and based on modern geomorphic studies, it will take thousands of years for these rivers to recover to pre-disturbance proportions (Brooks and Brierley 2004; Hoyle et al 2008).

4.2.3 Geomorphic Expectations

Comparative studies have been included in order to provide key examples of the geomorphic processes that are likely to have impacted the current study area because a review of the available literature on previous studies of the project area provided did not contain any specific geomorphic history. The comparative studies are included to illustrate the complicated nature of depositional histories within river valleys of the Hunter Valley (and importantly, in close proximity to the study area) and the importance of understanding these in order to make sense of Aboriginal settlement patterns. The absence of detailed geomorphic studies across areas being investigated for Aboriginal settlement patterns means that there is no stratigraphic or chronological control: testing surfaces with the 'expectation' that they are contemporary is simply untenable since it is highly likely that they reflect a combination of time-transgressive sequences⁴ with and without historical overlap. It is comparable to taking stratified deposits with artefacts from a vertically stacked sequence and mixing them up: i.e. there is **no** stratigraphic control.

-

⁴ Time-transgressive sequences with historical overlap are 'stratified' in an oblique manner and/or abut (e.g. river terraces); time-transgressive sequences without historical overlap are stacked vertically.



As illustrated in the example of following section – chosen because its geomorphology (if not geology) is comparable to the processes of the study area, the evolution of the landscape is important if we are to contextualise the various phases of Aboriginal settlement, identify a chronological sequence and thereby provide a landscape framework to use as a stepping stone to interpret the scientific, cultural, aesthetic and historic values of the study area.

Comparative Study: Terrace Development on Widden Brook, Upper Hunter Valley, NSW

Widden Valley is located in the Upper Hunter Valley in NSW. The upper part of the valley is nestled in the northern most part of Wollemi National Park on the western edge of the Sydney Basin and drains northwards into the Goulbourn River. The valley was the subject of a doctoral thesis on the development of river terraces and the post-LGM floodplain abandonment for each terrace sequence (Cheetham 2010: 114). The terrace sequences were in adjacent locations that demonstrated sedimentologically and chronologically distinct formation. These indicated that processes were spatially discrete and only operated on subreaches of the valley, rather than across the entire valley system and were interpreted as 'a series of nonsynchronous, episodic incision events beginning in the late Pleistocene (ibid: 122).' The study discounted climate, tectonic effects and relative sea-level changes as influences on the formation of the terrace sequence in the post-LGM (ibid: 126). The study:

'clearly demonstrated that formation was controlled by localised processes resulting from the cyclic erosion and deposition of alluvial sediments brought about when a local geomorphic threshold was reached. This process was intermittently interrupted or accelerated by large-scale events that stripped sections of the floodplain down to a basal gravel lag (ibid: 126-127).'

The study identified five phases of terrace formation dating to 13 ka BP, 6 ka BP, 2 ka BP, 1 ka BP and the Present respectively (ibid: 114) that reflect random incision events brought about by intrinsic threshold exceedance. This contrasts with other soil geomorphic studies that have demonstrated that fluvial terrace sequences can reflect wide-scale climatic, tectonic or base- level fluctuations, as well as landscape studies undertaken for the purposes of archaeological interpretation (Dean-Jones and Mitchell 1993; Hughes 2004; 2014). The cross section data recorded from this study illustrated a complex arrangement and relationship between and within terrace sequences (Figure 7). This complex relationship of stratigraphy is clearly demonstrated by the model of terrace sequence formation provided by Cheetham (2010: see Figure 8). In combination the cross sections and model illustrating the geomorphic history identify a complex succession of cut and fill episodes that are not necessarily correlated spatially or chronologically within a single valley system. The stratigraphic history of any given location studied in the Widden valley was generally unique to that particular location of the valley profile. This has ramifications for the geomorphic history of creeklines in the Hunter Valley and is of particular relevance because of the lack of detailed studies for the study area.



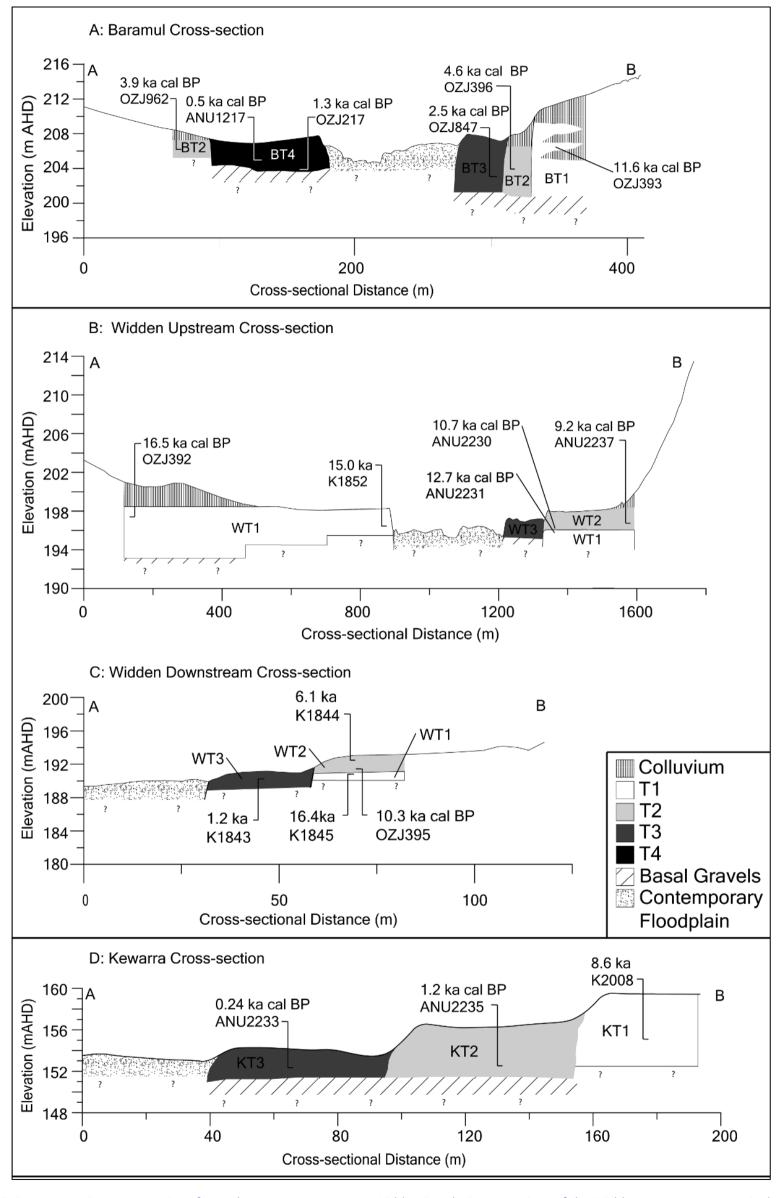


Figure 7: Representative cross-sections for each terrace sequence on Widden Brook. Cross-sections of the Widden terrace sequence include interpretational changes based on a revised chronology (source Cheetham 2010).



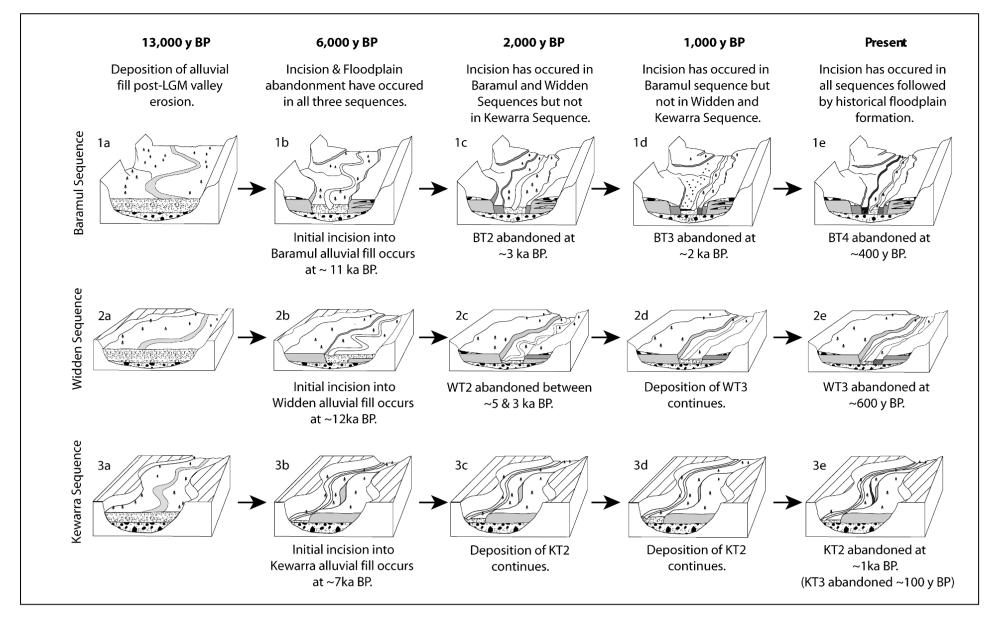


Figure 8: Illustrated phases of floodplain abandonment and terrace development for the Baramul, Widden and Kewarra sequences on Widden Brook (source Cheetham 2010: 115).



4.3 Geomorphology of the Hunter Valley: Discussion

Assumptions based on this wide-scale correlation of geomorphic phenomena such as floodplain formation, terrace sequences and soil formation underpin and are implicit in all previous studies of environmental factors in relation to archaeological patterning including the major studies of Dean-Jones and Mitchell (1993) and Hughes (2004; 2014). Contrary to the conclusions of Dean-Jones and Mitchell (*ibid*) and Hughes (*ibid*), the geomorphic evidence clearly suggests that any conclusions about 'generic' landscape processes and chronological correlation of soil mantles, terraces and floodplains must be supported by field and laboratory studies and not simple comparative assumptions or extrapolation. From an archaeological perspective it means that simple extrapolation of generic data from studies such as Dean-Jones and Mitchell (1993) and Hughes (2004; 2014) cannot be supported. In fact, this perspective is misleading and distorts the particular and specific dynamics of any creek system that has not been studied in detail.

The Widden Valley is relevant to the study area and potentially of direct relevance to the episodic and almost certainly nonsynchronous nature of landscape evolution across this area. The rugged hills, the slope landforms and the creeklines are subject to different degrees and intensities of geomorphic processes across the Widden Valley. Any potential geomorphic changes to one of these parts has knock-on effects for adjacent landforms and in all likelihood would have happened at different times, albeit with some overlap in time. Although detailed geomorphic studies have not been undertaken for the study area, the similarity in geomorphology and the contemporary processes that can be observed on different landforms for this area suggest a similar story of landscape evolution, but with its own unique chronology. It clearly illustrates the dangers of linking terrace sequences to wide-scale allogenic⁵ factors based on chronological correlation (Cheetham 2010: 127), or using oversimplified soil profiles to ascertain floodplain depositional histories - conclusions which are also supported by the Nowlands Creek study (Erskine 1994; see also Erskine's 2011 study of the Pages River in the Hunter Valley for further evidence).

In conclusion, it is clear that the geomorphic history of similar topographical settings across the Hunter Valley demonstrate both episodic and nonsynchronous landscape evolution. Clearly, understanding the timing and nature of landscape evolution has ramifications for the chronology and relationships of both tangible (archaeological) and intangible (cultural) values and the onset, timing and evolution of Aboriginal settlement patterns in a dynamic landscape.

4.3.1 Landscape Archaeology and Cultural Significance

The preceding sections discussed and illustrated geomorphic concepts, models and interpretations in relation to the Hunter Valley and how those landscape perspectives impact the nature, visibility, preservation and ultimately, the significance of cultural heritage across the study area. It should be abundantly clear therefore that, in terms of scientific significance, an understanding of context is fundamental to any interpretation or appreciation of the relative significance of any archaeological

⁵ Geological material that has been transported from where it was formed and deposited as sediment by a river.



finds. Fundamentally, archaeology is a stratigraphic exercise and the development of chronology – in relation to soils (chronosequences) and stratigraphy (chronostratigraphy)– is a necessary first step to defining significance (see for example Figure 9 and Figure 10 below).

However, one of the main reasons for the exposition on landscape in this section relates to the significance that Traditional Owners ascribe to cultural landscapes and the broad continuum of fauna, flora and landforms as expressed through ancestral beings and lore, ceremonial sites and other places of cultural significance. Traditional knowledge and the cultural memory that this reflects is embodied in cultural landscapes and unlike western paradigms that ascribe significance on linear trajectories (low, moderate, high for example), Aboriginal paradigms are more 'Zen' (to borrow Sahlin's phrase in relation to subsistence and the 'original affluent society': 1968: 85) in that they reflect circular (in the sense of no beginning, no end) all encompassing perspectives rather than linear, judgemental classifications. Obviously, ceremonial sites and particular landforms (e.g. increase sites, initiation sites etc) are very important in cultural terms; the difference is that they are not distinguished from the songlines that join them or the resources (e.g. plants, animals, lithics resources etc) that are found within them.

One way that archaeology and science can contribute to enhancing cultural significance is through holistic approaches integrating the natural sciences (soils, geomorphology, geology, palynology, palaeontology etc) and archaeology (material culture, intra- and inter-site analysis, behavioural archaeology, ethnoarchaeology etc). Providing an Aboriginal community, whether it is the PCWP or any other Traditional Owners, with a scientific dialogue that integrates climate, vegetation, fauna, firestick farming regimes and landscape evolution with aspects of archaeology such as material culture, subsistence and settlement patterns (for example) will allow for a more meaningful scientific dialogue *and* a better cultural integration and appreciation of this information. In a very real sense this embodies the fact that cultural significance is not static but evolves and takes on new or different or historic meaning. This appreciation in cultural as well as archaeological terms begins with and is fundamentally beholden to understanding landscape evolution.

The PCWP have a deep affiliation, understanding and appreciation of their traditional lands and ultimately respect that land and everything in it. And, whereas that land and the traditional knowledge and cultural memory that encapsulates it is considerable, the values are in many ways infinite. Importantly, the dialogues and histories that depict these are the cultural equivalents of geological and geomorphological dialogues and histories. And like the earth sciences, cultural landscapes describe and explain the evolution of *Aboriginal* landscapes in terms as significant and important as their more recent scientific counterparts.





Figure 9: A buried soil on the New England Tablelands: red arrow pointing to the dark grey deposit beneath the light brown overburden.



Figure 10: Example of a buried soil, Redbank Creek, Hunter Valley, NSW. Scale is 2m. The blue arrows demarcate the buried soil, the red arrow the overburden.





Figure 11: An example of an entrenched creek illustrating erosion, Redbank Creek, Hunter Valley, NSW. Scale is 2m.



Figure 12: An artefact scatter exposed through erosion, Hunter Valley, NSW. This reflects geomorphic processes rather than human behavior. Such locations should be considered 'lag gravels' rather than archaeological sites. Pink flags represent surface artefacts. Scale is 2m.





5 Hunter Gatherer Studies

5.1 Aboriginal Hunter-Gatherers: an introduction

Aboriginal people practised the hunter-gatherer lifestyle ever since they colonised Australia. It is in essence a mobile strategy to make use of a wide range of resources across different ecosystems and is also, in part, influenced by seasonal availability. One of the key factors in hunting and gathering is maintaining sustainability. Not only were resources carefully 'harvested' in order to ensure that they could re-establish and re-grow for the following season, but populations were kept at levels that would not overtax an ecosystem. This stability and ecological familiarity were embodied in the Traditional Lores, Customs and Creation stories. This Traditional knowledge covered every facet of Aboriginal life, including aspects like marriage, the distribution of resources across the landscape, the rules regulating the use of those resources and religious practices to name but a few.

Aboriginal people colonised every part of Australia and successfully adapted to every environment. Over the thousands of years that they lived in Australia, they also had to contend with climate changes and in particular the Late Glacial Maximum (LGM), which was at its peak between 27,000 to 17,000 years ago. The LGM brought colder and drier weather and in elevated mountain areas, glaciers (Tasmania and the Snowy Mountains on the mainland). During the LGM sea-levels were some 130m lower than today due to the fact that much of the world's water was locked up in ice-sheets, particularly those across Eurasia and the American continent. As a result, both Papua New Guinea and Tasmania were part of one large landmass with today's mainland known as Sahul land.

Hunting and gathering is a very efficient life style that has been widely studied by archaeologists and anthropologists. Unfortunately, all 'academic' studies have been undertaken in post-Contact societies and it has been difficult to gauge exactly how much influence this had had on Aboriginal culture. First contact accounts of European encounters with Aboriginal people were not written as studies but as impressions, obviously biased by the impressions of the time. It is important to understand therefore that once Europeans moved into Australia and begun clearing land for agriculture, the delicate balance that had been maintained was lost. In essence, Aboriginal people began to suffer from deprivations including scarcity of food, introduced diseases and forced removals from Traditional Lands. Unfortunately, with the changes wrought by Europeans, most areas of Australia became uninhabitable using a hunting and gathering lifestyle.

5.2 Tangible and Intangible Aboriginal Cultural Heritage

Aboriginal cultural heritage encompasses a significant range of material remains (e.g. stone artefacts, petroglyphs, hearths [fire places]), places with physical (e.g. rock shelters, open camp sites) or without physical traces (e.g. Ceremonial grounds [Bora's], birthing or initiation sites), intangible values associated with Traditional Lore, Ancestors, and Creation figures and landscapes (e.g. songlines or dreaming tracks). It is important to understand that not all of this information will be readily divulged: in many cases it is culturally inappropriate for Aboriginal stakeholders to talk about cultural knowledge with 'outsiders' or uninitiated people, or it may simply be due to gender



specific issues. In certain cases, Traditional knowledge holders will only demarcate an area or landscape as 'culturally significant'. The detailed or specific 'knowledge' of such areas is often restricted information. Whilst we can separate certain aspects of this cultural heritage from a 'Western' paradigm, for example, demarcate the extent of a surface stone artefact scatter, it should be understood that this is often inappropriate for Aboriginal people who believe (to quote Aristotle ironically) that 'the sum is greater than the parts'. In other words, the tangible and intangible cultural heritage values form part of a 'cultural landscape'.

5.3 Cultural Landscapes and Intangible Sites

From an anthropogenic perspective there are few examples of landscapes on Earth that have not – in some way or another – been impacted by human actions in some form or another. From an Aboriginal cultural perspective, a cultural landscape is:

'a place or area valued by an Aboriginal group (or groups) because of their long and complex relationship with that land. It expresses their unity with the natural and spiritual environment. It embodies their traditional knowledge of spirits, places, land uses, and ecology. Material remains of the association may be prominent, but will often be minimal or absent' (Buggey 1999; quoted in OEH 2010c).

The way perceptions, beliefs, stories, experiences and practices give shape, form and meaning to the landscape is termed a cultural landscape (ACH 1998; *ibid*). The concept of 'fire-stick farming' (burning practices) by Aboriginal people in Australia is at least 10,000 years old and potentially goes back 30-40,000 years ago. This practice has irrevocably changed the ecosystems of Australia but in a way that has (or rather had) achieved a balance in the ecosystems. This is therefore an anthropogenic landscape, an ecosystem 'mosaic' created to suit Aboriginal hunter-gatherer lifestyles.

Cultural landscapes symbolize a relationship between all parts of the natural ecosystem and cultural objects and places via past human behavior patterns (as in the fire-stick farming example above). This acknowledges the fact that the present-day landscapes are the long-term consequence of complex interaction between people and the natural environment. The approach encapsulates a 'landscape-scale of history and the connectivity between people, places and heritage items (ibid).'

The various forms that Aboriginal cultural landscapes can be identified include (*ibid*):

- 'Significant biodiversity and a diverse range of ecological systems and associations, all of which contributed to the continuing existence of Aboriginal peoples in the region over many thousands of years, and which are valued in different ways by Aboriginal communities today.
- Material remains of this continuing occupation in the form of a diverse array of Aboriginal sites and places known to the Aboriginal communities, some of which will be recorded on the Department of Environment, Climate Change and Water's Aboriginal Heritage Information Management System.
- Extensive historical records from 1788 through to today which record observations of Aboriginal people and lifestyles, wars, massacres, social and cultural events, population



census, social interactions, language etc, and which influence Aboriginal community values today.

- An Aboriginal population made up of people who have traditional association and knowledge
 of the region, as well as others who live, work and play within the region, all of whom may
 attribute various values with the area, derived from the distant and recent past, through to
 the present day.
- For Aboriginal people, the significance of individual landscape features is derived from their inter- relatedness within the cultural landscape. This means features cannot be assessed in isolation and any assessment must consider the feature and its associations in a holistic manner. This may require a range of assessment methods and will always require the close involvement and participation of Aboriginal people. By consulting with Aboriginal people and using the concept of cultural landscapes, the story behind the features can be told which demonstrates the associations that may exist between Aboriginal objects and other features within the landscape.'



6 Documenting the PCWP Cultural Values for the Project Area

6.1 Introduction

Cultural values are, of necessity, historically contingent, dynamic and situation specific (cf. Murdoch and Pratt 1997). Hence an understanding of the historical and social context of the individual and/or group's relationship with a particular place is pivotal to the assessment of the cultural values that may obtain at each place. Moreover, the fluid and multi-dimensional character of the place within which a 'culture' is represented, and from within which it acquires value, cannot be ignored. Ultimately, the meanings attributed to material and intangible cultural items or places mirror the processes of the cultural construction of those items or places. The contexts of the creation and expression of cultural values must be understood in order to fully characterise the places in which such values are being ascribed (Cotter and Boyd 2001). Hence the primary focus of this section is to provide the context(s) for the creation and expression of cultural values in the Project by the PCWP.

It is not possible to document every circumstance and define the appropriate investigative method to use for each and every investigation and assessment of Aboriginal cultural heritage (OEH 2011c). Nor is it sensible to restrict the methods by which data regarding the cultural heritage value(s) of an area is gathered and/or analysed. There are a multiplicity of meanings that may be ascribed to heritage items and places, and each individual or group may have a cognitive ownership (sensu Boyd et al 2005; Cotter 2009) of one or more of these items or places that needs to be explored and explained. In addition, for either the individual or group holder of a 'cognitive ownership' the significance each ascribes to the heritage item or place it 'owns' is likely to have a multivalent character (CQCHM 2011). Thus a site that has significance as a camping or occupation site may also be of significance because of the presences of an important creator being or its representation at the same location. Ultimately it is important to recognise that in both traditional and contemporary Aboriginal society there was (and is) no static list of places that were (are) deemed culturally important (Godwin and Weiner 2006). In this sense, and as has been articulated elsewhere in the assessment of Aboriginal cultural heritage items and places within the Environmental Impact Assessment framework (CQCHM 2011:60):

'..the entire landscape was [is] a cultural entity in which some locations required a greater level of response but in which people had to be continually aware that the 'old people' or other entities could manifest themselves. People regularly had experiences in the course of the daily round, or dreamed about places and things, that were then submitted to older, knowledgeable people for their consideration. Dependent on the outcome of that adjudication, areas and events were then added to a corpus of localities that were seen as important, demanding special attention and response from people: that is those places had to be managed.'

The centrality of landscape to Aboriginal Australians cannot be understated. For Aboriginal Australians, landscape is the locus of social memory such that stories, songs, dance and paintings are all means of retrieving meanings from 'Country' and, paradoxically, help to combine extreme and long-term continuity with considerable negotiability (Rumsey 1994 cited in Cotter 2009). One contemporary consequence of this juxtaposition of notions of continuity and negotiability is that Integrating Landscape Science and Aboriginal Cultural Knowledge For Our Sustainable Future



Aboriginal Australians continue to 'take extremely seriously the responsibilities they have to their ancestors, spiritual entities and hero figures, and to the management and protection of the cultural heritage areas and objects they have inherited from them (CQCHM 2011:60).'

A further consequence is that Aboriginal cultural heritage management regimes have increasingly been shown to need to accommodate landscape as heritage (Ross 1996; Ross et al 2010) and to more fully explore local Aboriginal interests in heritage (e.g. Clarke 2002; Smith et al 2003; Greer et al 2002; Greer 2010). Rose (1996) has demonstrated the appropriateness of doing so in her book, Nourishing Terrains where she explained the complex and multivalent nature of Aboriginal relationships to 'Country' in the following terms:

'Country in Aboriginal English is not only a common noun but also a proper noun. People talk about country in the same way they would talk about a person: they speak to country, sing to country, visit country, worry about country, feel sorry for country, and long for country. Country is not a generalised or undifferentiated type of place... Rather country is a living entity with a yesterday, today and tomorrow, with a consciousness, and will toward life (Rose 1996:7).'

With this recognition there has been a move away from notions of 'sites' to incorporate 'place value' and the notion of 'cultural landscapes' (Brown 2010). In general the term 'cultural landscapes' has been used to facilitate the analysis and management of cultural heritage beyond a rigid "sites" based approach - which tends to narrowly define and preserve heritage as 'relics' - to consider the spatial, temporal, physical and social contexts in which these 'relics' occur (Cotter and Boyd 2001; Cotter 2009). Further, a cultural landscape perspective enables recognition of the history of a place and its cultural traditions as well as and/or including its ecological value and its continuity between past and present (Mitchell and Buggy 2002 cited in Brown 2010). As outlined below this is most effectively done using a 'holistic approach' to the identification and assessment of landscape elements and the cultural heritage values that can be ascribed them.

6.2 A Holistic Approach

As it is the intersection of the biophysical and sociocultural elements of landscape that manifest as places (see Figure 13) then it follows that an integrated examination of these landscape elements is critical to determining the nature and extent of the cultural values that may exist at any such place. Cotter (2009) has demonstrated that there is ongoing merit in the use of a holistic approach in such an examination, particularly where identification of the cultural values of a multivalent Indigenous landscape is the focus of study. In the context of wanting to, as best as possible, articulate the PCWP values in the project, Tocomwall has similarly adopted a holistic approach.



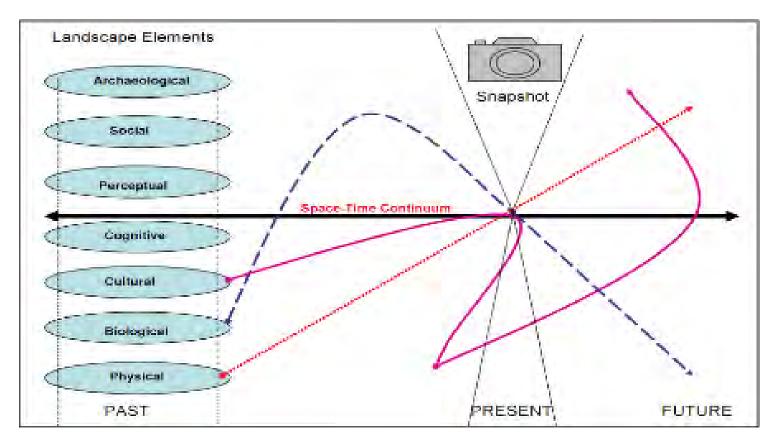


Figure 13: A schematic diagram of the structural elements of landscape and the variable trajectories in space-time that manifest as places(s) in the present (from Cotter 2009: xxiv).



At the most fundamental level a holistic approach crosses both the boundaries between academic disciplines and the boundaries between academic investigation and 'real-world' practice and does so in the concerted attempt to derive information from data that lies at the interface of human and natural systems (Hollaender et al 2008; Pohl and Hirsch Hordan 2008; Russell et al 2008). In doing so it provides for an investigative framework that allows for collaborative knowledge generation between researchers and stakeholders. The distinguishing feature of this approach is not simply collaboration between researchers or 'experts' from different disciplines but also collaboration with the community of interest. The ability of an individual researcher or Project Officer to fuse (or integrate) knowledge from a number of different disciplines and engage with community stakeholders in the process of generating knowledge(s) thus becomes the key to such collaboration (Wickson et al 2006; Kueffer et al 2007; Russell et al 2008; Pohl et al 2008). Consequently, no single method is prescribed in a holistic approach rather, flexible and adaptable project frameworks are required to allow methods to evolve if and when the nature and context of the investigation changes (Wickson et al 2006; Russell et al 2008).

In using a holistic approach to identify and investigate the cultural values of the PCWP in the Project, Tocomwall has sought to:

- To integrate scientific expertise and cultural knowledge in all elements of the research project but especially by developing a collaborative partnership between the PCWP knowledge holders and the technical experts retained by Tocomwall; and
- To use multiple research and investigative methods including (but not limited to):
 - Desktop archival research and literature review of disparate source materials of environmental, archaeological, ethnographic and historical information of relevance to the PCWP and its links to the Project;
 - Development and application of a rapid-infield assessment of the Project to identify the traditional, historical and/or contemporary natural resource values in the Project; and
 - Consultation and informal interviews with members of the PCWP, in accordance with the agreed protocols of the PCWP as to who can and does speak for each family on these matters.

An important consideration in the use of multiple research and investigative methods for this cultural values assessment is the range of literacy and numeracy skills held by members of the PCWP; and the consequent individual variation in the use of and access to public information sources by them. The use of and access to source materials is important in the context of understanding the derivation of the cultural value information provided about the Project area by the PCWP. Ultimately, knowledge of the information sources used to ascribe meaning and value to an item or place enables some temporal classification of these values. For example, it has previously been identified that Aboriginal natural resource use knowledge within parts of NSW derives from three separate but interlinked and overlapping sources (Cotter et al 2004). The first of these is knowledge that, in principal, can only be described as having been derived from traditional custom and practice and that generally requires the intergenerational communication of such knowledge by oral story and/or by physical example. This knowledge might, for example, pertain to the creation of



nets for trapping fish from native plant species in the form and pattern documented in the ethnographic record. This type of knowledge may also be shown to have been subject to adaptation in the historical period. Thus fish traps of traditional form may be recollected as having been made by grandparents using non-native species such as willow; and or more recently to have been made using 'chicken wire'.

The second type of Aboriginal natural resource use knowledge often derives from the involvement of Aboriginal people in the pastoral industry and their consequent adaptation of traditional methods to non-historical practices. For example, Charlie Franks recollected how his father would use paperbark (i.e. the bark from Melaleuca species) as a wound and poultice cover for his injured stock horses and cattle. The final type of knowledge about Aboriginal natural resource use comes from current and accessible literature and other media such as television and the internet. The PCWP are members of contemporary Australian society as well as being traditional Aboriginal owners of Wonnarua country. To this end the ecological values identified by the PCWP in the Project area may also be those that have been referenced in a number of contemporary sources including: Appetiti 2005; Bryce 1992, Cribb and Cribb 1981; Daw et al 1997; Gaikwad et al 2008; Green 2003; Harris et al 2000; Hiddins 2003; Julwarlu Aboriginal Corporation 2003; Lassak and McCarthy 2001; Latz 1995; Lindsay et al 2001; Maslin et al 1998; McKerney and White 2011; Miller et al 1997; Puruntatatemeri et al 2001; Stewart and Percival 1997; Turner-Neale 1996; and Wightman and Brown 1994.

The information sources from which the cultural values of the project (and its surrounds) are derived are necessarily identified; as the subsequent classification of this information into temporal classes such as traditional, historic and contemporary knowledge(s), provides form to the mixed-mode analysis of cultural value. However, it should not be misconstrued that this privileges one temporal class of values knowledge over another. Each values class is equally important as a component of the sum cultural values that the PCWP have and retain in the Project as a traditional owner group with ongoing connection to it.

6.3 Cultural values

The cultural heritage values that are explored and explained in this report are those encompassed by the broad umbrella of terms used in the Burra Charter (Australia ICOMOS 1999) to explain cultural significance. This Australian Charter provides a primary and 'best-practice' framework within which decisions about the management of cultural heritage in Australia should be made. The Burra Charter defines cultural significance as being derived from the following four values (Walker and Marquis-Kyle, 2004):

- Aesthetic value: This value derives from aspects of human sensory perception for which
 criteria can and should be stated. These criteria may result from consideration of the form,
 scale, colour, texture and material of the fabric; the smells and sounds associated with the
 item or place and its use.
- Historic value: This value encompasses the history of aesthetics, science and society, and therefore, to a large extent, underlies all other heritage values. 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 settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

- 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. In the context of cultural
 landscape analysis, it is the view of Tocomwall, that this value must necessarily be
 broadened from the typical focus on the scientific analysis of material culture remains (i.e.
 archaeological science) to consider the application of natural science techniques, particularly
 those associated with ecological analyses (particularly flora, fauna and biodiversity studies)
 in the evaluation of Aboriginal cultural values.
- Social value: This 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. Thus in this study the primary (and only) focus are the social values of the subject area to the PCWP.

6.4 PCWP Consultation and Participation

The authority of the PCWP to speak for Wonnarua country and to be involved in decision-making regarding the protection, and management of Wonnarua lands and waters is asserted on the basis of identification and recognition of individuals as Wonnarua people by cognate descent. Under Aboriginal law membership of the traditional owner PCWP group is a matter that is determined by Wonnarua people according to their traditional laws and customs. For the PCWP kinship is the idiom through which customary law is expressed:

'The reckoning of land tenure interests...on the basis of genealogical relationships is itself an implicit instance of customary law. That is, the laws of descent and of other kinds of relatedness practiced by a particular group are themselves part of customary Aboriginal land tenure law (Sutton 1995: 11).'

In so far as consultation with the PCWP has occurred about this Project, Tocomwall has at all times informed the PCWP Heads of Family as to its purpose, progress and outcomes. All three formal Heads of the PCWP families were contacted and interviewed in relation to the cultural values assessment for the Glendell Continued Operations project area. Ongoing email, phone and meeting contact with Heads of Family has occurred about the study area, and it is in these terms that the Heads of Family have currently endorsed the limited release of the current report.



7 Recognising the PCWP Values in the Project Area: Results

7.1 Introduction

This section reports the results of the exploration and documentation by Tocomwall of the historical, social, aesthetic and scientific values held by the PCWP in the study area. What follows is a complex record of the multiple and interconnected values held by the PCWP in the study area and its surroundings. To achieve this record Tocomwall has relied upon the integration of western and Aboriginal knowledge traditions. Information has been documented with reference to regional and local family histories and archives; formal and informal contemporary oral history and storytelling activities undertaken by and/or with PCWP members; active field participant observations; scientific evaluation of potential and likely archaeological values based on an archaeological survey and comparative analysis with data of similar values elsewhere obtained from the PCWP (Tocomwall 2012; 2013; 2016; 2017). Further, to facilitate the identification, elicitation and elaboration (including a necessary exploration of connection and overlap) of values and their contexts a 'historical narrative' or 'storytelling' approach has been adopted as the primary presentation mode for all the values held by the PCWP in the study area (cf. Masson 2002; Satterfield 2002). What is demonstrated by this narrative approach is that the project area is a multivalent Aboriginal cultural landscape of immense importance to the PCWP. It is an integral part of Wonnarua Country with ancestral, historic and contemporary values that are fundamental to the identity of the PCWP.

Section 7 should be read in conjunction with Appendix 1, Continued Operations Coal Project, Aboriginal Cultural Heritage Assessment Anthropology Report on PCWP Cultural Values By: Assoc. Prof. Neale Draper

7.2 Historical values

The capacity of an object, place or landscape to convey, embody or stimulate a relation or reaction to the past is part of the fundamental nature and meaning of heritage; and consequently historical values are recognised to be the root source of all other cultural heritage values (Mason 2002; Marquis - Kyle and Walker 2004). Historical values can accrue to an item, place or landscape on the basis of

- Its antiquity;
- Its ability to represent and/or evoke an historical period or theme;
- Its association with people or events of importance in the course of local, state or national histories; and/or
- Its rarity and/or uniqueness in its historical and/or environmental contexts.

This section of the report focuses on the documentation and assessment of historical values recognised in the project by the PCWP. In particular it outlines those cultural values of the project that result from the association of the PCWP with people, events and/or places of importance in the course of the local history of the project area, especially where these historically important people places and/or events have physical markers or referents within the project.

Integrating Landscape Science and Aboriginal Cultural Knowledge For Our Sustainable Future





7.2.1 Social values

In its broadest terms the Burra Charter describes social value as embracing the "qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group" (Marquis-Kyle and Walker, 2004). What follows is a documentary record of some of the social and spiritual values that the PCWP ascribe to the lands and creek systems of which the study area forms an integral part. It is not an exhaustive telling of the values that the PCWP retains in this landscape but reflects those values the PCWP has agreed are to be conveyed in order to best express the cultural importance of the study area to the proponent.

7.2.2 Spiritual values

As elsewhere in Aboriginal Australia the spiritual beliefs of the PCWP describe the creation of Wonnarua land and link this landscape with their ancestors. The activities of creative beings and ancestors of long ago transformed the world and laid down the pattern of life and the laws of the PCWP. Today the spiritual presence of the beings and the tangible evidence of their activities during the creation era are embodied in physical features of the landscape. Stories of the events and the associated sites are the cultural property of the PCWP and this knowledge has been passed down through the generations.

As will be outlined below with examples exclusive to the PCWP, the study area is part of a physical and mythological landscape of enduring importance. However, what must also be stated is that the PCWP are only two well aware of the isolation, fragmentation and loss of connectivity with and between elements of this spiritual landscape. This deterioration in the spiritual landscape of the Wonnarua is not an entirely new phenomenon. It in fact commenced with the uptake of the first grants of land by European settlers in the Central Hunter in the early 1820s. However it is the degree, scale and permanence of current and future mine induced landscape modification that has had and/or is likely to have the most profound effect on the spiritual landscape of the PCWP. In addition, the cognitive ownership of the related mythologies whilst strongly vested with the PCWP has been long subject to challenge as early ethnological recordings of physical elements of this landscape and its associated stories have been provided to the wider public for more than 100 years (e.g. Mathews 1897; Singleton Argus 1893). It is therefore not simply the generic recounting of these creation myths that provides proof of their authenticity or of their enduring spiritual importance. The PCWP establish the authenticity of their spiritual beliefs by their immediate association with the story telling of fond Aunts, Uncles and Grandparents and in their detailed recollections of these personalised stories. The following are some of the stories told:

7.2.3 Biami⁶ and the creation of Wonnarua Country

In a statement to the Native Title Tribunal Mr Scott Franks outlined the following story, as told to him by his Uncle Clyde (Franks 2012, para. 17). It is a creation story that clearly affirms for Scott the

⁶ It is recognised that there are variant spellings of the name of the creator and protector of Wonnarua Country, the spelling adopted herein is as per Mr Franks' statement to the Native Title Tribunal.



interconnectedness of the biophysical environment of Wonnarua Country and the spiritual realm from which it was created, and through which it continues to be protected and sustained.

'Before our people were allowed to enter the lands known today as the Hunter valley our creator Biami looked down from the skies. He then stepped down onto Big Yango with his son, Little Biami. As both then stepped onto Little Yango, Big Biami looked across the area and started to move the lands to make the valleys. As both then moved across the area Biami opened up the lands and made the hills and streams and gave life to the area, as both moved from Yango up into the Hunter valley, Biami and his son placed the animals in the lands and the birds in the skies.

Biami then looked at the waters and brought the fish. He first placed the mud gudgeon to settle the muddy water that was created from the new water as it flowed through the new streams. After the mud was settled he then put the catfish in the water and ordered him to make his nest of rocks on the bottom of the streams to slow the water. Once the stream has settled Biami set the other fish loose in the creek. The perch to hide and watch under logs and holes in the bank and yabbies to build up the banks and to eat all the grasses that were left in the lower streams. He then placed the sprat that all swam together travelling up and down the streams making sure everything was working (I recall too that Uncle Clyde used to call sprats sugar fish because they were so sweet. He would smoke them and eat them whole and he always took a special "sugar bag" with him in the bush just in case he came across some in the creek during our travels).

Once the water was in place Biami then started in the land so our people could live. He put the trees in the ground, and then blew his breath to make the wind. This wind pushed out and made the plains. Once the land settled our people were let go into the lands. Biami told all not to cross certain areas as others would come, the lands that was here was for our people and to look after it. As Biami move across the lands the trees started to grow. To watch over the trees Biami brought Yarra (Koala). Yarra was told to watch over our people in the campsites and the scrub as Biami would not be able to see them from the sky once the trees had grown. (Our mob was never allowed to harm any Yarra).

He then placed the Kangaroo (kaNawang) on the land to help make the tracks and flatten out the lands. The Kangaroo was told that he could be hunted by our people so he asked Biami for help to prosper so Biami gave him long legs to help him stand high, and be fast and ears that moved all around. He told the Kangaroo to always look for our people. As Biami watched our people he helped them with fire from the sky and showed them where to go for shelter when it was cold and where to camp when it was hot.

He told them to camp near the water when hot and when it was cold to move to the caves he had made. He told our people that he would make the springs near the caves so we could get water. In the springs he ordered the Yabby to live. He then gave the turtle legs so he could walk on the lands and so he could grow in the ponds formed by the spring. He also told the Eels that they could move on the lands only at night and in the early morning so he also could grow in the springs and ponds.



Now that our people had shelter and food Biami looked at the sky and made night and day, sunlight and rain. Our people were lost with the darkness of night and Biami saw this and so he placed the Moon and the stars in the sky and made the fire-fly. The fire-fly allowed our people to see that trees with fruit were nearby so they could eat and wait for the day to come. He also set the flying fox to watch over our people at night.

Biami then grew the ranges and the mountain around the Valley and told our people not to cross them as other people would be in those areas and it was their home not ours. As he was building up the Liverpool Ranges some of our people crossed into that area including six (6) men from the one family. Biami saw this and the men were taken. One of the wives started wailing and cried to Biami asking why he would take her man and Biami told her that all were warned. The wife told Biami that she would sit and wait till her man returned. As she sat on a high rock waiting and crying Biami looked down and turned her into stone forever as a warning to all our people. As she was turning to rock one of her tear drops fell from her crying face and set a light a cave and Biami to this day has kept that fire burning. (This is Burning Mountain). This area is known to be the border of our lands in the North. Biami told our people what he had done to the woman and ordered them to use that fire, carry fire sticks and to make fire at all our campsites. He warned all not to cross the ranges or risk what would happen.

Biami then turned his attention onto the lands in our country and to help our people move around the lands he gave them ceremonial tracks and taught them how to walk through the land and tell the stories of our people. He said ceremonial tracks will be used to teach what is needed to live in your lands.

Many of these ceremonial tracks are still in place today. One ceremonial track runs from the apex of the Barrington Tops right back to Yango. This track moves down out of Barrington Tops, following Glennies Creek, it passes through Carrowbrook, down to Falbrook and then it continues all the way to Jerrys Plains, Warkworth, Bulga and to Yango. When walking along this track our people would tell this story of how the land was made and of what was expected of you to live in our lands to ensure that the story was told to all in the lands.'

For Scott, the study area forms one part or segment of the ancestral lands created by Biami for the Wonnarua to enjoy. Likewise all traditional ecological resources to be found today within the study area are as those provided by Biami in ancestral times to ensure that he and his ancestors could survive off the land. Consequently for Scott the study area is part of a cultural landscape of immense and enduring spiritual value. Within this landscape ancestral ceremonial tracks are pathways and guides to the lores and customs required to ensure the health, prosperity and sustainability of the Wonnarua people.

Maria Stocks (Stocks 2012, para. 15-17) outlines the importance of storytelling in the development of her understanding of the interconnection between the physical and mythological elements of Wonnarua Country.



'Stories relayed to me by my grandparents of the times they had spent in Wonnarua Country - and of the things they were told by their parents - were often shared during picnics held at a lovely spot along Glennies Creek up on Old Carrowbrook Road... During these picnics we would listen to stories about the creation of Wonnarua country and about those special places and/or beings such as Biami, Tidilick the Frog and Burning Mountain that were of and from the beginning of time. I was told that a cave at Milbrodale was painted with an image of Biami. He was painted there to welcome people to the territory of the Plains Clan and, with his arms outstretched facing east northeast, he was there as a guardian and protector of our people and our clan country. I was also told of the ceremonial tracks that linked sites such as Biami Cave (Figure 14), the corroboree sites at Bulga and the old home spaces of my people up near Mt Olive and Glennies Creek. I was also told that there were many of the sites that women (females) should never go near. Burning Mountain which is up near Wingen, at the northern end of the territory of the Plains Clan of the Wonnarua, was one such place that my mum would never go near or pass by for fear that she would anger Biami. She would avoid driving up that way to Tamworth so that she was never in sight of this mountain.

...I especially remember that Pop told me that when up Milbrodale way I should never visit Biami's cave. In fact I had not done so until two weeks ago when given the impromptu opportunity I visited this site with Scott Franks, Robert Lester and a friend of ours. Frankly after all these years I was curious about a place I had been told I should not go near. I felt uneasy when I was there but nothing untoward happened immediately. However less than an hour after my visit, the two cars that had transported our visiting party to the site - one with Scott and Rob travelling south home together and the other with my friend travelling north home alone - were involved in two separate car accidents. No one was injured but both cars could no longer be driven. I believe these incidents occurred to show me how wrong I had been to go to that place. I simply was not meant to go there. My old people have spoken to me and told me again of the importance of keeping all our lores.'





Figure 14: Biami the Creator, Milbrodale, Hunter Valley, NSW.

7.2.4 Lizard Mountain

In another variant of the creation story little Biami features prominently as a protector and guardian of the Wonnarua people, especially in and around the Broke area. As described by Scott Franks this form of the creation story is as follows:

'As he stood at the bottom of Wollombi looking out toward our peoples lands Biami told his son to stay behind and protect his people. This was Wonnarua land and all in it. Little Biami then filled the creeks with life such as Becan (Platypus) Kutamong (turtle), perch, yabbies and the like. He also made the Kawal, (The Hawk) — To our mob the Wedgetail Eagle is our totem, and he is the eyes of little Biami left here to watch over our people and to protect us. — Little Biami then laid a giant lizard to sleep on the mountain range behind Broke (between Broke and Cessnock) to warn all others to stay away. This area is called, wirramin kooaran Lizard Mountain (Figure 15).'





Figure 15: Sacred Lizard Mountain: Little Biami, a creation being, placed a giant Lizard (Wirramin Kooaran) to sleep on the mountain between Broke and Cessnock to warn all others to stay out of Wonnarua lands.

7.2.5 Biami and Sentinel Mountain

Another topographic feature within the Broke-Milbrodale—Bulga area that is associated with Biami is Sentinel Mountain. As the PCWP members understand it, before Biami left all the lands he had made and returned to the heavens, he turned four Wonnarua warriors into trees. Three of the trees were left to guard the front of the cave where the image of Biami had been painted. The three warrior trees were placed at the cave to protect it from other mobs coming to that area. The trees were told to bring the breeze and send a howling noise to warn others to stay away. However as explained in this paraphrased remark of Scott Franks:

"In recent years some uninformed people have agreed to let the Warrior trees be removed so as to improve the access to the cave for tourists. It's a joke."

The PCWP remain concerned that these sorts of decisions have impacted directly on Biami and made 'their Country' more vulnerable to interference from other mobs.

As for the fourth warrior he was sent up into the mountain to the highest peak and there he was also turned into a tree so he could forever watch the paths into Wonnarua Country and forewarn the other three warrior trees that people were coming. If this high warrior and guardian saw other mobs coming in he would send the wind howling down the Valley with a noise like when Biami opened up the lands. This was to warn them that if they were to trespass on Wonnarua country without permission from Wonnarua people, Biami would come back with all his force and energy to deal with them.

7.2.6 Tiddilick the Frog



Although recognised by some PCWP members to be a generic and much retold Aboriginal myth (and see OEH, 2011d) the story of 'Tiddilick the Frog' does have geographical referents within the Broke-Bulga areas. Maria Stocks (Stocks 2012, para. 18) describes the way in which this story is being told and retold within her family:

'Today, having been taught by my grandparents my brother David tells my youngest children and grandchildren some of these ancestral stories too. A favourite of my grandson Oliver is "Tidilick the Frog". There is a giant mossy green frog to be found in the natural sandstone outcrop out near Wollombi (Figure 16). This is said to represent the frozen body of Tidilick the Frog. As my brother tells the story Tidilick was a gigantic frog that got greedy and swallowed up all the water from the creeks and rivers. This made all the plants and animals suffer. Luckily a platypus out near Wollombi way made him laugh so that he spat the water out and the water run to fill all the rivers and creeks of the area including Cockfighter's Creek, the Goulburn and Hunter Rivers, Loders Creek, Nine Mile Creek and Wollombi Brook. This made these creeks beautiful and abundant places for our people and it is why in good times this area was like a modern day supermarket for our mob.'



Figure 16: Mary Franks. c. 1980s photographed near the giant form of Tiddilick the Frog, Wollombi.

Photograph courtesy Alma Franks.

7.2.7 The 'Hairy Men and Other Leery People

In addition to creation beings the mythological realm of the PCWP is populated by other spirits, many of which are not benign protectors but rather scary and malevolent beings. Scott Franks (2012; para. 8) recounts the following story of the malevolent Hairy Man:

'Not long after this Dad and Uncle Clyde sat me and my brothers down and told us of the Half Moon Brush. This area was across the creek and up to the north about 1 km from where we lived, you could see it from our home. Dad and Uncle Clyde told us of the Hairy Man that



lived there. As boys my dad and his brother were out in that area Dingo hunting when they shot some Wonga Pigeons. They left them behind on the roo track to collect them on their return. On their way back as they come out of the Half Moon Brush a "Hairy Man" had found the Wonga Pigeons and was eating them. Dad and his brother heard the Hairy Man yell out and this scared them and they ran home. Dad's mum had told them that the Hairy Man lived in that brush and that he could stop time. This is how he could both scare and run away from people. She told my Dad and Uncles not to ever go back to the Half-Moon Brush as it was the Hairy Man's place. She said that "if he gets you you'll be trapped in time and vanish". Dad always told us boys that we were not allowed to go to that Brush as he and his brothers had seen the Hairy Man and they were lucky to have got away.'

Below, Maria Stocks (2012; para.9) similarly describes the story of the Hairy Men as told to her by her Grandmother:

'When David and I were young Gran told us stories about the "Hairy Men" that lived in the mountains and how these spirit creatures could make time stand still so as to get away from and/or avoid people. Gran told us that these Hairy Men came down at night looking for food...she said they stunk really bad...and that they looked in the windows when they heard a baby cry.'

Interestingly in conversation with Charlie Franks (pers. comm. May, 2012) he speculated that as much as these beings were described by his parents as being real, in the light of his adult eye they were also effective stories through with which his Dad had "scared the shit out of him" and stopped him and his brothers running about after dark. In this adult expression of the role of story and the spiritual realm in the lives of PCWP members, Charlie indicates that the spirit beings described and invoked by his parents had a very practical role in the discipline and socialisation of him and his brothers. This social role, which through the telling and retelling of stories had continued into the present, was clearly traditional in its origin and reflects the ongoing interconnectedness of the spiritual realm and the secular realm for the PCWP.

Scott Franks (2012, para. 8, 9 and 12) also describes other of the malevolent spirits he was told about by his parents and uncles. These beings may warn of imminent trespass or encounter with a ceremonial place for which you must have permission to enter or they may simply be protectors of the spirits of dead ancestors. Either way it is clear that the stories provided to him by his Dad and uncles were designed to equip him with the skills and knowledge to negotiate safely through this spiritual realm:

'One night me and my brothers were walking in the scrub on our way to go eel bashing when we heard a loud noise like footsteps going "crunch, crunch" through the scrub in front of us. As we stopped to listen and tried to work out what is was we heard a loud crash in the nearby waterhole. We then saw a bright light coming up from the water. At this stage I took off running home with my brother's behind me. When we got home Dad was waiting for us and he told us off as if he knew where we had been and what we had been up to. We told Dad what had happened. He told us that we had gone too close to the "Blacks Camp" and that one of the spirits had come to warn us not to go any closer. My brother told me that



before they could run the light in the water had come to the surface and it was glowing with a man inside it. The next day Dad got us all together and told us to stay away from there at night as at night time the protector of the valley was there watching over the body's that were left to rest.'

Up the road from where we lived there is a hill with a cliff on Razor-Back Mountain that we called "Baybuck". This was a bad place. It was told to me by Uncle Clyde and Ashley Hedges that in the early days the solders that drunk all the Rum [the Rum Corps?] took some of the Black Fella's and threw them off the cliff and shot all the Aboriginal women too. One of the woman's head was cut off and thrown in to a gully up from our home. At night Dad and my Uncle told me that she could be heard shaking a chain and not to go up there after dark.

'... I was taught that the fire that we made needed to be very smokey as smoke would clear the path for us to go ahead. Uncle Clyde and Ashley told me that this was a protected area and we needed to do this to let the "Leery People" know that we were from that area and to let us pass through. Leery People, as my Uncle explained it, were small spirit people that would torment you and that smelt really bad. The Leery People would guard certain areas and stop other Mobs going that way as we were getting close to the back of the property known as Sunnyside on Bridgeman Road. This property was adjacent to Sydenham and the ceremonial site where my great grandfather had been born.'

7.2.8 Totems and Taboos

The use of natural species as totems or 'skin names' to define classificatory kinship relationships is recognised as being common within traditional Aboriginal societies across Eastern Australia (Radcliffe-Brown 1929). At its most elemental, this use of classificatory skin names provided a means of social regulation whereby each individual within a language and/or clan group understood their relationships, roles and responsibilities to all other individuals within their group (ibid). Equally though the use of natural species, predominately animals, as totems and skin names brought both secular and ritual responsibilities to bear on individuals with regard to the animals to whom they were of the same 'skin'. In particular responsibilities to protect animals of the same 'skin' often resulted in hunting and eating restrictions on certain species (Rose et al 2003). The PCWP recognise a number of animal species to which traditional (and ongoing) totemic responsibilities apply. Of these, the primary totemic species recognised by all members of the PCWP is the wedge tailed eagle. This bird of prey is recognised as an important living embodiment of the 'eyes of Biami' and as such commands (and receives) the utmost respect and protection from the PCWP. Other species recognised to be totemic animals similarly protected by the PCWP were the Curlew, the Koala and the Black Snake. Of these, Scott Franks recalled how his father showed particular affection for the Koala:

'Dad has a real love of Koalas. He always protected them and taught us kids not to harm or touch them. When I was a kid he rescued a baby Koala. The mother was a road kill. He brought it home and with the help of mum who cared for it - and she was always caring for some sort of wildlife - it survived. We called it 'Blinky Bill' and it lived with us for about ten years, 'til the National Parks people found out and came and took it off us. Not long after



that Dad went to go see it and found out it had died. He reckoned it was 'cause the poor thing had fretted from being removed from us (Scott Franks, pers.comm, October 2012).'

In contrast other animals were strictly taboo species because they were associated with 'bad' or malevolent entities. Of these the Wonga Pigeon was considered taboo and dangerous to be eaten because of its being a food of the Leery People. It was therefore best avoided. Eels are also described as a taboo species not to be eaten as they did not have scales. However rather than avoid them the practice of 'eel bashing' was used to manage their numbers and ensure that they did not out compete other scaly fish species within the creeks and rivers of Wonnarua Country.

7.2.9 Ceremonial places and pathways

The repeated use of pathways as a means of traverse of the Australian landscape is a common reported feature of traditional Aboriginal society (e.g. Belshaw 1978; Campbell 1978; Steele 1984; Godwin 1990; 1997; Morris 1994; Sahukar et al 2003; Donovan and Wall 2004, Harris 2004; McBryde 2004; Beck 2006). So too the ethnographic record is replete with first-hand accounts of the aid provided by Aboriginal guides to explorers, surveyors and early settlers during their excursions into the 'colonial frontier' (e.g. Wallis 1821; Brown c. 1825; Cunningham 1827; Breton 1834; and see Lee 1925). Breton (1834: 186) for example, notes the following:

'The natives on the Hunter resemble their neighbours in every respect. In common with all those tribes with which we are aquainted, they make excellent guides, when well treated; but when hard pressed, which is sometimes the fact, when accompanying persons on horseback, who forget that a horse at a good walk goes faster than is convenient for a man on foot, they turn sulky, and avail themselves of the first opportunity to give their employers the slip.'

Today the PCWP recognise pathways as having both secular and/or sacred roles. In a secular vein they mark traditional routes through Wonnarua country traversed by their ancestors either in the daily search for and procurement of food and shelter, or in the seasonal cycles of return to known resource rich camping areas. Within the sacred realm the PCWP identify that pathways map the movement of creation beings across Wonnarua Country and link sites where physical manifestation of these beings occur. In addition they are the physical routes taken through 'Country' during important ceremonies such as initiation and often these pathways intersect sites where creation beings are manifest. Hence, Maria Stocks (2012: para.16) noted that she:

'was also told of the ceremonial tracks that linked sites such as Biami Cave the corroboree sites at Bulga and the old home spaces of my people up near Mt Olive and Glennies Creek.'

In the following extract Scott Franks (2012 para. 9,10,11,13,16, 17i and 19) indicates his knowledge of important ceremonial tracks and places. This extract is accompanied by a map showing the locational relationship between elements of these ceremonial tracks and the project (Figure 10). In the extract Scott describes the way in which he was physically brought to knowledge of these places in his childhood, whilst being in the bush in the company of his Uncle Clyde and Cousin Ashley. In this description we see that for Scott the physical, socio-cultural and spiritual domains of this landscape are not separate but rather are fused, as an interconnected network of nodes and pathways with multiple cultural values and meanings. These nodes and pathways have a clear



physical dimension in the creek systems that exist today but also as demonstrated in Scott's recount, these pathways have been "burnt into his head" as he listened, learnt and walked in the bush with fond Elders. This is both a clear affirmation of Scott's cognitive ownership of this landscape and a demonstration of the way in which, for him at least, traditional and contemporary, sacred and secular meanings coalesce in the 'walking' and 'talking' in and about Country.

'On the days that Uncle Clyde, Ashley Hedges and me would go out to the bush we would travel most of the times along the creeks from Mt Olive through to Bulga and the Putty. We would not take any food or water as Uncle Clyde and Ashley would teach me what food and resources were around for me to use. For most of this time I walked barefoot and only commenced wearing shoes when I had to wear them to attend High School. It was just one more reason not to enjoy School. My Dad used to joke about how tough the soles of my feet were saying that he reckoned he could light a match on my feet as they were so hard.

I was told that the creek formed the only route which I should use to travel through the country of my people. It was the track which my family would use to travel to ceremonies and to move across country to get food. As we walked along my Uncle and Cousin would talk and I would listen and learn. About a kilometre downstream from the Mission we would normally stop at the same place along the creek. This was a place where the channel of the creek became wider and deeper. At this place there were some big old she-oaks along the creek bank that had rings cut into them forming bands around the trunk. Uncle Clyde told me that when he was a boy he and his brothers had climbed the trees, cut the rings around them then jumped into the creek. This had been a normal game for Uncle Clyde and his brothers...

Once we left this area we would continue downstream and come to an area called 'Yankees Drop'. In this area we would stop and uncle Clyde and Ashley would make a small fire. Ashley would collect some bark from the paperbark tree and grind it up. Uncle Clyde would then mix the ground paperbark with the insides from the "Black boy" (grass trees) that grew at this place he would then use a long short stick and some cord with a small block of wood that he kept in his dilly bag. The block had a carved gate in it with a small indent. Uncle Clyde would put the grass tree and the paperbark in it, push the stick in then use another stick with the cord and pull it back and forth. This would spin the stick and heat up the material. Then he would drop that in. Then he would get me to blow on it softly and as I did this he and Uncle Ashley would ask the flame to come. (When this happened I did feel pretty special)...

At about this point in our travels me, Uncle Clyde and Ashley would leave the creek and walk up the hill towards this ceremonial site. It was made of stones that were arranged in a circle that had two openings one facing north and the other facing south. A path lined on either side with rocks extended out from each of the openings acting like corridors which we used to enter into the circle. My Uncles reminded me that you couldn't go into the "guts" of the circle but had to keep to the edge of the circle. I would also be reminded that this was because you could only go into the centre of the circle to speak and you could only speak if you had authority to do so. My uncles and I would walk silently through it but would never go around the outside of it as it was also not allowed. Uncle Clyde and Ashley would always tell



me about the boys coming here to become men. Ashley would tell me about how they would be in this area for over a week being shown how to catch fish and hunt. I was also told that somewhere nearby was a women's site also arranged with stones...

After being in the area for about three days I was told that these boys would then move off upstream towards the stone ceremonial site at Sydenham to continue their lessons. The boys would then make their way to Bowman's creek and continue downstream towards the Hunter River where they would then follow along the sandy creek banks of the Hunter eventually to arrive at a big bora ground near the present village of Warkworth where large ceremonies would take place.

Many of these ceremonial tracks are still in place today. One ceremonial track runs from the apex of the Barrington Tops right back to Yango. This track moves down out of Barrington Tops, following Glennies Creek, it passes through Carrowbrook, down to Falbrook and then it continues all the way to Jerrys Plains, Warkworth, Bulga and to Yango. When walking along this track our people would tell this story of how the land was made and of what was expected of you to live in our lands to ensure that the story was told to all in the lands...

An extension of this ceremonial track allowed people to move across from the Falbrook-Ravensworth Area down both Glennies and Bowmans creeks into the Warkworth area and then back up the Wollombi Brook, through Jerry's Plains past Plaschett and across to Apple Tree Flats. This route was burnt into my head as a child by my Uncles, Aunties and Father as the only way our people (my family) could travel to get to the bora. I was also taught that my family would return to Falbrook after the ceremonies had finished by way of Nine Mile Creek, Loders Creek then across to the Hunter River and back to Mt Olive and St Clair.'

This recount also alerts us to Scott's awareness of the need for reinforcement of the values of each known pathway and place via ongoing physical engagement with them (the "walking") and by ongoing oral transmission (the "talking") of their stories to other members of the PCWP. As he succinctly states "When walking along this track our people would tell this story of how the land was made and of what was expected of you to live in our lands to ensure that the story was told in all the lands" (Franks 2012: para 17i). In these terms the maintenance of the knowledge of these places and pathways and their spiritual importance is an ongoing obligation of the PCWP. Further for this obligation to be fully met individuals ultimately must "be" and "do" in this landscape. Critically for this to occur the pathways and places of importance must remain accessible and have a degree of physical connectivity that allows physical traverse across the landscape and/or appropriate reference points for the oral transmission of the linkage points between and about them.

7.2.10 The Bulga Bora Ground

In 1852 the people of Bulga witnessed the last recorded Bora held in the Hunter Valley. The Bora was an aboriginal ceremony which amongst other rites included the initiation of young males into manhood. According to the local white settlers as many as six hundred warriors attended the Bora. The Bora Ground which was located in the Wallaby Scrub close to the road to Warkworth, was encircled with an earth mound and symbolically carved trees- sadly nothing remains of that ceremonial ground today. (Mitchell 2004: 41-42).



Aboriginal heritage practitioners, local historians and Aboriginal community members make common reference to the presence of a former Aboriginal ceremonial ground within the vicinity of the central Hunter Valley village of Bulga (e.g. Eather 1921; Bulga School Centenary Committee, 1968; Brayshaw 2003; Mitchell 2004). It is apparently agreed that no physical evidence of this former ceremonial ground currently exists. It is generally understood that it was located somewhere in the vicinity of the 'Wallaby scrub' and Warkworth (Mitchell 2004). In a recent submission to the Land and Environment Court Scott Franks stated:

'The area is known to have been an important gathering area for the Wonnarua and neighbouring Aboriginal groups. It was an area where initiation and marriage ceremonies occurred and where tribal disputes, trade and social gatherings were conducted. The unique ecological diversity of the area now known as the "Warkworth sands" meant that in season there was an abundance of plant and animal resources including fish within the nearby Wollombi Brook that could be used to support large gatherings of people. As a boy I was taught the importance of this area by my Uncle Clyde and his Cousin Ashley Hedges as he included it in his description of the physical route and spiritual journey/songline that my family would take from Falbrook near Ravensworth to Warkworth to attend gatherings and initiation ceremonies, especially at the 'Bulga Bora Ground' (Franks 2012b: 1).'



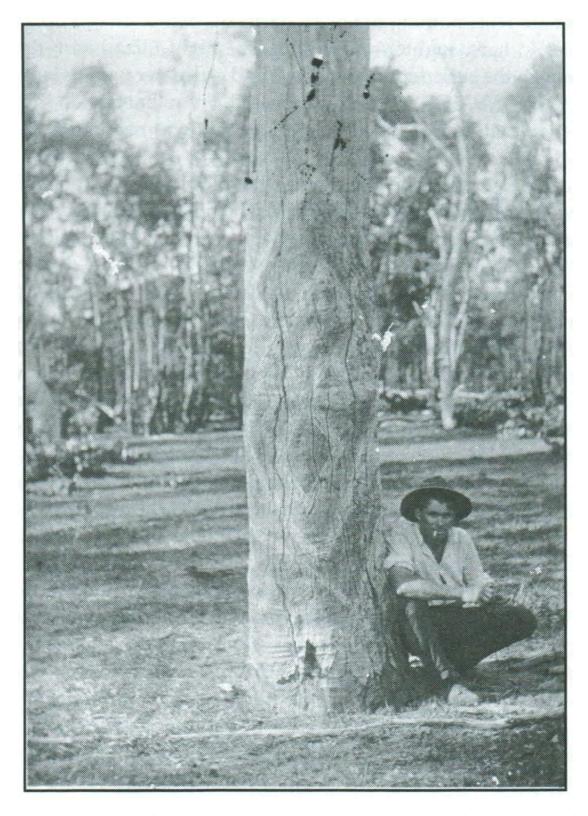


Figure 17: Image of carved tree associated with the 'Bulga Bora ground' Image courtesy of Mr Stewart Mitchell.



In 2011 the PCWP was advised that on the basis of evidence provided by Brayshaw (2003) Coal and Allied believed the nominal location of the Bora Ground was partly within the Wollombi Brook Aboriginal Cultural Heritage Conservation Zone and partly within the Wambo Mine Lease area. However a physical inspection of this location by Tocomwall staff, in the company of Wambo mine employees - coupled with further documentary and oral history research, undertaken by Tocomwall on behalf of the Plains Clans of the Wonnarua People - indicates that the more probable location of the Bulga Bora Ground is in fact solely within the Warkworth Mine Extension Project area (Franks et al in prep).

7.2.11 The Gold Ochre Site

The gold ochre site is a site with spiritual values that derive both from its important association with traditional ceremonial practice and its contemporary rediscovery as a result of the intervention of ancestral spirits. The site is known to many members of the PCWP because of their participation in a smoking ceremony that occurred at its location upon its rediscovery in the early 1990s. This location is in the vicinity of the Mt Thorley Rail Loop and Loading Pad, to the north of the BCC, and adjacent to Loders Creek. The smoking ceremony was attended by multiple generations of the PCWP; and the video record of it confirms the physical and oral transmission of important cultural and ceremonial information relating to the use of the gold ochre identified at the site. Mr Brian Grant, a Wiradjuri Elder who lived in the Singleton area for some time and was instrumental in the 1990s development of the Singleton – St Clair Aboriginal Corporation and the Ungaroo Aboriginal Corporation, was a key person in the rediscovery of the gold ochre site. In an informal phone conversation with Mr Grant in October 2012 he described how the rediscovery had occurred with words to the following effect:

'I had been troubled by reoccurring visions of a man who kept asking me to fix it. I did not know who the man was in my visions, nor did I know what I had to fix or how I was to do it. I told a Wonnarua Elder – she has since passed on - about my visions and described the man to her. She said that man you describe is my father and you better listen to him.

After several weeks of the vision I understood that it was occurring in the same place, although I didn't recognise the place. One day though I had to go to the local Dr because I had some trouble with my blood pressure. When I went to the Drs surgery there was some material about the coal loader rail loop and pad development at Mt Thorley. I looked at it and was immediately overcome as I recognised that a photograph of the area proposed for the rail loop depicted the same place as what I saw in my vision. I still didn't know what I had to fix but I knew I had to look at that area.

When I went out to the mine area to have a look, and despite the archaeologists having already done a survey and apparently found nothing, we come across the gold ochre site. It had been there since the beginning and the ancestors had led me to it.

I have wondered why me, as I'm not Wonnarua. However like the Wonnarua, my personal totem is the Wedge-tailed eagle, and you know when we went out to the site two wedge-tailed eagles were circling about.'



The PCWP recognise the important ancestral connections with this site, and also recognise it to be an important source of ochre for both the painting and repainting of the images of Baimi in the nearby rockshelters; and for the body paining that would occur during initiation ceremonies.

7.3 Cultural Mapping of the Cultural Landscape

The PCWP, through Tocomwall, are undertaking a long-term project that involves the mapping of their intangible cultural values. The project is already beginning to show promising results (see Figure 18). Importantly, the mapping has begun to illustrate that not only are the intangible sites part of an interconnected cultural landscape, but that the distribution of known archaeological sites is showing some interesting correlations with the cultural values (work currently in progress). This highlights the need to include a combination of detailed study and analysis of all values, including cultural, scientific, aesthetic and historical.

The travelling lines illustrated in Figure 18 were used by Wonnarua People to traverse their traditional lands, with different parts of the landscape being occupied by various clans (NTDA 2013: Attachment F, 0026 and 0031). Although each clan occupied a different part of the landscape or 'range', they were intimately linked via their cultural landscape through trade, subsistence, ceremony and social ties. If we traverse the cultural landscape from Mt Yengo in a northerly direction we find that the culturally significant sites are linked both by song lines and travel routes of the Wonnarua People, namely:

- Mt Yengo Tiddilick the Frog Yellow Rock Lizard Mountain Sentinel Mountain Baiame Cave – Bora Ground at Bulga – Bora Ground at Warkworth – Dural region – continuing north towards Burning Mountain;
- East of the Bora ground at Bulga we also have the Gold Ochre Quarry, which coincides with the initiation song line that flows through PCWP Country between Lake St Clair and Jerry's Plain: and
- Additionally there is the fire song line that connects with the initiation song line and
 ceremony at Dural, which has been described as an important ceremonial area and is also
 associated with the Hunter River and flows northward to the sacred site of Burning
 Mountain and westwards towards Putty where it eventually joins up with sites associated
 with the Sydney Aboriginal clans.

Importantly the fire ceremony and song lines are frequently associated with high levels of male initiation and cannot be told to those who are not likewise initiated. Therefore, the information provided is, due to cultural constraints, necessarily limited in detail.

The distribution of archaeological sites illustrated in the 2004 ERM archaeological baseline study (in particular Figures 3.3 to 3.5: 62-64) and covering the areas (in a north to south direction) of the Mt Royal Range, Barrington Tops and North Eastern Mountains, Southern Mountains and down into the Central Lowlands, demonstrates very high densities of sites associated with these song lines and travel routes. Despite the potential for bias in the archaeological site locations (since archaeological surveys are driven by development rather than research frameworks), there is a very clear



association and correlation between the very high archaeological site densities and culturally significant locations, song lines and pathways. It suggests settlement patterns that traverse the various functions mentioned earlier, namely trade, subsistence, ceremony and social ties and indicate an incredibly diverse use of the landscape through the very varied functions expected and required of the Wonnarua Clans. Furthermore, the distribution of Aboriginal sites illustrated in the ERM (2004: figures (3.3-3.5) provides physical evidence of the pathways and song lines that the PCWP have identified.



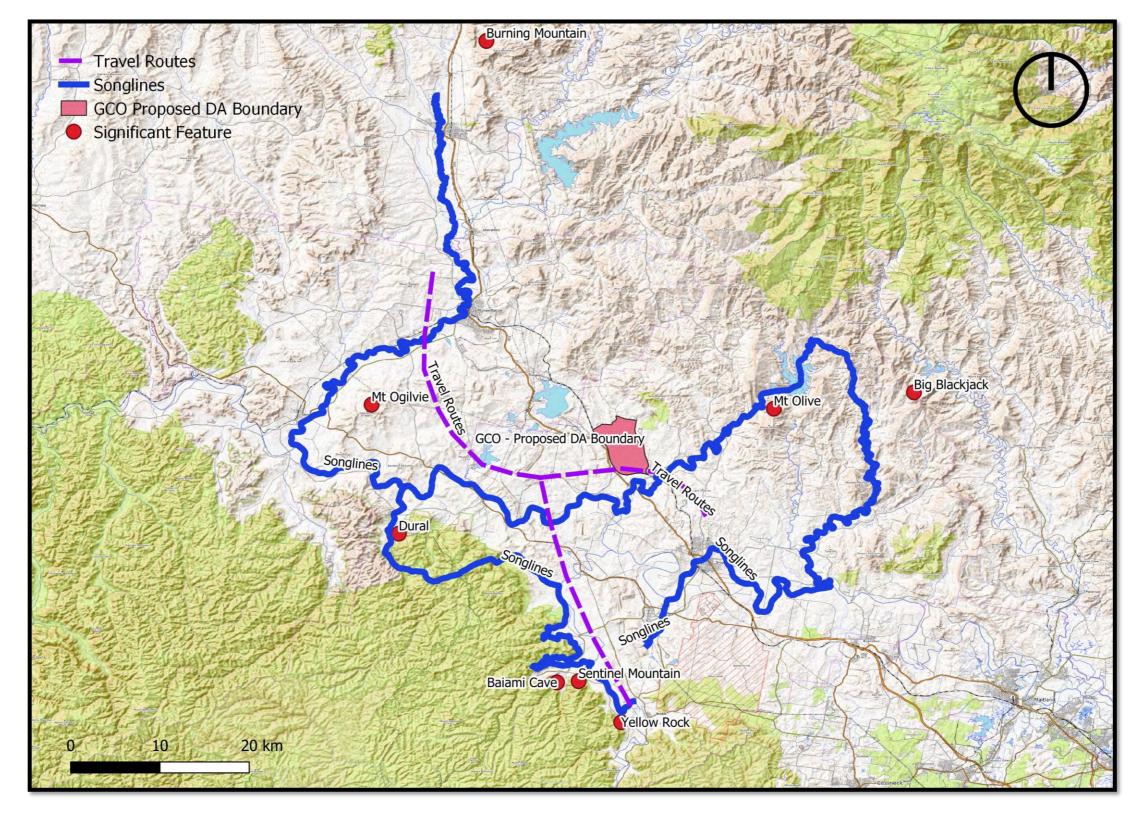


Figure 18: Ceremonial and song lines, as reported by Mr Franks 2015, and recorded in Tocomwall 2013. Also showing some key regional Aboriginal aspects, places and sites. Source: Scott Franks 2015, Tocomwall 2013, with GML 2015 (Map Source OSM Contributors).



7.4 Landscape and Environmental Context

7.4.1 Background

This section discusses landscape studies and how they contribute to a greater understanding of the soil geomorphology of the study area, particularly in respect to Aboriginal settlement patterns, site formation processes and visibility/preservation of the archaeology. Both geology and soil geomorphology play a pivotal role in the nature, visibility, distribution, and significance of site types that are likely to be encountered during the course of either archaeological surveys or excavation programs. Broadly defined as landscape studies, or in archaeological terms 'geoarchaeology' (the application of the earth sciences to archaeology), they are fundamental to understanding where and what type of archaeology is likely to be present within any given landscape type such as a floodplain, benched bedrock slope or dried up lakebed. The 'geoarchaeology' of Aboriginal settlement patterns is as important as finding the sites themselves. Put another way, understanding whether a landscape is stable, aggrading or eroding will have ramifications as to whether: archaeological sites are undisturbed (stable); buried under modern sediments (aggrading); or exposed on the surface (eroding). One of the factors that define the scientific significance of an Aboriginal archaeological site is a product of one, or a combination of these geomorphic processes. This has consequences for developing archaeological predictive models and plays a key role in understanding whether surface surveys, as one example, will be effective. This will be explained in more detail below.

7.4.2 Geology and Topography

The remaining undisturbed landscape of the study area consists of low undulating hills and low rises on Permian Wittingham Coal Measures. Slopes range from 3 - 10% (locally to 20%) with local relief from 20 - 90 m, and elevation from 30 - 280 m. Along Bowman's Creek consists of Quaternary alluvial sand, silt and clay derived from Permian sediments of Wittingham Coal Measures (OEH 2018).

Soils on the slopes of the study area include the Ravensworth Erosional soils. Along Betty's and York's creeks are the Donald's Gully transferral soils. Along Bowmans Creek is Foy Brook Alluvial soils (OEH 2018).

7.4.3 The Hunter Valley Region

Most of the evidence for Aboriginal occupation in the Hunter Valley comes from stone artefacts and the recording of these Aboriginal archaeological sites. Unfortunately, there is little ethnography concerning the production and use of stone artefacts. Typically stone resources are mentioned only with reference to the use of: quartz as a barb on spears; the use and curation through grinding of stone hatchets; and the use of 'chips' for skinning animal foods (Brayshaw 1986).

Formal examination of the Aboriginal archaeological heritage of the Hunter Valley region commenced at or about the 1930s with the research of Frederick McCarthy of the Australian Museum (Thorpe and McCarthy 1933; Moore 1970). An earlier excursion by Thorpe to the Hunter had confirmed the presence of a 'significant bora ground with carved trees, clearing and mounds still intact' at Bulga as reported by A.N. Eather; and provide some tangible evidence of the Aboriginal ceremonial use of the area (Etheridge, 1918; McCarthy, 1940).' Indeed the later papers prepared by



McCarthy (1944a; 1944b; 1944c; 1944d) provide descriptions and images of unusual Aboriginal objects collected by Mr Eather, at or near the site of this bora ground and its neighbouring camp sites.

Prior to the interest of the Australian Museum, only a few local individuals had taken an interest in the prehistory of the region (HLA-Envirosciences 2007). R.H Mathews, a surveyor, is one such person and he left accounts and drawings of some of the Aboriginal 'relics' he found (Moore 1970). He appears to have been the first to report publicly on the cave paintings near Bulga (Singleton Argus 1893; Mathews 1893). Drawings of the images seen by Mathews in the caves at Bulga accompanied the descriptions of them that he published in the Journal of the Royal Society of New South Wales in 1893 (Figure 5). In the 1940's McCarthy and Davidson began locating Aboriginal sites in Wonnarua County in the terraces and slopes along the Hunter River near Singleton (McCarthy and Davidson 1943).

In the mid-1960s the Australian Museum sponsored a more systematic survey of the locations identified by McCarthy and Davidson (1943) that found several types of sites including painted rock shelters, rock engravings, axe-grinding grooves, stone artefact scatters, manufacturing areas and habitation sites within the upper Hunter Valley (Moore 1969). As a result of these reconnaissance surveys Moore (1969; 1970) undertook a series of subsurface investigations of both open sites and rock shelters within the Milbrodale and Sandy Hollow areas of the upper Hunter with the aim of reconstructing the prehistory of the Hunter Valley's occupation by Aboriginal people. At Sandy Hollow, a rockshelter about 300m north of the Goulbourn River revealed a stone artefact assemblage of more than 4,280 artefacts (ERM 2004), as well as bone implements, shell and bone fragments and hearths (ERM 2004). Subsequent to the excavation program, a probable post-Contact Aboriginal burial was identified by some schoolboys who visited the site in the 1960s (Moore 1969; 1970).

Since this time, numerous surveys have been conducted as part of the consent process for a number of mining and large infrastructure projects within the Hunter Valley. The following is an indicative rather than an exhaustive list of some of the areas investigated and the projects undertaken: Antiene (ERM 2007; Perry 2010); Bayswater (Umwelt 1997); Black Hill (Brayshaw 1982); Drayton (Ozark 2013); Glennies Creek (Brayshaw 1986; Koettig 1986a; 1986b; Dowling 1991; Stuart 1999; Witter 2002); Hunter River (Haglund 1982); Liddell (Brayshaw 1982; 1983; Umwelt 2006); Liddell to Mount Arthur (Koettig and Hughes 1985; McDonald 1997; Kuskie 2000; Kuskie and Clarke 2004); Muswellbrook (Byrne 1987); Rixs Creek (Effenberger 1993); Bowman's Creek (Witter 2002); Loders Creek (Dyall 1981a; 1981b; Koettig 1994; Brayshaw 1988); Nine Mile Creek (Stern 1981); and Wollombi Brook (HLA-Envirosciences 1991; Wambo Coal Pty Ltd 2003). In concert these studies cover an extensive portion of the central Hunter Valley.

Site types other than artefact scatters that have been found in the region include scarred and carved trees, burials, stone and ochre quarries, grinding grooves and contact sites containing glass artefacts (ERM 2004). Brayshaw (1986) noted the presence of hearths sites along Glennies Creek, as did Koettig (1986; 1987). Radiocarbon dates obtained by Koettig (1986; 1987) from excavations



undertaken of hearth sites along Glennies Creek yielded Pleistocene ages and indicate that the Wonnarua had made use this landscape and the adjoining creek systems for over 20,000 years.



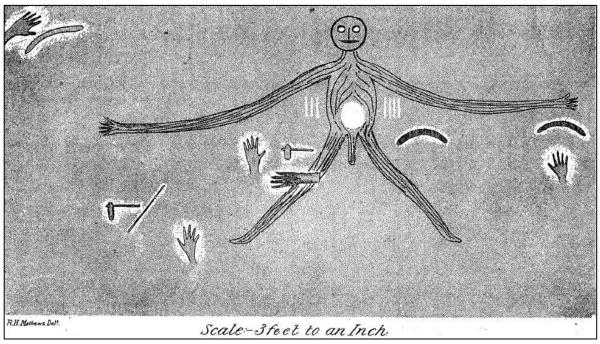


Figure 19: A copy of the drawing Mathews (1893: 356) produced of a figure he describes as 'The figure of Baiamai, or Devil Devil or whatever the image represents' as published in the Journal of the Royal Society of NSW.

7.5 Predictive Modelling for the Hunter Valley Based on Previous Archaeological Studies

Predictive modelling in archaeology is used as an interpretive framework to understand the distribution of archaeological sites in order to inform models relating to the nature, significance, patterns and distribution of human activities across the landscape. The expectation is that as the information base grows, the predictive modelling will evolve in relation to that expanding knowledge base. Unfortunately, the predictive modelling utilised in the Hunter Valley is very simplistic and has contributed very little to expanding some of the original patterns identified in the early days of exploration.

There is a paucity of ethnographic literature to draw upon in relation to Aboriginal lifestyles at the time of Contact in the Hunter Valley. Although early accounts exist in relation to cultural practices such as corroborries (e.g. Breton 1833) and land management practices such as systematic burning of the grasslands and undergrowth for hunting (Fawcett 1898), there are no records describing everyday activities such as foraging, hunting or the use of stone tools.

The current understanding of archaeological settlement patterns in the Hunter Valley is predominantly based on development driven archaeological studies. The predictive modelling is a result therefore of a selection of random study areas rather than ones selected systematically to build upon the knowledge of archaeological settlement patterns. As its stands the underlying variables for the current predictive models are:

The largest and most complex artefact scatters occur along watercourses



- Artefacts are generally located within 50 metres of tributaries as water is considered the most valuable resource
- Mudstone is the most dominant raw material in the region
- The landforms preferred tended to be lower slopes and waning slopes more than flood plains

However, the predictive models are biased in that testing programs have, since the late 1990s been selective in the landforms that they have targeted. The expectation that archaeology will be concentrated around modern watercourses has led to a disproportionate amount of 'testing' around current alignments of creeks and rivers, with the consequence that other landforms have been ignored. It also means that the archaeological activities that are being tested are those ones located in and around home-base camps rather than those associated with subsistence, trade, cultural activities (e.g. ceremonial) or mobility (e.g. moving between seasonal ranges). Early studies identified the types of sites that were present in particular landforms; subsequent studies have built on these locational factors to begin making predictive statements and expectations for Aboriginal settlement patterns.

The Hunter Valley has experienced considerable impacts primarily related to the mining industry and its related infrastructure. As studies have accumulated and progressed, the regional database of archaeological sites has provided the background knowledge to create predictive models for future research and a better understanding of the Aboriginal culture. However, archaeological investigations have favoured settings along the lower elevations of the Central Lowlands and very few projects have explored the higher elevations of the mountains, ridges and national parks.

The available research has been reviewed by several archaeological organisations including ERM (2004), GHD (2005), HLA Enviroscience's (2005) and Umwelt (2007), and provides the following regional summary of expectations:

- The majority of known Aboriginal objects are stone artefacts and they are recorded as archaeological sites in the Central Lowlands of the Hunter Valley in the form of artefact scatters/ open camp sites and isolated finds. Less common site types include scarred trees, art sites, quarries and grinding grooves.
- Archaeological sites, even where surface evidence is not present, occur on most landforms
 as confirmed by HLA-Enviroscience's (2005) excavation programme, in which Aboriginal sites
 were encountered on alluvial terraces, flats, slopes, bench areas, spurs and ridgelines. The
 majority of sites have been recorded along the Hunter River and its major tributaries.
 Previous archaeological investigations have established that the majority of archaeological
 sites occur within 50 metres of a creek line or creek confluence, although more recent
 investigations extend this to within 200 metres of permanent water.
- Sites along major creek lines typically have the highest potential for subsurface
 archaeological deposits, a result of aggrading trends for alluvial settings, as well as the
 potential for buried sites. However, these deposits can be subjected to erosional and
 depositional processes that may have reworked the archaeological deposits and therefore
 an understanding of geomorphology is critical to the understanding of subsurface
 archaeological potential.



- Site frequency and density are dependent on their position in the landscape, the ideal scenario including in situ deposits: these tend to be rare due to the extensive landscape modifications post-dating European settlement.
- The dominant raw material recorded is mudstone. The Hunter River is a key source of mudstone, along with silcrete which is thought to dominate later periods. Quartz, petrified wood, chalcedony, porcellanite and other igneous rocks are less frequent. The most common artefact types are flakes, broken flakes and cores, with smaller frequencies of other types such as backed artefacts, ground edge axes, hammerstones and grindstones.
- Despite the general lack of stratified sites with datable material in the Hunter Valley, a
 number of Pleistocene sites (archaeological deposits over 10,000 years old) have been
 identified by previous investigations. It is thought that Aboriginal people have occupied the
 Hunter Valley for around 40,000 years but further research needs to be conducted to
 validate this.



8 Significance Assessment

8.1 Introduction

'...people's sense of place, and their engagement with the world around them, are invariably dependent on their own social, cultural and historical situations (Ashmore and Knapp 1999: 20-21).'

The current study relates to the Glendell Continued Operations project and surrounding area. The values defined in this report are presented in a way that is sympathetic with cultural values since traditional values do not separate the 'natural' world from the cultural and archaeological values. Under traditional 'lore' the cultural landscape embodies what western paradigms separate into natural, anthropological and archaeological values.

Section 8 should be read in conjunction with Appendix 1, Continued Operations Coal Project, Aboriginal Cultural Heritage Assessment Anthropology Report on PCWP Cultural Values By: Assoc. Prof. Neale Draper

8.2 Aesthetic values

There is not one 'aesthetic' that can be assigned to the project area. The scale and dimension of the area, the geomorphological diversity of its landforms; the diversity of flora and fauna within it; and the scale and complexity of past and present land use practices and their allied infrastructure, inclusive of their singular and cumulative effects on the form and fabric of the landscape, variously intersect to achieve a mixed and often competing aesthetic. Moreover, as the aesthetic quality of objects or places result from the engagement of the individual or group with them via one or more of the five senses (i.e. touch, taste, smell, sight, and hearing) they are highly subjective and frequently changeable. Hence the aesthetic values described below are only those recognised for the area by the PCWP during the fieldwork and consultation component of the current study. Specifically, they are those values recognised for the project via the participant observation of the Tocomwall team in the archaeological and cultural values; and those determined via formal and informal enquiry of other PCWP members regarding their knowledge of the project area. Note too that the aesthetic values described here for the PCWP are not exhaustive but rather are illustrative of the range of such values that can be ascribed to the project. Where applicable the aesthetic values described are examined with reference to specific elements of the project where one or more other Aboriginal cultural values have also been identified.

8.2.1 Positive Aesthetic Values

Those aesthetic aspects of the project identified to have positive qualities by the PCWP are described below. Wherever possible the qualities described are illustrated with examples obtained from the project area. The scale at which the value can be/is ascribed to the project and/or its component parts and/or the cultural items and places within it are also outlined.



One of the positive aesthetic values of the study area is the diverse landforms and associated diversity in plants and animals. The cultural landscape of the study area embodies a 'tessera' in the larger 'mosaic' of the PCWP traditional lands. The study area reflects aesthetic values within a relatively small area that are representative of those found across larger areas of the PCWP traditional lands.

8.2.2 Negative Aesthetic Values

The onset of large scale mining operations in the Hunter Valley including those in the region of the Glendell Continued Operations Open Cut has clearly impacted the capacity for the PCWP to both describe and observe the song lines and pathways towards the PCWP cultural sites. This clearly impacts the ability for the PCWP to read, teach and understand the cultural landscape and highlights the issues that are faced in relation to intergenerational equity.

The qualification is made here that in general, and as is frequently described by the PCWP, mining is considered to be wholly intrusive and negative in its aesthetic consequences. For example in the recent statement to the Native Title Tribunal Maria Stocks recounted the following with respect to mining and its impacts on Wonnarua Country:

...my family has always identified as Wonnarua. We have always valued, and respected our land, our heritage and our identity. For me and my family the land is not ours but a gift given to us to use because everything comes from the land. We have been brought up and taught to believe that we were fashioned out of the earth and to the earth we will return. When Anastasia and Jeremiah (my two youngest children) were about eight I took them for a drive to show them about Glennies Creek where I grew up, rode horses and motorbikes and went fishing. When I got there I just gasped and went "Aargh" because there was nothing there. It was all gone. There was big hole from mining. I sat there and tears rolled down my cheeks. I couldn't show my children anything. It was like a part of me had been deleted. (Stocks, 2012, para 7).

8.2.3 Individual Artefacts

At the scale of individual artefacts the PCWP express the view that those that have an identifiable form have a positive aesthetic. Many of the Aboriginal objects encountered in the project area clearly had aesthetic values that were visual in character and related to the colour, lustre and homogeneity (or otherwise) of the raw material from which they were made; as well as to the shape and size of the manufactured artefact; and including evidence of the repeated attention to detail given to the object by its maker (e.g. level of retouch, number of flakes removed etc.). Many of the aesthetic values of individual artefacts are demonstrably tactile such that tools and cores were picked up by members of the PCWP, held in the hand to feel their weight and to grasp them as/and consider they might be held if they were to be used as a tool.

8.2.4 Artefact Scatters

All artefact scatters have a positive aesthetic for the PCWP particularly as visual markers of the prior use of the landscape by their ancestors. In general the size, distribution and content of each artefact *Integrating Landscape Science and Aboriginal Cultural Knowledge For Our Sustainable Future* | 86



scatter variously contribute to the overall aesthetic value it retains. Furthermore, as discussed in Section 7.3 above, there is a clear correlation between the significant cultural sites, song lines and pathways of the PCWP and the distribution of archaeological sites – the majority of which are artefact scatters. The distribution of archaeological sites reinforces the cultural knowledge and values of the PCWP.

8.3 Archaeological Values

Central to the deliberations of Aboriginal people today with regard to the cultural significance of an item or place is consideration of the duty of care they owe to the material culture, as a manifestation of their ancestors, spiritual entities resident in particular areas or mythical hero figures, and to the area as a whole, recognising they are being watched by their ancestors, spiritual entities and hero figures. Indeed, as Aboriginal field researchers often note in the course of fieldwork, they are aware they often are being observed by the 'old people' when they are in the field (CQCHM, 2011).

Archaeological values are typically considered to be scientific values and therefore achieved only by the archaeologist using scientific method to observe, record and explain the material cultural remains of a society as manifest in the 'archaeological record'. As the scientific method is derived from western modes of thought and practice there is a frequently assumed (and often manifest) tension between the traditional cultural values of the Aboriginal community whose material culture it is and the archaeologists(s) who are to investigate it. In response to this tension in the last fifteen years or so there has been an increasing focus on Aboriginal community participation and collaboration in archaeological research (e.g. Clarke 2002; Smith and Beck 2003; Greer 2010; Ross et al 2010). Frequently these collaborations have emphasised the importance of changing the focus of the archaeological research from articulation of the 'universal' human truths that might be yielded up by the 'archaeological endeavour' to consider the questions that the local Aboriginal community want to see answered from the material cultural remains of their ancestors (Greer 2010).

At a most fundamental level the project area is of cultural importance to the PCWP because it contains items of material culture manufactured, used and left within the landscape by 'the ancestors' during the course of their everyday lives. These material culture or archaeological remains are therefore of inherent cultural value to the PCWP. The inherent value of these items to the PCWP exists irrespective of the application of any general or specific scientific (archaeological) method to further explicate meaning from them. Moreover it is not the mere application of scientific method that gives further meaning or value to such cultural remains. Rather, for the PCWP it is the focused attention on the cultural relevance and suitability of the scientific method to be applied, and its ability to answer specific questions about the ancestral past that best values such Aboriginal material cultural remains. One critical aspect of the archaeological record infrequently addressed by archaeologists in any project context but of immediate importance to the PCWP is the influence and representation of gender in the material cultural remains of their ancestors. The PCWP recognise the area to be an engendered landscape. Hence both ritual practice and everyday resource use and exploitation are expected (and also presumed) to exhibit patterns in the material culture record that reflect men and/or women's business. The explication or otherwise of this patterning in the



archaeological record of the project area is a yet unrealised research potential; and hence, archaeological value of the area.

For this project the PCWP have participated in all aspects of the archaeological fieldwork (survey) and been provided with summary details of the archaeological assessment and its results. It is possible to move beyond some of the inherent values of the archaeological resource to the PCWP, and consider some of the values held by the PCWP in the 'doing' of archaeological work.

The practical involvement in archaeological fieldwork is of fundamental physical, social and psychological value to members of the PCWP. Some of this 'doing' value arises from the fact that with significant change in land tenure, especially in the past 20 to 30 years as a result of active mining within the coalfields that lie between Singleton and Muswellbrook (i.e. flanking either side of the New England Highway), access to land of cultural value to the PCWP has been increasingly restricted. Maria Stocks has expressed her dismay at finding that an open cut mine had 'deleted' the landscape of her childhood.

Many of the sites within the project area (and its surrounds) of value are without easy access. In this context it is only through the active doing of the archaeology that these cultural items and places have been able to be visited by contemporary members of the PCWP. Previously Danny Franks has eloquently expressed two aspects of value to the PCWP in the doing of archaeology that are worthy of reiteration (Tocomwall 2012). Firstly he noted that his very intersection with artefacts and archaeological sites makes it 'living archaeology" not an abstract. Secondly Danny commented on the value of the natural elements retained within a mine site that he is able to experience when doing archaeology; as these provide connection to memories and people of value to him:

'Regardless of the negatives, I have to endure and the constant questioning I have within myself and the disrespect and devastation environmentally I have to witness every single time I am out in the field. I do sometimes have moments where I enjoy being out in the field, but these moments are only flash backs of my childhood and most of the time I'm with my friends fishing or hunting. These are bitter sweet memories because the only things that trigger those thoughts are the specific wildlife I see; ones I am familiar with and have used as bait, have caught, or have even learnt how to track.'

It is also in the context of the prior development of conservation strategies and/or mechanisms for Aboriginal community participation in the rehabilitation and protection of archaeological and ethnoecological resource values within the wider project area that the 'doing of archaeology' has contributed to some members of the PCWP.

8.4 The Cultural Values of the PCWP in the Study Area: A Synthesis

The cultural landscape is greater than the sum of its parts, and the inter-relationships between the parts can be significant. For this reason, the details matter, significant loss of integrity and meaning can occur through the attrition of many small elements (Context et al 2002 cited in Brown 2010).

From the outset the PCWP have been concerned to ensure that no single Aboriginal item or place within the project be subject to an evaluation based on the systematic ranking of its Aboriginal Integrating Landscape Science and Aboriginal Cultural Knowledge For Our Sustainable Future | 88



cultural values relative to the other items or places within the project area. This type of ranking is counter to the expression and belief of the PCWP that it is not one item, artefact, grinding groove, plant or animal species that is of value to them in the project but rather it is the sum total of all such component parts of the landscape, and its surrounds, that provide cultural meaning to them. This has been clearly articulated by the late Aunty Barbara Foot. The following is an amended extract of notes made by Ms Sarah Paddington of OEH when in conversation with Aunty Barbara Foot and her son David in February 2011:

'As a girl I would travel along Bowmans [Creek]. We'd go from the mission, to school to town ... My Dad had a lot of cultural knowledge. He passed it on to me. He'd tell me places I could and couldn't go. He showed me important places. Places our ancestors still come through. I know how to read the signs of the land, the seasons. The signs are our lore, they show the way – like people used street signs to have order. Some of the signs, the trees, have been cleared but we know where they were from our ancestors, and we know what they tell us. People not from here don't have that knowledge....

The area is all important to us. We can't break it up for each mine – that is how they are getting away with destroying so much of our culture. They don't understand how it all links together, so it doesn't seem as important when you look at this little bit or that little bit. That's how they are breaking up our community too – the mine mention money and that starts fights. The mines want the fights as they get to keep what they want if the community is distracted (Aunty Barb Foot, February 2011 cited in attachment to email forwarded by Ms Sarah Paddington of OEH to Mr Scott Franks and Mr Robert Lester, 17 April 2011).'

In line with Aunty Barb's assessment it remains the broad view of the PCWP that the steady attrition of elements of the Aboriginal cultural landscape within their Wonnarua Country - especially those items of Aboriginal material culture subject to archaeological assessment - has occurred as a direct result of the application of a process of systematic ranking of items or places.

The purpose of this section then is to provide a synthesis of the cultural values that the PCWP ascribes to the project area; and to provide a summary of these values in the context of standard Burra Charter significance criteria. The statement of cultural significance that results from this summary and synthesis is by necessity at the 'whole of landscape' rather than the individual item or place. Tocomwall acknowledges that this 'whole of landscape' approach is not the evaluation mode adopted in the broader context of cultural heritage studies in NSW, both of which attribute some form of ranking of significance to component parts of the Aboriginal cultural landscape within the project area. Whilst this may make some elements of the integration of this report within the broader cultural values assessment challenging, Tocomwall believes that to include such rankings would be counter to the PCWPs world view; and consequently, would not be an effective synthesis of their cultural knowledge in and of the project area and its surrounds.

8.4.1 An Overview Statement of Cultural Value

The Heads of Family of the PCWP collectively support the following overview statement in relation to the cultural significance of the project area to them:



'We need to look at the landscape from a position of duty, responsibility, and focus on the achievement of inter-generational equity. We do not own the land, in terms of European concepts of ownership. Our ownership is in the context of the use of the land and its various animals and plants to sustain our bodies and we gave/give homage to them by creating ceremonial dances for them. The importance of this process should not be underestimated, for it is how our people worked with the environment, the landscape, our neighbours and how we all from different Aboriginal language groups, worked as one with Mother Nature. We were practising land management thousands of years before Europeans invaded our country.'

The study area is in an area with close proximity to places that have been used by our people since the time of creation. The location of ceremonial sites in the general area as well as pathways between them, known today as song lines, indicates that the cultural landscape of the study area and its environs holds significant values to the PCWP. The path was placed there by our creator Baiami, which in the beginning would have been sheltered from prying eyes and onlookers who were not supposed to know or see what was going on, unless invited. This pathway contains sites for initiations and religious practises (Dream Time).

'These same lands that may have interaction with this mine are places that represent what our people are about. The landscape (and its environs: my addition) has present ceremonial places (bora grounds) scarred trees, fishing holes, teaching and birthplaces and places to camp and prosper. In today's terms this is our home and our community. Even today you can talk to any member of our claim group and all will have some type of association with this area.

Having Glencore work with our people to understand its importance is a great step forward but at this stage it is a very small one as almost all reports that have been undertaken in the Hunter Valley and elsewhere, in the past regarding Aboriginal Cultural Heritage Values are centred solely on the identification of stone objects within a given location. The normal stakeholder incentive for involvement in this process is for paid fieldwork participation and often their expertise is in stone materials and identification only.

Consideration in the past, by those in the archaeological industry is that Aboriginal people had more to say about the landscape than just stones and bones. This has never been fully canvassed which has been a fundamental flaw in almost all previous reports. There has not been an inclusion of the values that Aboriginal people place on the fauna and flora within a given study area. This is a major issue, not only for Aboriginal people but for the wider community. The history of this country is for all to protect. As the human race we learn from our past and our history to better understand the future.

The Hunter Valley has been heavily impacted on for decades from both coal mining and the agricultural industries. The Plains Clans of the Wonnarua People's (PCWP's) country only has approximately 7.5% of our lands left untouched. Our own traditional lores and customs need to be able to protect this remaining pristine country for our people to live in harmony and for



all future generations to learn from. We need to continue teaching our people and all future generations about who we are and where we are from.

Most surveys focus tend on the artefacts that are found on the day and invariably no real effort is taken to understand why they are there, what is happening or where the artefacts are located. Most are recorded as isolated finds when in fact it is a series of sites that make up a complex camping ground being a recognised Aboriginal site. We were taught from these lands as we grew up. It is a place where our families lived, hunted and learnt to interpret the lands. To a non-Aboriginal person in this area is your house, school, hospital, church, shopping centre, doctors, police station, your whole community or society. That is why most reports do not reflect this; it is very complex for a non-Aboriginal to understand and interpret the lands and put into words.

The land around the project is extremely important to our people. Today, the lands, as in most other areas, are one of many pages in a book and allow us look back in time. It gives our people a better understanding of the stories we were told, when we were young, what they were about and about why. The land still has the footprints of our people from the beginning of time and allows our people to have direct contact with our lands and our elders.

As we looked around the landscape, and participated in surveys or test excavations we found many artefacts. Each time we encountered these objects we felt the presence of our people and the excitement that we were now standing in one of our people's houses. It is a firsthand experience and shows where our people lived, hunted, fought to defend their lands, thrived and were happy and cried.

This part of the Hunter Valley makes us feel like we are coming home. The reality is though that this is a place that will not be here in the future. Just as what has happened to the other homes of our people it will be lost. To try and put in words exactly what this place is worth is beyond comprehension.

We believe that if Glencore is willing and able to commit to working with our people on these lands that the mine is to operate on, the land will continue to reveal more stories and information. But the work needs to continue as the timeframes sought by approval for the project in no way allows our lands to be fully explained and understood (Heads of Family of the PCWP, September 2015).'

8.5 Summary Statements of Value Relative to Burra Charter Criteria

8.5.1 Summary Statement of Historical Value

The information in this report firmly indicates, the Heads of Family of the PCWP have a strong Aboriginal identity with specific knowledge and connection to the physical and spiritual landscape of Wonnarua country; and respect for the traditional lores and customs of their Plains Clans society. Equally they are modern Australians within an ever-globalised world with use and access of mobile phone, internet, and digital TV technologies; and fundamental use and respect of the law and practices of Australia today. Yet, it is an historical narrative that consistently emphasises a continuity



of association of members of the PCWP with land and landscape in and around the project area. It is not simply a story of dispossession and alienation from tribal lands. Nor is it one of regeneration of Aboriginal identity within the socio-centre of the Aboriginal reserve or mission, as is elsewhere typified for the Hunter Valley (Blyton and Ramsland 2012). It is a narrative of persistence, adaptation and cohabitation with various settler families. It is a story of negotiated spaces and shared landscape in the 'Country' to which the PCWP recognise that they now and forever have belonged.

8.5.2 Summary Statement of Social Value

The project area and surrounds are of immense and enduring social significance to the PCWP. This significance primarily derives from the complex mix of that which is understood to be 'sacred' and derived from the realm of the creator and that, which is 'secular' and arising out of their everyday experiences of both their ancestors and themselves within this landscape. Today, a unifying element in this sacred and secular world is the Hunter River. This watercourse's value to the PCWP as a dreaming track, as a loci of family histories, as an ecological resource zone, and as a site of recreation and story-telling is immeasurable. Furthermore, the PCWP maintains that the creek systems across the Hunter Valley were used as (a) manufacturing sites for materials that would be used in the initiation ceremonies to be conducted at the nearby Bora ground, (b) as sites for teaching hunting and stone knapping skills to initiates, (c) places where large groups gathered and prepared meals in support of the bora ceremonies; and (d) places where people dressed and painted their bodies using available ochre sources in preparation for the ceremonies.

The Aboriginal cultural landscape is also of historic and contemporary social importance as a place where either via participation in various historic and contemporary rural activities and/or recent mine related activities (including archaeological surveys as part of cultural heritage studies) the PCWP have been able to achieve freehold lease and/or ownership and/or access to part of their cultural landscape that is for them unprecedented within in the Hunter Valley.

8.5.3 Summary Statement of Aesthetic Value

The aesthetic values of the Project to the PCWP are mixed. This is predominately the result of the scale and form at which the aesthetic values of the area are considered. At the scale of individual Aboriginal objects, artefact scatters, grinding groove sites, water-bodies and native fauna and flora species the Project can be identified as a landscape that holds positive aesthetic values for the PCWP. Areas of the surrounding country, including the nearby crown lands have relatively low levels of impact. The area has high biodiversity values with diverse ecological communities. The project area includes threatened ecological communities including threatened plant and animal species (Umwelt 2019). These communities all contribute to the aesthetic value and importance of the place.

Overwhelmingly however, the immense scale at which development activity has and continues to alter the biophysical landscape of the surrounding areas, and negatively affect the visual and aural perception of the items and places of cultural value within it, means that the immediate project area is considered to have little aesthetic values for the PCWP. The PCWP commonly state that mining destroys the landscape, there is nothing left and that the landscape that remains has no integrity. Or



else it is stated that "When open cut mining is planned there are no aesthetic values for consideration the landscape is, or will be gone".

8.5.4 Summary Statement of Scientific Value

For the PCWP the archaeological and ethno-ecological values of the Project are both substantial and yet to be fully realised. For the PCWP the scientific value of the archaeological and ethno-ecological resources of the Project area have been diminished by a program of archaeological assessment that has been tied to the development process; and for which no due consideration of the Wonnarua perspective has been afforded. Numerous artefact scatters, and a significant number of plants and animals are known for the Project but to date none have been considered in their context as contributory elements of a unique, highly ritualised and bountiful cultural landscape to which the PCWP has direct ancestral, historic and contemporary links.

8.5.5 Statement of Cultural Heritage Significance

The landscape of the project area has a fundamental significance because of its historical, social, and scientific value to the PCWP. For the PCWP the project area and surrounds is a complex, multilayered cultural landscape where in combination (a) the biophysical attributes of the landscape including the drainage systems, fauna and flora, geology and soils; (b) the material traces of traditional Wonnarua people; (c) the historical associations and experiential reference points of its members, and in particular those of the Franks family (and all associated descendant families); and (d) the various spiritual, lived experiences and economic attachments of contemporary PCWP members contribute to a high level of cultural significance for which words are considered inadequate to describe.

This immensely important cultural landscape is however perceived by the PCWP to be highly fragmented and subject to catastrophic change and despoilment by the physical action and aesthetic impact of past, current and future mining activities. Mining has been a progressive and substantial intrusion on this cultural landscape for which the PCWP feel a profound and enduring sense of loss. This loss is compounded by their feelings of guilt and distress at not being able to protect the land for which they have custodial responsibility.

8.6 **Possible Mitigation Measures: The PCWP Viewpoint**

'You can't just borrow something, use it to the point of no sustainability then hand it back for future generations. It's not just land. By then it's lost its values both culturally and spiritually (Danny Franks, 2012).'

The PCWP has previously outlined to Glencore that Aboriginal cultural heritage assessments are 'front- end' requirements to mine development, and although the resultant Aboriginal Cultural Heritage Management Plans (ACHMPs) are frequently constituted as "Life of Mine" documents, the opportunities for engagement in mine-related activities by Aboriginal groups such as the PWCP is usually limited (Tocomwall 2012).



The PCWP notes that it has previously expressed a wish to partner with Glencore in longer-term mine-related activities that bring economic and cultural benefit to the PWCP; and which enhance (rather than destroy) the natural and cultural capital of Wonnarua Country more generally (Tocomwall 2012; 2013; 2016).

It is important to recognise that:

- (i) There is a continuing existence of Aboriginal archaeological sites in the surface and subsurface of the project area and these are coupled with physical attributions across this landscape of European pastoralism and settlement in which the members of the PCWP have had a historical association and/or continue to participate in (e.g. as fencing contractors, boundary riders, dingo bounty hunters, rabbit trappers etc.).
- (ii) For the PCWP the physical landscape continues to reflect their cultural narrative and has within it loci of social memory and cultural and spiritual meaning to which they can and do continue to refer.

The PCWP maintains that the measures outlined if provided for in the short-, mid- and long-term will enable them to be instrumental in managing the consequences of their decisions for all elements of their heritage within the project area.

8.7 Discussion and Recommendations

An ongoing concern of the PCWP has been that to date decisions about Aboriginal cultural heritage on Wonnarua lands have been made by people who do not have - and will never have - the cultural knowledge of, values in, nor connections to Wonnarua Country as do the PCWP. This is absolutely so for that part of Wonnarua Country bounded by the current project area that is in that part of the cultural landscape of the PCWP from which they derive their unique identity and cultural connections: it is the epicentre of their beginning and belonging.



9 Bibliography

Adlem, K.J. 2008. *Relating to Country: Listening, Reflecting and Relating to Contemporary Aboriginal stories from Wonarua Country in the Hunter Valley*. Unpublished, PhD Thesis (Fine Arts), University of Newcastle, NSW.

Albrecht, G. 2000. *Rediscovering the Coquun: Towards and Environmental History of the Hunter River*. River Forum 2000, Wyndum Estate, Hunter Valley.

Appetiti, E. 2005. Remedies from the Bush: Traditional Medicine among the Australian Aborigines.

Atwell, F. 1988. Upon a State Unknown. Terrigal, NSW.

Australian Heritage Commission, 2000a. *Protecting Heritage Places: Information and Resource Kit*. Australian Heritage Commission, Canberra, ACT.

Australian Heritage Commission, 2000b. *Protecting Local Heritage Places: A Guide for Communities*. Australian Heritage Commission, Canberra, ACT.

Australia ICOMOS 1999 *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999:* (with Associated Guidelines and Code on the Ethics of Co-existence). Australia ICOMOS Canberra.

Backhouse, J. 1843. A Visit to the Australian Colonies. London.

Beck, W. 2006. Chapter 8. Aboriginal Archaeology. In *Atkinson, A, J.S Ryan, I. Davidson, and A. Piper, (eds.) High Lean Country: Land People and Memory in New England, pp.88-97*. Allen and Unwin, Crows Nest.

Belshaw, J. 1978. Population distribution and the pattern of seasonal movement in northern New South Wales. In *McBryde, I. (ed.), Records of Times Past: Ethnohistorical Essays on the Culture and Ecology of the New England Tribes*. Australian Institute of Aboriginal Studies, Canberra, pp.65-81.

Binford, L. R. 1979. Organisation and formation processes: looking at curated technologies. In *Journal of Anthropological Research 35: 255-73*.

Binford, L. R. 1980. Willow smoke and dogs' tails: hunter-gatherer settlement systems and archaeological site formation. In *American Antiquity 45: 4-20.*

Blyton G. M., Heitmeyer D. G. and Maynard J. M. 2004. *Wannin Thanbarran: a History of Aboriginal and European Contact in Muswellbrook and the Upper Hunter Valley*. Muswellbrook Shire Aboriginal Reconciliation Committee, Newcastle.

Boodle, R.G. 1874. Recollections of ministerial work in the Diocese of Newcastle, New South Wales. In *Halcombe, J.J. Rev. 1874. (ed.) The emigrant and the heathen, or sketches of Missionary Life.*Society for Promoting Christian Knowledge, London.

Boyd, W.E., Cotter, M.M., Gardiner, J. and Taylor, G. 2005. Rigidity and a changing order...disorder, degeneracy and daemonic repetition: Fluidity of cultural values and cultural heritage management,



In Mathers, C., T. Darvill, and B.J. Little. (eds.), Heritage of Value, Archaeology of Renown: Reshaping Archaeological Assessment and Significance, pp. 89-113. University of Florida Press, Gainsville, Florida.

Brayshaw, H. 1966. Some Aspects of the Material culture of the Aborigines of the Hunter Valley at the Time of First White settlement in the Area. Unpublished, B.A. Honours Thesis, University of New England, Armidale.

Brayshaw, H 1982a *Archaeological Survey of Extended Open Cut Coal Mine near Liddell*. Report prepared for Croft and Associates Pty Ltd.

Brayshaw, H 1982b *Archaeological Survey of the Proposed Black Hill Coal Mine, near Muswellbrook in the upper Hunter Valley*. Report submitted to Sinclair Knight and Partners.

Brayshaw, H 1983 Archaeological Investigation at Hunter Valley Extended near Liddell, New South Wales. Report prepared for Croft and Associates Pty Ltd.

Brayshaw, H. 1986. *Aborigines of the Hunter Valley: A Study of Colonial Records: Bicentennial Publication No 4:* Scone, Scone and Upper Hunter Historical Society.

Brayshaw, H. 1986. *Archaeological Survey at the CSR Lemington Mine, Hunter Valley, NSW*. Report held by NPSW.

Brayshaw, H. 2003. *Looking for the Bora Ground in the Wallaby Scrub near Bulga NSW*. Unpublished report by Helen Brayshaw heritage Consultants, Drummoyne.

Breasted, J.H. 1916. Ancient Times: A History of the Early World. Boston Ginn.

Breton, R.N. (1834). *Excursions in New South Wales, Western Australia and Van Dieman's Land, During the Years 1830, 1831, 1832 and 1833*. 2nd Revised Edition, Richard Bentley, London.

Brooks A and Brierley G. 1997. Geomorphic responses of lower Bega River to catchment disturbance, 1851-1926. In *Geomorphology 18: 291-304*.

Brooks A and Brierley G. 2000. The role of European disturbance in the metamorphosis of lower Bega River. In *River Management: The Australasian Experience, Brizga SO, Finlayson BL (eds). John Wiley and Sons: London; 221-246.*

Brown, J. C. 1825. *Anonymous Diary by a Servant of the Scott family, 8 August 1821 –March 1824 (Written after 1825) with Notes.* [Transcribed and researched by Jan Thomas, State Library of NSW]. State Library of NSW MLMSS 7808(Safe 1/403). Located online at acms.sl.nsw.gov.au/_transcript/2011/D03307/a2852.htm#2a2852009.

Brown, S. 2008. *Cultural Landscapes*. Department of Environment, Climate Change and Water, Goulburn.

Butlin, Noel G. 1983. *Our original aggression: Aboriginal populations of south eastern Australia 1788* – *1850*. Allen and Unwin, Sydney.



Bryce, S., 1992. *Women's Gathering and Hunting in the Pitjantjatjara Homelands*. IAD Press, Alice Springs.

Byrne, D 1987 Survey for Aboriginal Archaeological Sites along the Route of the Proposed 330KV Liddell to Muswellbrook Transmission Line in the upper Hunter Valley, New South Wales. Report to the Electricity Commission of New South Wales.

Bryne, D., Brayshaw, H. and Ireland, T. 2003. *Social Significance: a Discussion Paper*. NSW National Parks and Wildlife Service. Hurstville, NSW.

Byrne, D. and Nugent, M. 2004. *Mapping Attachment: A Spatial Approach to Aboriginal Post-Contact Heritage*. Department of Environment and Conservation, Bridge Street Hurstville, NSW.

Campbell, J.F. 1928: John Howe's Exploratory Journey from Windsor to the Hunter River in 1819. In *Royal Australian Historical Society, Journal 4:232-241*.

Campbell, V. 1978. Ethnohistorical evidence on the diet and economy of the Aborigines of the Macleay River Valley. In *McBryde, I. 1978, Records of Times Past: Ethnohistorical essays on the Culture and Ecology of the New England Tribes*. Australian Institute of Aboriginal Studies, Canberra, pp. 83-100.

Close, A. E. 2000. Reconstructing Movement in Prehistory. In *Journal of Archaeological Method and Theory, Vol. 7, No. 1.*

Cotter, M.M. 2009. Landscapes of Deception: A Multi-modal Exploration of the Indigenous Cultural Heritage Values of Deception Bay, Southeast Queensland. (Vols. 1 and 2). Unpublished PhD Thesis, School of Environmental Science and Management, Southern Cross University, Lismore NSW.

Cotter, M.M. and Boyd, W.E. 2001. The value of cultural heritage in 'marginal' landscapes: a southeast Queensland case study. In Cotter, M.M., W.E. Boyd and J.E. Gardiner (eds), Heritage Landscapes: Understanding Place and Communities. Lismore: Southern Cross University Press.

Cotter, M. Boyd, B. and Gardiner, J. 2001. Heritage Landscapes: Understanding Place and Communities. Southern Cross University Press, Lismore, NSW.

Cotter, M., Davidson, I., Duncan, B., Porter, S. and Wilson, J. 2005. The Gamilaraay Resource Use Project: documenting Indigenous natural resource use in northern New South Wales. In Recording Indigenous Knowledge on Electronic Databases Workshop, Desert Knowledge Cooperative Research Centre, Alice Springs, February

Cotter, M., Davidson, I., Ross, H. Brown, D. Duncan, B and Waters, C. 2006. Win-win Aboriginal Community participation in cotton. In product, Production profit: progressing our Natural Advantage, Proceedings of the 13th Australian Cotton conference, Gold Coast, August 2006. Australian Cotton Growers Research Association, pp 173-179.

Cotter, M. and Gamilaraay Resource Use Project Team, 2004. Documenting aboriginal ecological knowledge in northern New South Wales: time to expand the cultural heritage management paradigm? In Cotter, M., W. Beck, C. Clarke, I. Davidson, K. Grant, R. James, C. Mitchell, M. Ridges, J.



Ross, A. Piper, D. Vale, P. Watson and R. Webb (eds) Networks and Narratives: Program and Abstracts, Australian Archaeological Association Annual Conference 12-15 December 2004. Armidale: School of Human and Environmental Studies, University of New England, pp. 76.

Cotter, M.M., Ulm, S., Lilley, I., Reid, J. and Cotter, S.J. 2001. The Application of LA-ICP-MS in Stone Artefact Provenance Determination: A Raw Material Resources Study, Southern Curtis Coast, Central Queensland, Australia. Paper presented at Archaeometry 2001, (February 2001) Auckland, New Zealand.

Cunningham, P. 1827. Two Years in New South Wales. 2nd Edition.2 Vols. Henry Colburn, London.

Dean Jones, P. 1995. Salvage of Archaeological Sites in the Northwest Corner of Lemington Colliery Lease, Hunter Valley, NSW. Unpublished Lemington Mine Report.

Dean Jones, P. and Mitchell, P.B. 1993. Hunter Valley Aboriginal Sites Assessment Project: Environmental Modelling for Archaeological Site Potential in the Central Lowlands of the Hunter Valley. Report to National Parks and Wildlife Services (NPWS)

DECCW, 2007. Data Audit and Summary of Aboriginal Cultural Heritage. Draft Report to the Lachlan CMA Regional Aboriginal Reference Group. Department of Environment Climate Change and Water, North West Branch, Dubbo NSW.

DECCW 2010a. Aboriginal cultural heritage consultation requirements for proponents 2010. Part 6 National parks and Wildlife Act, 1974. April, 2010. Department of Environment, Climate Change and Water, Goulburn St, Sydney.

DECCW 2010b. *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW*. Department of Environment, Climate Change and Water, Goulburn St, Sydney.

DECCW 2010c. *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*. Department of Environment, Climate Change and Water, Goulburn St, Sydney.

Dodson, JR. and Mooney, SD. 2002. An Assessment of Historic Human Impact on South-Eastern Australia Environmental Systems, Using Late Holocene Rates of Environmental Change. In *Australian Journal of Botany 2002, v50: 455-464*.

Dodson, J.R., Roberts, F.K. and de Salis, T. 1994b. Palaeoenvironments and human impact at Burraga Swamp in Montane rainforest, Barrington tops National Park, New South Wales, Australia. In *Australian Geographer 25:161-169*.

Dyall, L.K. 1981a. Saxonvale Coalmining Authorisation Report on Aboriginal Relics. Unpublished Report to BHP Co Ltd.

Dyall, L.K. 1981b. Aboriginal axe sharpening Grooves Located outside BHP's Saxonvale Coal Mine Property. Unpublished report to BHP Central Engineering, North Sydney. Effenberger, S. 1994. Archaeological Assessment — Rixs Creek. Unpublished Envirosciences Pty Limited Report for Bloomfield Collieries Pty Limited.



Environmental Resources Management Australia (ERM). 2004. *Upper Hunter Valley Aboriginal Heritage Baseline Study*. Report for the Upper Hunter Aboriginal Heritage Trust.

Envirosciences, 1991. Environmental impacts statement: expansion of Wambo Coal Mine at Warkworth. Unpublished report prepared for Wambo Mining Corporation Pty Ltd.

Erskine, W.D. 1994. Late Quaternary Alluvial History of Nowlands Creek, Hunter Valley, NSW. *In Australian Geographer, Volume 25, Issue 1: 50-60.*

Erskine, W.D. 2011. Geomorphic Controls on Historical Channel Planform Changes on the Lower Pages River, Hunter Valley, Australia. In *Australian Geographer*, 42:3, 289-307.

ERM, 2004. Upper Hunter Aboriginal Heritage Baseline Study. Unpublished Report for the Upper Hunter Aboriginal Heritage Trust.

Etheridge, R. 1918. The denroglyphs or carved trees of New South Wales. Memoirs of the Geological Survey of New South Wales, Ethnological Series No.3.

Fawcett, J.W. 1898a. Notes on the Customs and dialect of the Wonnah-ruah tribe. In *Science: of Man, 7:152:154.*

Fawcett, J.W. 1898b. Customs of the Wannah-ruah tribe and their dialect of vocabulary. Science of Man, 8:180:181.

Flood, J. 1995. Archaeology of the Dreamtime: The Story of Prehistoric Australia and its People. Sydney: Angus and Robertson.

Foley R. 1981a. A model of regional archaeological structure. *Proceedings of the Prehistoric Society* 47:1-17.

Foley R. 1981b. Off-site archaeology and human adaptation in eastern Africa: an analysis of regional artefact density in the Amboseli, southern Kenya. Oxford: *British Archaeological Reports International series 97. Cambridge Monographs in African Archaeology 3.*

Franks, S.2012a. Further Statement of Mr Scott McCain Franks 24 August 2012, in support of the Plains Clans of the Wonnarua People Native Title Application #2 (NNTT# NC12/4), Federal Court #NSD 1093/12, pp.12. Unpublished Statement to the National Native Title Tribunal, August 2012.

Franks, S. 2012b. Summary of Evidence of Mr Scott McCain Franks, Registered Native Title Claimant for the Plains Clan of the Wonnarua People. RE: Land and Environment Court Case # 10224/2012, Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Anor. To be given at Singleton Local Court, Elizabeth St Singleton, Wednesday 22 August 2012.

Gaikwad, J., Khanna, V., Vemulpad, S., Jamie, J., Kohen, J. and Ranganathan, S. 2008. CMKb: a webbased prototype for integrating Australian Aboriginal customary medicinal plant knowledge. BMC Bioinformatics, 9. Supplement 12:S25.

Gale, S.J. and R.J. Haworth. 2002. Beyond the Limits of Location: human environmental disturbance prior to official European contact in early colonial Australia. In *Archaeology in Oceania 37: 123–136*.



Gardiner J. N. 1991. *Hunter Region Environment Strategic Plan*. NSW Department of Water Resources: Muswellbrook.

GHD 2005 GHD (International) Pty Limited. *Proposed Coal Stockpile at Newpac No. 1 Colliery, Ravensworth. Environmental Impact Statement, Volume 1.* Report to Resource Pacific Ltd.

Godwin, L. 1990. Inside information: Settlement and Alliance in the late Holocene of Northeastern New South Wales, Unpublished PhD Thesis, University of New England.

Godwin, L. 2011. The Application of Assessment of Cumulative Impacts in Cultural Heritage Management: A Critique. Australian Archaeology, 73: 88-91.

Godwin, L. and Weiner, J.F. 2006. Footprints of the Ancestors: the Convergence of Anthropological and Archaeological Perspectives in Contemporary Aboriginal Heritage Studies. In David, B., Barker, B and McNiven, I.J. (eds), Social Archaeology of Australian Indigenous Societies. Aboriginal Studies Press, Canberra.

Gollan, V. 1993. The Military Suppression of the Wanaruah Resistance in the Upper Hunter 1826. Mount Arthur and Surrounding Area. Unpublished Report to Wanaruah Lands Council.

Grant, C., 2012. Analogies and links between cultural and biological diversity. Journal of Cultural Heritage Management and Sustainable Development, 2(2), pp. 153-163.

Gray, A. 2010. St Clair Mission. Accessed online April 2012 at www.australianmuseum.net.au/St-Clair-Mission/.

Green, J. 2003. Anmatyerr Plant Stories: By the women from Laramba (Napperby) Community. IAD Press, Alice Springs, NT.

Greer, S., Harrison, R. and McIntyre-Tamwoy, S., 2002. Community-based archaeology in Australia. World Archaeology, 34(2), 265-287.

Greer, S. 2010. Heritage and Empowerment: community based Indigenous cultural heritage in northern Australia. International Journal of Heritage Studies, 16:1-2, 45-58.

Haglund, L 1982 Archaeological Survey of Proposed Routes for Conveyor Belt and Haul Road Linking Hunter Valley No.2 Mine Authorisation Area with Hunter Valley No.1 Mine. Report for Croft and Associates Pty Ltd.

Harris, B., James, D., Ohlsen, E., Griffiths, P. and Barker, C. 2000. Pilaarrkiyalu of the Cobar Peneplain: Ngiyampaa Traditional Uses of Plants and Animals. NSW national Parks and Wildlife Service, Sydney.

Haworth R.J, S.J. Gale, S.A. Short and H. Heijnis. 1999. Land Use and Lake Sedimentation on the New England Tablelands of New South Wales, Australia. In *Australian Geographer*, 30:1, 51-73.

Hiddins, L. 2003. Bush Tucker Field Guide. Explore Australia Publishing Pty Ltd, Prahran, Victoria.

Hirsch Hadorn, G., Hoffmann-Reim, H., Biber-Klem, S., Grossenbacher-Mansuy, W., Joye, D., Pohl, C., Weismann, U. and Zemp, E. 2008. (eds) Handbook of Transdisciplinary Research, Springer, pp.448.



Hiscock, P. 2008. Archaeology of Ancient Australia. Routledge, London.

HLA-Envirosciences, 2002. Archaeological Assessment of Drayton Coal Lease Renewal/ Extension. EIS 02 Vol.3(I-M)

HLA-Envirosciences 2005 HLA Envirosciences (J. Czastka). *Preliminary Research Permit #1982: Excavations and Findings at Newdell Junction, Ravensworth*. Report to Macquarie Generation.

HLA-Envirosciences Pty Limited, 2007. Aboriginal Heritage Assessment of Proposed Longwalls 10 and 11, United Collieries, Warkworth, NSW. Unpublished report prepared for United Collieries.

Hoyle, J, A. Brooks, G. Brierley, K. Fryirs and J. Lander. 2008. Spatial variability in the timing, nature and extent of channel response to typical human disturbance along the Upper Hunter River, New South Wales, Australia. In *Earth Surface Processes and Landforms Vol. 33(6): 868-889*.

Karskens, G. 1985. *The grandest improvement in the country: An historical and archaeological study of the Great North Road, N.S.W., 1825-1836.* Unpublished M.A. Thesis, University of Sydney.

Kijas, J. 2009. *There Were Always People Here: a History of Yuraygir National Park*. Department of Environment, Climate Change and Water, Goulburn Street, Sydney.

Koettig, M. and P.J. Hughes. 1983. *Archaeological Investigation on the United Collieries Coal Lease, Warkworth, Hunter Valley, NSW.* Report to United Collieries PTY Ltd, Singleton NSW.

Koettig, M. 1986. *Test excavation at six locations along the proposed pipeline route between Glennies Creek Dam, Hunter Valley region, NSW*. A report to the Public Works Department, NSW.

Koettig, M. 1987. *Monitoring excavations at three locations along the Singleton to Glennies Creek pipeline route, Hunter Valley, NSW*. A report to the Public Works Department, NSW.

Koettig, M. 1994. *Bulga Authorisation Lease 219: Salvage Excavations*. Report by Margrit Koettig Archaeological Services to Saxonvale Coal.

Kovac, M. and J.W. Lawrie. 1991. *Soil Landscapes of the Singleton 1: 250 000 Sheet.* Soil Conservation Service of NSW, Sydney.

Lassak, E.V. and McCarthy, 2001. Australian Medicinal Plants Reed New Holland, Sydney Australia.

Latz, P. 1995. Bushfires and Bushtucker: Aboriginal Plant Use in Central Australia. IAD Press, Alice Springs.

Lee, I. 1925. Early Explorers in Australia. (From the Log-Books and Journals with maps and Illustrations). Methuen and Co Ltd, London.

Le Maistre, B. 1996. The Wonorua Tribe, its Land and European Penetration of the Hunter. Unpublished Report prepared for New South Wales Native Title Services.

Lester, R. 2012. Statement of Robert Lester 12 September 2012, in support of the Plains Clans of the Wonnarua People Native Title Application #2 (NNTT# NC12/4), Federal Court #NSD 1093/12, Unpublished statement to the Federal Native Title Tribunal, September 2012.

Integrating Landscape Science and Aboriginal Cultural Knowledge For Our Sustainable Future | 101



Lindsay, B.Y., Waliwararra. K., Miljat, F., Kuwarda, H., Pirak, R., Muyung, A., Pambany, E., Marruridji, J. Marrfurra, P. and Wightman, G. 2001. Malamalak and Matngala Plants and Animals: Aboriginal flora and fauna knowledge from the Daly River area, northern Australia. Northern Territory Botanical Bulletin No. 26. Parks and Wildlife Commission of the Northern Territory, Darwin.

Mangoola Open Cut, Glencore 2017 Biodiversity Offset Management Plan and Strategy.

Marquis-Kyle, P. and Walker, M. 2004. The illustrated Burra Charter: good practices for heritage places. Australia ICOMOS, Inc. Canberra, ACT.

Maslin, B.R., Thomson, L.A.J., McDonald, M.W. and Hamilton-Brown, S. 1998. Edible Wattle Seeds of Southern Australia: A review of species for use in Semi-arid Australia. CSIRO Publishing, Collingwood, Victoria.

Mathew, F. 1829-1832. Diary and Journal.

Mathews, R.H. 1893. Rock Paintings by the Aborigines in Caves on Bulgar Creek near Singleton. In *Journal Royal Society of New South Wales, 27: 353-358*.

Mathews, R.H. 1918. Description of two Bora grounds of the Kamilaroi Tribe. In *Journal of Proceedings of the Royal Society of New South Wales, 51: 423: 430.*

McBryde, I. 1978. *Records of Times Past: Ethnohistorical essays on the culture and ecology of the New England tribes*. Australian Institute of Aboriginal Studies, Canberra.

McCarthy, F. 1940. The Carved Trees of New South Wales. In *Australian Museum Magazine*, 7(5): 161-166.

McCarthy, F. 1944a. Some unusual cylindro-conical stones from New South Wales and Java. In *Records of the Australian Museum, 21 (5): 257-260.*

McCarthy, F. 1944b. The Windang, or edge-ground uniface pebble axe in Eastern Australia. In *Records of the Australian Museum, 21 (5): 261-263.*

McCarthy, F. 1944d. Adzes and adze-like implements from eastern Australia. In *Records of the Australian Museum, 21 (5): 267-271.*

McCarthy, F.D. and Davidson, F.A. 1943. The Elouera Industry of Singleton, Hunter River, New South Wales. In *Records of the Australian Museum 21: 210-230.*

McGuigan, A. 1983. Aboriginal Reserves in N.S.W: A land Rights Research Aid: A listing from archival material of former Aboriginal Reserves together with information required to access them. *New South Wales Ministry of Aboriginal Affairs, Occasional Paper No. 4, pp52.*

Mckerney, M. and H. White. 2011. *Bush Tucker, Boomerangs and Bandages: Traditional Aboriginal Plant Use in the Border Rivers and Gwydir Catchments*. Border Rivers-Gwydir Catchment management Authority, Inverell, NSW.

Miller, J.B., James, K.W. and Maggiore, M.A. 1997. *Table of Composition of Australian Aboriginal Foods*. Aboriginal Studies Press, AIATSIS, Canberra, ACT.

Integrating Landscape Science and Aboriginal Cultural Knowledge For Our Sustainable Future | 102



Miller, R. 1886. The Hunter River: The Wonnarua Tribe and Language. Australian Race: its origin, languages, customs, place of landing in Australia, and the roots by which it spread itself over the continent. 3 Vols, Melbourne, Government Printer, 1886/7.

Millis, R. 1994. *Waterloo Creek: The Australia Day Massacre of 1838. George Gipps and the British Conquest of New South Wales.* University of New South Wales Press, Sydney.

Mitchell, T.L. 1838. Three Expeditions into the Interior of Eastern Australia. London. Volume 1.

Moore, D.R. 1969. The prehistory of the Hunter River Valley. In *Australian Natural History, March* 1969: pp.166-171.

Moore, D.R. 1970. Results of an archaeological survey of the Hunter River Valley, New South Wales, Australia. Part 1. The Bondaian Industry of the Upper Hunter and Goulburn River Valleys. In *Records of the Australian Museum 28(2): 25-64*.

Morris, B. 1994. Part 2: Anthropological Study: The Gumbaingirr Peoples of Corindi Beach. In *Dallas, M and Morris, B. Archaeological and Anthropological Study of an Option of the Corindi Beach*.

Mulvaney, J and J Kamminga. 1999. Prehistory of Australia. Allen and Unwin Press.

Murdoch, J. and Pratt, A.C. 1997. From the power of topography to the topography of power: A discourse on strange ruralities, pp. 51-69. In Cloke, P. and Little, J. (eds.). Contested Countryside Cultures: Otherness Marginalisation and Rurality. Routledge, London.

Nanson G.C, and C. Doyle. 1999. Landscape stability, Quaternary climate change and European degradation of coastal rivers in southeastern Australia. In *Proceedings of the Second Australian Stream Management Conference, Rutherfurd, I. and R. Bartley (eds). Adelaide, February 8-11; 473 - 479.*

OEH. 2010. What is an Aboriginal Cultural Landscape? Fact Sheet 2.

http://www.environment.nsw.gov.au/resources/cultureheritage/commconsultation/09783factsheet 2.pdf

OEH, 2011a. *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*. Office of Environment and Heritage, Department of Premier and Cabinet, Sydney.

OEH, 2011b. *Operational Policy: Protecting Aboriginal Cultural heritage, Version 2*. Office of Environment and heritage, NSW, 59 Goulburn Street, Sydney.

OEH, 2011c. *Guide to Aboriginal Heritage Impact Permit Processes and Decision Making, Version 2*. Office of Environment and Heritage, 59 Goulburn Street, Sydney.

OEH, 2011d. "Pathways across the Hunter: a cultural journey..." Office of Environment and Heritage, Bridge Street, Hurstville, NSW.

OEH 2018. SLAM Soil Landscape Report for Hunter Region v 1.01



Olley J. M and R.J. Wasson. 2003. Changes in the flux of sediment in the Upper Murrumbidgee catchment, Southeastern Australia, since European settlement. In *Hydrological Processes* 17(16): 3307-3320.

OzArk Environmental and Heritage Management Pty Ltd. 2013 *Aboriginal Archaeological Assessment Proposed Relief Road, Drayton*. Report for URS Australia on behalf of Australian Rail Track Corporation.

OzArk Environmental and Heritage Management, 2013. *Due Diligence Archaeological Assessment: Proposed track Maintenance Hillcrest Offset Area, upper Hunter Valley.* Unpublished report to Ravensworth Operation Pty Ltd.

Peake, T. 2006. The Vegetation of the Central Hunter Valley, New South Wales, Vols. 1 and 2 (Version 2.2). Hunter-Central Rivers Catchment Management Authority, Paterson, NSW.

Perry, V 2010 Aboriginal Cultural Heritage Assessment for HCR10_176 Sneddon and Passfield, Antiene Row, Muswellbrook. Report for Hunter Central Rivers Catchment Management Authority.

Pohl, C. 2008. From science to policy through transdisciplinary research. Environmental Science and Policy, 11:46-53.

Pohl C. and Hirsch Hadorn, G. 2008. Core Terms in Transdisciplinary Research. Chapter 28, In Hirsch Hadorn G. et al., (eds) Handbook of Transdisciplinary Research, Springer, pp.427-432.

Prosser I.P. 1990. Fire, Humans and Denudation at Wangrah Creek, Southern Tablelands. In *Australian Geographical Studies 28: 77-95*.

Prosser I. P, I.D. Rutherfurd, J.M. Olley, W.J. Young, P.J. Walbrink and C.J. Moran CJ. 2001. Large-scale patterns of erosion and sediment transport in rivers networks, with examples from Australia. In *Freshwater and Marine Research 52: 1-99*.

Radcliffe-Brown, A.R. 1929. Notes on Totemism in Eastern Australia. The Journal of the Royal Anthropological Institute of Great Britain and Ireland, 59:399-415.

Ridley, W. 1864. The Aborigines of Australia: A Lecture. Delivered before the Young Men's Presbyterian Institute in the Free Church, Macquarie Street, Sydney, September 1864.

Robinson, K.W. and Burley, T.M. 1962. Flood-plain farming on the Maitland flats, Hunter Valley, N.S.W. Economic Geography, 38(3): 234-250.

Rose, D.B. 1996. Nourishing Terrains: Australian Aboriginal Views on Landscape and Wilderness. Australian Heritage Commission, Canberra, ACT.

Rose, D., James, D. and Watson, C. 2003. Indigenous kinship with the Natural World in New South Wales. NSW National Parks and Wildlife Service, Hurstville, NSW.

Ross, A., Prangell, J. and Coghill, B. 2010. Archaeology cultural landscapes and indigenous knowledge in Australian cultural heritage management legislation and practice. Heritage Management, 3(1): 73-96.



Rumsey, A. 1994. The Dreaming, human agency and inscriptive practice. In Oceania, 65: 116-130.

Russel, A.W., Wickson, F. and Carew, A.L. 2008. Transdisciplinarity: Context, contradictions and capacity. In *Futures*, *40*: *460-472*.

Russell, M and V Hardy 2002 *Archaeological Assessment of the Proposed Drayton Mine Extension*. HLA Envirosciences Pty Ltd report for Drayton Coal Pty Ltd.

Schumm S. A. 1969. River metamorphosis. In *Journal of Hydraulics Division - Proceedings of the American Society of Civil Engineers 95: 255-273*.

Scott, W. 1929. The Port Stephens Blacks. Chronicle Office, Dungog.

Singleton Argus, 1893. Rock Paintings by Aborigines, Some curiosities in the Caves at Bulga. Published Wednesday, 11 October, 1893, p.4. (Accessed online, 2012 at: http:://nla.gov.au/nla.news-article78701492).

Smith, A. and Beck, W. 2003. The archaeology of No man's land: indigenous camps at Corindi Beach, mid-north coast New South Wales. In *Archaeology in Oceania*, 38(2): 66-72.

Smith, L. 2005. Archaeological significance and the governance of identity in cultural heritage management. In *Mathers, C, T. Darvill, and B.J. Little (eds.), Heritage of Value, Archaeology of Renown: Reshaping Archaeological Assessment and Significance*. pp. 77-88. University of Florida Press, Gainsville, Florida.

Smith, L. and A. van der Meer. 2001. Landscape and the negotiation of identity: A case study from Riversleigh, north-west Queensland. In *Cotter, M.M., Boyd, W.E. and Gardiner, J.E. 2001 (eds.), Heritage Landscapes: Understanding Place and Communities*. Southern Cross University Press, Lismore NSW, pp. 51-63.

Smith, L, A. Morgan and A. van der Meer. 2003. Community-driven research in cultural heritage manage ment: the Waanyi women;s history project. In *International Journal of Heritage Studies 9(1), 65-80*.

Smith, L. R. 1980. *The Aboriginal Population of Australia*. Australian National University Press, Canberra.

Steele, J.E. 1984. *Aboriginal pathways of Southeast Queensland*. University of Queensland Press, St Lucia Brisbane, Qld.

Stewart, K. and P. Percival. 1997. *Bush Foods of New South Wales: A botanical record and Aboriginal Oral History*. Royal Botanical Gardens, Sydney.

Stocks, M. 2012. Statement of Mrs Maria Stocks September 10 2012, in support of the Plains Clans of the Wonnarua People Native Title Application #2 (NNTT# NC12/4), Federal Court #NSD 1093/12, pp.14. Unpublished statement to the National Native Title Tribunal, September 2012.

Story, R, R.W. Galloway, R.H.M van de Graaff and A.D Tweedie. 1963. *General Report on the Lands of* the Hunter Valley. Land Research Series No. 8. CSIRO.

Integrating Landscape Science and Aboriginal Cultural Knowledge For Our Sustainable Future | 105



Sutton, P. 1995. *Country: Aboriginal boundaries and land ownership in Australia*. Aboriginal History Monograph 3, ANU, Canberra.

The New Monthly Magazine, 1828. Rambles in New South Wales, Letters I-V. Vol. 22., pp. 236-247.

Threlkeld, L.E. c. 1828-1846. *Unpublished Journal of Lancelot Edward Thelkeld, c. Dec 1828 c. Feb.* 1846.

Thorpe, W.W., and McCarthy, F.D. 1933. Ethnological notes. In *No.5. Records of the Australian Museum*, 19(1): 23-27.

Tindale, N.B. 1974. *Aboriginal Tribes of Australia: their terrain, environmental controls, distribution, limits and proper names*. University Of California Press, Berkley.

Tocomwall Pty Ltd. 2012. *Our Country. Our Culture. Our Values. The traditional, historical and contemporary cultural landscape of the Bulga Coal Optimisation Project Area: A Plains Clans of the Wonnarua Peoples Perspective.* Unpublished Confidential Report prepared for Xstrata Coal.

Tocomwall Pty Ltd. 2013. *Beginning and Belonging: The Traditional, Historical and Contemporary Cultural Landscape of the Mount Owen Continued Operations Project Area: A Plains Clans of the Wonnarua Peoples Perspective*. Unpublished Confidential Report prepared for Glencore Coal Assets Australia.

Tocomwall Pty Ltd. 2017. *Hillcrest Aboriginal Cultural Values Assessment Report*. Unpublished Report prepared for Glencore Coal Assets Australia.

Tocomwall Pty Ltd. 2018. *Mangoola Aboriginal Cultural Values Assessment Report*. Unpublished Report prepared for Glencore Coal Assets Australia.

Turner-Neale, M-M. (with John Henderson) 1996. *Bush Foods: Arrernte foods from Central Australia, Nhenhe-areye anwerne-arle arlkwene*. IAD Press, Alice Springs.

Umwelt Pty Ltd 1997 *Archaeological Assessment – Proposed Modifications to Coal Preparation and Transportation System – Bayswater Coal Mine Project*. Report for Bayswater Colliery Company Pty Ltd and Ravensworth Coal Company Pty Ltd.

Umwelt Pty Ltd. 2006. Salvage of Artefacts from LID 1 under section 90 Consent #1443 Liddell Mine, Hunter Valley, NSW. Report for the Department of Environment and Conservation on the collection of LID1.

Umwelt Pty Ltd. 2006. *Archaeological Survey and Assessment of a Proposed 132kV feeder at Antiene, near Lake Liddell, NSW*. Archaeological assessment and survey report for Energy Australia.

Umwelt Pty Ltd. 2007. *Statement of Environmental Effects for the Bulga Underground Southern Mining Area Modification – Section 96(2) Application to Modify Consent DA 376-8-2003*. Report for Bulga Coal Management Pty Limited.

Umwelt Pty Ltd. 2019. Glendell Continued Operations Project: Biodiversity Development Assessment Report.

Integrating Landscape Science and Aboriginal Cultural Knowledge For Our Sustainable Future | 106



Ward, R. 2012. Statement of Rhonda Ward 12 September 2012, in support of the Plains Clans of the Wonnarua People Native Title Application #2 (NNTT# NC12/4), Federal Court #NSD 1093/12, pp.14. Unpublished statement to the Federal Native Title Tribunal, September 2012.

Wambo Coal Pty Ltd, 2003; Wambo Development Project: Environmental Impact statement, Vol 1 Main Report + Appendices.

Wickson, F., Carew, A.L. and Russell, A.W. 2006. Transdisciplinary research: characteristics, quandaries and quality. Futures, 38: 1046-1059.

Wightman, G. and Brown, J. 1994. Jawoyn, Plant Identikit. Common Useful Plants in the Katherine Area of Northern Australia. Conservation Commission of the Northern Territory, (Darwin) and Jawoyn Association, (Katherine, NT).

Wood W. A.1972. Dawn in the Valley, Wentworth Books, Sydney.



10 APPENDIX 1

Continued Operations Coal Project, Aboriginal Cultural Heritage Assessment Anthropology Report on PCWP Cultural Values By: Assoc. Prof. Neale Draper



Neale Draper & Associates

Archaeology

Anthropology

Native Title

Geographic Information Systems (GIS) Glencore Glendell
Continued Operations Coal
Project, Aboriginal Cultural
Heritage Assessment

Anthropology Report on PCWP Cultural Values

By: Assoc. Prof. Neale Draper

Date: 12 June 2020

Client Name: Tocomwall Pty Ltd

Client Contact: Will Moon

Address: PO Box 76 Caringbah NSW 1495

Phone: 02 9542 7714

Email: william@tocomwall.com.au

0408 657 544

email@ndaa.com.au

www.ndaa.com.au

Glencore Glendell Continued Operations Coal Project, Aboriginal Cultural Heritage Assessment

Anthropology Report on PCWP Cultural Values

By: Assoc. Prof. Neale Draper

Date: 12 June 2020

Client Name: Tocomwall Pty Ltd

Client Contact: Will Moon

Address: PO Box 76 Caringbah NSW 1495

Phone: 02 9542 7714

Email: william@tocomwall.com.au

Ownership and Disclaimer

Ownership of the intellectual property rights of ethnographic information provided by Aboriginal people remains the property of those named persons.

Ownership of the primary materials created in the course of the research remains the property of Neale Draper & Associates Pty Ltd.

This document remains the property of Tocomwall Pty Ltd. This document may not be used, copied, sold, published, reproduced or distributed wholly or in part without the prior written consent of Tocomwall Pty Ltd.

This document has been prepared in accordance with the brief provided by Tocomwall Pty Ltd and has relied upon information provided by the client, or collected during the completion of the document and under the conditions specified in the document. All findings, conclusions and recommendations contained in the document are based on the aforementioned circumstances. The document is for the use of Tocomwall Pty Ltd in addressing their brief and no responsibility is taken for the documents use by other parties.

The professional advice and opinions contained in this document are those of the consultants, Neale Draper & Associates Pty Ltd, and do not represent the opinions and policies of any third party.

The professional advice and opinions contained in this document do not constitute legal advice.

Spatial Data

Spatial data captured by Neale Draper & Associates Pty Ltd for any newly recorded features was acquired using an uncorrected GPS receiver.

Coordinate positions are presented using the MGA94 coordinate system.

Positions recorded using a Garmin GPS Receiver will be up to +/- 10m and typically +/- 3m.

Positions recorded using a Trimble TDC100 will be +/- 5m and typically < +/- 2.5m.

TOC03 Page | iii

Abbreviations

Term	Meaning
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHM	Australian Cultural Heritage Management Pty Ltd
AHIMS	Aboriginal Heritage Information Management System, NSW DPIE
DPIE	NSW Department of Planning, Industry and Environment
GIS	Geographic Information systems
ICOMOS	International Committee on Monuments and Sites (UNESCO)
ND&A	Neale Draper & Associates Pty Ltd
NTS Corp	Native Title Services Corporation, NSW.
OEH	NSW Office of Environment and Heritage, now part of DPIE
PCWP	Plains Clans of the Wonnarua People (Native Title Claim Group)
WNAC	Wonnarua Nation Aboriginal Corporation

TOC03 Page | iv

Executive Summary

The Glendell Mine is part of the Mount Owen Complex of open-cut coal mines located in the Upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres (km) north-west of Singleton (Map 1-1). The Glendell Continued Operations Project has applied for development consent for the Glendell Pit Extension and associated works, including:

- Rehabilitation of areas disturbed by mining activities, including overburden emplacement areas
- Realignment of a section of Hebden Road
- Relocation of Ravensworth Homestead
- Realignment of the lower section of Yorks Creek
- Construction and use of new mine infrastructure area (MIA) facilities, related infrastructure and associated access roads. (Canning 2019: 6).

Australian Cultural Heritage Management Pty Ltd (ACHM) conducted an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Glendell Continued Operations Project.

The ACHAR Aboriginal consultation process identified 32 Registered Aboriginal Parties (RAPs), including two representative bodies or 'Knowledge Holder Groups':

- Wonnarua Nation Aboriginal Corporation (WNAC)
- Plains Clan of the Wonnarua People (PCWP) (Canning 2019: vi, 9).

The second body named, the PCWP, has for several years been the registered native title claim group (NSD1680/13, NSD1093/12 and NSD788/13) for the project area. This native title claim was withdrawn by the applicants in early 2020, in order for amendments to be made following an anthropological review of Wonnarua claims (Draper 2018, 2020, Sackett 2019). The PCWP had declined to participate in the ACHM consultation process for the ACHAR (Canning 2019: 9-10), preferring to submit its own, separate 'Cultural Values Report' to the Aboriginal heritage assessment process. Glencore agreed to this process, and the PCWP Cultural Values Report is being prepared by Tocomwall (2020).

The PCWP Wonnarua people I spoke with in February 2020 around Singleton had a united view that none of the people consulted for the ACHM (2019) report actually were Wonnarua people. The view was that these RAPs did not provide any information concerning cultural values to Canning (2019) because they did not have any knowledge of or connections to the place, and not because such values are absent (as concluded by Canning 2019: viii).

The preparation of the PCWP Cultural Values Report for the Glendell Continued Operations Project has included the engagement of Associate Professor Neale Draper (Neale Draper & Associates Pty Ltd - ND&A) to research and prepare an anthropological report in consultation with the PCWP. The purpose of the anthropological report is to provide additional ethnographic data in relation to Aboriginal Traditional Owner cultural values relating to the project area (the current report).

Both the current report and the Tocomwall (2020) PCWP Cultural Values Report form part of the documentation for the ACHAR assessment process by DPIE, as part of the overall Project EIS.

The preparation of this report has involved background research of published and available archival sources (historical and ethnographic) related to the Aboriginal and colonial history of the project locality. This background research provides the context for ethnographic information on connections and cultural values related to the project locality that was recorded through site inspections and interviews with PCWP informants (Scott Franks, Maria Stocks, David Foot, Rob Lester) in a week's fieldwork in February 2020. The report also draws on some of the results of previous fieldwork and background research by the author for the PCWP native title claim (Draper 2018, 2020).

The PCWP Wonnarua people I spoke with in February 2020 around Singleton had a united view that none of the people consulted for the ACHM (2019) report actually were Wonnarua people. The view was that these RAPs did not provide any information concerning cultural values to Canning (2019) because they did not have any knowledge of or connections to the place, and not because such values are absent (as concluded by Canning 2019: viii).

The ethnographic research that I conducted with the PCWP Wonnarua for this study and for my previous native title report (Draper 2018), together with some of their oral history already on record (e.g., Franks 2012), provide a substantive and substantially unknown body of intangible cultural knowledge and historical perspective

associated with Ravensworth. This information provides the foundation of PCWP Wonnarua cultural values in relation to Ravensworth, and to the significance of Ravensworth in their cultural landscape, history, and identity.

This report provides the following Statement of Cultural Heritage Significance

Cultural/Social Significance

Ravensworth estate and homestead has very high cultural and social significance because:

- It is located adjacent to the important cultural route along Glennies Creek and its tributaries that form part of the traditional male initiation (Bora) cycle of the Wonnarua people, and the establishment of the estate contributed to the demise of the use of this section of the route for those cultural practices and associated traditional resource access by Wonnarua people.
- It is a central place in the colonial invasion and associated conflict and violence that resulted from the establishment of this and other estates in the 1820s that lead to the deaths of many Wonnarua people, as well as some colonists. Numerous conflict raids and reprisals, with accompanying fatalities in most cases, took place on the Ravensworth estate, which had two main roads passing through it and was one of the earliest and largest of such enterprises in the Hunter valley in the 1820s and 1830s.
- Dr James Bowman, who established the Ravensworth estate, was instrumental in persuading the Government
 of the 1820s to station military forces in the local area, including at Ravensworth, to subjugate Wonnarua
 resistance and to kill those who participated and take lethal reprisals on their families and community,
 resulting in both recorded and unrecorded massacres and executions of Aboriginal men, women and
 children. Wonnarua oral history suggests that Bowman may have personally killed or at least ordered the
 execution of some Wonnarua people in the mid 1820s.
- It's bloody colonial beginnings have engendered the strong belief that there are unsanctified burials of their
 ancestors on the Ravensworth estate, Wonnarua people maintain avoidance of contact with the place almost
 200 years after those events, apart from a Women's mourning ceremony held there in the early 1970s,
 considering it to be spiritually dangerous.
- This place is regarded as both symbolic of and central to the violent invasion and decimation of the Wonnarua people in this region.

Historical Significance

Ravensworth estate and homestead has very high historical significance because:

- It has a very strong association with the history of early colonial conflict and invasion of the Wonnarua people by the colonists and the military forces that assisted them.
- It was a central place in many of those historical events, as well as considered symbolic of the cause of Aboriginal resistance to colonisation in the Hunter Valley. This includes both written historical records of conflict, as well as oral history records from Wonnarua families related to the conflict.
- It is an important landmark in the overall pattern of European invasion and Aboriginal resistance in the Hunter Valley and neighbouring areas, such as the Bathurst region from the early 1820s onwards.

Scientific Significance

Ravensworth estate and homestead has very high scientific significance because of its potential to yield additional archaeological information about early colonial conflict events in the form of archaeological sites or conflict burials, as well as the focus for additional ethnographic (oral history) and historical research concerning the colonial conflict period around that location. The important themes surrounding the colonisation and Wonnarua resistance on and adjacent to the Ravensworth estate has only begun to receive overdue research attention in the last five years (e.g., Dunn 2015 to the current report), and has significant, further research potential (e., see Casey and Lowe 2018 significance assessment).

Aesthetic Significance

Ravensworth estate and homestead have high aesthetic significance, both visually as a very early and distinctive homestead complex (the oldest in the Hunter Valley?) and associated exotic garden and cleared home paddocks, as well as evoking severe dread and anxiety among Wonnarua people because of its central associations with the deaths of many of their ancestors and their loss of sovereignty, causing them to continue to avoid the place almost two centuries after those events.

TOC03 Page | vi

Table of contents

Ow	nershi	p and D	isclaimer	iii	
Spa	itial Da	ta		iii	
Abl	oreviat	ions		iv	
Exe	cutive	Summa	ary	v	
1	Introduction				
1	1.1				
	1.2				
	1.3	-			
2	Cultural Values Assessment Framework				
	2.1		duction		
	2.2		Aboriginal Cultural Heritage Assessment Guidelines		
	2.3		OS Burra Charter		
	2.4	Austr	alia ICOMOS Cultural Heritage Assessment Practice Notes	9	
			The Burra Charter and Indigenous Cultural Heritage Management. Practice Note ralia ICOMOS 2013a)	9	
		2.4.2 2013k	Understanding and assessing cultural significance. Practice Note (Australia ICOMOS	11	
		2.4.3	Intangible cultural heritage and place. Practice Note, Australia ICOMOS (2017)		
3	Cultural Heritage Values on Record			15	
	3.1	3.1 Contact History: Rapid Colonisation and Conflict		15	
	3.2		1 ACHAR Report (Canning 2019)		
	3.3	OzArch (2019)			
	3.4	Casey	and Lowe (2018)	28	
4	Description of Wonnarua Cultural Values for the Survey Area			36	
	4.1	Cultu	ral Identity and Traditional Country	36	
	4.2	2 Mt. Owen PCWP Cultural Values Report		37	
	4.3	Conta	ct History and Conflict		
		4.3.1	The Link to Mt. Arthur.		
		4.3.2	Ravensworth Estate		
	4.4		nuity and Current Cultural Associations		
		4.4.1	Continuing cultural and historical connection to the project area		
		4.4.2	Camberwell		
		4.4.3 4.4.4	Billy and the Betty's Creek Stone Arrangement		
		4.4.4	Ravensworth Estate and Homestead		
_					
5			ues Assessment		
	5.1	Descr	iption of Cultural Values	53	

		5.1.1	Is Ravensworth a Significant Aboriginal Place?	53
		5.1.2	Social or cultural value	53
		5.1.3	Historic value	54
		5.1.4	Scientific value	55
		5.1.5	Aesthetic value	55
		5.1.6	Representative, Rare and Educational.	56
		5.1.7	Assessing and Mitigating "Harm"	56
5.2 Statement of Cultural Heritage Significance		ment of Cultural Heritage Significance	56	
		5.2.1	Cultural/ Social Significance	56
		5.2.2	Historical Significance	57
		5.2.3	Scientific Significance	57
		5.2.4	Aesthetic Significance	57
	Riblio	granhy		58

List of figures

Figure 3-1:	Detail from Dangar (1828 survey Map, showing Bowman and other properties in the Ravensworth Parish (Dunn 2019: Figure 1).	17
Figure 3-2:	Detail from County of Durham Plan c. 1843, showing locations of Bowmans, Glennies and Lethbridges estates, and Chilcott's and Alcorn's huts (arrowed).	18
Figure 3-3:	Historical archaeology features near Ravensworth homestead (Casey and Lowe 2018: Figure 5_5)	29
Figure 3-4:	Maps showing the georeferenced location of the Ravensworth 'old house' from early maps by Dixon and White (Casey and Lowe (2018: Figure 5.7)	30
Figure 3-5:	Ravensworth Homestead in 1902, from the Sydney Mail (Casey and Lowe 2019: Figure 3.27).	31
Figure 3-6:	View of the front of Ravensworth homestead, February 2020. Note the wide windows	32
Figure 3-7:	View west from the front garden of Ravensworth homestead to the ridge location identified by Casey and Lowe (2018) as the likely site of the original dwelling.	32
Figure 4-1:	Interview on Mt Arthur Summit, 20 February 2020. L-R: Scott Franks, Clive Taylor	39
Figure 4-2:	Interview with Scott Franks at Ravensworth homestead 18 February 2020. L-R: Clive Taylor, Scott Franks	41
Figure 4-3:	Interview by Neale Draper (L) with David Foot (centre) and his siter Maria Stocks (R) on 18 February, 2020.	43
Figure 4-4:	Early surveyors maps showing Joseph Hugh's property at Scrumlow, Upper Bowman's Creek, with adjacent blocks owned by Bowman and Glennie (scource: Tocomwall)	44
Figure 4-5:	Camberwell Church Records showing paid work performed by members of the Smith Family in 1946 (courtesy of Diedre Olofsson, Camberwell)	45
Figure 4-6:	Aerial view of Camberwell Church and graveyard (courtesy of Diedre Olofsson, Camberwell)	46
Figure 4-7:	Betty's Creek stone arrangement site	47
Figure 4-8:	Ravensworth homestead 18 February 2020, with the homestead building and exotic garden in right foreground.	52
List of	maps	
Map 1-1:	Location of the Glendell Expansion Project Area, Hunter Valley NSW	2
Map 3-1:	Glendell expansion project area: previously reocrded Aboriginal Heritage Sites	16

TOC03 Page | ix

1 Introduction

1.1 Background and Project Brief

The Glendell Mine is part of the Mount Owen Complex of open-cut coal mines located in the Upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres (km) north-west of Singleton (Map 1-1). The Glendell Continued Operations Project has applied for development consent for the Glendell Pit Extension and associated works, including:

- Rehabilitation of areas disturbed by mining activities, including overburden emplacement areas
- Realignment of a section of Hebden Road
- Relocation of Ravensworth Homestead
- · Realignment of the lower section of Yorks Creek
- Construction and use of new mine infrastructure area (MIA) facilities, related infrastructure and associated access roads. (Canning 2019: 6).

Australian Cultural Heritage Management Pty Ltd (ACHM) was engaged by Umwelt (Australia) Pty Ltd and Glencore Coal Australia Pty Ltd to complete an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Glendell Continued Operations Project. The purpose of that assessment is to form part of an Environmental Impact Statement (EIS) being prepared by Umwelt to accompany an application for development consent under Divisions 4.1 and 4.7 of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) for the Project (Canning 2019: 6).

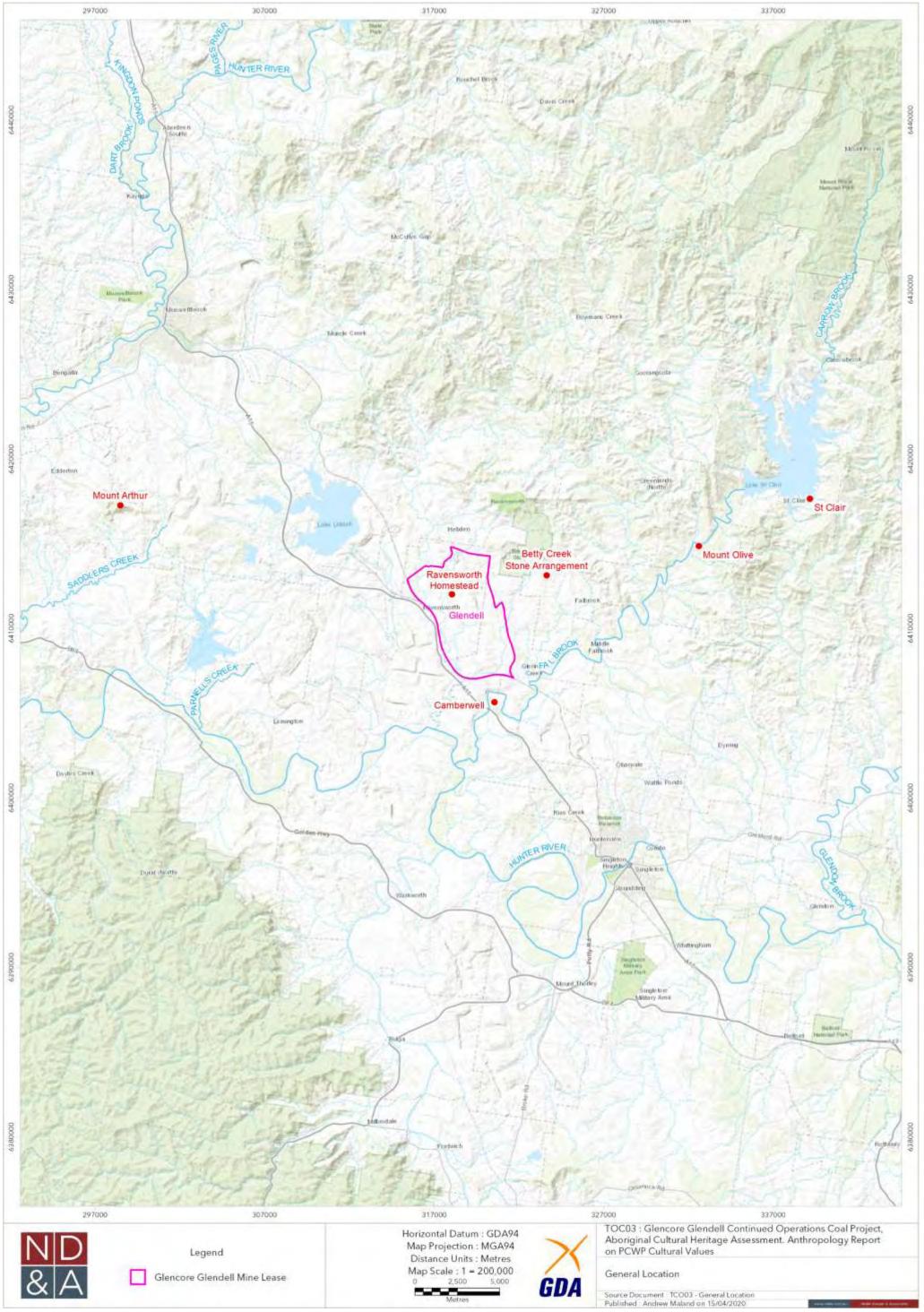
The ACHM ACHAR report (Canning 2019) follows the format prescribed by the NSW Office of Environment and Heritage (now part of the NSW Department of Planning, Industry and Environment - DPIE) in its 'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in New South Wales' (OEH 2011). The ACHAR Aboriginal consultation process identified 32 Registered Aboriginal Parties (RAPs), including two representative bodies or 'Knowledge Holder Groups':

- Wonnarua Nation Aboriginal Corporation (WNAC)
- Plains Clan of the Wonnarua People (PCWP) (Canning 2019: vi, 9).

The second body named, the PCWP, has for several years been the registered native title claim group (NSD1680/13, NSD1093/12 and NSD788/13) for the project area. I understand that this native title claim was withdrawn by the applicants in early 2020, in order for amendments to be made following an anthropological review of Wonnarua claims (Draper 2018, 2020, Sackett 2019). The PCWP had declined to participate in the ACHM consultation process for the ACHAR (Canning 2019: 9-10), preferring to submit its own, separate 'Cultural Values Report' to the Aboriginal heritage assessment process. Glencore agreed to this process, and the PCWP Cultural Values Report is being prepared by Tocomwall (2020).

Glencore conceived the scope of the PCWP Cultural Values Report as encompassing the following:

- 1. In consultation with the PCWP families, undertake a review of the previous PCWP Values Report for MOCO [Glencore Mt Owen Project Tocomwall 2013]
- 2. In consultation with PCWP families, update the Values report with any additional information the PCWP wishes to provide, including Cultural, Historic, Aesthetic and other values in relation to the GCOP
- 3. In response to your discussions on post-contact history in the Project Area, please also provide discussion of the PCWP's values
- 4. In consultation with PCWP families, provide discussion on the significance of Project Area, this would include any known events/contact within the boundaries of the Project Area, such as the Ravensworth Homestead estate.
- 5. In consultation with the PCWP families, provide discussion on recommendations in relation to Care & Control and potential Cultural, Intergenerational or other recommendations for Glencore's consideration.



Map 1-1: Location of the Glendell Expansion Project Area, Hunter Valley NSW

TOC03

6. As has been the case with previous recent Glencore Major Projects, we acknowledge that the PCWP may have information or Values that it wishes to remain non-disclosed to the wider public or other Groups or consultants. Glencore would request, if possible, that where this is the case, could the PCWP provide and additional note/report/memo/table of Key Values and Recommendations (specific or general) that the PCWP are comfortable to release so that this can be used in the publicly exhibited ACHAR and broader in the EIS process and studies.

- 7. Provide outputs as a Draft
- 8. After reviews and comments by the Glencore, submit final reports.

The preparation of the PCWP Cultural Values Report for the Glendell Continued Operations Project has included the engagement of Associate Professor Neale Draper (*Neale Draper & Associates Pty Ltd* - ND&A) to research and prepare an anthropological report in consultation with the PCWP. The purpose of the anthropological report is to provide additional ethnographic data in relation to Aboriginal Traditional Owner cultural values relating to the project area (the current report).

Both the current report and the Tocomwall (2020) PCWP Cultural Values Report form part of the documentation for the ACHAR assessment process by DPIE, as part of the overall Project EIS.

A draft of this report has been made available for review and comment to Tocomwall, PCWP and Glencore.

1.2 Methodology

The preparation of this report has involved background research of published and available archival sources (historical and ethnographic) related to the Aboriginal and colonial history of the project locality. This background research provides the context for ethnographic information on connections and cultural values related to the project locality that was recorded through site inspections and interviews with PCWP informants (Scott Franks, Maria Stocks, David Foot, Rob Lester) in a week's fieldwork in February 2020. The report also draws on some of the results of previous fieldwork and background research by the author for the PCWP native title claim (Draper 2018, 2020).

The author of this report, Neale Draper, conducted those interviews and site inspections, which were recorded by video ethnographer and ND&A Associate Consultant Clive Taylor ASC. The PCWP informants each agreed to the use of the resulting information in the preparation of this report, and a copy of all interview videos and fieldwork still and aerial-drone photography have been provided to PCWP. The ND&A maps in this report were prepared by GIS Analyst and ND&A Associate Consultant Andrew Maland. I have worked on native title and cultural heritage research and assessment projects with Clive Taylor and Andrew Maland on many projects during the last 20 years.

The author has had regard to the ACHAR preparation guide (OEH 2011), to insure the relevance of this report to that assessment process. The ACHAR assessment process is based upon the ICOMOS *Burra Charter* principles relating to cultural heritage values (Australia ICOMOS 2013), and this report also makes reference to the Burra Charter and to three associated professional Practice Notes from Australia ICOMOS regarding cultural ehritage assessments in relation to the Burra Charter, Indigenous cultural heritage, and Intangible cultural heritage (Australia ICOMOS 2013a, 2013b, 2017).

This is an anthropological report on the PCWP Wonnarua group's cultural connections and values in relation to the Glendell survey area (Map 1-1). It thus forms one part of the Tocomwall (2020) Aboriginal Cultural Values Assessment Report that is being submitted as part of the Aboriginal Cultural Heritage Assessment for this project. The Tocomwall report provides detailed contextual information on the project, the study area, the cultural identity of the PCWP Wonnarua people, as well as some background historical information.

1.3 Qualifications and Experience of the Author

The author of this report is Associate Professor Neale Draper. I am a qualified anthropologist and archaeologist (BA Honours Anthropology University of Queensland 1978, MA Anthropology University of New Mexico 1983, PhD Anthropology University of New Mexico 1992). I am the CEO and Principal Heritage Consultant of Neale Draper & Associates Pty Ltd. (ND&A), and was formerly for 15 years the CEO of one of Australia's leading heritage management consultancies, *Australian Cultural Heritage Management Pty Ltd* (ACHM). I have had more than 35 years of experience in research, tertiary teaching, professional-practice and expert witness work in anthropology and archaeology, mostly related to Australian Aboriginal heritage.

I am an International Member of ICOMOS (UNESCO's International Council for Monuments and Sites, the peak international body for the management of World Heritage cultural places and values). I am an expert member of the ICOMOS International Scientific Committees on Archaeological Heritage Management (ICAHM) and Intangible

Cultural Heritage (ICICH), as well as a contributing member of the International Scientific Committee on Cultural Landscapes (ISCCL). Correspondingly, I am a member of the ICOMOS Australia National Scientific Committees for Cultural Landscapes and Cultural Routes (NSC-CLCR) and for Intangible Cultural Heritage (NSC-ICH).

I am also an Associate Professor (Academic Level D) in the School of Humanities (Department of Archaeology), Faculty of Education, Humanities and Law, at the Flinders University of South Australia in Adelaide.

I am the Deputy Chairperson of the Lake Victoria Advisory Committee for the Murray Darling Basin Authority. This committee unites the stakeholders for Lake Victoria (NSW) in advising the MDBA on the effective management of the estimated 10,000 traditional Aboriginal burials and other highly significant cultural heritage values relating to the Lake and surrounding area.

I have previous experience in the research and preparation of anthropology and archaeology expert reports for the Federal Court in native title and Aboriginal Heritage matters (Chapman vs. Tickner and Ors. 1995 FCA 46), and for Government Agencies, major Corporations and Aboriginal Organisations in cultural heritage management matters. I have served as an expert witness in a wide variety of jurisdictions since the late 1980s.

In researching and preparing expert reports, I typically make extensive use of multi-disciplinary research teams in the fields of anthropology, archaeology, ethnohistory, video-ethnography and Geographic Information Systems (GIS) to gather efficiently, analyse and present relevant evidence, under my direct supervision.

My qualifications and experience lie in the interlinked anthropological fields of social anthropology and archaeology, particularly in relation to the evolution of hunter-gather societies in general, and in relation to Australian Aboriginal society, culture, prehistory and contact history in particular, and this report relies upon that expertise.

In terms of specific native title experience, I worked from late 1997 to 2000 as consultant anthropologist/archaeologist to the Goldfields Land and Sea Council (Kalgoorlie, Western Australia). With the assistance of such a multi-disciplinary research team, I produced an extensive draft native title connection report for the southern Goldfields region Ngadju Native Title claim (Draper 2000) as well as preliminary reports for the adjacent Esperance Noongar (Bullenbuk) and Western Mirning claims. This research process was refined further for production of the expert anthropology and archaeology connection report for the Kokatha Native Title Claim (SAD 6013/1998) in the Woomera Region of northern South Australia (Draper et al 2007), and subsequently for an expert Anthropology Report on key issues for the Banyjima native title claim (WAD6096/98) (Draper 2010). I prepared two expert archaeological reports (Draper 2015a & b) and gave testimony in the Lake Torrens Overlap Proceedings (SAS 90/2009) in South Australia. I have recently completed expert testimony with previous expert reports (Draper 2016, 2017c & d) for the Wutha Native Title Claim (WAD6064/1998) to the Federal Court. In 2017-2019, I prepared preliminary connection reports for the Darlot Native Title Claim (WAD142/2018). I prepared a series of anthropology Connection reports for the Kaurna Peoples Native Title Claim SAD 6001/200) and participated in associated expert conferences prior to the consent determination in March 2018.

I also have conducted reviews of native title connection reports for the Gunditjmara claim for the Victorian Department of Justice (Draper 2002) and for the Yaegl claim for the NSW Crown Solicitor (Draper (2008).

I have conducted anthropological fieldwork and associated background research with PCWP native title claimants in the Hunter Valley in the second half of 2016 and the first half of 2017, towards the preparation of an expert anthropology connection report for the PCWP claims. This previous research has included three field trips to the Hunter Valley of approximately one week each to interview claimants, collect genealogy and family history data, and to visit significant cultural places with claimants and record their knowledge of and associations with these places. The research has also included the identification and acquisition of relevant historical and ethnographic material, both published and unpublished, with the assistance of the claimants and their legal team, including visits to local libraries and historical societies in the claim area. The extent of this material is considerable, and I have had only the opportunity for a preliminary review of these sources.

In 2018 I provided an anthropological report on the PCWP claim to assist a Federal Court mediation process (Draper 2018), followed by a review of the Court-appointed anthropologist's report (Draper 2020).

2 Cultural Values Assessment Framework

2.1 Introduction

The current ACHAR assessment has not so far provided any anthropological investigation of the cultural values of local traditional owner families. This is the role of this current report. Consequently, I describe in this section of the report some detail in relation to the framework for anthropological recording and assessment of the cultural values of the Aboriginal traditional owners in relation to Ravensworth.

2.2 NSW Aboriginal Cultural Heritage Assessment Guidelines

The current cultural values anthropology report forms part of the PCWP cultural heritage values report (Tocomwall 2020) being submitted as part of the Aboriginal cultural heritage assessment process for the Glendell project by the NSW Department of Planning, Industry and Environment - DPIE). The assessment guidelines are provided by the 'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in New South Wales' (OEH 2011).

The assessment is concerned with the cultural heritage values of Ravensworth and the associated land within the Glendell project area in relation to whether or not it constitutes a significant Aboriginal Place, defined as:

"Place An area of cultural value to Aboriginal people in the area (whether or not it is an Aboriginal place declared under s.84 of the Act)." (OEH 2011: ii).

The reference is to the NSW National Parks and Wildlife Act (1974), which also prescribes that:

"Anyone proposing to carry out an activity that may harm an Aboriginal object or a declared Aboriginal place must investigate, assess and report on the harm that may be caused by the activity they propose.

The investigation and assessment of Aboriginal cultural heritage is undertaken to explore the harm of a proposed activity on Aboriginal objects and declared Aboriginal places and to clearly set out which impacts are avoidable and which are not. Harm to significant Aboriginal objects and declared Aboriginal places should always be avoided wherever possible. Where harm to Aboriginal objects and declared Aboriginal places cannot be avoided, proposals that reduce the extent and severity of harm to significant Aboriginal objects and declared Aboriginal places should be developed." (OEH 2011: iii).

Aboriginal cultural heritage is defined to include both tangible aspects (places, objects) and intangible aspects (cultural beliefs, connections, practices, historical associations).

"What is Aboriginal cultural heritage?

Aboriginal cultural heritage consists of any places and objects of significance to Aboriginal people because of their traditions, observances, lore, customs, beliefs and history. It provides evidence of the lives and existence of Aboriginal people before European settlement through to the present. Aboriginal cultural heritage is dynamic and may comprise physical (tangible) or non-physical (intangible) elements. It includes things made and used in traditional societies, such as stone tools, art sites and ceremonial or burial grounds. It also includes more contemporary and/or historical elements such as old mission buildings, massacre sites and cemeteries. Tangible heritage is situated in a broader cultural landscape, so it needs to be considered within that context and in a holistic manner.

Aboriginal cultural heritage also relates to the connection and sense of belonging that people have with the landscape and each other. For Aboriginal people, cultural heritage and cultural practices are part of both the past and the present and that cultural heritage is kept alive and strong by being part of everyday life."

"Aboriginal cultural heritage is not confined to sites. It also includes peoples' memories, storylines, ceremonies, language and 'ways of doing things' that continue to enrich local knowledge about the cultural landscape. It involves teaching and educating younger generations. It is also about learning and looking after cultural traditions and places, and passing on knowledge. It is enduring but also changing. It is ancient but also new." (OEH 2011: 1).

In the process of conducting and presenting the research and assessment of this cultural heritage, the Guidelines emphasise the rights and interests of Aboriginal people in the determination of cultural significance.

"Rights and interests of Aboriginal people in their cultural heritage

OEH recognises and acknowledges Aboriginal people as the primary determinants of the cultural significance of their heritage. In recognising these rights and interests, all parties concerned with identifying, conserving and managing cultural heritage should acknowledge, accept and act on the principles that Aboriginal people:

- are the primary source of information about the value of their heritage and how this is best protected and conserved
- must have an active role in any Aboriginal cultural heritage planning process
- must have early input into the assessment of the cultural significance of their heritage and its management so they can continue to fulfil their obligations towards their heritage and
- must control the way in which cultural knowledge and other information relating specifically to their heritage is used, as this may be an integral aspect of its heritage value." (OEH 2011: 2).

The consultation process required in order to comply with this guidance also is described.

"Consultation with Aboriginal people is an integral part of the process of investigating and assessing Aboriginal cultural heritage. Aboriginal people who hold cultural knowledge about the area, objects and places that may be directly or indirectly affected by the proposed activity must be given the opportunity to be consulted. This is done through the process of investigating, assessing and working out how to manage the harm from the proposed activity." (OEH 2011: Section 1.4).

The guide also states that consultation with Aboriginal people should include:

"Seeking information from the registered Aboriginal parties (in relation to the area of land to which the proposed application relates) on:

- whether there are any Aboriginal objects of cultural value to Aboriginal people in the area
- whether there are any places of cultural value to Aboriginal people in the area (whether they are Aboriginal places declared under s.84 of the Act or not)." (OEH 2011: 7).

In this case, the PCWP group consulted are not only a registered Aboriginal party, but also comprise the known Wonnarua Aboriginal traditional owners for the project area (e.g., Draper 2018, 2020),

The Guide also emphasises the limitations of document-based local history and the corresponding importance of gathering oral history from identified knowledge holders.

"Local histories often pay little attention to the Aboriginal history of the locality and can present Aboriginal people as invisible, unrelated to important local historical events, or passive victims of colonisation. So while local historical information will provide important and valuable starting points, when investigating historic values involving Aboriginal people and obtaining oral history is important." (OEH 2011: 6).

The NSW Aboriginal cultural heritage significance/values-assessment framework is based on the principles of the Burra charter.

"The identification and assessment of cultural heritage encompasses the four values of the Burra Charter: social, historical, scientific and aesthetic values (Australian ICOMOS 1999 [updated 2013])." (OEH 2011: 7).

The Guidelines interpret these four categories of cultural values as they relate to the NSW National Parks Act (1974) heritage assessment regime.

"Social or cultural value

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.

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 can experience a sense of loss should a place of social or cultural value be damaged or destroyed.

There is not always consensus about a place's social or cultural value. Because people experience places and events differently, expressions of social or cultural value do vary and in some instances will be in direct conflict (Johnston 1992). When identifying values, it is not necessary to agree with or acknowledge the validity of each other's values but it is necessary to document the range of values identified.

Social or cultural value can only be identified through consultation with Aboriginal people. This could involve a range of methodologies, such as cultural mapping, oral histories, archival documentation and specific information provided by Aboriginal people specifically for the investigation." (OEH 2011: 8).

"Historic value

Historic value refers to the associations of a place with a historically important person, event, phase or activity in an Aboriginal community. Historic places do not always have physical evidence of their historical importance (such as structures, planted vegetation or landscape modifications). They may have 'shared' historic values with other (non-Aboriginal) communities.

Places of post-contact Aboriginal history have generally been poorly recognised in investigations of Aboriginal heritage. Consequently the Aboriginal involvement and contribution to important regional historical themes is often missing from accepted historical narratives. This means it is often necessary to collect oral histories along with archival or documentary research to gain a sufficient understanding of historic values." (OEH 2011: 9).

"Scientific (archaeological) value

This refers to the importance of a landscape, area, place or object because of its rarity, representativeness and the extent to which it may contribute to further understanding and information (Australian ICOMOS 1988)." (OEH 2011: 9).

I note that this point is not quite accurate, and reflects an inappropriate archaeological bias - archaeology being in fact a sub-field of anthropology, which is a social science directly concerned with the scientific considerations mentioned above.

"Aesthetic value

This refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with the social values. It may consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use (Australian ICOMOS 1988)." (OEH 2011: 9).

The assessment of these four criteria must have regard to the following questions.

"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 for 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 will 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 characteristics 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 also be given to (DSEWPC):

- 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?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

Discuss what is significant and why – this should be summarised into a statement of significance." (OEH 2011: 10).

The Guidelines also address the assessment of "harm" in terms of an ACHAR assessment (OEH 2011: 12-14).

2.3 ICOMOS Burra Charter

The role of the ICOMOS Burra Charter (Australia ICOMOS 2013) in ACHAR assessment of cultural heritage values (OEH 2011) is summarised in the preceding section of this report, in relation to the four categories of social, historical, scientific and aesthetic values.

The Burra Charter also provides a more detailed definition of "place".

" For the purposes of this Charter:

1.1 Place means a geographically defined area. It may include elements, objects, spaces and views. Place may have tangible and intangible dimensions.

(Explanatory Note: Place has a broad scope and includes natural and cultural features. Place can be large or small: for example, a memorial, a tree, an individual building or group of buildings, the location of an historical event, an urban area or town, a cultural landscape, a garden, an industrial plant, a shipwreck, a site with in situ remains, a stone arrangement, a road or travel route, a community meeting place, a site with spiritual or religious connections.)" (Australia IComos 2013).

The Burra Charter notes that "Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects", and also that "Places may have a range of values for different individuals or groups" (Australia ICOMOS: Section 1.2).

One important aspect of the cultural values of a place lies in its setting.

"Setting means the immediate and extended environment of a place that is part of or contributes to its cultural significance and distinctive character.

Setting may include: structures, spaces, land, water and sky; the visual setting including views to and from the place, and along a cultural route; and other sensory aspects of the setting such as smells and sounds. Setting may also include historical and contemporary relationships, such as use and activities, social and spiritual practices, and relationships with other places, both tangible and intangible." (Australia ICOMOS 2013: Section 1.12).

Article 8 of the Burra Charter states in relation to Setting, that:

"Conservation requires the retention of an appropriate setting. This includes retention of the visual and sensory setting, as well as the retention of spiritual and other cultural relationships that contribute to the cultural significance of the place.

New construction, demolition, intrusions or other changes which would adversely affect the setting or relationships are not appropriate" Australia ICOMOS 2013: Article 8).

Article 9 is concerned with the closely related aspect of Location.

- "9.1 The physical location of a place is part of its cultural significance. A building, work or other element of a place should remain in its historical location. Relocation is generally unacceptable unless this is the sole practical means of ensuring its survival.
- 9.2 Some buildings, works or other elements of places were designed to be readily removable or already have a history of relocation. Provided such buildings, works or other elements do not have significant links with their present location, removal may be appropriate.
- 9.3 If any building, work or other element is moved, it should be moved to an appropriate location and given an appropriate use. Such action should not be to the detriment of any place of cultural significance." (Australia ICOMOS 2013: Article 9).

Both considerations of "Setting" and "Location" are relevant to defining cultural values and in defining "harm" to cultural values.

In terms of participation, the Burra Charter emphasises the important management role of the people for whom the cultural values are significant.

"Conservation, interpretation and management of a place should provide for the participation of people for whom the place has significant associations and meanings, or who have social, spiritual or other cultural responsibilities for the place." (Australia ICOMOS 2013: Article 12).

Article 13 of the Burra Charter specifically acknowledges that co-existing and conflicting cultural values may apply to a specific situation:

"Co-existence of cultural values should always be recognised, respected and encouraged. This is especially important in cases where they conflict.

(Explanatory Note: For some places, conflicting cultural values may affect policy development and management decisions. In Article 13, the term cultural values refers to those beliefs which are important to a cultural group, including but not limited to political, religious, spiritual and moral beliefs. This is broader than values associated with cultural significance.)" (Australia ICOMOS 2013: Article 13).

In the current situation, this could apply to conflicting views reaching back to the conflicts created by European colonisation of the Hunter Valley in the 1820s, or the contrast between the high cultural heritage significance of the Ravensworth Estate for PCWP Wonnarua people in relation to their cultural identity and family history, as opposed to its lack of significance to other Registered Aboriginal parties. This contrast could be attributed to the fact that the other RAPS do not appear to be people of local descent or having any special knowledge of or family history in relation to this place.

2.4 Australia ICOMOS Cultural Heritage Assessment Practice Notes

Since the NSW ACHAR guidelines (OEH 2011) were produced, Australia ICOMOS also has released a series of relevant Practice Notes, which provide more detailed and up-to-date advice on professional standards, issues, and investigative and reporting processes in relation to Aboriginal cultural heritage values for particular places.

2.4.1 The Burra Charter and Indigenous Cultural Heritage Management. Practice Note (Australia ICOMOS 2013a)

This ICOMOS Practice Note provides guidance to practitioners about the application of the Australia ICOMOS Burra Charter, 2013 (Australia ICOMOS 2013) within the field of Indigenous cultural heritage management.

The definition of "place is refined further in relation to Aboriginal cultural heritage values.

"The Burra Charter definition of 'place' is broad and encompasses Indigenous places of cultural significance.

'Place' includes locations that embody spiritual value (such as Dreaming places, sacred landscapes, and stone arrangements), social and historical value (such as massacre sites), as well as scientific value (such as archaeological sites). In fact, one place may be all of these things or may embody all of these values at the same time.

In some cases the find-spot of a single artefact may constitute a 'place'. Equally, a suite of related locations may together comprise a single 'place', such as the many individual elements that make up a Songline. These more complex places are sometimes called a cultural landscape or cultural route." (Australia ICOMOS 2013a: 2).

The comment on the potential "intertwined histories" of places such as rural homesteads receives specific mention.

"Indigenous cultural heritage can include any place with significant Indigenous connections and history. Some of these places may also be valued by other Australians. One place may embody both Indigenous and non-Indigenous values, and all aspects of a place's cultural significance must be considered as part of the assessment. A rural homestead may represent the entwined histories all of those who lived and worked there: a non-Indigenous pastoral family, Aboriginal stockmen and their families for example." (Australia ICOMOS 2013a: 2).

In the current case, the shared history is related particularly to the shared but largely unacknowledged experience of early colonial conflicts, and the lives of the descendants who survived. The critical importance of including the Aboriginal side of such history and heritage values is emphasised.

"Indigenous people are the relevant knowledge-holders for places of Indigenous cultural significance. Their traditional knowledge and experience must be appropriately used and valued in the assessment of places. Advice may need to be sought on who are the relevant knowledge holders.

Practitioners should work collaboratively with Indigenous people and engage with the Indigenous knowledge-holders to gain historic, ethnographic and anthropological data which may be held in a variety of sources including oral, and visual sources, as well as drawing on and sharing information from other sources such as published accounts. Article 4 of the Burra Charter guides that:

'Conservation should make use of all the knowledge, skills and disciplines which can contribute to the study and care of the place'" (Australia ICOMOS 2013a: 3).

Note the references to consultation with 'relevant knowledge holders, not just local district Aboriginal residents. There is a related caution about the dangers of preconceptions and subjective assessments.

"It is important that practitioners do not approach Indigenous heritage with preconceptions about how Indigenous people may value a place. They should listen carefully to the views of Indigenous people and seek to capture those views in the assessment of significance without bias.

During consultation, practitioners should seek to exercise objectivity, and they should be rigorous in the process of gathering relevant information. Practitioners should not be afraid to respectfully ask indepth questions of traditional owners if those questions will clarify issues relevant to significance and conservation. It may be necessary to carefully test the information that is provided.

Practitioners should always ensure that they consult with the appropriate people to speak for country. Practitioners should seek to gather information from a wide range of knowledge-holders, taking account of all kinds of connections, whether 'ancestral', 'traditional' or 'historical'." (Australia ICOMOS 2013a: 3).

Maintaining an objective perspective also entails recognition of the validity of processes of cultural evolution and change.

"Indigenous heritage values can change over time, like the heritage values of all communities. Places of significance to Indigenous people, and the reasons for their cultural significance, may change as Indigenous traditions adapt and evolve, and as Indigenous people are able to reconnect to places that have been denied to them in the past. For example, a place initially assessed as being of spiritual significance may be recognised as a place holding social or scientific value as Indigenous culture changes over time. Assessments of cultural significance should be sensitive to such changes, and this may require revision of assessments of significance." (Australia ICOMOS 2013a: 4).

This ICOMOS Practice Guide also provides awareness of and guidance to dealing with some common assessment issues that are very pertinent to the current situation.

"Issue: Tangible heritage is emphasised at the expense of intangible heritage

Heritage practitioners must not inappropriately privilege tangible places and objects over the intangible aspects of heritage.

Guidance: When preparing an assessment of cultural significance, always be aware that a place may provide the tangible locus for aspects of intangible heritage including traditional stories, medicine, cuisine, songs, dances, and ceremonies.

The associated intangible heritage may be dependent upon the very existence and form of the place. The intangible heritage may also form a key part of the significance of the place, and vice versa.

Intangible heritage may be a part of more recent expressions of meaning and association or it may reference traditions inherited from past generations." (Australia ICOMOS 2013a: 4).

This issue directly relates to the concern of the PCWP Wonnarua informants that ACHAR assessments often are biased towards archaeology, while underplaying or being unaware of important intangible heritage cultural values.

"Issue: Maintenance, preservation, restoration, reconstruction and appropriate 'change' can be culture dependent (Articles 15-20)

Practitioners may identify conservation needs and responses that are at odds with those identified by the traditional owners of a place, with the potential for misunderstanding and conflict.

Guidance: In some Indigenous cultures there is a strong social requirement to 'care for country', with serious physical and spiritual consequences for failing to do so. With respect to places of cultural significance, Indigenous perceptions of what constitutes an appropriate level of physical intervention, or appropriate forms of physical maintenance, may differ from those of heritage practitioners.

Indigenous cultures may be more accepting of change, including physical deterioration, at a place of cultural significance. The appropriate response will require balancing the conservation requirements and ongoing cultural traditions, and should be approached on a case by case basis.

In some Indigenous cultures, traditional techniques in arts and crafts, in the harvesting of resources and in construction, may have been lost due to the dislocations caused by the colonial period. Conservation of significant places provides an opportunity for these traditional skills to be revived, augmented where appropriate by modern techniques." (Australia ICOMOS 2013a: 6).

2.4.2 Understanding and assessing cultural significance. Practice Note (Australia ICOMOS 2013b)

The Australia ICOMOS (2013b) Practice Note on "Understanding and assessing cultural significance" provides guidance for practitioners conducting cultural heritage assessments based on the four categories identified in the Burra Charter (Australia ICOMOS 2013) and described above. Part of this guidance is in the form of the central research questions to ask in considering each category of cultural heritage value.

"In considering aesthetic value, ask:

- Does the place have special compositional or uncommonly attractive qualities involving combinations of colour, textures, spaces, massing, detail, movement, unity, sounds, scents?
- Is the place distinctive within the setting or a prominent visual landmark?
- Does the place have qualities which are inspirational or which evoke strong feelings or special meanings?
- Is the place symbolic for its aesthetic qualities: for example, does it inspire artistic or cultural response, is it represented in art, photography, literature, folk art, folk lore, mythology or other imagery or cultural arts?
- Does the place display particular aesthetic characteristics of an identified style or fashion?
- Does the place show a high degree of creative or technical achievement?" (Australia ICOMOS 2013b: 3).

"To help understand the historic value of a place, ask:

- Is the place associated with an important event or theme in history?
- Is the place important in showing patterns in the development of history locally, in a region, or on a state-wide, or national or global basis?
- Does the place show a high degree of creative or technical achievement for a particular period?
- Is the place associated with a particular person or cultural group important in the history of the local area, state, nationally or globally?"

(Australia ICOMOS 2013b: 3).

"To appreciate scientific value, ask:

- Would further investigation of the place have the potential to reveal substantial new information and new understandings about people, places, processes or practices which are not available from other sources?

(Australia ICOMOS 2013b: 3).

"To understand social value, ask:

- -Is the place important as a local marker or symbol?
- -Is the place important as part of community identity or the identity of a particular cultural group?
- -Is the place important to a community or cultural group because of associations and meanings developed from long use and association?"

(Australia ICOMOS 2013b: 4).

The Practice Note also considers an additional category, "spiritual value"

"To appreciate spiritual value, ask:

- Does the place contribute to the spiritual identity or belief system of a cultural group?
- Is the place a repository of knowledge, traditional art or lore related to spiritual practice of a cultural group?
- Is the place important in maintaining the spiritual health and wellbeing of a culture or group?
- Do the physical attributes of the place play a role in recalling or awakening an understanding of an individual or a group's relationship with the spiritual realm?
- Do the spiritual values of the place find expression in cultural practices or human-made structures, or inspire creative works?"

(Australia ICOMOS 2013b: 4).

The Practice Note also provides advice on "locating cultural signficance":

"The Burra Charter says that cultural significance is embodied in the place—in its fabric, setting, use, associations and meanings. It may exist in: objects at the place or associated with it; in other places that have some relationship to the place; and in the activities and traditional and customary practices that may occur at the place or that are dependent on the place.

A place may have multiple aspects of significance and these may or may not be interdependent. The process of assessing cultural significance should include defining the tangible and intangible attributes that embody each aspect of cultural significance.

For example, a bora ring or a temple is the tangible expression of the spiritual values of certain cultural groups while the ceremonies and rituals that are held at each place are the intangible expressions. For some cultural groups the meanings and associations of a place may transcend all the Burra Charter criteria. For example, the meaning of a place or country to an associated Indigenous group may be the source of and underpin fundamental aspects of their identity, purpose, meaning, cultural obligations or practices. Such meanings may not be able to be defined or described adequately in Western cultural terms.

It is also desirable to determine how important each of these attributes or expressions is in supporting the significance of the place." (Australia ICOMOS 2013b: 4-5).

The Practice Note also refers to some common issues encountered in understanding and assessing cultural significance. Two of those issues are directly relevant to the purpose of this report. The first of these issues concerns the potential for a 'Place' to be too narrowly defined.

"Issue: Place is too narrowly defined

'Place' in the Burra Charter has a broad meaning, and includes its elements, objects, spaces and views. Place may have tangible and intangible aspects.

Guidance: A place should be considered in its wider physical, social or spiritual context. It should not be assessed in isolation.

A group of individual places with shared histories, common social associations, or complementary aesthetic characteristics may form a larger 'place' or a serial place.

Care is needed in defining the extent of the place and the tangible and intangible elements of the place. Its setting may include views to and from the place, its cultural context and relationships, and links between this place and other places: refer to Articles 1.12 and 8 in the Burra Charter." (Australia ICOMOS 2013b: 8).

The second issue addressed is the importance of involving the Aboriginal traditional Owners who actually have cultural and historical associations with and knowledge of the place concerned.

"Issue: Importance of involving those with associations and knowledge

Places may have important associations with communities, cultural groups and individuals, and these associations should be considered in assessing significance.

Guidance: Assessment of cultural significance should involve all those for whom the place may have significant associations and meanings, including those who hold cultural knowledge about and responsibilities for a place.

In some traditional cultures and in other groups, relevant knowledge may reside in only a limited number of people. They should be identified and consulted. In particular, engagement with relevant knowledge-holders will be essential where cultural significance assessments concern social and spiritual values.

Review of preliminary conclusions by those with significant associations or cultural connections will help ensure that their values have been understood and clearly articulated." (Australia ICOMOS 2013b: 8)

This Practice Note also points out the primary importance of the social values of the present community, beyond connections revealed by historical research.

"Social value is the value to the present community, and is not the same as social history. Historical research into past connections and users of a place can provide a useful foundation for understanding social value.

A variety of social research methods can be used to help assess social value. Generally these include direct engagement with the communities or cultural groups that have known associations with the place using established research techniques such as interviews, group discussions and surveys." (Australia ICOMOS 2013b: 8-9).

Australia ICOMOS 2017 Intangible cultural heritage and place. Practice Note, Australia ICOMOS Inc.

2.4.3 Intangible cultural heritage and place. Practice Note, Australia ICOMOS (2017)

The Australia ICOMOS (2017) Practice Note on Intangible cultural heritage and place provides guidance for practitioners involved in the description and assessment of intangible cultural heritage values.

"Article 2 of the UNESCO Convention defines intangible cultural heritage as:

The intangible cultural heritage means the practice, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity.

Both the scope and terminology of the UNESCO Convention differ from the scope and terms used in the Burra Charter, its explanatory notes and other Practice Notes. The UNESCO Convention applies to the wide spectrum of intangible cultural heritage, irrespective of its association with a place or specific places, whereas the Burra Charter applies to places of cultural significance. The UNESCO convention uses the terms space, cultural space and natural space to refer to locations associated with the expression of intangible cultural heritage; this meaning is covered by the Burra Charter definitions of place and fabric." (Australia ICOMOS 2017: 1-2).

This Practice Note lists the range of defining characteristics of intangible cultural heritage and place.

- "• Intangible cultural heritage is an aspect of the associations that may exist between people and a place, and that contributes to the cultural significance of the place.
- Intangible cultural heritage is a form of knowledge, skills or techniques that is passed from person to person over time, and often across generations.
- Intangible cultural heritage may be known and important to a specific community or group or to a wider community or the society as a whole.
- Intangible cultural heritage may be traditional or contemporary or both, and is part of the life of its community or group.
- Intangible cultural heritage is often dynamic and may be characterised by continuity, adaptation, and revival, along with changes in methods, materials used, and technology.
- Intangible cultural heritage may be enriched through continuing cultural creativity, responses to the environment and nature, and interaction with other groups.
- Intangible cultural heritage is often undertaken, performed or practised by people with specific skills, knowledge or status within the community or group and who may have the responsibility for passing on the knowledge." (Australia ICOMOS 2017: 2).

A place may have both intangible and tangible attributes that contribute to its cultural significance. In relation to place, intangible cultural heritage may include cultural practices that:

- "• are part of the use of a place.
- relate to a single place, a series of places, or a large place such as a landscape or cultural route, or the setting or approach route to a place.
- relate to a place as a whole or to particular spaces within a place.
- are specific to the place, have modified the place or be modified by the place.
- occur away from a place but be symbolically or spiritually connected to that place.
- relate to or use objects and artefacts that are part of the contents of the place, or stored elsewhere.
- result in the creation of artefacts or objects which are retained or disposed of as part of the practice." (Australia ICOMOS 2017: 2-3).

3 Cultural Heritage Values on Record

3.1 Contact History: Rapid Colonisation and Conflict

As noted in the preceding Section, the ACHM ACHAR report for this project (Canning 2019) does not come to grips with the scope, intensity, or detail of the colonial frontier conflict that was focussed around Ravensworth and Bowman's and Glennies' creeks in the 1820s, or its enduring impact upon surviving Wonnarua families. In fact, as pointed out by Dunn (2015), these aspects of the early colonial history of the Hunter Valley have received scant attention at all in historical or ethnographic research.

Map3-1 shows the numerous small archaeological sites previously recorded within the Glenell expansion area. These are mostly small, surface artefact scatters, many of them disturbed by erosion or secondary accumulations. This map also shows places mentioned in the report close to the project area. Places further afield along Glennies Creek (Fal Brook) to the east, and Mt. Arthur to the west, are shown in Map 1-1 above.

After Howe's second exploratory expedition to the Hunter Valley in March 1820, he was promised a grant of 700 acres at Patricks Plains (now Singleton) for his discoveries, with other members of his party also taking up land around the Singleton area. The land promised to Howe marked the beginnings of European expansion into the middle valley (Dunn 2019: 2-3). By August 1822 he occupied land at Patricks Plains, and other Europeans were using his track to access the Hunter Valley. As their numbers increased, Governor Brisbane ordered land surveys along the Hunter River for partitioning into land grants, and Henry Dangar commenced this work in March 1822 (Dunn 2019: 3).

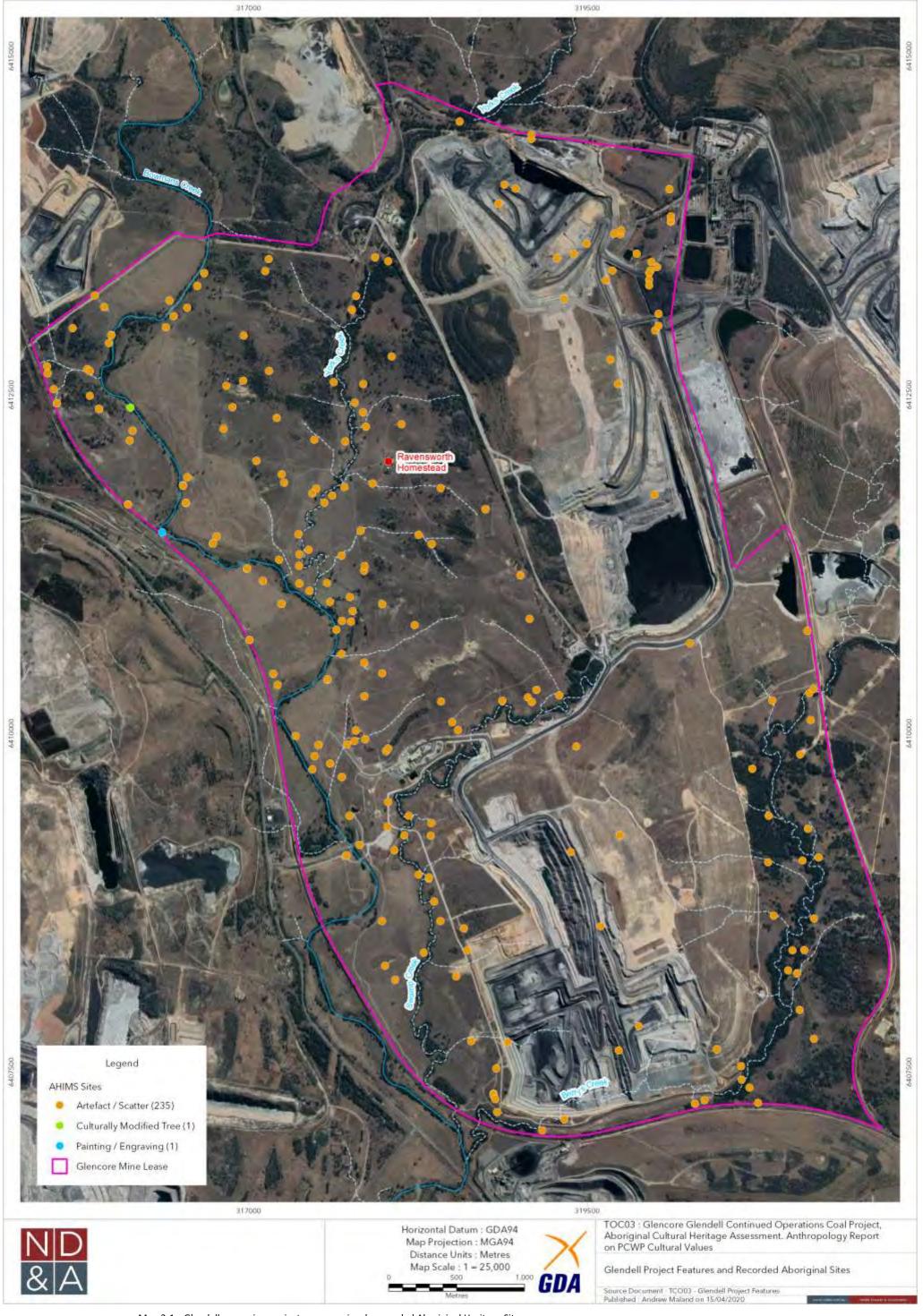
From March of 1822 to November of 1826, Dangar (1828:127-128) reported on the 'extraordinary advances in settlement' that were being made by the colony along the Hunter River. Dangar (1828) describes an:

".... amazing extent of 372,144 acres were appropriated by settlers; 132,164 acres were allotted for church and school purposes, to which may be added 100,000 acres were surveyed and not appropriated; making altogether 604,305 acres. In this division of the country, occupying upwards of 150 miles along the river, which, in 1822 possessed little more than its Aboriginal inhabitants." Dangar (1828:127-128)

Dunn (2019) summarises the role of Ravensworth and neighbouring properties along Glennies Creek (sometimes called Fal Brook) and Bowman's Creek in this very rapid process of colonisation.

"For five years Dangar worked on the survey (refer Figure 1). In July 1824 he reached the area around what is now Ravensworth, in the County of Durham. He named Fal Brook (now Glennies Creek) and Foy Brook (now Bowmans Creek) and dividing the land around Ravensworth into squares ready for settlement in what was named the Parish of Liddel (sic).5 A number of settlers had already been granted land in the Parish of Ravensworth prior to the survey. A 2597 acre grant had been made to the Church and School Estate, while Ebenezer Bunker had received 600 acres in March 1821, William Powditch had been granted 2000 acres in July 1824, with a further 500 acres purchased in May 1825, Captain John Brabyn had received his 800 acres in June 1824 and James Bowman had taken up 2560 acres at the same time. Bowman was granted a further 4600 acres and purchased an extra 5000 in May 1825. The only land then surveyed in the Parish of Liddell adjacent to the Parish of Ravensworth was land set aside as the Church and School Estate of 2560 acres.6" (Dunn 2019: 3).

Dunn's (2019) Figure 1 is a detail from Henry Dangar's 1828 map showing the County of Durham and the Parishes he surveyed from 1822-1827. The Parish of Ravensworth and Liddel are shown. The numbers correspond to the portions surveyed by Dangar. In the Parish of Ravensworth these are [1] Church and School Estate [2] Ebenezer Bunker [3+4] William Powditch [5] John Brabyn [6-8] James Bowman (Figure 3-1).



Map 3-1: Glendell expansion project area: previously reocrded Aboriginal Heritage Sites

In relation to Bowman's growing holdings, centred on Ravensworth, Dunn notes:

".... Bowman applied for and received a total of 12,160 acres in three portions, bounded by Foy Brook and Yorks Creek, which ran into the Hunter River. Bowman named his grant Ravensworth. Bowman was visiting the Hunter from August 1824 and occupied the estate late in 1824. He likely sent his convicts and overseer first to clear land and start the construction of the original house and associated outbuildings. By mid- 1825 the Ravensworth estate was described by Peter Cunningham, another settler in the district (his estate was Dalswinton near present day Denman), as being partly fenced, under cultivation with extensive buildings for packing and sorting wool, with Bowman's flocks being numerous and amongst the finest cross-breeds in the colony.8 In a letter to the Colonial Secretary in November 1826, Bowman described his estate as having "Sheep sheds, wool house, stores, cottage, kitchen, huts for ten men etc, which cost me Two Hundred and Sixty Pounds", with three miles of fence and 34 convicts.9

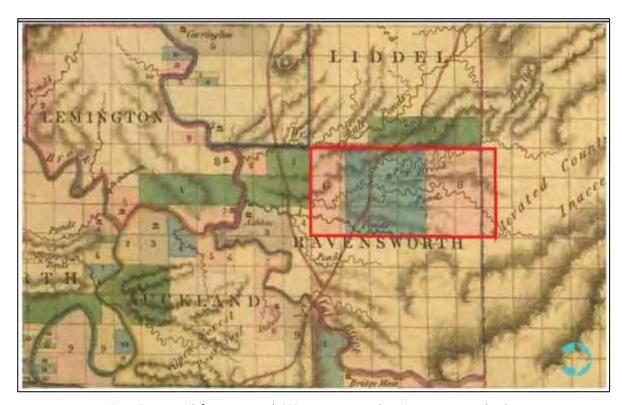


Figure 3-1: Detail from Dangar (1828 survey Map, showing Bowman and other properties in the Ravensworth Parish (Dunn 2019: Figure 1).

The location of Bowman's first cottage and its collection of outbuildings at Ravensworth was on the high ground between the two creeks, with views back across the estate, approximately 850m to the west of the current homestead. The land was made up of a series of gentle hills and alluvial flats, with Foy Brook (Bowmans Creek), Yorks Creek and other small creeks and rivulets across the farm. Bowman was not alone in this part of the valley, although his homestead had no neighbours in sight, with the surrounding hills blocking direct views. To the east, (approximately 11km in a straight line) Robert Lethbridge, a Lieutenant in the Royal Navy, had taken up his 1000 acre estate named Bridgman on Fal Brook (Glennies Creek) by May 1825. As Lethbridge spent much of his time in Parramatta where he was a member of the local bench of magistrates, the estate was managed by Richard Alcorn, who himself had a small parcel of 60 acres close by also on Fal Brook. Alcorn's farm adjoined the 60 acres of Duncan Kennedy, promised by Governor Macquarie in 1821 but later passed to John Cuneen (who appears on the Crown Plan for the area) in 1836, with the 100 acres of James Chilcott next to that. All three properties had frontage to Fal Brook. Alcorn and Chilcott both had small huts on their properties, as did Lethbridge." (Dunn 2019: 4-5).

These locations are shown in Dunn's (2019) Figure 2, a detail from the County of Durham Plan circa 1843, showing the locations of Bowman's Ravensworth estate, Glennies; property on Fal Brookand Lethbridge's farm further

along Falbrook. An arrow shows the bend in Glennies Creek where Chilcott's and Alcorn's huts were located (Figure 3-2).

Conflict between local Aboriginal people and the "settlers" began with the first land grants in 1821-22, and involved raids on huts and crops from around Newcastle up to Patricks Plains in 1822-24. The first recorded fatality among the settlers was Robert Greig near Denman in 1825, probably in reprisal for attempting to drive out the local Aboriginal people. Soon after, between Ravenswood and Denman, two stockmen were speared and another convict stockman was saved by other Europeans (Dunn 2015: 188; 2019: 6).

"However increasing numbers of European livestock, growing areas of cultivation and European farms along the rivers did begin to compromise traditional food sources by the mid-1820s. European hunting of kangaroos and emus with dogs for sport disrupted this food source, scattering mobs from their feeding grounds. Flocks of sheep tended by shepherds and herds of cattle let loose in the bush gradually trampled native pastures. New settlers now ensconced on their grants, worked to clear the land, erecting huts and planting orchards while their convict servants built fences, systematically locking in land parcels. Their growing sense of entitlement and ownership appears to have worked to harden their views on an Aboriginal presence in their neighbourhood. So, soon after many of these settlers had utilised the skills of Aboriginal guides and interpreters, they were putting in place measures, often threatening or violent, to exclude Aborigines from the very country they had led them through. Evidence of extreme violence and depravity committed by European settlers and their convict servants were seemingly overlooked in the quest to secure land and property." (Dunn 2015: 190-191).

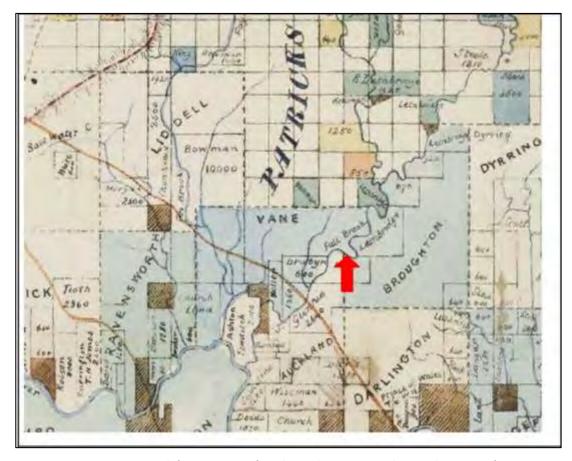


Figure 3-2: Detail from County of Durham Plan c. 1843, showing locations of Bowmans, Glennies and Lethbridges estates, and Chilcott's and Alcorn's huts (arrowed).

The increasing conflict in the Hunter Valley was not isolated. It was linked to the larger uprising of the neighbouring Wiradjuri people around Bathurst and Mudgee in the minds of the colonists, but also in cooperative resistance involving the Wiradjuri and Wonnarua together near their mutual traditional boundary.

"Reports of clashes between Europeans and Aborigines in the districts around Bathurst in 1824 had heightened tensions and nervous fears in the Hunter Valley, particularly amongst the settlers in the upper valley who were the most isolated from the population centres and garrisons. The violence in the west between Europeans and Wiradjuri had raged through 1824 and culminated with Governor Thomas Brisbane stationing 75 soldiers of the 40th Regiment at Bathurst and declaring martial law in August. A series of clashes between the troops under the command of Major James Morisset, formerly the Commandant at Newcastle, the killing of 16 Aboriginal men at Mudgee by William Cox's overseer and two other stockmen, and disruption caused by the need for constant relocation through fear of attack, combined to force the Wiradjuri to sue for peace in October 1824.²² The terrible violence that had swept through Bathurst was feared in the Hunter in late 1825 as rumours spread that bands of Wiradjuri from the Mudgee area had linked up with Hunter groups and led a series of attacks on isolated outposts in the mountainous country around Wollombi on the southern edges of the Hunter settlements including a raid on Joseph Onus' property where food and clothing were taken.²³"

[22 Connor, The Australian Frontier Wars, pp. 58-60.

23 Milliss, Waterloo Creek, p. 54.] (Dunn 2015: 195-196).

Soon after the Wollombi attacks, there were reports of attacks on farms along the Hunter, at Invermein, Segenhoe, and on the main road above Bowman's Ravensworth estate. These raids and robberies escalated with the killing of Robert Greig and his convict servant (Dunn 2015: 196).

"... the local magistrates sent to investigate wondered if it was due to Greig's known aversion to having Aboriginal people around him.²⁵"

[25 Report of Magistrates Mr Scott and Mr McLeod, 3 October 1826, Governor's Despatches, ML, Volume 8, A1197, p. 341] (Dunn 2015: 196).

His brother James Greig "... had been told by another friendly Aboriginal man that Robert had taken a man and beaten him, which had "irritated the tribe he belonged to, and caused Robert Greig's untimely end" (Dunn 2015: 197).

Unrestrained and indiscriminate reprisals from the military further exacerbated the situation.

"Following the attack on Greig's property, the Aboriginal raiders withdrew into the mountains to the south, a move the magistrates and later Cunningham described as a retreat made in dread of the European reaction. Two more European shepherds were attacked, one of whom was killed. The potential for an escalation of the violence was not helped by the party of soldiers sent from Windsor to Putty to intercept the raiders. Instead they encountered and killed several members of what was later discovered to be a friendly Aboriginal group.³²"

[32 Cunningham, Two Years in NSW, p. 198; Milliss, Waterloo Creek, p. 55] (Dunn 2015: 198].

Ten soldiers accompanied by constables were deployed to the Hunter from Newcastle as a result of this unrest. Some Aboriginal men identified as being involved in the raids were arrested but escaped. At the same time, George Forbes' Edinglassie estate was attacked (Dunn 2015: 199). PCWP ancestor King Billy was identified as one of the attackers at Forbes, and sent to jail in Newcastle (Dunn 2015: 200; The Australian, 17 June 1826, p. 2).

There were two attacks on stockman at Bowman's Ravensworth estate over the next week, and two stockmen were killed in their hut during the second incident (Dunn 2015: 200).

In June 1826, the detachment of soldiers and bush constables from Newcastle searched unsuccessfully for Grieg's assailants, and at the same time a shepherd was speared near Pike's on the Hunter River. In the same month, two of Bowman's convicts were killed, one in the bush and one in a hut somewhere on the estate. Then Chilcott's hut on Fal Brook (Glennies Creek) was raided by a group of Wonnarua men, who were driven off by farm workers. Magistrates Scott and Macleod reported to the Colonial Secretary (Watson and Chapman 1914:611) that the same group who killed the men at Bowman's station attempted to pillage James Chilcott's house, leading to a struggle between Chilcott and a man named Cato. Two other men working on fences on Bowman's estate also were attacked and injured (Dunn 2019: 6).

In response to this escalating conflict, the soldiers already in the Hunter were reinforced by a detachment of the newly-formed Mounted Police commanded by Lt. Nathaniel Lowe:

"In August, Lieutenant Lowe's detachment, travelling with local settlers John Lanarch from Patricks Plains and James Glennie, a neighbour of Bowman's, had come across and captured a number of Aboriginal men they suspected of having been involved in the attack at Chilcott's: first a single man, and then a group of at least seven men and one boy, including Cato. The captured group were tethered together and led by one of the mounted troopers to Chilcott's farm, where a number of them, including Cato, were identified as having been involved in the raids on Chilcott as well as the attack on Bowman's men, and then onto to Lethbridge's, although here none were identified.22

With the identification made, the three youngest were released and the rest restrained to be returned to Wallis Plains. Of the Aboriginal men taken, five including Cato and the first unnamed man were killed in the bush, attempting to escape from custody according to Lowe and his men. One was shot close to James Glennies hut on Fal Brook, with Glennie reporting hearing a shot soon after he left the party near his house. That is all the men reported captured, except the boys, were killed.23

Despite an inquiry established by Governor Darling and his attorney general Saxe Bannister, it was not known exactly where all the killings had taken place as each man interviewed gave a slightly different version of events. In January 1827, Threlkeld wrote to Bannister with further details of the events as told to him by an unnamed witness in the presence of another settler John Cobb. The witness said that one of the Aboriginal men suspected of involvement in the wounding of Bowman's men was captured and bought to Bowman's hut. Here he was secured with a rope around his neck, and then under armed guard he was taken one mile from the hut into the forest, made to climb a tree and tie the rope to an extended branch, whereupon he was shot. Wounded by the Europeans he was let fall and left hanging.24 Based on the date (1826) the hut referred to was the original Bowman homestead, on the ridge line above the creeks to the west of the later, and current, Ravensworth house complex of which was built c1832." (Dunn 2019: 9).

The Enquiry did not reveal much about the real extent of the violence in the Hunter or its causes, so Governor Darling convened a second a second investigation by the local magistrates Robert Scott and E. C. Close, during which Lowe and his troops gave their version of events in a series of depositions (Dunn 2015: 202). They said that on 12 August 1826 they captured an Aboriginal man they believed involved in the attacks at Bowman's and Glennies' estates, and tethered him to one of the horses, to lead them in pursuit of the others. He was shot down attempting to escape, and they hung his body over a fence as a warning to others (Dunn 2015: 202; 45 Deposition of Mr John Lanarch, 6 October 1826, Re: Aboriginal Outrages 1826, ML, Government Despatches, Vol. 8, A1197, p. 324.)

"A letter from Threlkeld to the Attorney General in August 1826 strengthens the suspicion that Lanarch was not telling the full truth of the incident. Threlkeld visited the hospital in Newcastle and spoke to the wounded fencer, who confirmed that he had been chopping wood when a spear hit him in the back. The fencer ran but was set upon by an Aboriginal man who beat him with a cudgel. The following day, soldiers appeared at his hut with a captured Aboriginal man, whom he recognised as one of the group, but not the one who had thrown the spear or attacked him. Despite this, the soldiers took the man outside, tied him to a tree and shot him, leaving the body trussed up at the spot of execution. 46"

[46 Threlkeld to Attorney General, 21 August, 1826, Supreme Court of NSW, 'Memoranda selected from 24 years of missionary engagements in the South Sea Islands and Australia by LE Threlkeld 1838', SRNSW, NRS 13705, COD 554, 5/1123, p. 46] (Dunn 2015: 203).

This is not the only aspect of this encounter for which the original reporting was called into doubt.

"Sometime after this, the troopers encountered a party of Aborigines and in the ensuing action took a number of them as prisoners. Although no accurate figure is recorded at least seven men and boys were captured. The group was tied up like the first prisoner and then led back to Chilcott's farm via Bowman's, where they were identified as the men involved in the raids in June. On their way back down the river towards Wallis Plains the captives managed to loosen their bindings and made to escape. Three were shot. However, whether this occurred in one place, two places or three places depended on which trooper was giving evidence. What was clarified was that Lowe, having experience on the frontier around Bathurst, had instructed his men that if any prisoner attempted to escape they were to be shot. If they did not fire Lowe would be compelled to bring the troopers to trial for not doing their duty. ⁴⁷ Sergeant Moore claimed the three were shot together as they escaped into the brush where the mounted police could not follow.

Private John Lee remembered one being shot escaping and then the other two in similar circumstances. Private James Fielding recalled that every effort was made to get the escaping men to return before they were fired on; while Private George Castles reported that the three were shot in different places and circumstances where they could not be followed by the troops. All denied reports that Aboriginal prisoners had been hung in a tree by the troops, although Fielding said one of them may have been hung up after they left. John Lanarch testified that Lowe's men had hung the body of one of the Aboriginal prisoners on the farm as a terror to the others.

One of the men in custody was Cato, identified as the main assailant at Chilcott's farm. James Glennie testified that on being taken to Chilcott's farm, Cato refused to cross the creek and was forced on by soldiers beating him with the flats of their swords. Glennie left the group at his own farm, where three of the youngest captives were released. Soon after he reported hearing a single pistol shot as Cato was killed.⁵⁰

As terrible as it all was, the actions of the troops were seen by the metropolitan newspapers in the context of the supposed outrages against settlers, and the justifiable actions of those attempting to bring prisoners in difficult and confusing circumstances. But the report of the magistrates did not cover all the details that were emerging out of the bush. Reports from Aboriginal people escaping to the sanctuary of Threlkeld's mission told of even darker tales of executions and torture. The inconsistencies of the first magistrates report, followed by further obfuscations in the second enquiry and the urging of Threlkeld's letters to Bannister resulted in Darling ordering a third investigation. After a false start, Acting Attorney General W. H. Moore travelled to Newcastle and Wallis Plains in January 1827 before reporting to the Executive Council in Sydney. By then it was hardly a secret that terror was a weapon employed by the Europeans against the Aboriginal population. A report in The Australian by a "wandering" anonymous correspondent in the Hunter in February 1827 explained some of the methods used by settlers:

'We saw the skull of a black fellow who had been shot dead with a pistol ball, in the act of making his escape from a party of police. The respectable settler in whose house it is preserved, suffers it to remain carelessly on a table or shelf opposite his door, and the blacks who look on it with a superstitious dread, will hardly come near the house much less enter it; the skull acting as a powerful talisman to keep them off at all hours.'52"

- [47 Deposition of Lieutenant Nathanial Lowe, 6 October 1826, Re: Aboriginal Outrages 1826, ML, Government Despatches, Vol. 8, A1197, p. 304
- 48 Deposition of Sergeant Lewis Moore, John Lee, Jams Fielding and George Castles, 6 October 1826, Re: Aboriginal Outrages 1826, ML Government Despatches Vol. 8 A1197, pp. 308-320.
- 49 Deposition of Mr John Lanarch, 6 October 1826, Re: Aboriginal Outrages 1826, ML Government Despatches Vol. 8 A1197, p. 325.
- 50 Deposition of James Glennie, 6 October 1826, Re: Aboriginal Outrages 1826, ML Government Despatches Vol. 8 A1197, p. 329.
- 51 Wood, Dawn in the Valley, p. 131.
- 52 The Australian, 17 February 1827, p. 2] (Dunn 2015: 203-205).

Threlkeld provided Attorney General Moore with additional reports of executions. One was the execution by firing squad at the Wallis Plains goal of Jackey Jackey, arrested in relation to the killing of Bowman's stockman on Ravensworth (Dunn 2015: 205). Another was the alleged hanging at Bowman's estate at Ravensworth.

"Again at Bowman's, a man was taken during the pursuit of those involved in the spearing of the stockman. This man was bought in to Bowman's, where a rope was secured around his neck and he was forced to climb a nearby tree and tie the rope to a branch. The Europeans then proceeded to fire their muskets at him, wounding him twice before he fell and was left hanging in the tree. Threlkeld said that the person who supplied the rope had told his informant of the incident. This was not the first report of Aboriginal people being hung in the trees in the district. In July 1826 Threlkeld had been told by McGill, one of his interpreters, that a man caught stealing corn had been shot and hung in the trees with the corn cob stuck in his mouth as a warning to others. Indeed the hanging of Aboriginal warriors had also been employed as a tactic of terror along the Hawkesbury in the 1790s and at Appin in 1816.

[54 Gunson, Australian Reminiscences, p. 95.

55 Gunson, Australian Reminiscences, p. 92.

56 Connor, The Australian Frontier Wars, p. 51] (Dunn 2015: 206-207).

As described by Dunn (2015: 207), these events were the catalyst for further hostilities along the Hunter River.

"Lowe's atrocities appeared to have succeeded in subduing the attacks and by mid-July Allman was reporting no acts of violence in the previous few weeks and that Lowe's "exertions" gave reason to hope for no more. The But this was not to be. If anything, Lowe's tactics inflamed the situation and united large bodies of warriors across the upper Hunter. On August 8, Threlkeld wrote to Saxe Bannister again, warning him that an Aboriginal man had come to the mission on Lake Macquarie with news that a large number of Aborigines was gathered in the mountains around the upper Hunter. They were threatening to descend into the valley and burn all the houses of all the Europeans unless the man Billy was released from the Newcastle gaol. They were worried that Billy would be shot like Jackey Jackey. Se"

[57 Milliss, Waterloo Creek, p. 55.

58 Gunson, Australian Reminiscences, p. 92] (Dunn 2015: 207).

The "Billy" referred to is claimed to be an ancestor of the Franks, Foote and Lester families, known as "King Billy" for a "King Plate" that he had and wore in photographs later in life. The descendants claim that he was born at the Betty's Creek stone arrangement site, about 6km north east of Ravensworth homestead, which would place the Bowman, Lethbridge and Glennies estates at the centre of his traditional country. It is not clear to me what his actual genealogical connection to this family was, although that is not unusual after nearly 200 years (see Section 4.4.3 below).

In fact, the raids and reprisals overwhelmingly involved local Wonnarua families. When Captain Foley wrote to Lieutenant De La Condamine, the Military Secretary of the Colony, of his observations and actions in the immediate days after the attacks on Chilcott's and Alcorn's huts, he stated that:

"It may be necessary to observe that all the acts of outrage have been committed without exception by Natives who are domesticated on the very Estates, where that have occurred, and not by the incursions of unknown or wild tribes; every one of those is perfectly and intimately known by names, they have received amongst the Settlers, near whom they have dwelt." (HRA 1919: 617).

There was another serious incident further up the Hunter at Merton, William Ogilvie's property, in late August 1826. This involved a large group of Aboriginal men to whom Dunn unaccountably refers to as a "a war party of upwards of 200 warriors" (2019: 9). The memoirs of Ogilvies' son record that:

".... soldiers had persuaded some of the Blacks to come to Merton under pretence of seeking guides to go after the bushrangers, but when the Blacks came they seized two of them (our Chief Jerry and another man) believing that this Jerry was a murderer of the same name for whom a reward was offered." (Bundock 1896).

The Ogilvies themselves interceded to secure the release of Jerry, and later the two boys who had been taken to Newcastle.

Soon after, on August 28, a group of approximately 15 Aboriginal men gathered at the hut of Richard Alcorn, overseer for Captain Robert Lethbridge on the Bridgman estate at Fal Brook. They requested and were given food. When Alcorn arrived, he recognized three of the men believed to have been involved in the raid on Chilcott's hut. He attempted to get them to leave, but they attacked, with the Europeans besieged in the hut. Mounted police stationed at Glennie's property nearby and the attackers raided adjoining worker's huts and retreated (Dunn 2019: 10).

Magistrate Robert Scott inspected the scene of the attack the next day, and ascertained that the men responsible were not the same one involved in previous incidents, but but Woodbury named four, including three from the Chilcott's Hut raid. Scott's possee of mounted police, local men and Aboriginal trackers encountered an Aboriginal camp approximately 32km away 5 days after the attack. Scott described what followed as a skirmish in which one European was speared, two Aborigines killed and an unknown number wounded (Dunn 2019: 11).

"The Australian newspaper however provided a more detailed account as reported to them: the pursuing group led by Scott came on the camp in the evening, guided in by the light of the camp fires. Two of the party, one European and one Aboriginal tracker, each with a musket, were sent forward to reconnoitre the site, but being seen they fired into the camp and then retreated behind trees to reload. The Aboriginal tracker was struck in the face with a spear, but was not killed, and the rest of the party rushed forward to join the fight. As each was armed with a musket, their firing resulted in the death of eighteen Aborigines and the capture of a man and a woman.32" (Dunn 2019: 12).

Another, local history version is provided in "The Glennies Creek Story" (Noble 19--):

"The natives had made camp near the creek on the hill at Mt. Pleasant (Upper Falbrook). Around daylight a number of settlers and police were approaching to surround the natives and but for a young girl who was going to the creek for a drink, who warned them, all the natives would have been annihilated. In the fight that ensued one white man was injured, some Koori [= Wonnarua] were killed and some where wounded, the others had managed to escape into the hills.

As a result of this attack, two more policemen were stationed at 'Dulwich' and 'Ravensworth' and one at 'The Goodlands', James Chilcott's farm." (Noble 19--: 18, reference to calling Wonnarua "Koori", page 1).

In September 2016, eleven landholders signed a petition requesting replacements or reinforcements for the mounted police, most of whom had been withdrawn after Lowe's actions, leaving only a small detachment stationed at Glennies on Fal Brook. They wanted to be safeguarded from further attacks. James Bowman was the first signatory (Dunn 2019: 9, 12).

Governor Darling replied to the petitioners that perhaps they should spend more time on those properties rather than in Sydney where the majority resided permanently, to set an example to their servants and prevent "irregularities" occurring. However, he also declared that if the settlers united and took "vigorous measures for their own defence", they would be more effective than the military and would receive the support of the government in doing so (Dunn 2015: 217).

There was a further altercation recorded on Bowman's estate.

"Following Scott's attack on the camp site, one more serious incident was recorded in the area. In his summary of events in the Valley, Robert Scott reported to the Governor on 3 October 1826 that a body of warriors attacked some fencer's working on Bowman's estate, the third time Bowman's had been targeted. Five fencers were alerted by the barking of their dogs to the approaching warriors and managed to get to their weapons before the attack, wounding an Aboriginal man but sustaining no injuries themselves. 36" (Dunn 2019: 12; Watson and Chapman 1914:610-615).

There were ongoing clashes in this general area in late 1826 and early 1827. In September 1826, Governor Darling wrote to Under-secretary Hay about the ongoing conflicts, noting:

"You will be aware by my former Correspondence that I have always considered that the Natives have been aggrieved by the Stock Men, which, I am satisfied, has alone prevented a good understanding being established with them." (Watson and Chapman 1914:574-575).

However, Darling also reported to Haye that he had ordered a detachment of troops to the Hunter to punish the Aboriginal people considered to be the aggressors.

Darling also wrote to Earl Bathurst in an October Despatch:

"But I fear the conduct of the Natives has not been altogether unprovoked; and, being strict observers of the Law of retaliation, I am informed that they never fail to exact blood for blood." (Watson and Chapman 1914: 608).

In a separate dispatch discussing his request for the investigation of the killing of an Aboriginal man in custody, together with the separate killing of three other men, Darling wrote:

".... it is impossible to subscribe to the massacre of prisoners in cold blood as a measure of justifiable policy." (Watson and Chapman 1914: 623)

In March 1827, one of Bowman's overseers, Samuel Owen, was accosted by a group of 15 Aboriginal men (some he knew) while returning to Ravensworth from searching for stray cattle. Cobborn Mary, the wife of Byirybyrry, arrived and spoke to the men, convincing them to leave without harming Owen. On the same day, Benjamin Singleton at Patricks Plains and James Glennie both reported cattle having been speared (Dunn 2019: 13). Reports of conflict declined after that, with few made after the middle of 1827 (Dunn 2019: 13).

Dunn points out that from about the same time onwards, there are some records of more positive interaction with settler landholders employing Aboriginal workers, though not on Bowman's estates.

"Not all interactions in the middle Hunter during this period were violent. Many of the estates and farms also employed Aboriginal people in work, paying them with food, tobacco and blankets. Although there is no evidence of Bowman employing Aboriginal workers, Robert Scott did on his estate at Glendon, as did William Ogilvie at Merton, including some in permanent work as shepherds. In 1826 Peter Cunningham employed 50 Aboriginal workers to cut and collect his maize crop, George Wyndham employed Aboriginal workers in 1830 and 1833 to cut maize, while William Bell at his Lemington estate on the Hunter River close to Ravensworth employed Aboriginal men to build bark races for his sheep during shearing in 1833.40" (Dunn 2019: 13).

A report in The Australian by a "wandering" anonymous correspondent in the Hunter in February 1827 explained some of the methods used by settlers to subdue surviving local Wonnarua people.

"We saw the skull of a black fellow who had been shot dead with a pistol ball, in the act of making his escape from a party of police. The respectable settler in whose house it is preserved, suffers it to remain carelessly on a table or shelf opposite his door, and the blacks who look on it with a superstitious dread, will hardly come near the house much less enter it; the skull acting as a powerful talisman to keep them off at all hours.⁵²"

[52 The Australian, 17 February 1827, p. 2] (Dunn 2015: 205).

Dunn (2015) quotes William Breton's statement after visiting the Hunter Valley in 1833, that:

"We have taken possession of their country, and are determined to keep it; if therefore they destroy the settlers, or their property, they must expect the law of retaliation will be put in force, and that reprisals will be committed upon themselves." (Dunn 2015: 214; 71 Breton, Excursions in NSW, p. 200).

Dunn places this comment into perspective in the context of the continuing war on the Hunter, and around Ravensworth in particular.

"While Breton was certainly right about Europeans having taken possession of Aboriginal country, his justification regarding the law of retaliation masked what it actually was, which was a form of war on the Aboriginal people, with indiscriminate attacks on camps, family groups and Aboriginal warriors when they could be found. Following Scott's raid on the Aboriginal camp, another body of warriors attacked Bowman's Ravensworth estate again in early September - the third time the estate was targeted. Five fencers working on the property were alerted by the barking of their dogs to the approach of the armed men and managed to get to their weapons before the attack, wounding one Aboriginal man and sustaining no injuries themselves. This was the last serious incident reported in the upper Hunter in 1826, bringing to a close eleven months of skirmishes and raids."

[72 Supreme Court Miscellaneous Correspondence relating to Aborigines, SRNSW, COD 294A, /1161, Items 378-867, pp 42-49] (Dunn 2015: 214-215).

As a result of the continuing hostilities, Robert Scott wrote to the Colonial Secretary in May 1827:

"He felt that the Aboriginal warriors around Patricks Plains were showing increasing signs of hostility towards the Europeans and was convinced that any move to capture Bit-O-Bread would result in bloodshed, as the neighbouring Aboriginal groups had already threatened to descend on the Europeans if he was taken in. The same applied to any attempts to arrest those identified as being involved in the attacks on Bowman or Alcorn Scott pointed out that none of perpetrators could be taken without violence in the first instance, followed by open warfare, for they never appeared near the settlements except in numbers, and would require a considerable force to overcome.⁹⁷"

[97 Robert Scott to Alexander McLeay, 17 May 1827, 28 March 1827, Supreme Court Miscellaneous Correspondence relating to Aborigines, SRNSW COD 294A 5/1161, Items 378-867, p. 90] (Dunn 2015: 225).

Threlkeld wrote to Sax Bannister again to express his fear that open warfare was about to break out in the Hunter, with settlers under arms and more soldiers being sent there.

"He also reported that his own brother-in-law, James Arndell, had seen two hundred warriors while on the road to the Hawkesbury, who, while not harming him, had threatened vengeance against Dr Bowman." (Dunn 2015: 215; Gunson, Australian Reminiscences, p. 93).

This information corroborates the PCWP Wonnarua cultural and historical perspective that places James Bowman and Ravensworth as a central focus of the conflict and killings in the central Hunter valley in the mid 1820s. This is what historian Mark Dunn has referred to as the "unknown valley".

"The Hunter Valley is populated by historic towns, with their fine stock of heritage buildings, such as Morpeth in the lower Valley or Wollombi on its southern fringe, and large colonial homesteads prominently sited on high ridges, along the river or on the outskirts of the towns and villages. These heritage towns and surviving estates, with their genteel settings and ordered landscapes, are the prisms through which much of the Hunter Valley's colonial history has been viewed. It is a triumphant and sanitised history, one that hides the struggles, the failures and the violence of the colonial frontier. These cultural landscapes mask the convict labour that built them and largely ignore the Aboriginal people that their development displaced. The Aboriginal and convict past is missing in much of the historiography of the Hunter Valley, they exist in the hidden valley, the valley that lies behind the heritage façade. It is this unknown valley that this thesis will explore." (Dunn 2015: 7-8).

Dunn (2015) refers to the contemporary characterisation of this frontier conflict as a "war" by the colonists

"After years of relative quiet following the Hunter's opening for European settlement, what caused the outbreak of violence in 1826 in the first place? The reports of the magistrates indicate that settlers saw the series of attacks as a co-ordinated campaign, with one event leading inexorably onto the next as bands of Aboriginal raiders moved through the upper reaches of the settled areas. The settlers at first feared and then talked openly of a war, demanding the government deploy foot soldiers and mounted troops in response. And, in the early months of 1827, with threats by King Jerry of assembling 1000 warriors to kill all the Europeans, it appeared the war might come. Colonial memories of the frontier conflict in Bathurst were still fresh, and those settlers who had relocated from the Hawkesbury well remembered the attacks along the Hawkesbury and Nepean Rivers in the 1790s and early 1800s and its resurgence in 1816-1817." (Dunn 2015: 226-227).

However, Dunn (2015) also detected that certain landowners and places were specifically targeted in the pattern of these raids and reprisals, from a presumed Aboriginal perspective. Bowman's Ravensworth estate and the adjacent properties (Lethbridge, Glennies etc.) were at the centre of this conflict.

"It appeared on the face of it to be a sweeping campaign, moving south to north across the edges of settlement, taking advantage of the isolation of the farms, shepherds huts and embryonic estates to attack each in turn before any type of frontier defence could be organised. By the time the troops appeared at one property, the raiders had moved on to the next. However if we take each incident in turn and try to look at it, as best we can, from an Aboriginal perspective, another pattern appears: one of targeted raids and attacks on specific people or places. Whether or not these were coordinated between groups, or the pressure of the European expansion reached a breaking point at the same time across the valley, or the timing of attacks was simply coincidence, or one group took advantage of the chaos generated by other attacks is unknown. What can be seen, however, is that each of the major incidents cited by the magistrates can be traced to a particular individual, and their actions. While some of the raids on crops may have been opportunistic, the attacks where spears were thrown all appear to be in retaliation. Robert Greig for example, had a record of being violent towards Aboriginal people, while the shepherds at Putty had been involved in attacks in 1816 on the Hawkesbury.

The concentration of the later attacks around the Ravensworth estate of Dr Bowman and his neighbours would appear to be an escalation following the military's first foray into the valley when a number of suspects from the Greig attack were captured. The arrival of the mounted police under Lowe soon after, which resulted in the shooting of the "escaping" three and the capture of Jackey–Jackey, marks the moment of intensification that swirled around Ravensworth and its neighbours. Bowman's property remained the centre of the troubles up until the confrontation with Samuel Owen in March 1827." (Dunn 2015: 229).

However, the power, ferocity and mortality rates that ensued from these hostile encounters not only escalated quickly, but in the process also caused serious attrition, both in the numbers and moral of the traditional Aboriginal landowners resisting this invasion.

"While the Aboriginal attacks appear to be targeted in the Hunter during this period, the random attack of the soldiers from Windsor in late 1825, Scott's killing of eighteen Aboriginal men and women in his dawn raid in August 1826 and Lowe's execution of his prisoners all threatened an outbreak of a general war, as the threats of King Jerry to assemble 1000 warriors and kill all Europeans in the valley demonstrated. The increasing evidence of European power may have led to Aboriginal resistance and retribution being rethought by the warrior groups, and forced them to move towards reconciliation and accommodation rather than the pursuit of all-out war." (Dunn 2015: 233).

Bowman's Ravensworth estate constitutes a central focus in this turbulent, violent history of the usurping of Wonnarua traditional owners by these powerful colonists and their convict servants, with the assistance of major military interventions.

3.2 ACHM ACHAR Report (Canning 2019)

The main Aboriginal Cultural Assessment Report (ACHAR) for the Glendell Expansion Project was prepared by ACHM (Canning 2019), sub-contracting to Umwelt Environmental & Social Consultants, NSW. Based upon previous ACHAR participation (e.g., Mt. Owen 2013), the PCWP Wonnarua group declined to be involved in the general Registered-Aboriginal-Party consultation process which involved group consultation meetings with local residents who are not Wonnarua descendants, at least partially for reasons of maintaining the confidentiality of their family-history and cultural knowledge. The ACHAR report notes that:

"Glencore has engaged with the PCWP since the commencement of the Project. This has included numerous meetings and phone calls. At the time of writing the PCWP have not elected to participate in a Values and Recommendations Workshop and have not provided a Values and Recommendations Report or Statement, as was received for the Mt Owen Continued Operations Project. The offer for inclusion of PCWP Values and Recommendations remains open through the assessment process.

Whilst specific input has not been received, the engagement has raised the PCWP's concerns regarding colonial frontier violence and claims of a massacre of Aboriginal people. This was also the Subject of an Application under section 10 of the ATSIHP Act, made by some members of the PCWP. This has since been withdrawn and is discussed further in Section 1.5.1. It is also the focus of the additional work that was commissioned for this Project which is discussed in Section 3.2 and Section 3.3." (Canning 2019: vi).

The provision of a PCWP cultural values report was delayed by fieldwork restrictions associated with the 2019-2020 catastrophic bushfire season, and the reporting has been delayed by subsequent COVID-19 restrictions and their impact on the research processes for this report and the associated Tocomwall (2020) report. Consequently, it was not available to be considered in the ACHM ACHAR report (Canning 2019: 10), which in its absence concluded:

"Through the involvement of RAPs who identify a range of connections to both country and community, and through several past cultural heritage investigations (most notably the extensive assessments and consultations through the Mount Owen Continued Operations Project ACHAR undertaken between 2011-2013) the region surrounding the Project Area is known to contain a number of archaeological sites and to also hold certain cultural, historic and aesthetic values. The wider region has been identified as being of high cultural significance to many Wonnarua people, however the Project Area has been assessed during this ACHAR process as holding lower cultural significance than much of the surrounding region." (Canning 2019: v).

"Alongside a previous ACHAR over the wider Project area (the Mount Owen Continued Operations Project ACHAR), this ACHAR has reaffirmed that there are no traditional cultural values associated with the Project Area (directly and specifically) held by the participants in this ACHAR process. By 'traditional' cultural values, we refer to these in the Native Title sense as an inherited and cohesive body of 'traditional' knowledge, laws and customs that are still observed and maintained by a particular Indigenous group.

However, in common with many urbanised communities, strong contemporary cultural values exist in almost universal claims of 'connection' to the land in question, and a sense of anguish and/or anger at having been 'disconnected' from the land in question by historical circumstances. In this case, the RAPs also expressed a potential for there to have been connections through time with the Ravensworth Homestead complex, however none of the RAPs had any direct knowledge of any of their ancestors having a direct association with the property.

It is the opinion of the author that the Project Area has undergone considerable modification since European settlement. Traditional Aboriginal lifeways and customs began to disappear in the early days of contact with Europeans and had largely disappeared before the turn of the 19th Century. Much of the natural landscape no longer exists in any cohesive manner, as the long history of agriculture in the area has irreversibly altered the landscape. Combining the historical disconnection of people from place with the extensive landscape modification since settlement means that the Project Area has a relatively low cultural significance when compared to other places within the wider region. This is also consistent with the archaeological assessment, which has determined that most of the archaeological sites are of low to moderate scientific significance." (Canning 2019: viii).

The current report indicates clearly that these conclusions apply only to the non-Wonnarua Aboriginal people consulted by the RAP process referenced, and that anthropological consultation and research with the actual, local Wonnarua descendants indicates that this location instead has a very high level of cultural values for those Aboriginal Traditional Owners. Neither do the Canning (2019) conclusions indicate an assessment based upon the ICOMOS and Burra Charter principles of significance and assessment that are both fundamental to the ACHAR

process (OEH 2011), and to this level of assessment and reporting of cultural heritage values in Australia generally (Australia ICOMOS 2013, 2013a, 2013b, 2017), as summarised in Section 2 of the current report.

The additional work commissioned for the project that is cited above by (Canning (2019: vi) in relation to "colonial frontier violence and claims of a massacre of Aboriginal people" refers to a short report by Dunn (2019) which is referred to below (Sections 4.3). Dunn's short report does not include any detailed brief, and misses much relevant detail from his preceding PHD thesis (Dunn 2019), as well as being based solely on written sources of history. Perhaps partially as a consequence, the coverage of the significant cultural issue of "frontier violence" in the ACHM ACHAR report is restricted to an incomplete summary of a single event in 1826, rather than to the overall pattern of events during the 1820s which make Ravensworth such a prominent, symbolic place in Wonnarua oral and family history and contemporary cultural beliefs and practices (see Section 4 below). The ACHM ACHAR report incorrectly states:

"The available historic evidence and analysis by Umwelt (2004) does not dispute that a mass killing of Wonnarua people took place in late 1826, however the conclusions drawn indicate that the murders reported in the book 'Waterloo Creek' (Milliss 1992) occurred well beyond the Ravensworth Estate. Many Wonnarua people hold the view that there were numerous unreported and undocumented killings in the vicinity of Ravensworth estate in the early days of white settlement. While these views are important and deeply held, it is also difficult to establish the veracity of these widely held oral histories. Compounding the difficulty, there is no other primary recorded historical evidence documenting any other killings in the immediate vicinity of the Project Area. Consequently, there is currently no known 'massacre sites' within the Project area, including the Ravensworth Estate, nor is likely that this type of place will be identified within the Project Area." (Canning 2019; 23).

Considering the catalogue of violence and death related to the Ravensworth estate in 1826-1827 alone in Section 3.1 above, there clearly were many such conflicts and numerous deaths on and around the Ravensworth estate, including the project area. This error constitutes a critical deficiency in the ACHAR assessment and dismissal of this historical conflict as a major Aboriginal cultural value in relation to the project area.

The ACHM ACHAR report also references two other heritage assessment studies.

"A stand-alone Aboriginal Archaeological Impact Assessment (AAIA) report was prepared by OzArk Environmental and Heritage Management (OzArk) to assess the archaeological values of the Project Area and provide management recommendations for sites within the Project Area. The results of that archaeological assessment have been incorporated into this ACHAR. Historical archaeological investigations were also undertaken at the Ravensworth Homestead complex and surrounds by Casey & Lowe Pty Ltd." (Canning 2019: 6).

3.3 OzArch (2019)

As noted above, the ACHAR report (Canning 2019) incorporates an Aboriginal Archaeology Impact Assessment Report (AAIA) undertaken by OzArk, which concluded that:

"The majority of Aboriginal sites identified have been assessed as having low scientific significance. The overall low scientific significance of the new sites is directly related to the extensive and long-running previous disturbances within the Project Area. (Canning 2019: vi).

The archaeological study reported:

"No evidence of colonial conflict or skeletal remains was identified during the survey or test excavation programs. As such, nothing in the current archaeological assessment was able to corroborate or extend the scant information the written sources provide regarding colonial conflict." (OzArk 2019: vii).

A salient feature of this assessment is that the stand-alone archaeological assessment is devoid of any appreciation of the Aboriginal oral history and cultural knowledge related to the local area, which provides a substantial ethnoarchaeological context for interpreting and understanding that remnant archaeological record. Such compartmentalisation diminishes the accuracy and value of Aboriginal cultural heritage assessments.

However the OzArk report does note that a previous Aboriginal Archaeological Assessment for the original Glendell Open Cut Mine (Umwelt 2004) reported that the salvaged artefact assemblage from the joint Bowman's Creek/ Swamp Creek flood plain included the following:

"Several artefacts relating to colonial occupation of the area were also recovered, including fragments of glass and pottery. The location of this material closely correlated with concentrations of Aboriginal stone artefacts. Additionally, at least one Aboriginal artefact manufactured from glass was salvaged, suggesting that the area was used by Aboriginal people in the post-contact period." (OzArk 2019: 44).

This archaeological evidence confirms the continued presence of Wonnarua people in the Bowman's Creek - Ravensworth area during the colonial period.

3.4 Casey and Lowe (2018)

Casey and Lowe (2018) conducted the historical archaeological assessment for the Glendell expansion project.

"This report assesses the potential historical (non-Aboriginal) archaeological remains of the Ravensworth Estate, situated within the Hunter Coalfields, NSW through an analysis of historical records, site inspection and comparative analysis. The assessment has been prepared as part of an Environmental Impact Statement (EIS) required under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). In preparation for the proposed Glendell Pit Extension (the Project). The Glendell Mine forms part of the Mount Owen Complex (MOC) (Figure 1.1) and is situated within Dr James Bowman's original 1824 'Ravensworth' land grant." (Casey & Lowe 2018: i).

This study was limited in scope to non-Aboriginal historic-period (i.e., post-colonisation archaeology.

"This report is designed to assess the historic development of the Ravensworth Estate in order to determine the nature of historic archaeological remains that may be present, as well as to consider the Project's impacts on these historic remains. It does not deal with the potential of the study area to retain evidence of its pre-contact Aboriginal use. This work is being undertaken by Ozark EHM and Australian Cultural Heritage Management and has also been considered in several prior studies." (Casey & Lowe 2018: 4).

The potential to uncover Aboriginal traditional artefacts, archaeological sites or burials was incorporated into Casey & Lowe's (2018:167-169) test excavation methodology. No Aboriginal archaeological evidence was discovered during the test excavations, but the historical archaeological study recommended that:

"Further analysis within the study area should include:

• Targeted archaeological testing of potentially State-significant sites related to the Bowman era, including the Ravensworth Homestead complex, the surrounding cultivation areas, and the nearby early house site." (Casey & Lowe 2018: 172).

The Casey and Lowe (2018) report also acknowledges the significance of Bowman's occupation and rapid development of the Ravensworth estate for local Aboriginal people. James Bowman received his 6,000 acre land grant in 1824.

"Two major roads crossed the land that became Bowman's estate. One followed the Hunter towards Muswellbrook. It split into two roads at Glennies Creek. Both these roads crossed Bowman's land." (Casey & Lowe 2018: 19).

The routing of these two major roads through the Ravensworth estate ensured that it would be an important focus of Aboriginal resistance activities.

"In 1825. Peter Cunningham described Ravensworth. He reported that Bowman's property was situated between two creeks, one of fresh water and the other brackish. According to him, Bowman had 'extensive buildings for packing and sorting wool'. ³⁴

The original Aboriginal inhabitants of the Hunter Valley did not willingly submit to the appropriation of their traditional lands and there are reports of clashes between the Aboriginal inhabitants and the settlers. Hunter claims that a stockade like structure was built on the property.³⁵ No map or archival reference has been found to confirm this. In June 1826. Bowman's farm was attacked by Aborigines. A watchman employed by Bowman was killed in his hut.³⁶ Two Aborigines thought to have been behind attacks, particularly those on Bowman's farm, were captured in August 1826 but were shot dead on what was claimed to be an escape attempt en route to Wallis Plains. An inquiry was later held and the officer in charge replaced.³⁷" (Casey & Lowe 2018: 19).

The Bowman estate expanded and developed (buildings, land clearing, fencing and stocking) rapidly thoughout the conflict period in the mid to late 1820s.

" on 11 November 1826. Bowman returned a printed form for an additional grant without purchase. He held 5,000 acres by purchase and 6,000 acres by reserve (leased to him), of which 250 acres had been cleared, with his livestock totalling 270 cattle, 3,300 sheep, and 6 horses. He. stated that he had erected 'Sheep Sheds, Wool House, Stores, Cottage, Kitchen, huts for ten men etc, which cost me Two Hundred & Sixty Pounds'.

In addition. he had built a stout fence three miles long and had maintained 34 convicts." (Casey & Lowe 2018: 19-20).

Casey and Lowe (2018: Figure 5.5) map the built features in close vicinity to the Ravensworth homestead, including the close proximity of the Great North Road (Figure 3-3).

"On 7 March 1832. Sir William Edward Parry visited Ravensworth on his journey to Liverpool Plains, with Henry Dangar. Manager James White. previously employed by the Australian Agricultural Company, and his wife met him. Parry was not impressed with the estate believing too much money had been spent clearing a large home paddock. White described the flat land near Foy Creek as not being good land. Higher land was thickly timbered with ironbark and would probably not be good land. Bowman was then building a substantial stone cottage for White. A garden of 8 acres with a paling fence and small stream through it was laid out in an ornamental fashion. Parry thought it too large for a private estate." (Casey & Lowe 2018: 24)

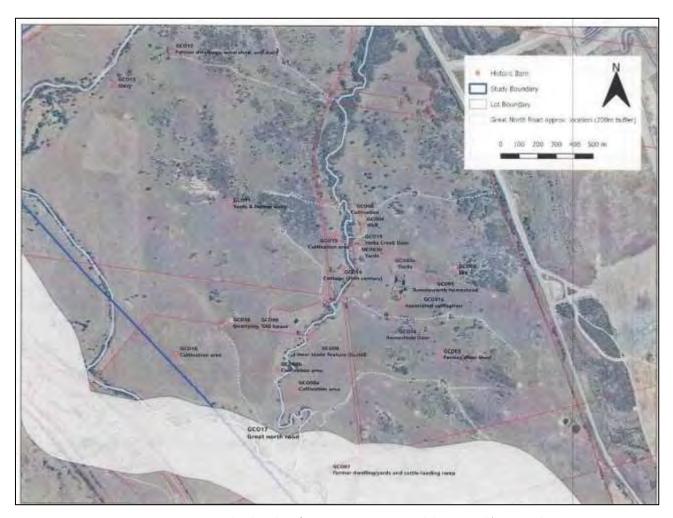


Figure 3-3: Historical archaeology features near Ravensworth homestead (Casey and Lowe 2018: Figure 5_5).

Casey and Lowe (2018) record that the current homestead was built in 1932, and that the original homestead hut was at a different location, on a ridge line across the creek to the west (Figure 3-4).

"The 'old house' mark don White's map appears to correspond to the 'house' on Dixon's map, which was located to the west of the current historic Ravensworth Homestead. White's map includes hachuring indicating breaks of slope around prominent ridge lines. The hachuring indicates that the old house was situated on a ridge and that the land sloped to the south, to the west and to the east of the house site (Figure 5.2)." (Casey & Lowe 2018: 106).

However, the actual location of the original building remains uncertain.

"Field inspection failed to reveal any obvious traces of the house, although it provided an opportunity to consider the topography and environs. The ridge is exposed and windswept and does not at first sight appear to be an ideal location for the house. However, it would place the house in an elevated and defensible position, while also providing for extensive views to the east. to the south and to the southwest as well as views to the 1830s Ravensworth Homestead. One potential location for the house is a terrace on the southeastern corner of the ridge. It overlooks the modern farm track and is also adjacent to the later east-west running lot boundary.

It could be significant that mapping this lot boundary in conjunction with the early fence marked on the 1832 Dixon map would create a rectangular enclosure, possibly reflecting the early first homestead paddock. Interestingly, the potential grave (GC06) site is located just off this line too and on the other side of the creek." (Casey & Lowe 2018: 115).

The grave site (GC06) referred to above is anecdotally reported as the possible grave of James Bowman (Casey and Lowe 2018: 137).

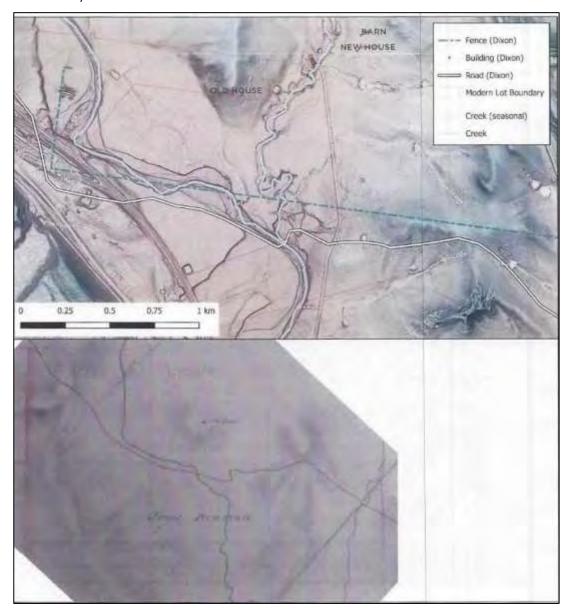


Figure 3-4: Maps showing the georeferenced location of the Ravensworth 'old house' from early maps by Dixon and White (Casey and Lowe (2018: Figure 5.7)

According to local family historian Lyn McBain, all of the early Hunter Valley homesteads were slate-roofed huts. A hilltop location for the original Ravensworth homestead is unlikely, in her experience, as they were all built close to a water supply – "the mansions on the hill came later". (Interview with Lyn McBain, Singleton Family History Society 19/02/2020, Draper 2020: 69). This view resonates with the point made by Casey and Lowe (2019: 115, cited above) that ".... the ridge is exposed and windswept and does not at first sight appear to be an ideal location for the house". Scott Franks remains unconvinced that the current homestead was not built on top of the old one, or very close by (Scott Franks Interview 18/02/2020, Draper 2020: 63).

There is also a continuing mystery regarding an article that appeared in the Sydney Mail in 1802, which is referred to by Casey and Lowe (2019).

"On 15 February 1902, the Sydney Mail published an article on Ravensworth. It claimed the property was the oldest m the Hunter. The walls of the house were of stone 3 feet thick with windows built to use as firing ports for rifles to defend the house. It also noted that the grave of Miss White was close to the farm house." (Casey & Lowe 2018: 58).

The Sydney Mail article included a photograph of the homestead in 1902 (Figure 3-5). I paid particular attention to the main stone walls and windows of the original parts of the building during our site visit in February 2020. The homestead has original external walls approximately 65cm thick. The windows are high and wide (Figure 3-6) and could not be described as "firing slits".

Perhaps that may have applied to the original, pre-1832 homestead, which Casey and Lowe (2019) believe was approximately 700m to the west on the hillside (Figures 3-4, 3-7), of which no trace has been found so far. However, it is unlikely that the original homestead had walls almost a metre thick. (Draper 2020: 62-63 and photos). Scott Franks thinks that the original homestead was in the same place as the current one (Draper 2020: 64).

However, the reference to Miss White's grave confirms that the Sydney Mail reference is to the current homestead, recorded as being built in 1832, rather than the original homestead hut, the location of which is uncertain. Perhaps the windows of the stone-walled homestead had been remodelled prior to 1902. Casey and Lowe (2019: 58) note that before 1900 the stone buildings had deteriorated, and that the rear wing of the house was dismantled and the stone was reused elsewhere on the site. Assuming that the Sydney mail article was based on direct observation (and presumably the newspapermen took the photos in the article), it suggests that even in the early 1830s there was a substantial fear of further conflict among the local estate owners.



Figure 3-5: Ravensworth Homestead in 1902, from the Sydney Mail (Casey and Lowe 2019: Figure 3.27).



Figure 3-6: View of the front of Ravensworth homestead, February 2020. Note the wide windows.



Figure 3-7: View west from the front garden of Ravensworth homestead to the ridge location identified by Casey and Lowe (2018) as the likely site of the original dwelling.

In establishing the frame of historical events associated with the Ravensworth estate, Casey and Lowe refer to the early conflict as a major factor in relation to Ravensworth.

"Dunn has undertaken the most comprehensive review to date, exploring the conflict over land and resources in the first decades of European occupation and settlement of the Hunter from 1820 until the 1850s. Dunn explores the geological formation of the Valley and the role of the rivers in the lives of Aboriginal and Europeans who lived there. The Ravensworth Estate, and James Bowman, feature quite frequently in the historical records in the 1820s.

Dunn documents significant activity in and around the Ravensworth estate – with significant violent conflict occurring across 1825-1826. On 4 September 1826 a petition was sent to the Governor signed by eleven settlers on properties from Lochinvar and Maitland in the lower valley, to Merton and Segenhoe in the upper valley -James Bowman was one of the signatories. Dunn notes:

'In a curious turn of phrase, they wanted troops to protect their property from "the revenge and depredation of these infuriated and savage people". The description of the Aboriginal group as vengeful and infuriated suggests that the petitioners acknowledged an initial wrongdoing on their part, or a wider injustice by Europeans in the valley'. [307 Dunn 2015: 216]

Dunn attributes the concentration of the later attacks around the Ravensworth estate of James Bowman and his neighbours to an escalation following the military's first incursion into the valley. [308 Dunn 2015: 229]

Correspondence from Governor Darling to Under Secretary Hay on 11 September 1826 notes that:

'They have put two Stock Keepers of Mr Lethbridge's to death and speared two others, and not long since murdered an overseer of Mr Bowman's, and also speared one or two of his Stockmen. The latter event appears to have been occasioned by the circumstance of one of their Tribe, who had been taken up for some offence, having been confined for a day or two on Mr. Bowman's Farm, which it is supposed had induced them to think that Mr. Bowman's People had been concerned in Apprehending their Comrade.' [309 Governor Darling to Under Secretary Hay, 11 September 1826 Historical Records of Australia Vol XII, p574]

The information from these sources, in relation to Aboriginal - European interaction on the Ravensworth Estate, provides an opportunity to explore the archaeological nature of initial contact in the Upper Hunter Valley particularly in relation to the original location of house/homestead/farm on Bowman's grant." (Casey & Lowe 2018: 95).

Casey and Lowe (2018) carry over their recognition of these intangible and possibly tangible (archaeological) cultural heritage values into their heritage significance assessment, according to the Burra Charter Principles (Casey & Lowe 2018: 139). In doing so, they provide a very contrasting assessment to the view of the ACHM ACHAR report that "the Project Area has a relatively low cultural significance when compared to other places within the wider region the Project Area has a relatively low cultural significance when compared to other places within the wider region" (Canning 2019: viii).

In his ACHAR report, Canning (2019: 40-43) refers to the results of the Casey & Lowe (2019 historical archaeology investigations and refers in passing to their recommendations that the archaeological values of the Ravensworth homestead area includes Aboriginal heritage values and research potential (Canning 2019: 42-43). However, he does not incorporate or even refer to Casey & Lowe's inclusion of Aboriginal cultural values in their significance assessment in his own ACHAR "Consolidated Statement of Significance" (Canning 2019: Section 6.10; see Section 3-3 above). Consequently, it is worth summarising the relevant aspects of the Casey and Lowe heritage significance assessment.

Aboriginal heritage values are referred to with reference to Criterion (a): Assessment of historic significance – (evolution): "an item is important in the course, or pattern of NSW's cultural or natural history (or the cultural or natural history of the local area)".

One of these significant historic values is described by Casey & Lowe as"

"Ravensworth Estate is one of a number of identified places demonstrating the early interactions and tensions over land between Aboriginal people and he British-government and the colonists settling in the Hunter Valley. This new stage of expansion into the Hunter Valley saw a number of raids, both by the military and/or settlers and by Aboriginal groups, in the 1820s. Three separate Aboriginal raids on the Ravensworth estate saw the deaths of Bowman's men while working on the estate.

These historic values are likely to be significant at a State and local level." (Casey & Lowe 2018: 141).

Criterion (b): Associative Significance - (association): is defined as "an item has strong or special association with the life or works of a person, or group of persons, or importance in NSW's cultural or naturalhistory (or the cultural or natural history of the local area)."

One of the eight associations of both State and local significance identified by Casey & Lowe (2018) under this criterion is:

"Convict labour system which allowed for the spread of British settlement and the removal of Aboriginal people from their traditional lands within this part of the Hunter Valley." (Casey & Lowe 2018: 142).

Convicts on the Ravensworth estate were both victims and perpetrators of violence during the protracted conflict with local Wonnarua people, as well as the labourers who built the infrastructure (buildings, fences, roads) and cleared the land in the process of usurping the Wonnarua.

Under Criterion (d): Social Significance - (contemporary community esteem), part of the locally significant social values identified by Casey & Lowe (2018) was:

"Ravensworth is held in high regard by the local community of Singleton and surrounds as well as groups interested in the history of the colonial settlement a development of the Upper Hunter, colonial architecture, historical archaeology, convict genealogy and history, and the Aboriginal community." (Casey & Lowe 2018: 143).

In the case of Wonnarua people, the terms "high regard" and "esteem" probably is not the appropriate term, but the place certainly is highly significant to them in to them in relation to these factors, though not in a celebratory sense.

Criterion (e): Technical/Research Significance is concerned with archaeological, educational, research potential and scientific values of a place. Casey & Lowe listed four research questions for which the Ravensworth Homestead Complex has potential, including:

"Early frontier life and the nature of contact and conflict between British settlers and Aboriginal people and their traditional practices." (Casey & Lowe 2018: 143).

"Where it survives historical archaeology relating to the former Ravensworth Estate has the potential to provide information on:

Bowman Period (1824-1846)

- The lives of Aboriginal people and the nature of interaction with the British arrivals in the Contact period when they were dislocated from their lands and how this was expressed in the landscape and built environment.
- The level of fortification of the place (the House site and the homestead), if any, for a newly established estate on a frontier." (Casey & Lowe 2018: 143-144).

In addition to these recommendations, Casey and Lowe commented on the potential for future research to combine archaeological and oral and written historical research and sources to shed further light on our knowledge of the colonial period locally.

"There is extensive documentation about the Ravensworth Estate, and the settlement and development of the Hunter Valley more generally, which serves to complement and interact with the physical evidence creating a wealth of documentary and physical evidence of past practices and traditions. This provides a significant opportunity to consider the nature of the oral and written sources to further understanding of how and archaeological record support, amends or challenges the written history of this period. This evidence when considered together will offer considerable new insights into its history and archaeology.

There is moderate to high potential for the archaeological resource within the Ravensworth Estate to provide information that is unavailable from other resources. The ability of a site to reflect knowledge that no other resource can is dependent upon the Research Questions which are posed and the methodology employed to investigate the archaeological resource.

The potential research significance of the archaeological remains at Ravensworth Homestead Complex are likely to be significant at both a State and local level." (Casey & Lowe 2018: 144).

In my opinion, the results of the short period of ethnographic and oral history research summarised in this report demonstrate the accuracy of the statement above in terms of amending and challenging the written history of this period of local history, as did Dunn (2015) recently.

Casey and Lowe also include consideration of this important period of conflict in their assessment under Criterion (f): Rarity.

"The Ravensworth Homestead Complex and surrounds has the potential for substantial evidence across the landscape of the archaeology of beginnings of settlement in the upper Hunter Valley, including:

- As part of the convict assignment system,
- Evidence of conflict with Aboriginal people over land and resources
- Beginnings of sheep husbandry outside of the Cumberland Plain and its strong association with the Macarthur and Bowman families.

The known and potential rarity of the archaeological remains within the study area are likely to be significant at a State and local level." (Casey & Lowe 2018: 145).

These assessment considerations are carried over into the Statement of heritage significance for archaeology prepared by Casey and Lowe (2018) The relevant sections are highlighted in the quotation of this statement below.

"The Ravensworth Homestead Complex is important as an archaeological landscape containing an 1820s 1 olonial house and associated outbuildings which were modified throughout the 19th and 20th centuries, and the archaeology of the estate. The homestead buildings, the remnant 19th-century farm and garden layout built by assigned convicts all provide evidence of this landscape and its history. This can testify to the way in which this early occupation by surgeon James Bowman with expansion of the wool industry into the Upper Hunter Valley, aided by assigned convicts, irrevocably changed the lives of Aboriginal people and the modified the landscape of the Hunter Valley.

The archaeology of the place is associated with a number of prominent individuals: James Bowman, Mary Bow an (nee Macarthur), John Macarthur, overseers James White and John Larnach, as well as later owners Captain William Russell and the Marshall family. This cultural landscape with its buried sites, works, relics, and ruins should provide evidence of technical achievements associated with an evolving pastoral activity, notably early wool production. Aspects of these archaeological values will be important to the local community, notably evidence of the material culture and rural technology of the residents, the main families, lives of convicts and free persons.

The homestead's potential research significance relates to its ability to demonstrate the way of life, tastes, customs and functions in a rural context through the 19th to early 20th centuries. From its establishment, the site is a good example of a colonial rural estate built on convict labour. The intactness of the site's structures and their landscape settings enhances its role as a site of archaeological and scientific importance. **Key research themes relate to the nature of lives on a newly established frontier and contact with Aboriginal people,** material culture and lives of significant colonial people, convict lives and the assignment system and, how it is implemented within this landscape, use of technology and management of water, changing transportation and economics and how they shaped life on the estate.

The Ravensworth Estate is rare for its contribution as part of the new convict assignment system, evidence of conflict with Aboriginal people and the beginnings of sheep husbandry outside the Cumberland Plain and its association with the Macarthur and Bowman families.

Representative values are expressed through its 1820-1840s homestead and estate, pattern of pastoralism and closer settlement.

The archaeological landscape, sites and material culture of this place have the ability to be of both State and local significance." (Casey & Lowe 2018: 146, **emphasis added**).

These statements concerning Aboriginal heritage significance of the Ravensworth estate and the Glendell expansion project area lie in complete contrast to the Aboriginal Cultural Heritage Assessment report (Canning 2019). They also provide a strong, independent, supporting context for the Aboriginal cultural heritage values in relation to Ravensworth estate raised by Wonnarua people, both previously and in this report

4 Description of Wonnarua Cultural Values for the Survey Area

4.1 Cultural Identity and Traditional Country

The survival of the PCWP Wonnarua families and their essential cultural identity through the years of invasion, invasion and subsequent occupation is well summarised in the statement below from their previous native title application (currently withdrawn for amendment and resubmission).

"Despite the extensive violence visited upon the Wonnarua People at the hands of European settlers (including armed suppression in the early 19th century when the settlers arrived in force and widespread decimation of the Aboriginal inhabitants across the Hunter Valley generally), the PCWP and their ancestors were able to stay on or close to the territory of their forebears at and around the Hunter River and the broader Singleton (Patricks Plains) region. They inherited a wide range of laws and customs about its walking tracks, ceremonial places, stories and how to hunt and gather there, which have been continually practiced there over the generations since settlement. The PCWP have continuously maintained their association with the application area since settlement and have retained a connection to this area through their acknowledgment and observance of traditional laws and customs: see Attachments FI-F4." (PCWP 2013: Attachment F, [3]).

The PCWP Wonnarua people I spoke with in February 2020 around Singleton had a united view that none of the people consulted for the ACHM (2019) report actually were Wonnarua people. The view was that these RAPs did not provide any information concerning cultural values to Canning (2019) because they did't know anything or have any connections to the place, and not because such values are absent. In an interview at Ravensworth homestead, Scott Franks said:

"This is a significantly bad place. This landscape that we're on today, the Bowmans and Lethbridge estates, it doesn't matter how anyone paints it up was a slaughter route against Wonnarua people. It was for over 10 years. Nothing I have seen today in the current EIS even goes down that road. Their primary source of information done his thesis on the evils here and names this place as one of the massacre sites." (ND&A 2020: video 0002).

The references above are to Dunn (2015, 2019).

In terms of information being handed down from generation to generation, he added:

"We are fortunate that we are only going back most cases seven generations to people living on the land." (ND&A 2020: video 0002).

"That is what's missing from this. What happened here? Why is it so always about the stones on the ground? We know they are there. We have our people's bodies laying scattered across this landscape that have never been recovered. You know, we have ceremonies recorded in the early days from Etheridge of over 500 blacks he says all gathered for one ceremony. If you're gathering 500, where's their bodies? We've got 46 open cut mines, yet we've got no bodies. We've got "Uncle Arthur" who was dug up at Mt. Arthur; we've got we've got a traditional burial site still intact on Hillcrest; we've got a traditional child burial site on Bulga Optimisation in a tree; and we possibly have three cairns on the Hillcrest property which sort of align then with where the mounted units went after this mob. So why is it we've got no bodies? Where are they?" (ND&A 2020: video 0002).

"If someone asked me how to describe this, where we're standing today was the epicentre of the destruction of our culture and our people. This was it." (ND&A 2020: video 0002).

In an interview at Mt Arthur, Scott Franks described in more detail the PCWP Wonnarua families' frustration with RAP consultation processes. In their view, these processes do not include the basic anthropological tasks of distinguishing traditional owner families from the multitude of locally-resident Aboriginal people and organisations that invariably sign up as RAPS for ACHAR consultation, and of effectively consulting those traditional owners about cultural values, particularly intangible cultural values.

"With all the assessments that go on here, they're very archaeologically based. So it's all about the stones and the physical evidence, but there's no ethnographical or continuation of, not only linguistics, but what happened here. We all know there are artefacts here. It's just the way it is. You go to any mob's country and you'll find artefacts. But, unfortunately, the way industry collectively at this stage have treated us, if you are Aboriginal or a first nations' person you get a voice whether you're from that country or not, because there's been no real identification of who is who. Even with the native title process where there is a clear association of who is who, but you are still thrown in this bucket. And I think this has had a huge impact on not only protecting the stories, the laws and customs, as in our laws, but also understanding, and helping industry understand some of these areas are incredibly important. They are more important than a scatter of artefacts sitting in a paddock. We've got sites where women and children learned and played and grew crops. You know, you've got all of this harvesting carrying on, very specific areas, and that's what Hillcrest [NW of Ravensworth] represents along the water basin there. You've also got these places where boys were trained." (ND&A 2020: video 0041).

I note that the problems expressed above relate directly to three of the main "Issues" topics included in Australia ICOMOS Practice Notes. The issue of too much emphasis on tangible (e.g., archaeological) cultural heritage at the expense of intangible cultural heritage is raised in the Practice Note on "The Burra Charter and Indigenous Cultural Heritage Management" (Australia ICOMOS 2013a; Section 2.4.1 above). The issues of defining "Place" too narrowly to capture related cultural values and the issue of identifying and involving the appropriate knowledge holders are addressed in the Practice Note on "Understanding and assessing cultural significance" (Australia ICOMOS 2013b; Section 2.4.2 above).)

4.2 Mt. Owen PCWP Cultural Values Report

The PCWP Wonnarua previously submitted a cultural values report in relation to the adjacent Mt Owen open-cut mine project (Tocomwall 2013). That report expressed their cultural perspective concerning the recognition and preservation of significant cultural landscape in this locality, rather than a narrow focus upon comparative assessment of individual heritage sites.

"From the outset the PCWP have been concerned to ensure that no single Aboriginal item or place within the Project be subject to an evaluation based on the systematic ranking of its Aboriginal cultural values relative to the other items or places within the Project area. This type of ranking is counter to the expression and belief of the PCWP that it is not one item, artefact, grinding groove, plant or animal species that is of value to them in the Project but rather it is the sum total of all such component parts of the landscape - and its surrounds - that provide cultural meaning to them. This has been clearly articulated by the late Aunty Barbara Foot. The following is an amended extract of notes made by Ms Sarah Paddington of OEH when in conversation with Aunty Barbara Foot and her son David in February 2011:

"As a girl I would travel along Bowmans [Creek]. We'd go from the mission, to school to town ... My Dad had a lot of cultural knowledge. He passed it on to me. He'd tell me places I could and couldn't go. He showed me important places. Places our ancestors still come through. I know how to read the sings of the land, the seasons. The signs are our lore, they show the way – like people used street signs to have order. Some of the signs, the trees, have been cleared but we know where they were from our ancestors, and we know what they tell us. People not from here don't have that knowledge....

The area is all important to us. We can't break it up for each mine – that is how they are getting away with destroying so much of our culture. They don't understand how it all links together, so it doesn't seem as important when you look at this little bit or that little bit. That's how they are breaking up our community too – the mine mention money and that starts fights. The mines want the fights as they get to keep what they want if the community is distracted."

(Aunty Barb Foot, February 2011 cited in attachment to email forwarded by Ms Sarah Paddington of OEH to Mr Scott Franks & Mr Robert Lester, 17 April 2011)13

In line with Aunty Barb's assessment it remains the broad view of the PCWP that the steady attrition of elements of the Aboriginal cultural landscape within their Wonnarua Country - especially those items of Aboriginal material culture subject to archaeological assessment - has occurred as a direct result of the application of a process of systematic ranking of items or places." (Tocomwall 2013: 86).

This cultural landscape perspective also permeates the PCWP statement of cultural value in relation to the Mt Owen Project, the scope of which also embraces the Glendell expansion project area and the Ravensworth estate on Bowman's Creek.

"Mt Owen is in an area with close proximity to places that have been used by our people since the time of creation. The Glennies Creek catchment is a place known to our people, which contained a pathway, known today as a song line. The path was placed there by our creator Biami, which in the beginning would have been sheltered from prying eyes and onlookers who were not supposed to know or see what was going on, unless invited. This pathway contains site for initiations and religious practices [sic] (Dream Time).

These same lands that may have interaction with this mine are places that represent what our people are about. The landscape has present ceremonial places (stone arrangements) scarred trees, fishing holes, teaching and birthplaces and places to camp and prosper. In today's terms this is our home and our community. Even today you can talk to any member of our claim group and all will have some type of association with this area." (Tocomwall 2013: 87).

The same considerations and scope are apparent in the accompanying Mt. Owen Statement of cultural heritage significance:

"The landscape of the Project area has a fundamental significance because of its historical, social, and scientific value to the PCWP. For the PCWP the Mt Owen Consolidated Project Area and surrounds is a complex, multi-layered cultural landscape where in combination (a) the biophysical attributes of the landscape including the drainage systems, fauna and flora, geology and soils; (b) the material traces of traditional Wonnarua people; (c) the historical associations and experiential reference points of its members, and in particular those of the Smith, Franks and Lester families (and all associated descendant families); and (d) the various spiritual, lived experiences and economic attachments of contemporary PCWP members contribute to a high level of cultural significance for which words are considered inadequate to describe.

Mt Owen is part of an immensely important cultural landscape to the PCWP. It is, however, a part of this landscape that has already been subject to catastrophic change and despoilment by the physical action and aesthetic impact of past, and current mining activities. Open cut coal mining has been a progressive and substantial intrusion on the cultural landscape values of the lands within Mt Owen for which members of the PCWP feel a profound and enduring sense of loss. This loss is compounded by their feelings of guilt and distress at not being able to protect the land for which they have custodial responsibility." (Tocomwall 2013: 90).

These considerations have been raised by the same Wonnarua informants in my research for this current report. With the advantage of a dedicated anthropological study, albeit fairly brief, the current study has added substantive detail that directly relates both to the Ravensworth estate and to the range of significance assessment criteria and guidelines pertaining to the NSW heritage assessment regime as well as the associated Australia ICOMOS Burra Charter (2013) and Practice Notes (2013 a & b; 2017).

4.3 Contact History and Conflict

The ethnographic research that I conducted with the PCWP Wonnarua for this study and for my previous native title report (Draper 2018), together with some of their oral history already on record (e.g., Franks 2012), provide a substantive and substantially unknown body of intangible cultural knowledge and historical perspective associated with Ravensworth. This information provides the foundation of PCWP Wonnarua cultural values in relation to Ravensworth, and to the significance of Ravensworth in their cultural landscape, history, and identity.

This is also a cultural perspective based on connections between Ravensworth and other, associated places, cultural traditions and historical events. In terms of contact history and conflict, the Wonnarua view is that the important history at Ravensworth starts in important ways at Mt. Arthur.

4.3.1 The Link to Mt. Arthur.

In Wonnarua oral history from the Franks/ Smith/ Lester families, open conflict between the Wonnarua and the colonists started with the Ogilvie family and estate and Mt. Arthur. (Scott Franks 18/02/2020, Draper 2020: 65).

Scott Franks said that the vicinity of Mt Arthur was a critical place in the wave of conflict between Wonnarua and settlers in the mid 1820s, that led to the events centred around Ravensworth. Some time after the Ogilvie homestead incident, a young white girl was killed near Mt Arthur after she unknowingly trespassed into to a men's only ceremonial site. They dismembered her body. Later, an Aboriginal man was seen by Europeans with one of her detached arms, pulling the sinews to make it move. A revenge party from nearby Musswellbrook then

massacred Aborigines at the nearby camp site at the Pocket, below Mt Arthur. A survivor went into the town, climbed a telegraph pole and perched there, howling, for three days. The police constable refused to intervene. (Scott Franks interview Mt Arthur 20/02/2020, Draper 2020: 70).

The massacre took place at the men's camp site (included boys during the initiation process) at "the Pocket" on Eddington Road, adjacent to Mt. Arthur. A group of men gathered at the Ogilvie homestead. The daughter had walked into the men's camp area, and had been killed and butchered, hence the incident with her severed arm. A posse from Musswellbrook came to the camp and massacred people there in retaliation. The violence escalated from there, and was largely a response to the rape of Aboriginal women, and loss of access to food and resources. (Scott Franks interview Mt Arthur 20/02/2020, Draper 2020: 71).

I conducted an interview with Scott Franks on the summit of Mount Arthur in February 2020, with a commanding 360 degree view of the surrounding country (Figure 4-1). Here, he spoke further of an Indigenous view of the genesis and spread of conflict in the 1820s, and the brutal impact of military intervention in the invasion of the Wonnarua people.

"The end result was The catalyst at the time where the Europeans had just about had enough of the constant attacks that were being thrown at them because the Europeans were attacking our people. They were taking their women and raping them. They were stealing their land. There's even old folklore stories here where the local mob were stealing sheep and that. They probably were, but they knew it was an ongoing source for the Europeans and they were burning crops and all sorts of things. Because they were effectively ploughing up the areas that our people used to harvest seed and that. You know, the women and that, it's all part of our farm land back at the time. As we seen it, to manage the land, it was just being stolen. There was no interaction about usage. So we've lost all of our propagation fields for traditional foods ... and that's what a lot of these things, you'll find hebe And burrawong– a lot of base staples – was prolific through here, but obviously since mining here a lot of it has gone, none of it has been reintroduced. Back in the late 80s, probably 84-85, you came up into these areas of the lower catchment, you would be finding ... Burrawong – cycads, used to be all through here ... yams ... this ridgeline going right back to the Hunter at Jerry's Plains, full of yams. Just millions of them. ... you also get Hebe, a little pink berry. ... It was very common in the Hunter Valley, away from the first-order tributaries on the second and third [order tributary streams], there were always chains of ponds full of rushes, and the seeds from them were milled into a paste, and you slap them around like that [demonstrates, slapping his hands together in a particular motion] ... we call them Jacky Bread. And because you get such high temperatures up here very quickly in a short period, usually two to three, four o'clock, very high spikes in temperature, these rocks we're sitting on today [Mt Arthur summit] were our ovens in a sense to make bread. ... We cook them on the rock." (ND&A 2020: video 0042).



Figure 4-1: Interview on Mt Arthur Summit, 20 February 2020. L-R: Scott Franks, Clive Taylor.

Scott Franks also mentioned crustaceans in the creeks, kangaroo and rock wallabies as other staple food sources.

"So you had this clear area of propagation and usage that flowed down out of the pocket, down the catchment behind us and back through to the Glennies Creek catchment and then off into the Mt. Olive catchment. ...it was just a flourishing society of people moving around, seasonally using the land for its resources, but then traditionally burning it as well to promote growth." (ND&A 2020: video 0042).

He spoke particularly about the aftermath of the massacre at the men and boy's camp in the Pocket below Mt. Arthur, and how the wave of violence against his ancestors had spread out from there.

"The outright slaughter of a group of men and boys was beyond any sort of comprehension for our people here. They took one life, which is justifiable – she shouldn't have been there, end of story – no woman should have been there. The end result though, what our people seen, was the complete and utter rounding up and annihilation of our people. It didn't just stop here. Once they got to the pocket, that posse – and I do call it a posse because that is what they were. It was a group of men and anyone who could ride a horse and who could hold a gun. They went from here and headed down the catchment, because they knew that down the other side of this vantage point [Mt. Arthur] the other campsites were. And even when you're up on top here they would have seen the campfires, they would have seen the smoke, they would have had a clear directional pitch then on where to go, and in they went. And just carried all the way though, right away down following Emu Creek, back in through Ravensworth, then heading straight back out to Mt. Olive – even where today the old St. Clair Mission site is. The followed that catchment all the way through to the top of Mt. Olive. So, you know, it's a sad, sad position to be in, like this area, to demonstrate the hostilities against our people. You know, it was never in my mind 'us against them'. They came here by force, They didn't come here, genuinely to work with our people. They had no intentions of having any comprehension of our people being human beings, let alone a race of people. We were treated as animals." (ND&A 2020: video 0043).

"As that was all occurring and unfolding they got a message to Newcastle and the garrison about what was happening. At that point the garrison has already disembarked – it was on route So by the time the posse from here [Muswellbrook], and it wasn't a straight run, they were killing people along the way. They were slaughtering anyone and and anyone who wasn't. They didn't care, if they were black they were dead. Kids, women, children, whatever, the elderly – slaughtering them. And by the time they got to the Liddell location, the garrison was already on site, waiting for them. So they now had reinforcements ready to go, and ... from then on, it was two or three years. And for interest, just here behind me, in the late [19]80s a dozer uncovered when it was stripping, the partial section of a skull. Now, that guy is now called 'Uncle Arthur.' He's buried on site. The skeletal remains, and he still had his dilly bag with all of his tools on him and that was still intact. The forensic anthropologist that ultimately done the removal of the remains to determine (a) whether they were Aboriginal and the age, had placed that person at around 20 to 30 years old. But what was so surprising was The forensic anthropologist had determined that that individual was impacted by a heavy beast, and she made that call. The injuries that he sustained, he lived from, but essentially his hip was crushed. Over time the bone had re-grown into a big ball, and he had a very extending, L-shaped leg. He survived "for quite some time like that before he ultimately passed away. ... He was trampled into the ground (video 0043).

"Our people were so subdued; the only way they had to survive was to work with the British. They had no choice, you know. It was work with them, or be slaughtered. Even King Billy, when the raids got from here {Mt. Arthur area} to the Ravensworth area, the local detachment arrested him and incarcerated him in Newcastle jail, while his people were getting slaughtered. Then they released him, because they knew he was the spokesperson for that family group. When you take him out, they knew there was going to be a power struggle happen. That's what was going on. Standard army tactics." (ND&A 2020: 0044).

"It is remembered, I mean, it has to be. These are our battlefields." (ND&A 2020: 0044).

The view of these Wonnarua families is that the wave of deadly conflict began at Mt. Arthur and swept along the stream catchments, encompassing Ravensworth and nearby estates, and there it took hold. This refers to the repeated attacks and reprisals on and around the Ravensworth estate, and the ensuing military presence around Bowman's and Glennies Creeks.

4.3.2 Ravensworth Estate

In an interview on 18/02/2020 at Ravensworth homestead (Figure 4-2), Scott Franks referred to the conflict between his Wonnarua ancestors and posses of mounted police and civilians in the mid 1820s, over the

establishment of properties such as Ravensworth. James Bowman and his workers were alleged to have killed Cato – shot and impaled on a fence – and to have hung other men from trees near the creek. Lt. Lowe was investigating this. This was consistent with Governor McLachlan's POW order 20 years earlier and still being followed, for public executions of troublesome blacks to instill fear and teach them a lesson. Ravensworth was the focus for several conflicts and numerous deaths and Wonnarua consider it to be a bad place – Barbara Foote and her family would not come here. (Summary from Scott Franks interview 18/02/2020, Draper 2020: 63).



Figure 4-2: Interview with Scott Franks at Ravensworth homestead 18 February 2020. L-R: Clive Taylor, Scott Franks.

He said that in the mid 1820s James Bowman sent a despatch seeking military assistance from the Governor, based on continuing attacks on colonists from Wonnarua men. Lt Lowe investigated the possible massacre of native prisoners. Cato was shot by Bowman and impaled on the fence. Two others were hanged. From "Garrison diaries", there are other records on the massacre of native prisoners.

He said that Alma Lester (grandmother of Maria Stocks and David Foot) would not come to this property because Aboriginal women were raped here. Soldiers were stationed here. Half caste children were appearing in full-blood families.

He referred to a newspaper report of a Hunter Valley homestead with a native skull on the mantelpiece to frighten away Aboriginal people. His family believes that this is a reference to Ravensworth and to the skull of a man shot by James Bowman outside his house. (Scott Franks 17/02/2020, Draper 2020: 62).

He described a Wonnarua perspective on the conflict that occurred on and near the Bowman estate at Ravensworth.

"Local people trying to shame the farmers – raids, taking food and stripping colonists of their clothes. The hostilities were exacerbated by Bowman and Lethbridge starting and sending a petition to the Governor for military support. There were huge impact on the Wonnarua traditional owners. People were killed and were moved on. This is considered to be a bad place, with some of our people still laying here today. Mounted police based on these properties hunted down Wonnarua people. Governor McLachlan had previously ordered that Aboriginal prisoners were to be dealt with as prisoners of war, and if they resisted, to be shot or hanged publically, to set an example. Five of the seven native captured nearby were brought back to Ravensworth and were killed – judge, jury and executioners. There is clear evidence here of a military force brought in at the request of Dr Bowman and Lethbridge to take whatever means to suppress, disperse and kill Wonnarua people. "Our people were Slaves effectively; brutalised, punished and despatched n the most heinous way, which we have seen across this country."

"The site of Alcorn's hut and the conflict that took place there in 1826 needs to be identified and protected too."

"You have got a very clear attack by Wonnarua pople, if it is in that location, which resulted in a continuation of the carnage instilled on the Wonnarua people here, to pursue them across the landscape and and just slaughter them. It wasn't let's take you back to court, it was we're going to kill you and that's exactly what they done." (ND&A 2020: video 0001)

He continued:

"Captain Lethbridge (owner of the property next door to Ravensworth) was the witness at the forced marriage of apical ancestor Mary Shoe) and Joseph Hughes (white).

"So what we have is our people, Mary, being forced to marry a European because she's pregnant. That's what's going on. So I'm here today and we have very clear lines back to post-colonisation through Mary Shoe, Matilda Hughes, Sarah Smith my grandmother, and my father. My grandmother's sister was Aunty Barb's great grandmother. So our womenfolk were raped here, they became pregnant, and were then forced to marry European settlers and prisoners. You know, it's not only in us, I mean, you wouldn't get Aunty Barb's daughter out here. She wouldn't come outside here. She knew we were coming here today, but she wouldn't come here." (ND&A 2020: video 0001)

Scott Franks summarised the significance of Ravensworth for Wonnarua people:

"If someone asked me how to describe this, where we're standing today was the epicentre of the destruction of our culture and our people. This was it." (ND&A 2020: video 0002).

I also conducted an interview with Maria Stocks and her brother David Foot on 18/02/2020 (Figure 4-3).

Maria Stocks spoke of her grandmother, Alma Shearer, who told them that when her mother was still alive (Maria's GGM) they were near Bowman's Creek, with a group of relatives, fishing at some fish traps. They saw horsemen coming. Troopers with guns and swords. Alma's mother's sister was there with her children, and they ran away to hide. There were half a dozen mounted troopers, who chased them. In the pursuit. Two small children were shot, and Alma's mother was grabbed by horsemen and stabbed. Others hid up in the gullies near Bowman's creek. Another, pregnant woman was chopped with a sword and disemboweled. (Maria and David Stocks Interview 18/02/2020, Draper 2020: 66). To the best of my knowledge, there is no written historical record of this event.

There has been a concatenation of generations and individuals in this oral history from the Foot family. According to available birth, marriage and death certificates and the associated draft genealogy prepared by NTS Corp NSW annotated - Draper 2016), Alma Shearer was born in 1906, and her mother, Alice Henrietta Leslie was born in 1880. Alice's grandmother, Mary Shoe was born about 1800, and it was Mary's generation who were adult women at the time of the height of the conflict with colonists in the 1820s. It is quite common for oral history passed down in families to undergo this kind of concatenation after three or four generations, in terms of the attribution of the original participants or witnesses at the origin of the story. In this case, we are looking at six or seven generations, and a time period of approximately 200 years. This does not invalidate the content of the story, which may persist for many generations (though probably in increasingly attenuated form), long after the correct genealogical association has been lost.

Maria Stocks was told by her mother. Barbara Foote that terrible things happened at Ravensworth in the early colonial years. She was told that Aboriginal men were buried out there in shallow graves. She was told a lot of younger Aboriginal boys were decapitated and buried there – they had not been initiated into adulthood through the Bora ceremonies (Maria and David Stocks Interview 18/02/2020, Draper 2020: 66).



Figure 4-3: Interview by Neale Draper (L) with David Foot (centre) and his sister Maria Stocks (R) on 18 February, 2020.

4.4 Continuity and Current Cultural Associations

4.4.1 Continuing cultural and historical connection to the project area

The PCWP Wonnarua families have a strong cultural and family-history association with the project area and surrounding landscape from the time of the earliest occupation of the Ravensworth Estate by James Bowman and his servants to the present day. They also have a rich oral history, handed down in their families concerning that history, and continuing cultural beliefs and traditions concerning Ravensworth estate, within a web of tangible and intangible cultural associations with high cultural heritage significance.

These families and their ancestors have always been in the immediate local area.

Joseph Hughes, the (husband of Mary Shoe (Matilda Hugh's mother) had land upstream from Bowman's, near the top of the catchment. (Scott Franks 17/02/2020, Draper 2020: 63). These blocks of land are shown in the surveyors map (Figure 4-4), with nearby blocks owned by Bowman and Glennie.

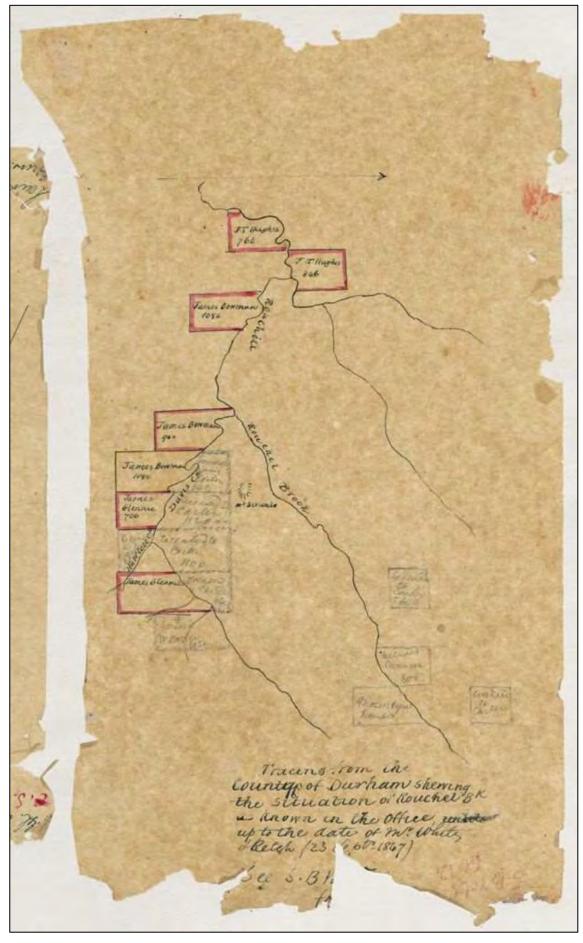


Figure 4-4: Early surveyors maps showing Joseph Hugh's property at Scrumlow, Upper Bowman's Creek, with adjacent blocks owned by Bowman and Glennie (scource: Tocomwall).

4.4.2 Camberwell

The Camberwell Church was established just across Bowman's Creek from Ravensworth (Map). According to Wonnarua informant Scott Franks, there was a traditional camp and a Bora Ground (Men's initiation site) there already.

"The surveyor before Dangar included in his notes a sketch map showing Camberwell across the creek from Ravensworth, with the annotation "Blacks". (Scott Franks 17/02/2020, Draper 2020: 63).

Maria Stocks said that in colonial times her ancestors had been married and buried at the Camberwell Church, opposite Ravensworth. David said there was formerly a bora ground (men's initiation site) ar the church site, close to Glennies Creek. The church was built on the bora ground, to keep Aboriginal people away. Another little church along Glennies Creek also was built on a Bora ground. (Maria and David Stocks Interview 18/02/2020, Draper 2020: 67).

Wonnarua ancestor of the Franks, Foot/Stocks and Lester families, Matilda Hughes and James Arthur Smith were married at Camberwell Church, on the property adjacent to Ravensworth. The witnesses were local property owners (Scott Franks 17/02/2020, Draper 2020: 61).

The Smith family are well-represented in the records of grazing fees for the Camberwell Church common and Church maintenance expenses from the 1930s to the 1950s (the only time period that I have seen - e.g., Figure 4-5).

Camberwell Church history records that because registration of births, marriages and deaths was not at first compulsory, the earliest records of burials commence in 1844, recorded as Falbrook, Glennies Creek or Camberwell. Some of these burials are unmarked graves at Camberwell Graveyard (Figure 4- 6), but many people probably were buried where they lived. It is noted that "there are also said to be graves on 'Ravensworth'.' (Garvie n.d.) It is my understanding that the only known burial at Ravensworth is of Miss White, the original overseer's daughter, just near the homestead.

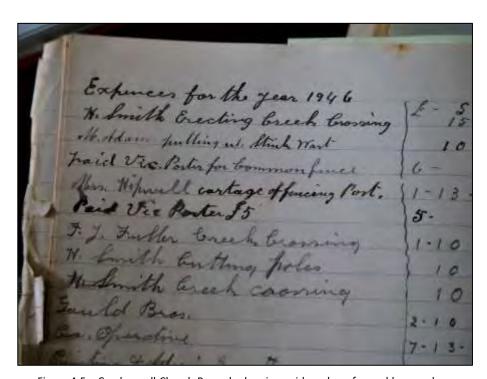


Figure 4-5: Camberwell Church Records showing paid work performed by members of the Smith Family in 1946 (courtesy of Diedre Olofsson, Camberwell).

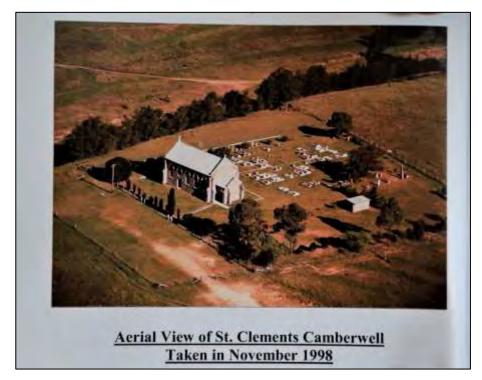


Figure 4-6: Aerial view of Camberwell Church and graveyard (courtesy of Diedre Olofsson, Camberwell).

4.4.3 Billy and the Betty's Creek Stone Arrangement

"King Billy" is an important ancestor of the Smith/ Franks family, in relation to his birthplace association with the Betty's Creek stone arrangement near Mt. Owen and the cultural knowledge he is said to have handed down to his descendants.

In a native title application affidavit, Scott Franks recorded that:

"2. As a young boy I would avoid school. I hardly turned up from a very young age and left school as soon as I was allowed which was when I was 14 and 9 months. I would always be in the bush as my father owned a property of more than 1000 acres known as Mt Olive. This property was situated 14 miles north of Singleton along Bridgman Road. In those early years I would run around the bush with my Uncle Clyde and his first cousin Ashley Hedges. Ashley was a dingo bounty hunter and Aboriginal man. He had been taught by my non-Aboriginal grandfather Charles Henry Franks to call a dingo and track them. My grandfather had been taught this skill as a young man by "King Billy" the Aboriginal father of his eventual wife, Sarah Anne Smith. It was the expert knowledge to howl and call in dingoes that enabled my grandfather to make enough money from dingo bounties to purchase Mt Olive which my father inherited and lived on for all but the last ailing years of his life." (Franks 2012: [2]).

In our interview at the Betty's Creek Stone Arrangement, just north east of Ravensworth (see below), Scott Franks spoke of his ancestor Billy in terms of that important cultural and archaeological site, and the cultural traditions concerning it that he handed down through his family.

"This is where Billy was born, so in his mind it was his great grandfather. We'd always site over there. He would start a fire as he did on Yankee's Drop and the smoke would come through here and clear away the leery people, they're the protectors. [We would] come in through the entry point here and go in on the right side and out through that [the opposite gap in the circular stone arrangement] following the smoke. So that was the only way to get through. But he wouldn't go on until that smoke went through here. There was no way – he would sit there for an hour."

The Betty's Creek stone arrangement lies approximately 6km NE of Ravensworth homestead, near another tributary of Glennies Creek. It is a registered Aboriginal Heritage Site (AHIMS 37-3-0637). This is a circular stone arrangement, which has been partially displaced by erosion (Figure 4-7). Scott Franks remarked that some of the rocks displaced by erosion have been replaced in the wrong position (which was fairly obviously the case).

He said that this was a birthing place for future chieftains only, and a ceremonial site. King Billy was born here. Uncle Clyde and Ashley Hodges walked through here with Scott numerous times when he was about 10-14 years old. There is a chain of ponds down the creek line and the area around the stone arrangement used to be flat. There was been a lot of water and soil erosion since then. (Site inspection 18/02/2020, Draper 2020: 65, photos).



Figure 4-7: Betty's Creek stone arrangement site.

In our interview at the stone circle, Scott Franks recalled being taught by his uncle Clyde the culturally appropriate way of approaching and interacting with this place.

"This is where Billy was born, so in his mind it was his great great grandfather. We'd always site over there. He would start a fire as he did on Yankee's Drop and the smoke would come through here and clear away the leery people, they're the protectors. [We would] come in through the entry point here and go in on the right side and out through that [the opposite gap in the circular stone arrangement] following the smoke. So that was the only way to get through. But he wouldn't go on until that smoke went through here. There was no way – he would sit there for an hour." (ND&A 2020: Video 17).

Scott had previously recorded some oral history regarding this place and these events in a Wonnarua native title application affidavit.

"12. I was taught that the fire that we would make needed to be very smokey as smoke would clear the path for us to go ahead. Uncle Clyde and Ashley told me that this was a protected area and we needed to do this to let the "Leery People" know that we were from that area and to let us pass through. Leery People, as my Uncle explained it, were small spirit people that would torment you and that smelt really bad. The Leery People would guard certain areas and-stop other Mobs going that way as we were getting close to the back of the property known as Sunnyside on Bridgeman Road. This property was adjacent to Sydenham and the ceremonial site where my great grandfather had been born.

13. At about this point in our travels me, Uncle Clyde and Ashley would leave the creek and walk up the hill towards this ceremonial site. It was made of stones that were arranged in a circle that had two openings one facing north and the other facing south (Attachment D). A path lined on either side with rocks extended out from each of the openings acting like corridors which we used to enter into the circle. My Uncles reminded me that you couldn't go into the "guts" of the circle but had to keep to the edge of the circle. I would also be reminded that this was because you could only go into the centre of the circle to speak and you could only speak if you had authority to do so. My uncles and I would walk silently though it but would never go around the outside of it as it was also not allowed. Uncle Clyde and Ashley would always tell me about the boys coming here to become men. Ashley would tell me about how they would be in this area for over a week being shown how to catch fish and hunt. I was also told that somewhere nearby was a women's site also arranged with stones. I estimate that this area lies about four kilometres east of the current New England Highway between Bowman's and Glennies Creek.

14. When we returned back down the hill to Glennies Creek we would continue downstream to the New England Highway. Here just near the current front gate of the Ashton Coal Operations Area there used to be a headstone of a man called Fox. I remember that the headstone was made of sandstone and that the name FOX was etched into it. I don't remember how it was so but Uncle Clyde emphasised to me that this man called Fox was important to my family and to Wonnarua people in general.

15. Across the road from this burial site I was told that a ceremony was conducted where ·boys would use gold ochre sourced from the Bulga area. The boys would stay there for three (3) days learning how to use the 'she oaks' that grow along the creek. Bark from the 'she oaks' would be crushed and placed a little upstream and allowed to flow with the water down into some small ponds that had been made using the rocks in the creek. When the crushed she oak bark reached these ponds it leached enough sap into the water to affect the fish. All the perch, sprats, mud gudgeons, eels, catfish and mullet that were in the ponds at this time would float to the surface allowing them to be easily caught. I was also told they would use the she oak branches as I had done to catch yabbies.

16. After being in the area for about three days I was told that these boys would then move off upstream towards the stone ceremonial site at Sydenham to continue their lessons. The boys would then make their way to Bowman's creek and continue downstream towards the Hunter River where they would then follow along the sandy creek banks of the Hunter eventually to arrive at a big bora ground near the present village of Warkworth where large ceremonies would take place." (Franks 2012: [12-16]).

Scott Franks spoke about this again when we visited the stone arrangement in February 2020.

"So it's in on the right hand side and exit on the right hand side, under smoke. It's a birthing site, and that's where William Billy was born. William Billy was my great great grandfather, that's Matilda Hughs' father. He's the same guy in the photo with the brass breast plate at Scone. This is where he was born. This is the old Sydenham property names after the second ship in the first fleet. And Maria Stocks has a different view. She knows this is a birthing site. She will say it's a birthing site, but it continued on as a ceremonial site." It's right along the songline that comes out of Glennies.." (ND&A 2020: Video 17).

Maria Stocks also referred to the stone arrangement and women's site at Betty's Creek near Mt. Owen. (Maria and David Stocks Interview 18/02/2020, Draper 2020: 66).

Family oral history passed down through 6-7 generations has combined the Billy who was taken from the Bowman estate to Newcastle goal in 1826 and William "Billy" Smith, Clyde Franks' grandfather and Scott Franks' great grandfather. William Smith was born in 1858. He could have been born at or gone through some kind of birthing ceremony at Betty's Creek. His birth and death certificates record that he was born at Glennies Creek, while the NTS Corp draft genealogy has his birhplace at "Sydenham near Singleton" (Draper 2016).

As I have noted above (Section 4.3) in relation to oral history provided by Maria Stocks and David Foot, it is fairly common for oral history passed down in families to undergo this kind of concatenation after three or four generations, in terms of the attribution of the original participants or witnesses at the origin of the story. In this case, we are looking at William "Billy" Smith (1858-1908) four generations back from Scott Franks, and "King Billy", going back six or seven generations, nearly 200 years ago. This does not invalidate the content of the story, which may persist for many generations (though probably in increasingly attenuated form), long after the correct genealogical association has been lost.

In this case, I have no doubt that William "Billy" Smith possessed substantial cultural knowledge that he passed down through his family and that he was closely associated with the Betty's Creek stone arrangement site, and

perhaps even was born there, or ceremonially associated with the site as an infant. The Betty's Creek stone arrangement undoubtedly was associated with the earlier Billy, who was a local Wonnarua man arrested on Bowman's Ravensworth estate and incarcerated for a time in Newcastle jail in the mid 1820s. He was known as "King Billy" because of a "King Plate" (breastplate) bestowed on him later in life according to family oral history. This original Billy would have been of the same generation or one generation older than Mary Shoe (born around 1800), the recorded apical ancestor of the Smith/Foot/ Franks/ Lester families, and may have been a relative of hers. In that case, William "Billy" Smith may have been named after the original Billy, if he was a great grandfather or great uncle.

4.4.4 Traditional Cultural Routes and Resources

The PCWP cultural values report for the adjacent Mt. Owen Project cited Maria Stocks and David Foot's mother, Barbara Foot:

"As a girl I would travel along Bowmans [Creek]. We'd go from the mission, to school to town ... My Dad had a lot of cultural knowledge. He passed it on to me. He'd tell me places I could and couldn't go. He showed me important places. Places our ancestors still come through. I know how to read the sings of the land, the seasons. The signs are our lore, they show the way – like people used street signs to have order. Some of the signs, the trees, have been cleared but we know where they were from our ancestors, and we know what they tell us. People not from here don't have that knowledge." (Tocomwall 2013: 86).

Scott Franks also was taught about these important cultural routes and their associated significance and natural resources by his older relatives.

"5. Every month me, my Uncle Clyde and Cousin Ashley would walk the family property and hunt and gather. During our travels we would be gone for days at a time travelling along the bush tracks in our country (my Peoples land). I was taught that one ceremonial track passed through our property "Mt Olive". It commenced at the headwaters of Falbrook/Glennies Creek near Goorangoola and Mt Royal and travelled down along the creek all the way to Singleton." (Franks 2012: [5]).

"9. On the days that Uncle Clyde, Ashley Hedges and me would go out to the bush we would travel most of the times along the creeks from Mt Olive through to Bulga and the Putty. We would not take any food or water as Uncle Clyde and Ashley would teach me what food and resources were around for me to use." (Franks 2012: 9).

"10. I was told that the creek formed the only route which I should use to travel through the country of my people. It was the track which my family would use to travel to ceremonies and to move across country to get food. As we walked along my Uncle and Cousin would talk and I would listen and learn." (Franks 2012: [10]).

In a 2020 interview, he told me that his Uncle Clyde showed him the traditional way to pull weed out of the water on the banks of Glennies and Bowman's Creek to get baby trout (Scott Franks 17/02/2020, Draper 2020: 61).

For Wannarua people, these traditional cultural routes and resources were brought into being by their creation ancestor Biami (or Baiami). The outline of this creation mythology for the Hunter Valley is contained in an affidavit to the PCWP native title application.

"a. Before our people were allowed to enter the lands known today as the Hunter valley our creator Biami looked down from the skies. He then stepped down onto Big Yango with his son, Little Biami. As both then stepped onto Little Yango, Big Biami looked across the area and started to move the lands to make the valleys. As both then moved across the area Biami opened up the lands and made the hills and streams and gave life to the area. As both moved from Yango up into the Hunter valley, Siami and his son placed the animals in the lands and the birds in the skies.

b. Biami then looked at the waters and brought the fish. He first placed the mud gudgeon to settle the muddy water that was created from the new water as it flowed through the new streams. After the mud was settled he then put the catfish in the water and ordered him to make his nest of rocks on the bottom of the streams to slow the water. Once the steam has settled Siami set the other fish loose in the creek. The perch to hide and watch under logs and holes in the bank and yabbies to build up the banks and to eat all the grasses that were left in .the lower streams. He then placed the sprat that all swam together travelling up and down the streams making sure everything was working (I recall too that Uncle Clyde used to call sprats sugar fish because they were so sweet. He would smoke them and eat them whole and he always took a special "sugar bag" with him in the bush just in case he come across some in the creek during our travels)." (Franks 2012: [17]).

"h. Biami then turned his attention onto the lands in our country and to help our people move around the lands he gave them ceremonial tracks and taught them how to walk through the land and tell the stories of our people. He said ceremonial tracks will be used to teach what is needed to live in your lands.

i. Many of these ceremonial tracks are still in place today. One ceremonial track runs from the apex of the Barrington Tops right back to Yango. This track moves down out of Barrington Tops, following Glennies Creek, it passes through Carrowbrook, down to Falbrook and then it continues all the way to Jerrys Plains, Warkworth, Bulga and to Yango. When walking along this track our people would tell this story of how the land was made and of what was expected of you to live in our lands to ensure that the story was told to all in the lands." (Franks 2012: [17]).

Scott Franks also recorded in that affidavit some additional aspects of the cultural knowledge taught to him by his Uncle Clyde.

"18. My Uncle Clyde taught me that the area about Jerry's Plain was extremely important because of its closeness to the large bora ground near Bulga. He explained that a ceremonial track associated with this bora ground extended from the Dural Caves out the back of Jerry's Plains (off Jones Reserve Road) and back through Apple Tree Flats. This ceremonial track crosses the land that is the Claimed Area.

19. An extension of this ceremonial track allowed people to move across from the Falbrook Ravensworth Area ·down both Glennies and Bowmans creeks into the Warkworth area and then back up the Wollombi Brook, through Jerry's Plains past Plaschett and across to Apple Tree Flats. This route was burnt into my head as a child by my Uncles, Aunties and Father as the only way our people (my family) could travel to get to the bora. I was also taught that my family would return to Falbrook after the ceremonies had finished by way of Nine Mile Creek, Loders Creek then across to the Hunter River and back to Mt Olive and St Clair." (Franks 2012: [18-19]).

In our interview at the Betty's Creek stone arrangement (See below), Scott Franks spoke further about this traditional, initiation cycle and travelling route. In placing the stone circle site within the local, Wonnarua cultural landscape, he said:

".... It's right along the songline that comes out of Glennies.

This is definitely the songline that comes out of Glennies Creek. It goes all the way to - it's called gold tree, the site - that was the third initiation point, for fishing." (ND&A 2020: video 17).

As noted above, Uncle Clyde Franks brought Scott through here a s a boy on annual trips along the initiation trail.

"This is where Billy was born, so in his mind it was his great great grandfather. We'd always site over there. He would start a fire as he did on Yankee's Drop and the smoke would come through here and clear away the leery people, they're the protectors. [We would] come in through the entry point here and go in on the right side and out through that [the opposite gap in the circular stone arrangement] following the smoke. So that was the only way to get through. But he wouldn't go on until that smoke went through here. There was no way – he would sit there for an hour."

Past here there was a bend on the left that would take you back to Glennies Creek. From here to Camberwell, to the gold tree site (fishing), the birthing site and then back to the Hunter River at Singleton. Continue along there to Area Four and the canoe tree site, over the New England Highway to the top of Nine Mile Creek andthen Lotus Creek. There was a big camp site on Lotus Creek. From Lotus Creek to Wollombi and then to Baiame (the painted rockshelter) and then to the initiation site at Bulga." (ND&A 2020: video 0017).

There is a consistent build-up of orally-transmitted cultural knowledge of and continued connection with this highly significant cultural route evident in the sum of this testimony, in my view. Scott also spoke of the section of this cultural route around Ravensworth and Betty's Creek in relation to his ancestor King Billy and the other Wonnarua men involved in the conflict there in the 1820s, and how he believed they would have conceived and made use of it.

"The men who raided Bowmans and neighbouring properties in the mid 1820s used these trackways as escape routes after raids.

"These men that came from these [places like Betty's Creek circle] were effectively the warriors within the tribe group. This was their safe haven. This is where their spiritual beliefs came from. That's why they were here all the time They would practice here for calling in, I suppose you would call their I suppose you would call them spirit protectors, to guide them. That's why the men went back this way. They were coming to hide. To get back, they probably believed at the time that the Europeans couldn't see them and that they had the leery people and everyone to protect them, because they wouldn't have been coming right in here." (ND&A 2020: video 20).

Uncle Clyde told Scott during one of these walking trips that our people wouldn't attack until there was light misty rain so it would soften the grass and the enemy couldn't hear them coming (ND&A 2020: video 0020).

Different individuals always have varying oral history and cultural knowledge from one another, as these are both family-based and individual learning experiences, transmitted from person to person between generations. With this in mind, my interview with siblings Maria Stocks and David Foot corroborates the information above from the related Franks/ Smith family.

As children, Maria and David occasionally went down Glennies Cree with their mother — "when she got it into her head, it was time to go". They went to the fish trap a few times, and to Betty's Creek and Bowman Creek. They said that at Betty's creek there is a birthing site, which is separate from the stone arrangement that was King Billy's birth place. They were not allowed to go to that one. David did go there once with his mother (in his 40s) at her request, and he waited outside the marker scarred trees for his mother, who went to the actual site alone. (ND&A 202: video 0021).

4.4.5 Ravensworth Estate and Homestead

I visited Ravensworth homestead (Figure 4-on 18 February 2020 with Scott Franks and Rob Lester, video ethnographer Clive Taylor and Glencore representatives. Scott and Rob both were very uncomfortable being at the homestead because of its reputation as a bad place associated with the deaths of their ancestors during the colonial conflicts, but Maria Stocks and David Foot declined to go there at all, for the same reasons.

When I interviewed them later, Maria Stocks said:

"David and I grew up out at Glennies Creek. Everybody knows that. And we did go up to Ravensworth quite a bit, on different things. Our Grandmother actually taught at that school (not Aboriginal). My father went to that school.Dad would talk about different things as he was growing up, as a child. But also with our grandmother Alma Shearer, she told us stories about what had happened out at that homestead, which wasn't a very nice thing that happened out there. Her personal experience when she was growing up, when her mother was still alive, they were out down at Bowman's creek." (ND&A 2020: video 0021).

That oral history is related above in Section 4.3.2.



Figure 4-8: Ravensworth homestead 18 February 2020, with the homestead building and exotic garden in right foreground.

Their parents also told them that the 'old people' camped near Ravensworth homestead, but they didn't recall any further details. David Foot said that a lot of their relatives were born around Camberwell, near Ravensworth. Pop was born at Garangula. They were born all along Glennies Creek. David said his Dad took him to Ravensworth town site, but not to the homestead. (ND&A 2020: video0022).

There is one remarkable exception to the avoidance of Ravensworth by recent generations of this family. In the mid 1970s when Maria was about 13-14 years old, her mother took her to attend a smoking ceremony near the creek (York Creek), close to Ravensworth homestead. There were other women there and other girls too, including Wilma, Barb's sister and Maria's cousin Gail (mother's sister's daughter). There were no men present. The women collected pampas grass from the Ravensworth front garden, with the big "tails", and laid it on the ground in a star pattern. There was a small, smoky fire going. Maria doesn't know what the purpose of this was. Her grandmother was sitting, rocking back and forth and humming. A few of the older women did that, but not her mother or Wilma. She wasn't allowed to stand close, and with Gail had to stand back. The adult women painted their fingertips white, and put scented oil on their foreheads.

Maria was not told the purpose of this ceremony at Ravensworth. It was most unusual, because otherwise they always stayed away from the place. It was some kind of Women's business, and she was not told more about the meaning of the event, and was told not to talk about it – probably because she was too young to be told. This was during the time when the Marshalls still owned the homestead, but she doesn't know them and there were no white people present (Maria and David Stocks Interview 18/02/2020, Draper 2020: 66).

As Children, Maria and David always were told not to go into the Ravensworth State Forest, just down the end of the street from their house near Glennies Creek. Maria did go there once, nearly as far as the homestead, when she was about 15, and was "told off" severely by her mother and put straight into the bath to get thoroughly clean from having gone there. She wasn't allowed out of her Mum's sight again. She wasn't smoked, because she had a congenital heart defect and would choke on the smoke. If David went somewhere he shouldn't, their parents would smoke him. (Maria and David Stocks Interview 18/02/2020, Draper 2020: 66).

5 Cultural Values Assessment

5.1 Description of Cultural Values

5.1.1 Is Ravensworth a Significant Aboriginal Place?

Is Ravensworth a significant Aboriginal Place? There is considerable evidence to support the recognition of the remaining Ravensworth Estate, including Ravensworth Homestead, as an "Aboriginal Place" as defined in the NSW National Parks and Wildlife Act (1974):

"Place An area of cultural value to Aboriginal people in the area (whether or not it is an Aboriginal place declared under s.84 of the Act)." (OEH 2011: ii).

The detailed definition of what constitutes Aboriginal cultural heritage in OEH (2011) – see Section 2.2 above, incorporates the kinds of cultural values attributed to Ravensworth by the PCWP Wonnarua families.

These values include intangible cultural heritage relating to the traditional cultural and travelling routes and significant cultural sites (birthing, initiation, communications with Ancestors and spirits, etc.) down Glennies Creek and including its tributaries (Bowman's Creek, York Creek, Betty's Creek).

They include the traumatic history of violence and invasion from the early 1820s on involving their direct ancestors, focussed centrally upon Ravensworth estate as the "epicentre". It is central in terms of historical events (including Wonnarua oral history) related to early colonial conflict in this part of the Hunter valley. It is also central in relation to James Bowman's prominent role in the takeover of the land and the crushing of resistance through a vigilante campaign led by military forces that were brought to the fray at the instigation of Bowman and his neighbours.

There is a deeply held belief within these Wonnarua families that there also exist tangible remains of those tragic historical events on the remaining Ravensworth estate, consisting of numerous "shallow graves" resulting from both recorded and unrecorded killing of local Aboriginal people, their ancestors. This last consideration is consistent with, and expands on the archaeological significance assessments provided by historical archaeologists Casey and Lowe (2018) for this ACHAR – summarised above in Section 3.4.

Wonnarua people from these families today still have knowledge of and also continue to follow cultural traditions and practices in relation to this important set of cultural routes and places. Cultural beliefs concerning Ravensworth estate and homestead relate mostly to its status as a very "bad place" at the centre of the most tragic events in Wonnarua history — a place to be avoided. However, within the last 50 years it also has been the specific focus of at least one women's ceremonial event specifically associated with it.

It is my understanding that for these Wonnarua people, Ravensworth symbolises the colonial invasion that erased the majority of their ancestors and their traditional ownership of the land and traditional lifeways, and stands in contrast to the cultural knowledge and traditions that they retain. To destroy the remaining Ravensworth estate and to relocate the homestead appears to them to constitute the erasure of the remaining tangible and intangible cultural heritage and history that they associate with this place, and may disturb the physical remains of more of their ancestors, as happened at Mt. Arthur, who were victims of the historical conflict there.

This view stands in stark contrast to the reported lack of cultural values resulting from consultation with other Registered Aboriginal parties for this ACHAR (Canning 2019, see Section 3.2 above). The PCWP Wonnarua families assert that this difference is due to a lack of any cultural or historical connection between those RAPS and the local area, and that none of those people or organisations actually are Wonnarua, as opposed to historical immigrants into the region. That view is consistent with the genealogical information that I have been able to access (Draper 2018, 2020). The ACHAR assessment guidelines note that there may not be a consensus regarding a place's cultural or social value (OEH 2011: 8), based upon Article 13 of the Burra Charter (Australia ICOMOS 2013; see Section 2.3 above).

These cultural values are considered below in relation to the four criteria adopted for ACHAR assessments (OEH 2011) from the ICOMOS Burra Charter (Australia ICOMOS 2013): social or cultural value, historic value, scientific value, and aesthetic value. These assessment guidelines are described above in Section 2 of this report.

5.1.2 Social or cultural value

The Wonnarua families that I consulted have spiritual, traditional, historical and contemporary cultural and social associations and attachments to Ravensworth and the immediate surrounding area. Those connections are in terms of the tragic historic events that took place there or were focussed around the immediate vicinity of the Ravensworth estate and the participation of original owner James Bowman and his employees (most of them

convicts), and also in terms of cultural loss and cultural continuity in relation to those events and the local cultural landscape.

Ravensworth also is significant for its strategic location and blocking effect through land clearance, fencing and agriculture in early colonial history to the important cultural initiation and travelling route along Glennies Creek and its tributaries, from the Betty's Creek stone arrangement near Mt Owen, to the tradtiional camps located in oral history and indicated by archaeological discoveries at Ravensworth and York Creek, and the boria initiation site formerly at the adjacent Camberwell church site.

This place has high social and cultural significance in terms of its associations with contemporary Wonnarua identity. There is no doubt that this community would experience a severe sense of loss should this place be damaged or destroyed.

These elements of social and cultural value have been identified as a result of consultation with PCWP Wonnarua families who have documented, traditional and historical cultural associations with the subject land from the period of invasion and colonisation in the 1820s onwards. Other Aboriginal views reported by Canning (2018) came from people who appear not to have any cultural or historical association with Ravensworth. This relates to the advice of the Burra Charter Indigenous Cultural Heritage Management Practice Note regarding the importance of consulting with the appropriate Aboriginal people to speak for country (Australia ICOMOS 2013a: 3, 8; see Section 2.4.1 above).

The NSW Heritage Office (2001) assessment criteria pose the question in relation to social or cultural value: "Does the subject area have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons?" In relation to the PCWP Wonnarua group, the answer certainly is "Yes".

The ICOMOS Practice Note on Understanding and assessing cultural significance (Australia ICOMOS 2013b) provides additional criteria in relation to the Burra Charter (2013). Ravensworth has high significance based on all three of these criteria:

- "-Is the place important as a local marker or symbol?
- -Is the place important as part of community identity or the identity of a particular cultural group?
- -Is the place important to a community or cultural group because of associations and meanings developed from long use and association?" (Australia ICOMOS 2013b: 4; see Section 2.4.2 above).).

Ravensworth is an important marker or symbol for local Wonnarua people and for the broader community to some degree in relation to the large-scale transformation of the central Hunter Valley in the 1820s through colonial invasion and occupation, and the decimation of the Wonnarua people. These events shaped the history and the identity of surviving Wonnarua people for the next 200 years, to the present day. Ravensworth continues to be avoided by Wonnarua descendants for that reason, with the notable exception of the Women's ceremony held there in the early 1970s, which from Maria Stocks' description was clearly a commemorative mourning ceremony.

The Wonnarua also are very concerned that the "shallow graves" of murdered ancestors from the colonial conflict would be disturbed by the proposed mine expansion around Ravensworth, exposing them to extreme spiritual and physical danger from those unsettled spirits.

5.1.3 Historic value

Ravensworth has high historical value to Wonnarua people in relation to their oral history and cultural traditions relating to the colonial conflict that took place there and in which the property and its owner and staff took part, from the early 1820s onwards. These intangible and possibly tangible historic values (burials, archaeology) are shared with the wider, non-Wonnarua community, as they relate to events that transformed the local area and the Hunter Valley region more widely. This has been indicated in the historical archaeology significance assessment by Casey and Lowe (2018), discussed in Section 3.4 above. This phenomenon of shared value also is highlighted in the Burra Charter Indigenous Cultural Heritage Management Practice Note (Australia ICOMOS 2013a: 2; see Section 2.4.1 above).

In researching and recording the outline of these historic values, I have been mindful of the admonition in the ACHAR guidelines that:

"Places of post-contact Aboriginal history have generally been poorly recognised in investigations of Aboriginal heritage. Consequently the Aboriginal involvement and contribution to important regional historical themes is often missing from accepted historical narratives. This means it is often necessary to collect oral histories along with archival or documentary research to gain a sufficient understanding of historic values." (OEH 2011: 9).

The NSW Heritage Office (2001) assessment criteria pose the question: "Is the subject area important to the cultural or natural history of the local area and/or region and/or state?" In relation to Wonnarua cultural heritage,

the answer is "yes" at both local and regional (Hunter Valley) levels, and this largely untold history (Dunn 2015, Casey and Lowe 2018) also is significant at State and national levels.

The ICOMOS Practice Note on Understanding and assessing cultural significance (Australia ICOMOS 2013b) provides additional criteria in relation to the Burra Charter (2013). Ravensworth certainly has high significance to the Wonnarua in terms of the following criteria:

- association with an important event or theme in history;
- showing patterns in the development of history locally, in a region, and on a state-wide, or national basis;
- association with a particular cultural group important in the history of the local area (Australia ICOMOS 2013b: 3; see Section 2.4.2 above).

The historical theme and events are the violent invasion of the central Hunter Valley, particularly on and around Bowman's Ravensworth estate, which typifies and contributes many examples of the pattern of this invasion across the Hunter Valley, as well as its links to the neighbouring Bathurst region and the colonisation of the Wiradjuri lands and their resistance. The particular group associated with this place and its historical significance are the surviving Wonnarua families, who have also contributed their own oral history relating to Ravensworth and colonial conflict in this report.

5.1.4 Scientific value

Ravensworth certainly has high significance "because of its rarity, representativeness and the extent to which it may contribute to further understanding and information (Australian ICOMOS 1988 [2013])." (OEH 2011: 9). Casey and Lowe (2018 – see Section 3.4 above) refer to the potential historical archaeological record there in relation to historical conflict in the 1820s. While neither Casey and Lowe (2018) or OzArch (2018) discovered such archaeological evidence in their limited investigations on the subject land, Oz Ark (2019: 44) refer to previous archaeological discoveries of historic Aboriginal artefacts (e.g., flaked glass tools) locally. Scott Franks referred to the discovery of Ancestral skeletal remains at Mt. Arthur mine that were identified forensically as resulting from being run down by a horse (Section 4.3.1 above), which demonstrates that further archaeological and burial discoveries relating to the historical conflict may be made in future. In fact, it is a matter of great concern to Wonnarua people that conflict burials of their ancestors ("shallow graves") and their restless spirits would be disturbed through expansion of coal mining into the Glendell expansion area around Ravensworth homestead.

In addition, the current report has followed the guidelines for ACHAR assessments (OEH2011) and the Australia ICOMOS professional Practice Notes (2013a & b, 2017) to focus on direct ethnographic (oral history) research with Aboriginal traditional owners and knowledge holders for the place concerned, as well as directly related, documented history. As a result, significant previously unrecorded oral history has been recorded in relation to Ravensworth with only a very short period of field research, and the prospect has been raised thereby for further understanding and information to be gained in the future.

The NSW Heritage Office (2001) assessment criteria apply to the assessment of scientific value the question: "does the subject area have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state?" I have indicated above above that the answer to this question is "yes".

5.1.5 Aesthetic value

This is a strange case, in that aesthetic values usually are associated with scenic beauty and other positive attributes, whereas this is a matter of powerful, negative aesthetic values instead.

The sensory, scenic, and architectural characteristics of Ravensworth (OEH 2011: 9) have a high significance for Wonnarua people. The cleared home paddocks, homestead compound, farm buildings, and remnants of the exotic garden (Figure 4-8) all invoke the establishment and growth of the Bowman Estate and the setting of acts of violence involving their ancestors. These visual and sensory characteristics clothe the location to provide the unique, physical presence of this "bad place" for Wonnarua people. It is a negative aesthetic significance associated with general avoidance and at least one ceremonial event of mourning and loss within living memory, but it is a very strong association nonetheless.

In relation to aesthetic value, the NSW Heritage Office (2001) assessment criteria asks: "Is the subject area important in demonstrating aesthetic characteristics in the local area and/or region and/or state?" According to the 1902 Sydney Mail article on Ravensworth, this is a landmark early colonial estate and the oldest in the Hunter Valley, with reference to its architecture, appearance, and setting. Casey and Lowe (2018) found it significant on similar grounds from an historical archaeology perspective, and Wonnarua people consider it significant for the same reasons, but from an Aboriginal perspective that is founded in negative conotations.

The ICOMOS Practice Note on Understanding and assessing cultural significance (Australia ICOMOS 2013b) provides additional criteria in relation to the Burra Charter (2013). Two of these criteria definitely are relevant.

To the question "Is the place distinctive within the setting or a prominent visual landmark?" the answer from a Wonnarua perspective obviously is "yes".

To the question "Does the place have qualities which are inspirational or which evoke strong feelings or special meanings?" the answer also is "yes".

5.1.6 Representative, Rare and Educational.

In other terms, Ravensworth retains considerable **research potential**. It is both *representative* of key aspects of the colonial history of the local area and at the same time very **rare** in the fact that it has avoided destruction for so long. It also has both **educational potential** and an important, ongoing educational role in the teaching of oral history about colonial conflict and colonisation of the Hunter Valley for farming, among both Wonnarua people, and other local residents who are interested in local history and cultural heritage (OEH 2011: 10; see Section 2.2 above).

5.1.7 Assessing and Mitigating "Harm"

It is my understanding that for the PCWP Wonnarua families, Ravensworth symbolises the colonial invasion that erased the majority of their ancestors and their traditional ownership of the land and traditional lifeways, and stands in contrast to the cultural knowledge and traditions that they retain. To destroy the remaining Ravensworth estate and to relocate the homestead appears to them to constitute the erasure of the remaining tangible and intangible cultural heritage and history that they associate with this place, and may disturb the physical remains of more of their ancestors, as happened at Mt. Arthur, who were victims of the historical conflict there.

They are convinced that the Ravensworth estate harbours the shallow graves and restless spirits of Wonnarua people who were killed there during the course of colonial a and conflict, including men, women, and children, and that the disturbance of those places and remains through the expansion of open-cut coal mining would be both traumatic and culturally dangerous.

I am aware that this is the Wonnarua view, which may vary from the views of some heritage practitioners (Australia ICOMOS 2013a: 6; see Section 2.4.1 above).

In this case, the only effective mitigation of this harm would be to preserve this remaining landscape and built infrastructure on the Ravensworth estate from destruction and dislocation from open-cut mining. Should the mine expansion proceed, the proposed relocation of Ravensworth homestead would cast it adrift from its geographic "sense of place" that is at the core of its cultural heritage significance for Wonnarua people.

In addition, their fears that the mining expansion would expose or destroy unsanctified conflict burials of their ancestors, as in the case of Mt. Arthur, would cause additional distress to the Wonnarua descendants. Considering the enormous scale of earthmoving operation associated with the expansion of an open-cut coal mine, the burial discovery at Mt. Arthur must be regarded almost as a fluke. This severe cultural impact could be mitigated to some degree if the mining expansion proceeds by engaging PCWP Wonnarua traditional owners (i.e., not just any locally resident Aboriginal people) to monitor all earthmoving operations of topsoil capable of containing burials or archaeological material throughout the expansion area, and to conduct the recovery, recording and repatriation of any discoveries, in conjunction with suitably qualified archaeologists and anthropologists of their choosing. Additional anthropological and archaeological research that is targeted to investigte these topics of concern (See Section 5.1.4 above) should be an important part of any such mitigation process.

5.2 Statement of Cultural Heritage Significance

5.2.1 Cultural/ Social Significance

Ravensworth estate and homestead has very high cultural and social significance because:

- It is located adjacent to the important cultural route along Glennies Creek and its tributaries that form part of the traditional male initiation (Bora) cycle of the Wonnarua people, and the establishment of the estate contributed to the demise of the use of this section of the route for those cultural practices and associated traditional resource access by Wonnarua people.
- It is a central place in the colonial invasion and associated conflict and violence that resulted from the establishment of this and other estates in the 1820s, that lead to the deaths of many Wonnarua people, as well as some colonists. Numerous conflict raids and reprisals, with accompanying fatalities in most cases, took place on the Ravensworth estate, which had two main roads passing through it and was one of the earliest and largest of such enterprises in the Hunter valley in the 1820s and 1830s.

- Dr James Bowman, who established the Ravensworth estate, was instrumental in persuading the Government
 of the 1820s to station military forces in the local area, including at Ravensworth, to subjugate Wonnarua
 resistance and to kill those who participated and take lethal reprisals on their families and community,
 resulting in both recorded and unrecorded massacres and executoions of Aboriginal men, women and
 children. Wonnarua oral history suggests that Bowman may have personally killed or at least ordered the
 execution of some Wonnarua people in the mid 1820s.
- It's bloody colonial beginnings have engendered the strong belief that there are unsanctified burials of their ancestors on the Ravensworth estate, Wonnarua people maintain avoidance of contact with the place almost 200 years after those events, apart from a Women's mourning ceremony held there in the early 1970s, considering it to be spiritually dangerous.
- This place is regarded as both symbolic of and central to the violent invasion and decimation of the Wonnarua people in this region.

5.2.2 Historical Significance

Ravensworth estate and homestead has very high historical significance because:

- It has a very strong association with the history of early colonial conflict and invasion of the Wonnarua people by the colonists and the military forces that assisted them.
- It was a central place in many of those historical events, as well as considered symbolic of the cause of Aboriginal resistance to colonisation in the Hunter Valley. This includes both written historical records of conflict, as well as oral history records from Wonnarua families related to the conflict.
- It is an important landmark in the overall pattern of European invasion and Aboriginal resistance in the Hunter Valley and neighbouring areas, such as the Bathurst region from the early 1820s onwards.

5.2.3 Scientific Significance

Ravensworth estate and homestead has very high scientific significance because of its potential to yield additional archaeological information about early colonial conflict events in the form of archaeological sites or conflict burials, as well as the focus for additional ethnographic (oral history) and historical research concerning the colonial conflict period around that location. The important themes surrounding the colonisation and Wonnarua resistance on and adjacent to the Ravensworth estate has only begun to receive overdue research attention in the last five years (e.g., Dunn 2015 to the current report), and has significant, further research potential (e., see Casey and Lowe 2018 significance assessment).

5.2.4 Aesthetic Significance

Ravensworth estate and homestead have high aesthetic significance, both visually as a very early and distinctive homestead complex (the oldest in the Hunter Valley?) and associated exotic garden and cleared home paddocks, as well as evoking severe dread and anxiety among Wonnarua people because of its central associations with the deaths of many of their ancestors and their loss of sovereignty, causing them to continue to avoid the place almost two centuries after those events.

6 Bibliography

Australia ICOMOS 2013 The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance. Australia ICOMOS Incorporated

Australia ICOMOS 2013a *The Burra Charter and Indigenous Cultural Heritage Management*. Practice Note, Australia ICOMOS Inc.

Australia ICOMOS 2013b *Understanding and assessing cultural significance.* Practice Note, Australia ICOMOS Inc.

Australia ICOMOS 2017 *Intangible cultural heritage and place.* Practice Note, Australia ICOMOS Inc.

Bundock, W. 1896 Mrs. Bundocks Memoir: Early life in New South Wales, The Coming of the Ogilvies to the Clarence, Hardships of The Journey, Their arrival at Yulgilbar. Clarence River Historical Society. *Daily Examiner* Saturday 2 April 1932, Grafton, NSW. page 7

Canning, S. 2019 Glendell Continued Operations Project: Aboriginal Cultural Heritage Assessment Report. Report prepared by ACHM for Umwelt and Glencore.

Casey & Lowe 2018 Ravensworth Homestead Complex and Surrounds. Historical Archaeological Assessment & Archaeological Research Design. Report by Casey & Lowe Archaeology and Heritage to Glencore.

Dangar, H. 1828 Index and directory to map of the country bordering upon the River Hunter; the lands of the Australian-Agricultural Company, with the ground plan and allotments of King's Town, New South Wales: containing a detail of the annual quit rent and amount of the redemption of the same; also historical notes upon the tenure and principle of granting lands in the colony since 1810; also for the guidance of emigrant settlers, a description of the unlocated country in the vicinity of Hunter's River; useful geographical notes on Liverpool Plains; the present regulations and conditions upon which grants and sales of land are made by government, with observations thereon, with a view of the present state of agriculture in the colony, price of land, advice to settlers, &c. the whole forming with regard to land affairs in that colony, a complete emigrant's guide / by H. Dangar.

Draper, N. 2016 Hand-corrected copy of NTS Corp genealogy, descendants of Mary Shoe, and associated Birth, Marriage, and Death Certificates. Neale Draper & Associates, Pty. Ltd.

Draper, N. 2018 Plains Clans of the Wonnarua People Native Title Claims: Anthropology Report for Federal Court Mediation. Anthropology desktop report prepared for Chalk & Behrendt Lawyers & Consultants, and the PCWP Native Title Applicants.

Draper, N. 2020 Wonnarua Native title Mediation: Review of Court Expert's Report NSD1680/13, NSD1093/12 and NSD/788/13 PCWP Native Title Claims. Report prepared for prepared for Chalk & Behrendt Lawyers & Consultants, and the PCWP Native Title Applicants.

Draper, N. 2020a Glendell Project, Field Notes 17-20 February 2020. Neale Draper & Associates Pty Ltd.

Dunn, M. 2015 A Valley in a Valley: Colonial struggles over land and resources in the Hunter Valley, NSW 1820–1850. PhD Thesis, School of Humanities and Languages, University of New South Wales, Sydney.

Dunn, M. 2019 *Ravensworth Contact History*. Report prepared for Umwelt Environmental & Social Consultants, NSW.

Franks, S. 2012 Further Statement of Mr Scott McCain Franks 24 August 2012. NSD1680-2013 Amended PCWP Native Title Application.

Garvie, C. (no date) The Graveyard and it's Stories. Camberwell District, St Clements Burial Ground. The occupants and their history. Carol Garvie and the Family History Society, Singleton.

Gollan, V. 1993. The Military Suppression of the Wanaruah Resistance in the Upper Hunter 1826. Mount Arthur and Surrounding Area. Unpublished Report to Wanaruah Lands Council.

HRA 1919 Captain Foley to Lieutenant De La Condamine, Newcastle 22 September 1826. Historical Records of Australia, Vol. XII.

ND&A 2020 Glendell Project, Video Interviews 17-20 February 2020. Neale Draper & Associates Pty Ltd.

NSW Heritage Office 2001, Assessing heritage significance, NSW Heritage Office, Sydney, Australia.

OEH 2011 Guide to investigating, assessing and reporting on Aboriginal cultural heritage in New South Wales. NSW Office of Environment and Heritage (now part of DPIE).

OzArk 2019 Aboriginal Archaeology Impact Assessment. Report prepared for Umwelt Australia and Glendell Tenements Pty Ltd.

PCWP 2013. Plains Clan of the Wonnarua People NSD1680-2013 Amended PCWP Native Title Application. (withdrawn early 2020 for amendment and resubmission).

Sackett, L. 2019 Wonnarua Native Title Claims: Traditional Wonnarua Lands, Wonnarua Laws and Customs Concerning Rights and Interests in Lands and Waters, and Wonnarua Apicals. Anthropology expert desktop review for National Judicial Registrar – Native Title, Federal Court of Australia (final version).

Tocomwall 2013 Beginning & Belonging: The traditional, historic and contemporary cultural landscape Values of the Mt Owen Continued Operations Project Area: A Plains Clans of the Wonnarua Peoples Perspective. PCWP Cultural Values Report for the Glencore MOCO (Mt Owen) Project.

Tocomwall 2020 Glendell Aboriginal Cultural Values Report. Report by Tocomwall Pty Ltd for Glencore

Coal Assets Australia and the Glendell Project ACHAR Application.

Watson, F., Chapman, P. and Australia Parliament Library Committee. 1914. *Historical records of Australia Library Committee of the Commonwealth Parliament, Sydney.* Volume 12. viewed 3 January 2020 http://nla.gov.au/nla.obj-476838109

Appendix F Upper Hunter Valley Contact History by Dr Mark Dunn

P18-0089 Page 249



Ravensworth

Contact History

Dr Mark Dunn Historian July 2020

Contents

Introduction	2
Pre-Contact Landscape of Ravensworth and the middle Hunter Valley	2
Background to settlement	4
European Arrival in the Hunter Valley	4
Exploration of the Middle Hunter Valley 1819-1822	4
Dangar's Survey and the European occupation 1822-1826	5
Dr James Bowman and the Ravensworth Estate	6
Conflict in the Hunter Valley 1822-1827	9
Early Conflict in the Lower Valley	9
Attacks on Settlers in the middle and upper Hunter 1825-1826	9
Attacks on Settlers: James Bowman (Ravensworth), James Chilcott (Glennies Creek) an Ogilvie (Merton)	
Attacks on Settlers: Richard Alcorn, August 1826	13
Ongoing Clashes in the Upper Hunter: 1826-1827	17
Gostwyck 1827	18
Conclusion	19

Introduction

The following short report outlines the history and events that occurred in the Hunter Valley between British settlers and Aboriginal people during the 1820s. The information outlined is taken from a combination of primary and secondary sources including contemporary accounts to the period, official reports and later histories. All events are referenced with the list of sources and references provided at the end of the document.

Pre-Contact Landscape of Ravensworth and the middle Hunter Valley

Ravensworth sits within Wonnarua Country. The Wonnarua occupied much of the central Hunter Valley from around present day Maitland and inland to the foothills of the Dividing Range in the upper reaches of the Hunter Valley. Their neighbours included the Awabakal people on the coast around Newcastle, the Worimi near Port Stephens, the Darkinjung in the mountains to the south and the Kamilaroi around Merriwa and over the Liverpool Plains. Ceremonial ties and trading routes meant each group was linked throughout the region to each other. Their country was dominated by open forest and grasslands, with isolated patches of rainforest in the more remote valleys to the north.

The population of the Wonnarua prior to European settlement is unknown, and approximations vary widely. Estimates were made well after populations had declined, so must be treated with caution, with actual numbers often taken from blanket distributions after c1828, in which only a limited number of people would collect the blankets from the total population in the district.¹

The structure of Indigenous communities was complex. The Wonnarua comprised a nation, or language group. They all spoke the one language and shared similar customs and beliefs. However, within that group there were clans, each with their own territories. According to the anthropologist J.W. Fawcett, Wonnarua men belonged to one of four skin groups: either of the Ippye, Kumbo, Murree or Kubbee. Women, conversely, were either Ippatha, Butha, Matha or Kubbitha. With marriage within skin groups strictly forbidden, members of different clans lived together in small communities or familial groups.²

The Wonnarua lived a semi nomadic life but, it was not random wanderings. The position of camps was often determined by the availability of natural resources, like food and water, which were sometimes seasonal or affected by floods, droughts and other climatic events. The availability of water was especially important in choosing a location, 'irrespective of the size of the watercourse.'

The smaller the waterway, the smaller the camp. Many creeks and creek junctions were particularly

popular, as is evident in the archaeological record of the Singleton, Muswellbrook and Jerrys Plain region reinforces this with her modelling of a variety of Indigenous sites types in the Hunter Valley, the vast majority of which are located in close proximity to water courses.³

When British settlers arrived in the middle and upper Hunter in the early 1820s they found a landscape perfect for the grazing of sheep and cattle. Assistant colonial surveyor Henry Dangar arrived in the area in 1824, recording the first British accounts of the area around the future Ravensworth estate and the neighbouring country. Dangar had been given the task of dividing the country into portions for the allocation of grants to arriving settlers. He charted a series of areas called Parishes, which he used to designate the different areas of the Hunter Valley. Ravensworth and its neighbours covered the parishes of Ravensworth, Liddel (sic) and Vane. Dangar described the area in his field book thus:

Much alluvial flat and undulating land on the banks of Foy Brook. The west, middle and east parts are well watered by Foy Brook and two small chains of ponds—forest land generally undulating surface, of the first and second class description, some being third class. Iron bark, scrubby land of small extent—soils rich vegetable alluvial, rich stiff and friable loams with some poor stuff and stone gravelly, yet forming a very desirable tract of country.⁴

In 1828, in a directory to the Valley for settlers based on his 1824 survey, Dangar described both the Parish of Ravensworth as being "lightly timbered, well-watered, and though (except the vallies [sic]) a thin iron stone gravelly soil, yield a healthy and good sheep pasture" and the adjacent Liddell also as "an excellent tract of open, sound and deep loam" and "a most desirable tract for winter or spring sheep or cattle grazing". The neighbouring parish of Vane was also good country with desirable pasture extending along Fal Brook.⁵

Dangar's descriptions of open, thinly timbered country match with earlier accounts of John Howe, the first to make the successful overland journey from Windsor to the Hunter Valley in 1819 and again in March 1820. In letters reporting his expeditions to Governor Macquarie, Howe described the land around Jerrys Plains and towards Singleton as being fine grazing land, with extensive pastures and in some cases less than 4 or 6 trees to the acre.⁶

Background to settlement

European Arrival in the Hunter Valley

Europeans first began to enter into the Hunter Valley from the late 1790s, as first escaping convicts from Sydney and then search parties came into what is now Newcastle harbour on their way north. In September 1797, Lieutenant John Shortland entered Newcastle harbour while pursuing escaping convicts and reported on the coal deposits in the cliffs around the harbour and stands of timber along the river. His discovery encouraged commercial traders from Sydney to make trips to gather coal and timber. In 1801 a small convict camp was established at Newcastle to mine the coal, and although this was abandoned in 1802, by 1804 a permanent penal station had been established marking the beginnings of Newcastle as a town.

From 1804 onwards convict timber getters working out of the Newcastle penal station began to explore the reaches of the Hunter River looking for stands of timber to log. Between 1803 and 1821, the penal station and its outlying camps around Maitland were the only permanent settlements of Europeans in the Hunter, with the remainder being off limits to European settlement. Despite this restriction, Europeans and Aboriginal people had early contact around Newcastle and inland around Maitland and Morpeth. By 1810 convict timber camps were established along the river around what was known as Wallis Plains, close to present day Maitland. From here convicts ventured further inland in their search for timber. Contact with Aboriginal people was reported around these camps and by those convicts working in the bush. In July 1819 when Governor Macquarie toured the penal station and its camps he noted that the cedar gang based at what is now Maitland had a "military guard of a Corporal and three privates to protect them from the natives".

Exploration of the Middle Hunter Valley 1819-1822

In November 1819, a party of eight men from Windsor on the Hawkesbury– six Europeans led by John Howe and two Aboriginal guides– emerged from the Bulga Ranges on the southern edges of the Hunter Valley onto alluvial plains close to present day Jerrys Plains. John Howe was a constable from Windsor, and had set out to follow the paths of two previous attempts to get through the mountains. His party left Windsor in late October and arrived at the Hunter River on 5 November 1819. In reports to Governor Macquarie, Howe noted the potential for grazing in this new valley, remarking that the country was thinly timbered, with twenty trees per fifty acres in some areas. 9 After a day in the valley, Howe and his party returned to Windsor without exploring any further.

On 6 March 1820, Howe set off for a second expedition, this time with a party of sixteen including two Aboriginal guides, at least one, named Myles, who had accompanied him on the first journey. ¹⁰ The expedition reached the Hunter River on 15 March. This time they proceeded along the river banks until they came across convict timber getters at Wallis Plains, confirming that they were, and had previously been, in the Hunter Valley. In a letter to Governor Macquarie, Howe reiterated the grazing potential of the land he had passed through. Returning to Windsor, Howe was promised a grant of 700 acres at Patricks Plains (now Singleton) for his discoveries, with other members of his party also taking up land around the Singleton area. Howe's grant marked the beginnings of official British expansion into the middle valley. With the closure of the Newcastle penal station following soon after, the Hunter Valley was opened for free settlement from 1822.

By August 1822 Howe was on his land at Patricks Plains, with other settlers from Windsor also using his track to access the Valley. Some of these earliest forays were unofficial, with small farmers from Windsor trying to get onto land before large areas were alienated through grants. As numbers of settlers increased, the newly arrived governor Sir Thomas Brisbane instructed Surveyor General John Oxley to begin surveying land around Newcastle and along the Hunter River for partition into land grants. Oxley in turn instructed Assistant Surveyor Henry Dangar to undertake the survey, which he started on 14 March 1822. By this time early arrivals had established themselves on land close to Newcastle and the settlement at Morpeth including John Brown on his land at Bolwarra.

Dangar's Survey and the European occupation 1822-1826

For five years Dangar worked on the survey and in July 1824 he reached the area around what is now Ravensworth, in the County of Durham. He named Fal Brook (now Glennies Creek) and Foy Brook (now Bowmans Creek) and dividing the land around Ravensworth into squares ready for settlement in what was named the Parish of Liddel (sic). A number of settlers had already been granted land in the Parish of Ravensworth prior to the survey. A 2597 acre (1050ha) grant had been made to the Church and School Estate, while Ebenezer Bunker had received 600 acres (243ha) in March 1821, William Powditch had been granted 2000 acres (810ha) in July 1824, with a further 500 acres (202ha) purchased in May 1825, Captain John Brabyn had received his 800 acres (324ha) in June 1824 and James Bowman had taken up 2560 acres (1036ha) at the same time. Bowman was granted a further 4600 acres (1862ha) and purchased an extra 5000 (2020ha) in May 1825.

By 1825 Ravensworth was surrounded by neighbouring estates. George Forbes's Edinglassie estate on the Hunter River near present day Muswellbrook equalled 6000acres (2428ha), William Ogilvie with his wife Mary and children were at Merton on the river near present day Denman which

totalled 6176 acres (2500ha), and their neighbour Peter Cunningham on just over 2500 acres (1100a). Nearby were the brothers George and John Blaxland who had a combined estate totalling 4000 acres (1620ha). Near the present town of Scone was the Segenhoe estate of Thomas Potter Macqueen. Under the management of his overseer Peter McIntyre, Potter had two grants made to him equalling over 20,000 acres (8100ha), twice the size of Ravensworth.¹³

By the end of 1826, all the arable river front land between Newcastle and the present town of Scone had been alienated through grants or purchase for farming estates. This included the land along the lower valley rivers like the Paterson and Williams, as well as the mid-valley Goulburn River and most of the flowing creeks and streams. In 1828, Dangar produced a large scale map of the surveyed areas of the Hunter Valley, from Newcastle on the coast inland to the lower slopes of the Liverpool Ranges, which was accompanied by an Index and Directory. In his directory, Dangar described both the Parish of Ravensworth and of Liddel [sic]. Ravensworth was noted as being "lightly timbered, well-watered, and though (except the vallies [sic]) a thin iron stone gravelly soil, yield a healthy and good sheep pasture" with Liddell also "an excellent tract of open, sound and deep loam" and "a most desirable tract for winter or spring sheep or cattle grazing". The neighbouring parish of Vane was also good country with desirable pasture extending along Fal Brook.¹⁴

Dr James Bowman and the Ravensworth Estate

James Bowman had arrived in New South Wales in 1819 having been appointed Colonial Surgeon to replace D'Arcy Wentworth. Already a trained naval surgeon, Bowman was put in charge of the Sydney Infirmary (hospital). In 1823, Bowman married Mary Isabella Macarthur, the daughter of John and Elizabeth Macarthur. Macarthur gave Mary a dowry of 2,000 sheep and 200 cattle and Bowman soon after applied for a land grant. With the stock in hand, Bowman applied for and received a total of 12,160 acres (4921ha) in three portions, bounded by Foy Brook and Yorks Creek, which ran into the Hunter River. Bowman named his grant Ravensworth. From August 1824 Bowman visited the Hunter Valley and took possession of the estate late that year. He likely sent his convicts and overseer first to clear land and start the construction of the original house and associated outbuildings, as his work as colonial surgeon kept him in Sydney for most of his time.

In mid-1825 the Ravensworth estate was described by Peter Cunningham, another settler in the district (his estate was Dalswinton near present day Denman), as being partly fenced, under cultivation with extensive buildings for packing and sorting wool, with Bowman's flocks being numerous and amongst the finest cross-breeds in the colony. In a letter to the Colonial Secretary in November 1826 Bowman described his estate as having "Sheep sheds, wool house, stores,

cottage, kitchen, huts for ten men etc, which cost me Two Hundred & Sixty Pounds", with three miles of fence and 34 convicts. 16

The location of Bowman's first cottage and its collection of outbuildings at Ravensworth was on the high ground between Foy Brook (now Bowmans Creek) and Yorks Creek, with views back across the estate, approximately 850m to the west of the current homestead. A survey of roads completed by Robert Dixon in 1833, shows the position of the original house in relation to the later Ravensworth house. (Refer Figure 1) The estate was made up by a series of gentle hills and alluvial flats, with Foy Brook (Bowmans Creek), Yorks Creek and other small creeks and rivulets across the farm. Bowman was not alone in this part of the valley, although his homestead had no neighbours in sight, with the surrounding hills blocking direct views. To the east, (approximately 11km in a straight line) Robert Lethbridge, a Lieutenant in the Royal Navy, had taken up his 1000 acre estate named Bridgman on Fal Brook (Glennies Creek) by May 1825. As Lethbridge spent much of his time in Parramatta where he was a member of the local bench of magistrates, the estate was managed by Richard Alcorn, who himself had a small parcel of 60 acres also on Fal Brook. Alcorn's farm adjoined the 60 acres of Duncan Kennedy, promised by Governor Macquarie in 1821 but later passed to John Cuneen (who appears on the Crown Plan for the area) in 1836, with the 100 acres of James Chilcott next to that. All three properties had frontage to Fal Brook. Alcorn and Chilcott both had small huts on their properties, as did Lethbridge. (Refer Figures 2 and 3)

Although his estate was one of the largest, Bowman himself was rarely at the property. Throughout 1824 and 1825 Bowman regularly served as the sitting magistrate in Sydney and was appointed by Governor Brisbane to his Legislative Council in May 1825. He served only two months before his appointment was terminated by Royal Warrant in July, although he remained on the Council until November 1825.¹⁷ As well as these combined responsibilities Bowman worked at the Sydney hospital, where he, with his wife Mary and their children lived until 1828 before moving to Macquarie Place after he was appointed Inspector of Hospitals. His estate at Ravensworth was likely managed by his supervisor John W Alexander, a free man and the overseer of the estates convict workforce. Alexander is listed in the 1828 Census as Bowman's overseer in the district of Patricks Plains, while Bowman himself is listed as living at Macquarie Place in Sydney with his family.¹⁸

In 1824, Bowman had also been appointed as one of the colonial directors for the Australian Agricultural Company (A.A. Co), which was under the local direction of his father-in-law John Macarthur. The main estate was at Port Stephens, where the company had been granted over one million acres on which to run sheep. Taking advantage of his position, Macarthur acted as a local

French merinos for the A.A.Co, which after landing them at Sydney, he took them to Port Stephens. White served as superintendent of sheep for the A.A. Co until 1829, after which he left to manage the flocks for Bowman at the Ravensworth estate. White became the manager of the estate for Bowman the same year, arriving on the 30 March 1829, a position he held until 1839. While White managed Ravensworth, in Sydney Bowman purchased a 33 acre portion of the Cowper Glebe Estate at Wentworth Park, in the modern suburb of Glebe in 1833. Here he had Sydney architect John Verge design and build a family mansion, Lyndhurst, into which the family moved in. The family remained at Lyndhurst, finally returning to Ravensworth after 1839 when Bowman finished working in the hospital at Sydney. The family suffered badly in the economic downturn of 1840 with large debts from Bowman's attempts to build up his flocks and herds, and from extensions carried out at Lyndhurst. In 1846 Bowman died suddenly at Ravensworth. The farm was managed jointly by the Macarthur family and Edward Bowman, the eldest son of James and Mary until 1847 when it was sold to recoup debts and Mary and children left to live with the Macarthurs at Camden. 19

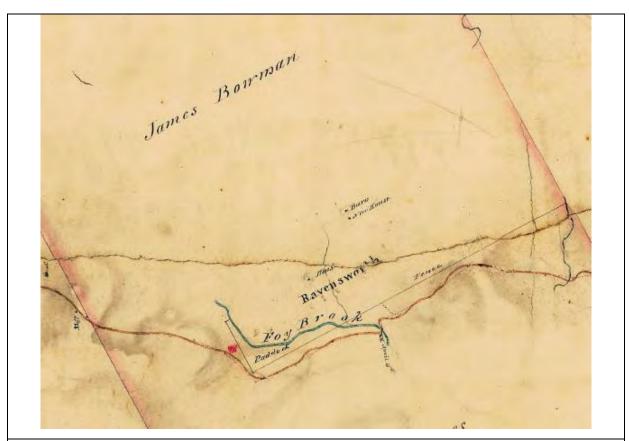


Figure 1: Part of Dixon's road plan showing buildings on Ravensworth including 'House', 'New house' and 'Barns' (Source: R.5.830, Crown Plan)

Conflict in the Hunter Valley 1822-1827

Early Conflict in the Lower Valley

Tensions between Aboriginal people and settlers had been apparent since the first grants were made in 1821-22, with attacks on isolated huts and raids into ripening maize crops recorded around Newcastle, Wallis Plains (Maitland) and Patricks Plains (Singleton) between 1822 and 1824. As with other frontier areas of the colony such as the Hawkesbury and Nepean in Sydney and the Bathurst Plains, wherever British outposts and farms appeared, local Aboriginal groups met them with a combination of resistance and negotiation.

Around Newcastle and Wallis Plains most of the incidents were concerned with the taking of maize crops with direct contact and violence relatively rare. ²⁰ As early as July 1822, Edward Close the magistrate at Morpeth had recommended the deployment of three soldiers and a constable to the Williams River area to protect farms against Aboriginal incursions. The same had already been done at the Paterson River settlements and those on the Hunter around the future site of Maitland.²¹

At Glendon on the Hunter River near Singleton, the brothers Robert and Helenus Scott's crop was raided in May 1824. Corn from the fields was taken, and their convict huts raided for bread. Robert Scott caught and held one of the raiders for a day, hoping this would discourage further attempts. Robert, in his role as a magistrate, later ordered the arrest of a man known as Jerry of the 'Patricks Plains tribe' for his ongoing involvement in raids and attacks. In December 1824, John Platt on his farm at Ironbark Hill, near present day Hexham reported his crop of maize destroyed by a fire, as well as a barn with his harvest, his farm implements and some of his livestock killed. Platt did not specify how the fires had started but as he had already been targeted twice by Aboriginal raids despite the 'severe example' he had made of the earlier attackers, he implied it was the work of Aboriginal raiders again.²²

Attacks on Settlers in the middle and upper Hunter 1825-1826

In late 1825 after a period of relative quite in the Hunter Valley, circumstances changed with the fatal attack on an isolated hut near present day Denman. In November 1825 it was reported that Robert Greig, cousin of the settler James Greig who had a farm on the banks of the Hunter River, had been attacked and killed in his hut and a stockman on the same property was missing, presumed dead.²³ As the details came to light, it became apparent that the attack was provoked by Greig, who had, according to his cousin James, taken an Aboriginal man at the property and beaten him, which had "irritated the tribe he belonged to, and caused Robert Greig's untimely end".²⁴ Further

allegations that Greig had attempted to drive the Aboriginal people off the land were told to the missionary Reverend Lancelot Threlkeld and reinforced the likelihood that the attack was targeted and in response to bad treatment.²⁵

Soon after Greig was killed, two other unnamed stockmen were speared and another, the convict of Captain John Pike, saved only by the arrival of two other Europeans. Pike's estate, Pickering, was on the Hunter River close to its junction with the Goulburn River approximately 34km to the west of Ravensworth and close to Greig. Greig's death was the first recorded in the area and prompted the then Commandant in Newcastle, Captain Allman to order a detachment of soldiers to proceed to the area in June 1826. Ten men, accompanied by bush constables headed inland to apprehend the identified Aboriginal assailants. None were captured in this action. The soldiers were not based or garrisoned in the area, but rather moved between the estates in an attempt to track and capture the Aboriginal men they supposed to be involved. While the soldiers were in the area, Edinglassie the estate of George Forbes approximately 13km north of Pike's on the Hunter River was also attacked and a shepherd speared. The shepherd recovered from the attack. In response, *The Australian* newspaper recommended that "such decisive measures to be adopted that will convince those sable depredators that they cannot attack the peaceable Settlers with impunity". ²⁶

Attacks on Settlers: James Bowman (Ravensworth), James Chilcott (Glennies Creek) and William Ogilvie (Merton)

On 18 June 1826 two convicts assigned to James Bowman were killed by Aboriginal attack, one in the bush and another in a hut on the estate, the whereabouts of which was not reported.²⁷ Soon after, the hut of James Chilcott located approximately 10km to the east of Ravensworth on Fal Brook (Glennies Creek) was raided. Chilcott wrestled over a musket with one of the attackers, a man known locally as Cato, before he managed to drive the rest away with the assistance of other farm workers.²⁸ In the same period two more of Bowman's men, working in the bush on the fences around Ravensworth were attacked, with both men severely wounded, one receiving seven spear wounds and being taken to the hospital in Newcastle.²⁹ The wounded man was interviewed by Reverend Threlkeld in the hospital over the incident, saying he had been speared in the back while working, then chased and set upon with cudgels.³⁰

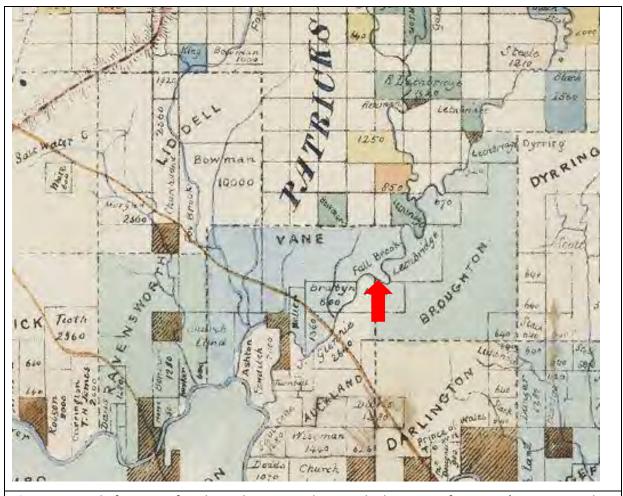


Figure 2: Detail of County of Durham plan c1843, showing the locations of Bowman's Ravensworth estate, Glennies property on Fal Brook and Lethbridge's farm further along Fal brook. The arrow shows the bend in Fal Brook where the huts of Chilcott and Alcorn were located (Source: SLNSW).

With the violence appearing to escalate, the soldiers who had been despatched at the start of June were joined by a detachment of the newly formed Mounted Police under the command of Lieutenant Nathaniel Lowe. The Mounted Police were soldiers, not civilian police and remained on regimental pay, although the cost of the horses was borne by the colony. They had been established by Governor Brisbane to act against bushrangers as well as Aboriginal attackers, with half the detachment sent to Bathurst in November 1825 and the other half to Wallis Plains (present day Maitland, approximately 65km south east) where they were stationed for action in the Hunter Valley.³¹

In August the Mounted Police detachment, led by Sergeant Lewis Moore with three privates, travelled with local settlers John Lanarch from Patricks Plains and James Glennie, a neighbour of Bowman's, in pursuit of those Aboriginal men suspected in the attacks on Chilcott's farm. The six

riders came across and captured a number of men including a lone man, and then a group of at least seven others and one boy, including Cato. The captured group were tethered together and led by the mounted troopers to Chilcott's farm, where a number of them, including Cato, were identified as having been involved in the raids on Chilcott as well as the attack on Bowman's men. They were then taken to Lethbridge's farm but here none were identified there as having been involved in attacks.³²

With the identification made, the three youngest were released and the rest restrained to be returned to Wallis Plains. Of the Aboriginal men taken, five including Cato and the first unnamed man were killed in the bush, attempting to escape from custody according to Lowe's men. One was shot close to James Glennies hut on Fal Brook, with Glennie reporting hearing a shot soon after he left the party near his house. All the men reported captured, except the boys, were killed.³³

The detail of where these shootings took place was never recorded, despite an inquiry into the action established by Governor Darling. Each of the men involved gave a slightly different version of events, but as the captives were being taken to Maitland from Glennies Creek, it is likely that the men were shot near Glennies farm or on the way down through the Hunter towards Maitland.

In January 1827, Threlkeld wrote to Bannister with further details of the events as told to him by an unnamed witness in the presence of another settler John Cobb. The witness said that one of the Aboriginal men suspected of involvement in the wounding of Bowman's men was captured and bought to Bowman's hut. Here he was secured with a rope around his neck, and then under armed guard he was taken one mile from the hut into the forest, made to climb a tree and tie the rope to an extended branch, whereupon he was shot. Wounded by the Europeans he was let fall and left hanging. Based on the date (1826) the hut referred to was the likely the original Bowman homestead, on the ridge line above the creeks to the west of the later Ravensworth house complex, which remains in situ that was built c1832. It may have also referred to one of the shepherd's huts on the Bowman estate, but no specific details were recorded at the time. It also not clear from Threlkeld if this was one of the group captured by Sergeant Moore or an individual man taken at a different time.

As the details of the various actions emerged Lowe was put on trial, not for the killings in the bush of the six men captured, as he was not physically present, but, for the wilful murder of another Aboriginal man, Jackey-Jackey who had been returned under arrest to Wallis Plains in July and then allegedly executed on 1 August 1826. Jackey-Jackey, otherwise known as Commandant or Jerry, was taken as a prisoner by the mounted police during July as one of those involved in the killing of

Bowman's shepherds in June 1826. Despite eye witness accounts of the shooting at Wallis Plains, Lowe was found not guilty in May 1827 and no further action was taken in relation to the other men captured and shot. This was the first time a military officer had been brought before the courts for actions against Aboriginal people.³⁵

Lowe's incursion appeared to have quelled the violence and Darling ordered the mounted police withdrawn to Wallis Plains, although a small detachment remained stationed at James Glennies property on Fal Brook.³⁶

In the last week of August at Merton, the property of William Ogilvie, a war party of upwards of 200 warriors suddenly appeared while William was away. Merton was located on the banks of the Hunter River close to the modern day town of Denman and approximately 32km to the west of Ravensworth. The house was occupied by his wife Mary and children. The men had appeared in response to one of their own having been arrested by the mounted police at Merton. The police had enticed the men to Merton under the pretence of looking for guides to capture bushrangers. When they had approached they had been seized. One of the men was named Jerry. Although Mary convinced the mounted police that the men were not involved in any local violence, it was the second time this had happened in as many weeks, with two other men already taken to Newcastle. When the warriors approached, it was the released man Jerry who led them. Angry at his own treatment and suspicious as to why he had been released but the earlier two had not, Jerry had returned. But, confident in their friendship between them, Mary and her son William spoke to Jerry and the others in their own language reassuring them they had tried to help and were friends. Jerry in turn spoke to the assembled warriors and, telling Mary to tell the soldiers not to interfere with them, the party moved off with no further incident.³⁷

Attacks on Settlers: Richard Alcorn, August 1826

On August 28 1826, another group of approximately 15 Aboriginal men gathered at the hut of Richard Alcorn, overseer for Captain Robert Lethbridge on the Bridgman estate at Fal Brook (See Figure 3). The small hut stood just over 800 metres along the creek line of Fal Brook (Glennies Creek) from Chilcott's property, and it was typical of the back country workers' huts of the period, with two rooms, one large outer room with a fireplace and a smaller inner room with a bed. There was a single entry doorway (no door) and three windows (no glass or shutters), two in the large and one in the small room. ³⁸

Around midday, John Woodbury, a convict servant arrived at Alcorn's hut to find the 15 Aboriginal men already there. Alcorn's wife Charlotte, her baby daughter Sarah Jane and young son Richard were inside. Woodbury sent the boy off to fetch two men working nearby, while Charlotte offered the assembled group some kangaroo to eat, which they took and roasted on a fire set for the purpose. Young Richard, who had been followed by one of the Aboriginal men, soon returned with the two workers. Asking for bread and maize, a few of the gathered warriors came into the hut, but Woodbury reported they showed no signs of violence in word or action at this point. At around 4pm, Richard Alcorn arrived at the hut and on recognising three men believed to have been involved in the raid on Chilcott's hut, decided with Woodbury that it was not safe having so many armed Aboriginal men around the huts and told them they had to go. Woodbury testified that at this point, the three men called out and those at the fire rose and advanced on the hut. The Europeans dashed for the inner room to get their muskets, while Charlotte, the baby and Richard junior got under the bed for protection.

With no door or shutters the hut was particularly vulnerable to attack and soon enough spears were coming in through the openings. Before Woodbury could discharge his musket he was struck in his hand with a spear, forcing him to drop the weapon. Henry Cottle, one of the workers, was struck in the left side and fell dead. As Woodbury regathered his musket the second man, Morty Kernan was also hit with a spear while firing from the inner doorway. Spears continued to fly in through the doorway and the windows, as Woodbury and Alcorn fired back out. As the shot for the muskets was in the outer room, both men were firing only with powder, hoping to fool their attackers into thinking they had lethal weapons. With spears exhausted the Aboriginal raiders began throwing large stones, one of which struck the wounded Kernan in the head and killed him.

In desperation, Alcorn had tied a bayonet to a long pole and used this improvised pike to thrust out at the Aborigines now in the outer room, while Woodbury took a large wooden box to block the window. The box was soon smashed in with clubs and stones and Alcorn was knocked senseless. At this the attack began to break up, as a shepherd, alerted by the shooting, was observed by the attackers going to fetch the mounted troops who were stationed at Glennie's property nearby. The adjoining workers' huts were raided for bedding and blankets and the warriors retreated into the bush. Not realising that the troops had been alerted, Woodbury tried to raise the alarm by firing his musket twice more and then once again sent young Richard Alcorn to Chilcott's farm. The mounted troops pursued the group but did not find them.³⁹

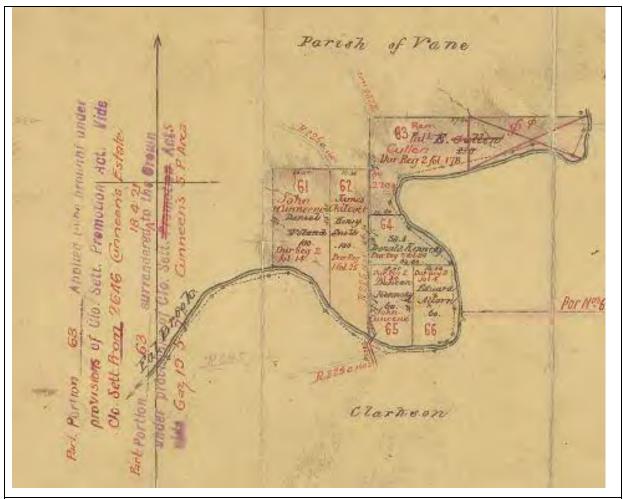


Figure 3: Crown Plan 66-663 showing the position of Chilcott's and Alcorn's farms on a bend in Fal Brook (Glennies Creek) (Source: LPI)

Robert Scott, the nearest magistrate, arrived the following day and saw broken spears lying all around the area, stones in the hut and the smashed box used in the defence. According to Scott, the warriors were not those involved in other incidents. Nevertheless, Woodbury identified four of them by name, including three from the attack on Chilcott's: Ball, Murray and Togy, another man named Brandy, and a boy captured and released on Glennie's farm nearby. The others he did not know well, although he felt he should. The response to this attack was swift. Two days after the attack, Robert Scott gathered a party of men, including five mounted police, four settlers and four Aboriginal trackers from his estate at Glendon near Singleton to pursue the attackers. Three days later, on 2 September, Scott's party came across an Aboriginal camp approximately 20 miles (32 kilometres) from Alcorn's hut. Two versions as to what happened were subsequently reported. Scott claimed that they came on the camp in the morning of the third day, whereupon a skirmish occurred, with one of the European's in his party speared in the face, two Aborigines killed and an

unknown number wounded. Scott reported that he had been told this by an Aboriginal woman captured during the action.⁴¹

The Australian newspaper however provided a more detailed account as reported to them: the pursuing group led by Scott came on the camp in the evening, guided in by the light of the camp fires. Two of the party, one European and one Aboriginal tracker, each with a musket, were sent forward to reconnoitre the site, but were seen as they approached. They each fired into the camp and then retreated behind trees to reload. The Aboriginal tracker was struck in the face with a spear, but was not killed, and the rest of Scott's party rushed forward to join the fight. As each was armed with a musket, their firing resulted in the death of eighteen Aborigines and the capture of a man and a woman. Roger Millis, in his book Waterloo Creek suggested that the discrepancies in the descriptions points to two separate incidents, one occurring in the morning and another in the afternoon. There is no evidence to suggest two raids, as Scott makes no further reference. More likely is that Scott had played down the event in his original report, whereas The Australian, through other informants had reported a fuller version. The report describes the chaos that ensued during the raid, with close quarter fighting against a group surprised at their camp.

The fear of more attacks amongst the settlers grew and in September a petition, signed by eleven landholders, called for the replacement of the mounted police with others or the reversal of the order to recall them in order that the district might be safe from future rumoured attack. James Bowman of Ravensworth was the first signatory, followed by near neighbour Peter McIntyre of Segenhoe, John Cobb who had been present when Threlkeld learnt of the hanging at Ravensworth, William Ogilvie whose own farm Merton had been the scene of a threatened attack by 200 warriors, as well as other landholders from lower down the Valley around present day Singleton, Lochinvar and Maitland.⁴⁴ Chilcott and Alcorn, the only ones at the time to have had direct contact with the violence were not signatories, nor was Glennie. While the Attorney General Saxe Bannister advised Governor Darling to deploy the military as a sign of the Government's overwhelming force, Darling dismissed the settlers concerns and the petition, commenting that the threat was minor, with few Aboriginal people in comparison to the settlers. He also advised that if the petitioners were so worried then they should consider spending more time at their properties rather than in Sydney, where he understood most were during the recent attacks. Further, their presence on the estates would enable them to counsel their servants and prevent the 'irregularities' that he suspected was the root cause of much of the trouble. He did however declare that if settlers united to take vigorous measures in their defence, they would prove more effective than a military force in protecting themselves, and that they would receive every necessary support for their exertions. 45

Ongoing Clashes in the Upper Hunter: 1826-1827

Following Scott's attack on the camp site, one more serious incident was recorded in the area. In his summary of events in the Valley, Robert Scott reported to the Governor on 3 October 1826 that a body of warriors attacked some fencer's working at Ravensworth, the third time Bowman's estate had been targeted. Five fencers were alerted by the barking of their dogs to the approaching warriors and managed to get to their weapons before the attack, wounding an Aboriginal man but sustaining no injuries themselves. ⁴⁶

In late 1826 John Elliott, a blacksmith at Thomas Macqueen's Segenhoe estate (approximately 33km north of Ravensworth, close to modern day Scone), avoided an ambush by Aboriginal men when warned by another, with whom he was friends about the plan. In November the child of John and Catherine Hunt at Patricks Plains was reportedly abducted by a man known to Europeans as Bit-O-Bread and to his own people as Byirybyrry. Hunt was a district constable at Patricks Plains. In March 1827 a large group of warriors surrounded the hut of convict George Claris at Redbournberry (near Singleton), including Byirybyrry who was seeking vengeance for the wrongful accusation of kidnapping. The arrival of two more Europeans at Claris's hut averted any attack. The Aboriginal men declared they would assemble 1000 warriors to attack the valley if Byirybyrry came to harm.⁴⁷

Three days after this event, on 28 March 1827, the last series of what did turn out to be the end of the violence in the middle and upper Hunter occurred. Samuel Owen, an overseer for James Bowman was returning to Ravensworth having been searching for strayed cattle. At Fal Brook (Glennies Creek), close to home, Owen was surrounded by a party of 15 Aboriginal men, one he recognised as Jackass (likely a man called Girrogan from Patricks Plains, identified by that name on the same blanket returns as Byirybyrry) who had caused 'so much mischief about Dr Bowman's'. The men asked Owen if he was 'the big constable' and when he said yes, they surrounded him in a circle, with Jackass and Owen in the centre—Jackass flourishing a waddie (club) and Owen parrying with his musket. The contest was stopped by the arrival of a woman, Cobborn Mary, the wife of Byirybyrry, who spoke to the men and convinced them to leave, likely saving Owen's life. On the same day, Benjamin Singleton at Patricks Plains and James Glennie both reported cattle having been speared.

Although tensions remained high, Robert Scott advised that there was no point in pursuing or arresting any of the suspected Aboriginal men. Although convinced of their identity, Scott thought that with Aboriginal warriors showing increasing signs of hostility in the area, and travelling in large groups around the settlements, no arrests could be made without violence, bloodshed and possibly

open warfare, requiring a considerable force to overcome.⁴⁹ In the end there was no need, as reports of violence in the Hunter Valley declined, with few made after mid-1827.

Gostwyck 1827

In late February 1827, on or around the 22nd-24th February, at the large Gostwyck estate of Edward Cory on the Paterson River, approximately 55km south east of Ravensworth, close to what is now the town of Paterson, an altercation took place that resulted in the deaths of twelve Aboriginal people. First reported in the *Australian* newspaper on 3 March, the story claimed that a dispute had arisen between a group of Aboriginal people and a shepherd at Gostwyck, after the shepherd had killed a dog belonging to the group. In retaliation the Aboriginal group had burnt the wheat crop on the farm by first lighting the grass around the stacked wheat, and then, while the workers tried to put it out, throwing a lit spear into the stack of wheat, burning the equivalent of fifteen bushels.⁵⁰ The original report made no mention of any Aboriginal people being killed, but laid the blame on their aggression. On 9 March, the *Monitor* reported the same scant details.⁵¹

Further details emerged through March. On 22 March, the Sydney Gazette ran a short report on the killing of 'about a dozen' Aboriginal people who, laden with maize, were retreating from the fields when they were shot. The report claimed this happened between ten and twelve miles from the magistrate Mr McLeod's farm, and they wondered if true, why no Justice of the Peace was near enough to investigate the incident.⁵² Alexander McLeod was the magistrate in question, with his estate being at Luskintyre, near present day Lochinvar. On the 24 March the Sydney Gazette ran a longer report that gave more details as to the event and the outcomes. It claimed that a convict shepherd of Cory's saw a group of dogs attacking his flock, and on approach had a spear pass close by him. On seeing a large party of Aboriginal men approaching he retreated to his hut, where he collected another convict, and both armed with guns, they went back to the flock. Again, the two men were confronted by a large group of Aboriginal men, with spears slipped and ready, so they once again retreated, this time to the main home to collect more convicts to help. The enlarged and armed party then returned to the field where a short, sharp battle ensued which resulted in twelve Aboriginal men killed. The Gazette, while commending the convicts on the basis of their story being true, also cast some doubt on the veracity of the details, suspecting that the shepherds had more to do with the events than was reported.⁵³

No further details emerged on the events until fifty years later. In 1877 a correspondent to the Maitland Mercury, in a series of letters under the pseudonym Memory, wrote of his youth in and around the Maitland area in the 1820s and 1830s. In his letters, he reported a conversation with a

man who admitted to being in a party that pursued an Aboriginal group that had been pulling maize from the fields and taking it in nets to their camp. The armed group, seeing campfire smoke in the nearby bush, approached the camp where they observed a group of men, women and children. Unobserved, the group fired into the Aboriginal camp killing some and wounding others. The survivors fled through the bush pursued by the party until they came to the river, and in the attempts to swim to safety a number of the Aboriginal group drowned.⁵⁴

Each version differs slightly, a common theme in frontier clashes as details emerged, but each ends with the death of up to twelve Aboriginal people. It is probable that the 1877 version comes closest to the actual events, with a raid on a camp rather than open combat in the fields. There are striking similarities to the events in the upper Hunter at the same time and show the nature of the frontier in the Hunter Valley at this time, with violent encounters stretching right across the valley.

Conclusion

The violence that erupted in the later years of the 1820s across the Hunter Valley was not unusual in the colonial period of New South Wales. Sydney had experienced a long running war from the late 1790s through to 1816, with fighting breaking out at various points along the Nepean and Hawkesbury River. To the west, over the mountains around Bathurst, a violent series of clashes had led to martial law being imposed and the mounted police deployed during the main fighting between 1822 and 1824. The violence that then came to the Hunter Valley was one more example of this evolving and fluid frontier.

The notion of a frontier in the Hunter Valley was an ever changing one. There was no frontline of fighting behind which either side was safe. Ravensworth was surrounded by large estates on all sides, such as the Chief Justice Francis Forbes 10,000 acre Skelltor estate approximately 22km to the north west, near present day Muswellbrook, or Thomas Macqueen's 24,000 acre Segenhoe estate approximately 33km to the north near present day Scone further inland. Attacks by Aboriginal raiding parties and on Aboriginal groups occurred at all these places throughout the period in question sometimes with weeks or months of each other. Events were also recorded at Merton approximately 32km to the west near present day Denman and later back down the valley some 20km near Singleton.

The years 1825-1827 cycled through a series of tit-for-tat attacks and retributions between

Aboriginal people and Europeans in the middle Hunter Valley. A combination of increasing pressures on traditional food sources by the influx of settler's livestock, the locking-off of land through fencing

and farming, provocation by convicts against Aboriginal people all combined to create an atmosphere of tension and the potential for violence. A close reading of the available evidence, through newspapers, depositions and enquiries appears to show not a series of random attacks, or rampaging bands of warriors, but rather targeted attacks against individuals and isolated workers. Bowman's large estate was the site of three attacks resulting in two Europeans killed, two wounded and one Aboriginal man wounded. Another Aboriginal man captured by mounted police was reported to have been hung from a tree approximately one mile from the old homestead. Bowman's worker, Samuel Owen was also confronted close to the estate but was not hurt.

Ravensworth was not the only estate to be targeted. Violence spread across the Valley floor from Merton (Denman) 32km to the west to Patricks Plains (Singleton) and Gostwyck (Paterson) 55km in the south east, with a series of raids and attacks against mostly small, isolated huts and outposts. The compounds that had been developed on the large estates, with the exception of Ogilvie's Merton, were rarely seriously threatened. Aboriginal people were probably aware of the danger in attacking these establishments, which were easily defended and often had sizable populations of convicts and workers around.

Some however were used as temporary staging posts for the mounted police and district constables, such as James Glennie's property. It was from the property of James Glennie on Fal Brook (Glennies Creek), not Ravensworth, which Robert Scott set out with his party to pursue the attackers on Alcorn's hut in late 1826. The attack by this party that was reported by *The Australian* occurred 20 miles (32 kilometres) from Alcorn's Hut and resulted in the death of 18 Aborigines. Even though the exact location of this event is unknown, the plotting of a 20 mile (32 kilometre) radius from Alcorn's Hut situates this event well beyond Ravensworth Estate, which lies approximately 5 miles (8 kilometres) to the north-west.

By c1832, Bowman had completed construction of a new home on the Ravensworth estate for his manager James White. The new site was approximately 850 metres to the east of the original homestead site located on a slight rise (although lower than the hill of the original homestead) with flat land around it. The old homestead was rarely mentioned after this and disappears from maps and surveys of the estate, suggesting it was abandoned or removed once the new house and buildings were completed.

¹ Brayshaw, H., *Aborigines of the Hunter Valley: A study of Colonial Records,* Scone & Upper Hunter Historical Society Bicentenary Publication No.4, 1987, p20.

² Fawcett, J W, 1898 'Notes on the customs and dialect of the Wonnah-Ruah', Science, August 22, pp/ 152- 181 http://www.newcastle.edu.au/resources/divisions/academic/library/cultural%20Collections/pdf/fawcett1898.pdf

³ Glendell Continued Operations Project, Aboriginal Cultural Heritage Assessment Report prepared Dr Shaun Canning, Australian Cultural heritage Management prepared for Umwelt Environmental & Social Consultants, September 2019 pp17-20.

⁴ Brayshaw, p.25; Also Henry Dangar Surveyor Field Book No.220, State Archives NSW 2/4860

⁵ Dangar, H, Index and Directory to Map of the Country bordering upon the River Hunter; the lands of the Australian-Agricultural Company; with the ground –plan and allotments of King's Town, New South Wales: containing a detail of the annual quit rent and amount of the redemption of the same; also, historical notes upon the tenure and principle of granting lands in the colony since 1810 with a view of the present state of agriculture in the colony... the whole forming, with regard to and affairs in that colony, a complete emigrants quide, 1828, British Library Historical Print Editions, British Library, London pp. 17-18.

⁶ Macqueen, A., *Somewhat Perilous: the journeys of Singleton, Parr, Howe, Myles & Blaxland in the Northern Blue Mountains*, self-published, 2013, p.104.

⁷ John Purcell to Colonial Secretary, 6 July 1810, Colonial Secretary's Correspondence, Special Bundles-Newcastle, SANSW, R6066 4/1804, p22.

⁸ Macquarie, L., Journal of a tour to and from Newcastle 27 July 1818–9 August 18, SLNSW, ML Manuscripts A781, CY303 p.13.

⁹ John Howe to Governor Macquarie, 17 November 1819, Colonial Secretary's Correspondence, SANSW, Reel 6048 4/1743, p121.

¹⁰ The second Aboriginal man is not named in Howe's first expedition; it may have been Mullaboy or someone else.

¹¹ Wood, W A., Dawn in the Valley: The Story of Settlement in the Hunter River Valley to 1833, Sydney, 1972, p 42

¹² Dangar, *Index and Directory*, p.17.

¹³ For details of the grants and their sizes see Dangar, *Index* pp 1-26.

¹⁴ Dangar, *Index and Directory* pp. 17-18.

¹⁵ Cunningham, P., *Two Years in New South Wales*, Volume 1, Henry Colburn, London, 1827, p 80.

¹⁶ CSIL26/7403, in NRS 907, Col Sec, Correspondence re Land, James Bowman file, SANSW 2/7807 as quoted in 'Ravensworth Homestead Complex and Surroundings: Historical Archaeological Assessment and Archaeological Research Design' prepared for Glencore by Casey and Lowe Archaeology & Heritage, September 2018, p.20

- ¹⁷ The Sydney Gazette, 26 May 1825, p.1. https://www.parliament.nsw.gov.au/members/formermembers/Pages/former-member-details.aspx?pk=221
- ¹⁸ Sainty, M., & K. Johnson, Census of New South Wales: November 1828, Library of Australian History, Sydney, 1980 (Ref A0196 + B1828).
- ¹⁹ Hunter, C., Ravensworth Homestead Historical Text, prepared for EJE Architecture Ravensworth Homestead Farm Complex Structural and Material Condition report, August 1997, p.9
- ²⁰ Dunn, M., Valley in a Valley: Colonial Struggles over land and resources in the Hunter Valley, NSW 1820-1850, PhD Thesis UNSW 2015, pp196-201. See also John Connor, *The Australian Frontier: 1788-1838*, UNSW Press Sydney, 2005, pp 62-64.
- ²¹ Dunn, M., *The Convict Valley: The Bloody Struggle on Australia's early frontier*, Allen & Unwin, Sydney, 2020, p.153
- ²² Dunn, The Convict Valley, p.155
- ²³ The Australian, 10 November 1825, p.3; James Greig letter to his brother, 11 November 1826, ML, Doc 2316.
- ²⁴ James Greig letter to his brother, 11 November 1826, ML, Doc 2316.
- ²⁵ Dunn, M., Valley in a Valley: Colonial Struggles over land and resources in the Hunter Valley, NSW 1820-1850, PhD Thesis UNSW 2015, p203.
- ²⁶ The Australian, 17 June 1826, p.2.
- ²⁷ The Australian, 24 June 1826, p.3.
- ²⁸ Governor's Despatches, ML Volume 8, A1197, pp. 342-343.
- ²⁹ Governor's Despatches, ML Volume 8, A1197, p. 343
- ³⁰ Threlkeld to Attorney General, 21 August, 1826, Supreme Court of NSW, 'Memoranda selected from 24 years of missionary engagements in the South Sea Islands and Australia by LE Threlkeld 1838', SRNSW, NRS 13705, COD 554, 5/1123, p. 46.
- ³¹ Wood, op cit, p.103.
- ³² Deposition of John Lanarch; Report of Robert Scott, ML Government Despatches Vol.8, A1197, pp. 324
- ³³ Dunn, op cit, pp. 207-210. See Governor's Despatches, ML Volume 8, A1197, pp. 288-329.
- ³⁴ Gunson, Neil (ed), *Australian Reminiscences and Papers of LE Threlkeld: Missionary to the Aborigines 1824-1859, Vol I and II*, Australian Institute of Aboriginal Studies, Canberra, 1974, p.95.
- ³⁵ The King against Nathaniel Lowe, Depositions, SANSW T24A, SC27/56.
- ³⁶ Report of Magistrates Mr Scott and Mr McLeod, 3 October 1826, Governor's Despatches, ML Volume 8, A1197, p. 344.
- ³⁷ Mary Bundock Memoir, Papers of the Bundock Family of Wynagarie, Richmond River, ML A6939, p. 7.
- ³⁸ Deposition of John Woodbury, ML Government Despatches Vol.8, A1197, p. 357.

³⁹ Deposition of John Woodbury; Report of Robert Scott, ML Government Despatches Vol.8, A1197, pp. 352–357; p. 344.

⁴⁰ Deposition of John Woodbury, ML Government Despatches Vol. 8, A1197, p. 356.

⁴¹ Report of Magistrates Mr Scott and Mr McLeod, 3 October 1826, Governor's Despatches, ML Volume 8, A1197, p. 344. It should be noted that the AHMIS site card for the Ravensworth Massacre is based on the account put forward by Roger Millis in his *Waterloo Creek The Australia Day Massacre of 1838, George Gipps and the British conquest of NSW*, McPhee Gribble, Melbourne, p58. Millis has used the report of Scott and the Australian newspaper 23 September 1826, p3.

⁴² The Australian, 23 September 1826, p.3.

⁴³ Millis, R, Waterloo Creek: The Australia Day Massacre of 1838, George Gipps and the British conquest of NSW, McPhee Gribble, Melbourne, p.58.

⁴⁴ Petition to Governor Darling, 4 September 1826, ML, Governors Despatches, Volume 8, A1197, p. 219. The signatories to the petition were: Dr J Bowman (Ravensworth), Peter McIntyre (Segenhoe), AB Sparke (Ravensfield, Maitland), Leslie Duguid (Lochinvar), J Gaggin (Luskintyre), John Cobb (Minimbah), TW Winder (Windermere near Lochinvar), David Maziere (farm on site of Dalwood, Branxton), William Ogilivie (Merton), A Malcolm, John Brown (Bolwarra).

⁴⁵ Governor Darling–Response to petitioners, 5 September 1826, ML, GD Volume 8, A1197, p. 223.

⁴⁶ Report of Magistrates Mr Scott and Mr McLeod, 3 October 1826, Governor's Despatches, ML Volume 8, A1197, p. 345.

⁴⁷ George Claris, 25 March 1827, Supreme Court Miscellaneous Correspondence relating to Aborigines, SANSW, COD 294A, 5/1161, Items 378-867, p. 74.

⁴⁸ Samuel Owen, 28 March 1827, Supreme Court Miscellaneous Correspondence relating to Aborigines, SANSW COD 294A 5/1161, Items 378-867, p. 80.

⁴⁹ Robert Scott to Alexander McLeay, 17 May 1827, 28 March 1827, Supreme Court Miscellaneous Correspondence relating to Aborigines, SRNSW COD 294A 5/1161, Items 378-867, p. 90.

⁵⁰ The Australian, 3 March 1827, p2.

⁵¹ The Monitor, 9 March 1827, p.2

⁵² The Sydney Gazette, 22 March 1827, p.2

⁵³ The Sydney Gazette, 24 March 1827, p.2

⁵⁴ The Maitland Mercury, 25 August 1877, p.10.

Appendix G Further ACHAR Feedback - August 2020

Following receipt of the PCWP Cultural Values Report, this ACHAR was revised to include PCWP values. Due to the revisions made to the ACHAR and in accordance with the Guide (DECCW, 2010), the revised ACHAR was provided to the Project's RAPs for a further 28 day review period from 21 July to 19 August 2020 so as to enable the RAP's to provide any feedback. Some feedback was received after the conclusion of this additional 28 day review, but has also been included in the ACHAR. Feedback was received from 8 RAPS and has been incorporated here.

Table G-1: Summary of RAP feedback on revised ACHAR

Date received	RAP	Summary of RAP feedback
8 August 2020	Corroboree Aboriginal Corporation	Written feedback received stating no issues with ACHAR and that Corroboree Aboriginal Corporation agree with project plans.
10 August 2020	Des Hickey	Verbal feedback received stating he is satisfied with the updated ACHAR and has no additional comments
12 August 2020	Rhonda Perry	Verbal feedback received stating she is satisfied with the updated ACHAR and has no additional comments
18 August 2020	Hunter Valley Aboriginal Corporation (HVAC)	Written feedback received stating the HVAC wishes for the history of the Ravensworth Homestead to acknowledge the possibility of Aboriginal peoples as labourers or residential staff from Macarthur's estate at Camden Park.
		Furthermore, the HVAC supports the relocation of the Homestead to Broke. The reasoning for this position is to ensure that the heritage and history of the homestead is maintained and is accessible to the wider community.
19 August 2020	Neale Draper on behalf of PCWP	Report received from Neale Draper on behalf of PCWP. Refer to Table 2 for Glencore's comments on the matters raised in the Neil Draper Report. The Draper (2020a) comments are provided below in Table G–2.
20 August 2020	Laurie Perry (Wonnarua Nation Aboriginal	Letter received from Laurie Perry (CEO) on behalf of Wonnarua Nation Aboriginal Corporation (WNAC). (Appended below).
	Corporation)	The WNAC acknowledge that there were a number of skirmishes between Aboriginal people and early settlers throughout the Hunter Valley, however they do not believe that there was anything more significant about the events that took place at Ravensworth Estate when compared to other areas. In their opinion, if a massacre had occurred at Ravensworth, then their ancestors would have known that this had occurred.
		The WNAC identify St Clair Mission, Baimie Cave, Lizard Rock and Redbourneberry Hill as significant Aboriginal places.
		The WNAC suggest a range of mitigation measures for the Project that include support for cultural healing and mental health workshops, and funding for the development of a native food plants supply business.
21 August 2020	Noel Downs (Wanaruah Local Aboriginal Land Council)	Letter of support for the project from the Wanaruah Local Aboriginal Land Council. The WLALC submission is mostly a broad commentary on the Aboriginal occupation and history of the Hunter Valley. The WLALC recommends funding be set aside for disadvantaged members of the community and land management aligned with (undefined) 'traditional' practices.
		See copy of letter appended below.
31 August 2020	Arthur Fletcher	In a phone call to Bradly Snedden (Glencore) Arthur Fletcher stated that 'he and his immediate family support the updated ACHAR'.



Wonnarua Nation Aboriginal Corporation

Ground Floor 254 John St Singleton

PO Box 3066, Singleton Delivery Centre NSW 2330

Phone: 02 6571 8595 **Fax**: 02 6571 8551

Mobile: 0412 593 020

Web Site: www.wonnarua.org.au Email: wonnarua@bigpond.com

ABN: 50 012 829 925

Mr Shaun Canning ACHM by email

Cc: Shane Scott, Brad Sneddon and Tim Walls at Glencore by email.

Date: 19/08/2020

Re: Glendell Mine ACHA

Dear Shaun,

The Wonnarua Nation Aboriginal Corporation is a registered Aboriginal Corporation with over 500 members across the Upper Hunter Valley, NSW.

WNAC represents descendants of key apical ancestors across the Hunter Valley Region and a far.

We were invited to participate in the Aboriginal Cultural Heritage Assessment you undertook for Glencore's Glendell Continued Operations Project, and we took the opportunity to provide cultural heritage values of the Hunter and in-particular those values of the Project area and nearby vicinity.

We advised Dr Canning of our cultural links to the Hunter, and pointed out how we have established a facility at the former St Clair Mission (Registered Aboriginal Place) in the adjacent Glennies Creek catchment nearby to the Project.

We have commenced developing this place as a resource for community events, including cultural healing and wellbeing events.

We have also received a recent report by the Plains Clan of the Wonnarua People (PCWP) including work by Dr N Draper which identifies PCWP views of historical impacts to Aboriginal heritage in the early 1820s. Please note that the WNAC does not recognise the PCWP, who are not a Native Title Claimant, and only represent a small number of family members of a break-away group, some of whom were previously members of the Nation.

The PCWP report is inaccurate, contains no real local Aboriginal oral history that we have from our ancestors and elders living today.

The Nation acknowledges that there were a number of skirmishes between our ancestors and white settlers throughout the Hunter Valley. We do not believe that there was anything more significant about the Project Area than other places. If there were massacres at Ravensworth, our genuine traditional ancestral structures would have known this, and we would object to any proposal to mine the area. But there were none. The recorded skirmishes were all tragic events for our ancestors, and for us today.

In fact, the destruction of our culture continued from the early colonial settlement times through to the 1950 and 1960s. There are many more significant important places to our membership than Ravensworth.

The St Clair Mission carries stronger associations with the impacts on Aboriginal people caused by the government and settler attacks on our ancestors and the impacts on our culture.

The other key cultural places include Biaime Cave Aboriginal Protected by WNAC, Lizard Rock and Redbournberry Hill a former Aboriginal reserve where our ancestors were forced to live with clear evidence of occupation from noted Wonnarua Historian James Wilson Miller Book "Koori A will to Win". This land is now Aboriginal Protected as well by WNAC.

As such there is a lot of evidence that our community still suffer the pain of this loss of culture and loss of people, which presents itself today in current mental health issues, feelings of loss, lack of confidence, incarceration rates, unemployment, poor literacy and numeracy outcomes and intergenerational trauma etc. Therefore one of our key objectives is to establish programs, aligned with the Federal Government "Close the Gap" targets, that provide cultural healing for Aboriginal people and other mental health and wellbeing initiatives.

We have provided Glencore with outlines of these programs.

We believe that it would be appropriate for Glencore to provide mitigation measures for the Project that support the Nation in partnership to provide these ongoing services to the Aboriginal community, and therefore to address the long term loss of culture to our people across the Hunter Valley.

These include:

- Support for the development and maintenance of WNAC St Clair Mission to hold these cultural and mental health and wellbeing events.
- Support for the WNAC to hold cultural healing and mental health workshops for Aboriginal community members in the Hunter. This work is to be provided by Aboriginal service providers nominated by WNAC.
- Support for workshops for recent young offenders to identify and avoid incarceration.
- Funding for the development of the WNAC trial of a native food plants (bush tucker) supply business. This will include the cultivation of bush tucker produce to sell at local restaurants in the Hunter Valley tourist region and through markets. The objective of this program is to establish a sustainable business and provide long term employment opportunities for Aboriginal youth.

If you have any questions, please contact me by mobile 0412593020

Laurie Perry

CEO Wonnarua Nation Aboriginal Corporation



Bradley Sneddon
Project Approvals Manager
C/o Mount Owen Complex
Private Mail Bag 8
Singleton NSW 2330

Re: Revised Aboriginal Cultural Heritage Assessment Report – Glendell Continued Operations Project

Dear Brad,

Wanaruah Local Aboriginal Land Council considers all Aboriginal sites within its constituted boundaries important to the local Aboriginal community. Aboriginal Cultural Heritage is not limited to the relics and art that have survived the impact of European settlement. Aboriginal Culture is a living culture and includes landforms, water holes vegetation zones, habitats, and peoples. It is in the landscape itself that stories and songs of creation and teaching are written. To irreversibly destroy a section of landscape is to tear out a page in the history of all being. The plants and trees, birds and animals, from the microbes to the people, the places where people lived, hunted, gathered, fished, taught their children and entertained themselves, the paths they travelled are all as culturally significant to Aboriginal people as the Opera House, The Rocks, Hyde Park, Bondi Beach and Harbour Bridge are to Australians of European decent... None of which are a place of ceremony, spirituality or cemetery. Those places are culturally significant sacred places.

When discussing Cultural Values and Cultural Landscape Values it is important to remember that the types of historical things culturally important to non-Aboriginal people are the same types of things culturally important to Aboriginal people. Often when discussing Aboriginal Heritage Cultural Value is applied incorrectly only to those areas of "spiritual significance" ignoring all of the other landscapes and sites with "Cultural Value". You only need look to see that the majority of the culturally significant places to all communities are those that historically housed, fed, clothed, educated and entertained people, not just churches and other places of ceremony or worship. The evidence shows that this area and landscape was a place that historically housed, fed, clothed, educated and entertained Aboriginal people. So the only conclusion that could be reached is that this landscape is culturally significant. As more and more of it is destroyed by mining impact the remaining areas increase in their significance and need for protection. This misinformation prevents Aboriginal people and others making informed decisions about Aboriginal Culture and denies Aboriginal people their rights to self-determination.

The Hunter Valley is more than just a place where Aboriginal people lived. It was also part of the "Song line" the major arterial link between the Western Plains, and New England Table lands to the Sydney Basin. It traces past the Wingen Maid and Mount Dangar through to Mount Arthur and continues through past Mount Yengo. There are many other sacred formations and areas, some we cannot reveal, many we know only as "do not go near that area". To say this area is "VERY Significant" is to understate its importance. In recent months as more cultural mapping work is being

done, we are finding out just how important this area has been to our ancestors and is to us, our children and future generations.

Yet as quickly as we begin to understand something about how our people lived, (the activities they partook in and the time lines showing when, "history" that was not passed on because of the savage impact of European settlement), it is lost because of development. Many of the people still living in this area cannot speak the language of their tribe, we cannot sing the songs, we cannot tell our children the stories of all creation. This was lost because these things were considered "Evil" by the missionaries. What little is still known is closely guarded by those entrusted with it who pass it on as "need to know" on those occasions when something vital to the dreamtime is endangered. All that is left is to the majority is the few markers that remain of a once full and harmonious society and culture. These markers along with the snippets allowed to us by those entrusted, is all we have to link us to our mother the earth.

Culturally, these places give us an insight to our forbearers. The level of occupation and the length of occupation give us insight to what the landscape was like and the activities the conducted. With no culture of writing, history has been passed by word of mouth. To aid the telling, many of the creation stories incorporated the land forms. This included how they came to be. No amount of written language can adequately describe or replace the value and meaning of being in touch with the living remanets of our dreamtime.

On a social level these remanets and markers give hope to a displaced people. No longer is it "Shame" to be Aboriginal. We have for many years been told that our culture was "Bad, Heathen, Satanical, Backward, Uncivilised and generally unacceptable". Employment, education, and health issues can be directly linked to one's vision of one's self and community. We still suffer from stereotyping and bigotry. We need something that is ours to take pride in. All we have is tied to the land in the remanets and markers.

Much of what is currently believed in the Hunter is NOT Correct. We dispute all findings that paint Aboriginal people as violent baby killers, thieves and that any attack on settlers were ever anything but pay back for crimes committed by the colonials.



Figure 1 Draft Dialect Mapping in the Hunter Valley (please note there are two known dialect groups not yet included. As more information and research has been done adjustments, additions and changes will be done)

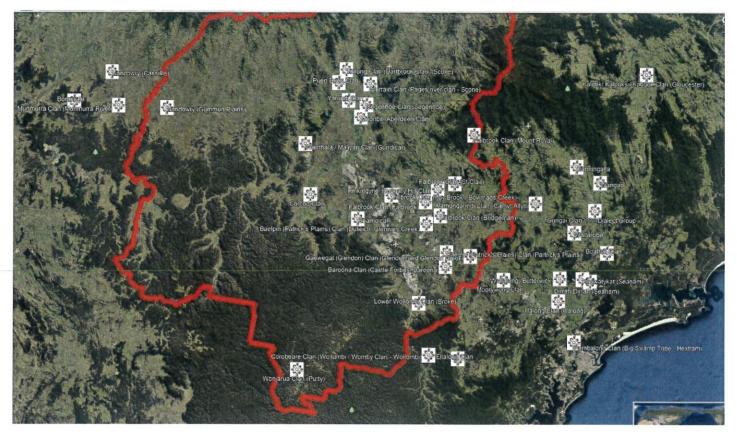


Figure 2 Draft Clan Mapping in the Hunter Valley (please note more information and research has been done adjustments, additions and changes will be done)

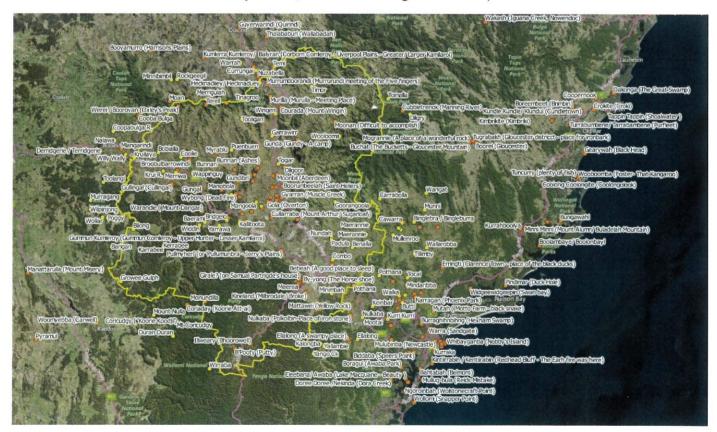


Figure 3 Aboriginal Place Names in the Hunter Valley (please note more information and research has been done adjustments, additions and changes will be done)

Wanaruah LALC has shared a number of images relevant to the area showing clans, dialect areas and place names. We are happy to supply references to support these...

Wanaruah LALC sees value in work done beyond just objects and sites. Local Historical societies can contain gems of diverse information relating to Aboriginal people, hidden in journals and writings of people who were just telling of their lives.

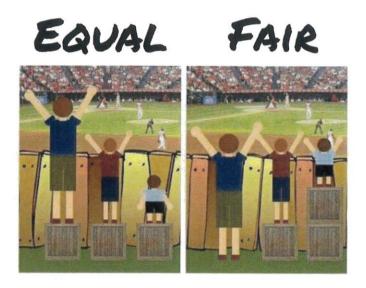
We would like to believe these studies give opportunities to clarify historical knowledge but there always seems to be an underlying agenda beyond wanting the most accurate account of Aboriginal people in the Hunter told.

Generally, the report is no different to dozens of others recounting the same (often erroneous and incomplete) reports as references. There is little if any new information though it is good to see some thought has been put into trying to find more about the massacre site.

Recommendations

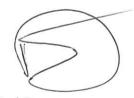
Wanaruah supports the recommendations except for where it specifies "Wanaruah" (or any of the other various spellings) People. There is still dispute over which language group was the primary language spoken in this area. In line with traditional practices: programs, funding, employment, educational opportunities and other opportunities and resources must be available to all Aboriginal people who have made this part of the valley home, just as in the past all who lived here prior to colonial settlement had equal access to the bounty and resources the country offered.

In addition, we also would like to see funds set aside to target the most disadvantaged sections of our community to aid barrier removal and supports to assist them in accessing better outcomes for themselves and their children in education and employment. The current proposals seem to be aimed solely at easy fixes in schools rather than any real attempt at helping the whole community.



We also would like to see all Land, and Bio diversity managed in a traditional manner to minimise cost and maximise sustainability.

Thank you for this opportunity for input,



Noel Downs CEO

21 August 2020

The following table (Table G–2) provides a summary of matters raised by Draper (2020a) in his review of the revised ACHAR - grouped by themes, and also provides corresponding responses.

Table G–2: Comment on matters raised in PCWP response to Revised ACHAR

Matters Raised (by theme)	Project Responses
The updated ACHAR does not achieve its purpose with respect to the required level of consideration of Aboriginal cultural values and remains critically deficient in its consideration of the fundamentally important aspect	The Code of Practice for Archaeological Investigation of Aboriginal objects in NSW (the Code; DECCW 2010) and the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (the Guide; OEH 2011) was followed in detail in the preparation of the ACHAR, to ensure that the ACHA process and report meet the appropriate guidelines identified in the Project SEARs.
of intangible cultural heritage awareness and assessment	Extensive consultation was undertaken following the Aboriginal cultural heritage consultation requirements for proponents (DECCW 2010). This consultation included all RAPs and recorded all tangible and intangible cultural heritage values that were provided by the RAPs. The PCWP were offered the same opportunities as the other RAPs to provide their tangible and intangible values through a facilitated workshop though chose not to, instead choosing to prepare their own cultural values report. The ACHAR includes a full copy of the PCWP cultural heritage values report. All views of all RAPS were considered, and all RAPs were given opportunity to contribute in a forum or way they felt comfortable. No RAP was provided a privileged role above another RAP.
	The ACHA consultation process has spanned a period of approximately two years and provided opportunities for all RAPs to contribute. The BCD (now Heritage NSW) submission noted that 'consultation with the Aboriginal community has been undertaken in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010'. BCD further noted that 'the significance assessment of the Aboriginal cultural heritage values of the project area have been adequately accessed (sic), as well as any potential impacts on those values' (refer to Section 4.1).
The ACHAR dismisses PCWP cultural values despite the detailed report by Draper	No oral history or cultural values have been dismissed and a clear record of all cultural values has been provided in the ACHAR and its appendices. The PCWP report has been reproduced and provided in full (refer to Appendix 3).
	The ACHA consultation process was commended by BCD (Heritage NSW) in their submission as being best practice (refer to Section 4.1).
	No RAP has been afforded a privileged status and all views are compiled and presented, having been treated equally and respectfully.
The ACHAR ignores the Casey and Lowe report	Note that the Casey & Lowe (C&L) Historical Archaeological Assessment and Archaeological Research Design report (Casey & Lowe, 2018) was the initial assessment report prepared by C&L prior to the historical and Aboriginal archaeology fieldwork being completed and the ACHA being undertaken.
	Since this time, a substantial body of work and consultation has been undertaken, informing the ACHA, including the detailed historical archaeological assessment, the Aboriginal archaeological survey and assessment and the colonial historical research as well as the extensive consultation undertaken with all RAPs, and former owners of Ravensworth Estate. This work has been used to inform the ACHAR, in accordance with the Guide (DECCW, 2010).
	C&L's report Historical Archaeological Test Excavation Report and Impact Statement for the Core Estate Lands (Casey & Lowe, 2019) presents a revised statement of archaeological significance in Section 5.2.1. This statement of significance states that "The Place has the potential to provide information, by way of further study and archaeological investigation, into contact-period with Aboriginal people" and "key research themes relate to the nature of lives on a newly-established frontier and contact with Aboriginal people". The statement of significance concludes by saying, "The archaeological landscape, sites and material culture of parts of the Core Estate Lands and Ravensworth Homestead Complex are of State and local significance". While this statement of significance

does rightly mention the possibility of contact period archaeology, the major values contributing to the heritage significance of the Ravensworth Homestead Complex, in the view of C&L, are the buildings themselves, the historic archaeological remains and the association of the place with colonial historical events and people. This is further supported by C&L in their statement in their report (cf. page 80, C&L 2019) that "No evidence of early conflict between Aboriginal people and European settlers was uncovered during the testing program". All historical events that were identified through the research of Dr M. Dunn Ravensworth was the centre of a military-supported campaign of were presented in the EIS. Further research undertaken has confirmed the violence and massacre, and that original understanding of the chronology and location of colonial period conflicts Bowman's Ravensworth Estate between Aboriginal people, settlers, and government forces. The research Ravensworth was a focus of the identified which events occurred on Ravensworth Estate and which events military campaign of violence occurred elsewhere in the Hunter Valley. This does not support the PCWP and toward Aboriginal people Draper position that the Ravensworth Estate was the centre of a military campaign. The heritage assessment criteria Dr M. Dunn was not engaged to identify intangible cultural heritage aspects or requires consideration to review oral history. Dr M. Dunn specialises in colonial historical events and intangible cultural heritage which records, which are provided and referenced in his report. were absent from the revised Ben Churcher (OzArk) undertook the Aboriginal archaeological assessment of **ACHAR** the Project area and this provides the scientific values associated with the record of cultural heritage items and artefacts located across the Project Area. No artefact sites located were recorded with a high scientific significance and there were no findings that indicated historic contact or conflict in the Project Area. Dr S. Canning provided a record in the ACHAR of the intangible cultural heritage values associated with the Project Area and the broader Hunter Valley context, as provided by all RAPs. The revised ACHAR also includes a full copy of the Draper report commissioned by PCWP, containing the tangible and intangible cultural heritage values of the PCWP associated with the Project Area and the broader Hunter Valley context. Draper's Scope of work Glencore was aware that Draper was going to be engaged by PCWP but had no control over terms of engagement by PCWP or how the work was to be undertaken by Draper The complete scope of this independent report or methods used by Draper is not known to Glencore There were a significant number of RAPs engaged in the ACHA process – not just PCWP. Draper identifies that he had Draper identifies that he has been provided with additional information access to other information regarding conflict between Aboriginal people, settlers, and government forces by PCWP. However, the exact nature of this information has not been identified and has not been disclosed and the information has not been made available to Glencore or its consultants., Opportunities have been made available for over two years for PCWP to provide any additional information for consideration in the ACHA, including on a confidential basis if required however no such additional information has been provided. PCWP is not a Native Title Claimant for the Project Area. Extensive consultation has been undertaken with the PCWP (and other RAPs) in accordance with ACHCRs (DECCW 2010) throughout the Project assessment phase. Recommendations for mitigation Based on all feedback received, Glencore has developed a package of measures management and mitigation measures which acknowledge the cultural connection and potential loss of cultural values should the Project be approved, and the recommendations made by the RAPs. The mitigation measures also include opportunity for the community to

continue to propose mitigation and projects, post approval (should the Project be approved), based on the themes of values, impacts and recommendations presented.

These mitigation measures have been circulated to all Project RAPs for comment and feedback.

Glencore remains open to receiving feedback on these mitigation measures and recommendations as part of the assessment process.

Glencore is open to discuss any mitigation measures with any of the RAPs, and as noted provides for these to continue to be proposed and developed.

The PCWP Cultural Values Report provides very little regarding suggested mitigation measures, and none which relate to their intangible cultural values. Draper has proposed a suggestion to engage the PCWP (in his words: "i.e. not just any locally resident Aboriginal people") to monitor all earthmoving operations capable of containing archaeological material.

A substantial amount of fieldwork has been completed including extensive coverage of the proposed disturbance area. No evidence of potential burials has been found to date despite surface surveys, subsurface archaeological excavations, and a ground penetrating radar investigation around the Ravensworth Homestead. The possibility of burials or remains in the Project Area is considered low. Appropriate processes will be followed in the event of the discovery of human remains. Procedures for the discovery of human remains are also set out in Section 7.5.4 of Historical Archaeological Test Excavation Report and Impact Statement for the Core Estate Lands (Casey & Lowe, 2019). A process has been proposed in the ACHA and Glencore has committed to putting in place a procedure to manage the unlikely discovery of burials or human remains in the revised ACHMP, in accordance with relevant legislation.



Neale Draper & Associates

Archaeology

Anthropology

Native Title

Geographic Information Systems (GIS)

Glencore Continued Operations Project, Hunter Valley NSW

Comments on Revised Aboriginal Cultural Heritage Assessment Report

By: Assoc. Prof. Neale Draper

Date: 18 August 2020

Client Name: Tocomwall Pty Ltd

Client Contact: Will Moon

Address: PO Box 76 Caringbah NSW 1495

Phone: 02 9542 7714

Email: william@tocomwall.com.au

0408 657 544

email@ndaa.com.au

www.ndaa.com.au

Glencore Continued Operations Project, Hunter Valley NSW

Comments on Revised Aboriginal Cultural Heritage Assessment Report

By: Assoc. Prof. Neale Draper

Date: 18 August 2020

Client Name: Tocomwall Pty Ltd

Client Contact: Will Moon

Address: PO Box 76 Caringbah NSW 1495

Phone: 02 9542 7714

Email: william@tocomwall.com.au

Ownership and Disclaimer

Ownership of the intellectual property rights of ethnographic information provided by Aboriginal people remains the property of those named persons.

Ownership of the primary materials created in the course of the research remains the property of Neale Draper & Associates Pty Ltd.

This document remains the property of Tocomwall Pty Ltd. This document may not be used, copied, sold, published, reproduced or distributed wholly or in part without the prior written consent of Tocomwall Pty Ltd.

This document has been prepared in accordance with the brief provided by Tocomwall Pty Ltd and has relied upon information provided by the client, or collected during the completion of the document and under the conditions specified in the document. All findings, conclusions and recommendations contained in the document are based on the aforementioned circumstances. The document is for the use of Tocomwall Pty Ltd in addressing their brief and no responsibility is taken for the documents use by other parties.

The professional advice and opinions contained in this document are those of the consultants, Neale Draper & Associates Pty Ltd, and do not represent the opinions and policies of any third party.

The professional advice and opinions contained in this document do not constitute legal advice.

Spatial Data

Spatial data captured by Neale Draper & Associates Pty Ltd for any newly recorded features was acquired using an uncorrected GPS receiver.

Coordinate positions are presented using the MGA94 coordinate system.

Positions recorded using a Garmin GPS Receiver will be up to +/- 10m and typically +/- 3m.

Positions recorded using a Trimble TDC100 will be +/- 5m and typically < +/- 2.5m.

TOC03 Page | iii

Abbreviations

Term	Meaning		
ACHAR	Aboriginal Cultural Heritage Assessment Report		
ACHM	Australian Cultural Heritage Management Pty Ltd		
AHIMS	Aboriginal Heritage Information Management System, NSW DPIE		
DPIE	NSW Department of Planning, Industry and Environment		
GIS	Geographic Information systems		
ICOMOS	International Committee on Monuments and Sites (UNESCO)		
ND&A	Neale Draper & Associates Pty Ltd		
NTS Corp	Native Title Services Corporation, NSW.		
OEH	NSW Office of Environment and Heritage, now part of DPIE		
PCWP	Plains Clans of the Wonnarua People (Native Title Claim Group)		
WNAC	Wonnarua Nation Aboriginal Corporation		

TOC03 Page | iv

Executive Summary

The Glendell Mine is part of the Mount Owen Complex of open-cut coal mines located in the Upper Hunter Valley of New South Wales (NSW), approximately 20 km north-west of Singleton (e.g. Draper 2020: Map 1-1). The Glendell Continued Operations Project has applied for development consent for the Glendell Pit Extension and associated works.

Australian Cultural Heritage Management Pty Ltd (ACHM) conducted an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Glendell Continued Operations Project. The ACHAR Aboriginal consultation process identified 32 Registered Aboriginal Parties (RAPs), including two representative bodies or 'Knowledge Holder Groups':

- Wonnarua Nation Aboriginal Corporation (WNAC)
- Plains Clan of the Wonnarua People (PCWP) (Canning 2019: vi, 9).

The second body named, the PCWP, wasfor several years the registered native title claim group (NSD1680/13, NSD1093/12 and NSD788/13) for the project area. This native title claim was withdrawn by the applicants in early 2020, in order for amendments to be made following an anthropological review of Wonnarua claims (Draper 2018, 2020a, Sackett 2019). The PCWP had declined to participate in the ACHM consultation process for the ACHAR (Canning 2019: 9-10), preferring to submit its own, separate 'Cultural Values Report' to the Aboriginal heritage assessment process. Glencore agreed to this process, and the PCWP Cultural Values Report is being prepared by Tocomwall (2020).

The PCWP Wonnarua people I spoke with in February 2020 around Singleton had a united view that none of the other RAPs consulted for the ACHM (2019) report actually were Wonnarua people. The view was that these RAPs did not provide any information concerning cultural values to Canning (2019) because they did not have any knowledge of or connections to the place, and not because such values are absent for traditional owner families (as concluded by Canning 2019: viii).

The preparation of the PCWP Cultural Values Report for the Glendell Continued Operations Project included the engagement of Associate Professor Neale Draper (Neale Draper & Associates Pty Ltd - ND&A) to research and prepare an anthropological report in consultation with the PCWP. The purpose of the anthropological report was to provide additional ethnographic data in relation to Aboriginal Traditional Owner cultural values relating to the project area (Draper 2020), particularly in relation to intangible cultural heritage. Both Draper (2020) and the Tocomwall (2020) PCWP Cultural Values Report form part of the documentation for the ACHAR assessment process by DPIE, as part of the overall Project EIS.

On 21 July 2020, Glencore notified registered stakeholders that an updated ACHAR Report (Canning 2020) had been produced to incorporate consideration of the PCWP Values Report (Tocomwall 2020, incorporating Draper 2020), and inviting comments on that revised ACHAR report.

On behalf of PCWP, Tocomwall has referred the updated ACHAR report to Neale Draper (ND&A) for review. In the author's opinion, the updated ACHAR contains substantial misconceptions and misinformation in relation to the Draper (2020) report, which are addressed in this supplementary report.

The Cultural Values assessment based on PCWP evidence (Draper 2020: Section 5) properly considers all of the factors highlighted by OEH (2011), the Burrup Charter (AICOMOS 2013) and the associated professional practice notes (AICOMOS 2013a & b, 2017, Draper 2020: Section 2). My review of the updated ACHAR only confirms and strengthens my previously-stated opinion that this document does not achieve its purpose with respect to the required level of consideration of Aboriginal cultural values, and remains critically deficient in its consideration of the fundamentally important aspect of intangible cultural heritage awareness and assessment.

The updated ACHAR (Canning 2020: Section 7) effectively dismisses the PCWP cultural values assessment (Draper 2020) and the recommendations regarding avoidance of harm and fails to address those cultural values or concerns in any meaningful way. Consequently, the ACHAR assessment of harm and associated mitigation represents a comprehensive failure to provide suitable recommendations of the management of harm to cultural heritage values and assets, in relation to the proposed development.

Table of contents

Ow	nership	and Disclaimer	III
Spa	itial Da	ta	iii
Abl	oreviati	ons	iv
Exe	cutive	Summary	v
1	Purpo	ose of Report	1
2	Comr	nents on Updated ACHAR Report	2
	2.1	ACHAR Section 1.3 Key Issues	
	2.2	ACHAR Section 3.2.1 Ravensworth Massacre Site	2
	2.3	ACHAR Section 3.3 Dr Mark Dunn's Historical Research	3
	2.4	ACHAR Section 6.7 PCWP Cultural Values	3
	2.5	ACHAR Section 6.11.2 Draper Report (2020)	3
	2.6	ACHAR Section 6.11.3 OzArk Response to Draper Report	5
	2.7	ACHAR Section 6.11.4 Dr Mark Dunn Response to Draper Report	6
	2.8	ACHAR Section 6.12 Conclusions	7
	2.9	ACHAR Section 7 Avoidance of Harm	8
2	Riblio	granhy	q

1 Purpose of Report

The Glendell Mine is part of the Mount Owen Complex of open-cut coal mines located in the Upper Hunter Valley of New South Wales (NSW), approximately 20 km north-west of Singleton (Draper 2020: Map 1-1). The Glendell Continued Operations Project has applied for development consent for the Glendell Pit Extension and associated works.

Australian Cultural Heritage Management Pty Ltd (ACHM) conducted an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Glendell Continued Operations Project. The ACHAR Aboriginal consultation process identified 32 Registered Aboriginal Parties (RAPs), including two representative bodies or 'Knowledge Holder Groups':

- Wonnarua Nation Aboriginal Corporation (WNAC)
- Plains Clan of the Wonnarua People (PCWP) (Canning 2019: vi, 9).

The second body named, the PCWP, was several years been the registered native title claim group (NSD1680/13, NSD1093/12 and NSD788/13) for the project area. This native title claim was withdrawn by the applicants in early 2020, in order for amendments to be made following an anthropological review of Wonnarua claims (Draper 2018, 2020a, Sackett 2019). The PCWP had declined to participate in the ACHM consultation process for the ACHAR (Canning 2019: 9-10), preferring to submit its own, separate 'Cultural Values Report' to the Aboriginal heritage assessment process. Glencore agreed to this process, and the PCWP Cultural Values Report is being prepared by Tocomwall (2020).

The PCWP Wonnarua people I spoke with in February 2020 around Singleton had a united view that none of the RAPs consulted for the ACHM (2019) report actually were Wonnarua people. The view was that these RAPs did not provide any information concerning cultural values to Canning (2019) because they did not have any knowledge of or connections to the place, and not because such values are absent (as concluded by Canning 2019: viii).

The preparation of the PCWP Cultural Values Report for the Glendell Continued Operations Project has included the engagement of Associate Professor Neale Draper (Neale Draper & Associates Pty Ltd - ND&A) to research and prepare an anthropological report in consultation with the PCWP. The purpose of the anthropological report was to provide additional ethnographic data in relation to Aboriginal Traditional Owner cultural values relating to the project area (Draper 2020). Both Draper (2020) and the Tocomwall (2020) PCWP Cultural Values Report form part of the documentation for the ACHAR assessment process by DPIE, as part of the overall Project EIS.

On 21 July 2020, Glencore notified registered stakeholders that an updated ACHAR Report (Canning 2020) had been produced to incorporate consideration of the PCWP Values Report (Tocomwall 2020, incorporating Draper 2020), and inviting comments on that revised ACHAR report.

On behalf of PCWP, Tocomwall has referred the updated ACHAR report to Neale Draper (ND&A) for review. In the author's opinion, the updated ACHAR contains substantial misconceptions and misinformation in relation to the Draper (2020) report, which are addressed in this review. The approach of the updated ACHAR to the Draper (2020) report appears to be thoroughly defensive and completely negative as well as frequently misdirected.

Unfortunately, the clear signposting of heritage assessment criteria for intangible cultural heritage contained in the Burra Charter (AICOMOS 2013) and the associated professional practice notes (AICOMOS 2013a & b, 2017) that were highlighted in Draper 2020: 8-14) remain steadfastly absent from updated ACHAR (Canning 2020 and the included Dunn 2020). I also note that the updated ACHAR continues to ignore the very substantial report on colonial history and archaeology by Casey and Lowe (2018), which provides very substantial support for the anthropological significance assessment by Draper (2020). These omissions caused significant deficiencies in the original ACHAR assessment (Canning 2019), and essentially remain unchanged in the updated ACHAR document.

The comments below refer to specific sections of the ACHAR Report (Canning 2020) that have been updated in response to the PCWP submission. Most, but not all of these sections are identified in the letter from Glencore to Registered Stakeholders on 21 July 2020, inviting comments.

2 Comments on Updated ACHAR Report

2.1 ACHAR Section 1.3 Key Issues

The updated Section 1.3 states:

"... PCWP have provided a Values Report on 12 June 2020 and this ACHAR has subsequently been updated. Engagement has raised the PCWP's concerns regarding colonial frontier violence and claims of a massacre of Aboriginal people." Canning 2020:

This statement is incorrect and seriously misrepresents the information presented in Draper (2020). The PCWP concerns reported there relate not just to "claims of a massacre of Aboriginal people" (i.e. a single event), but to a military-supported campaign of violence and massacre centred on Bowman's Ravensworth Estate (Draper 2020: Sections 3 and 4). Although this was not the only focus of these confrontations, the role of Ravensworth and Dr Bowman in Wonnarua history far exceeded "claims of a massacre". This included numerous violent events centred on and associated with the estate, the blocking of critically important traditional trade and ceremonial routes and places, the leading role played by Bowman to persuade the Government to introduce military action, and as a very significant landmark and symbol for Wonnarua people of the cultural and physical genocide of their people that occurred from the mid 1820s (Draper 2020: vi, Section 5). The ACHAR comment is both inaccurate and inappropriately dismissive. In any case, the cultural values significance of Ravensworth for the PCWP Wonnarua families and its place in their oral history and cultural beliefs constitutes the primary focus of its intangible cultural heritage significance - not just the patchy documentary record referred to in the ACHAR.

This cultural heritage significance for PCWP families, the descendants of the original, local Wonnarua Traditional Owners, is explicitly based upon both tangible and intangible cultural heritage considerations, and upon both written and oral history sources, and also was clearly acknowledged in the assessment by Casey and Lowe (2018) without even talking to PCWP people directly. However, both Canning (2020) and Dunn within that document conveniently restrict their perspective to known tangible archaeological evidence and documentary records completely ignoring the ICOMOS professional practice guidelines with regard to Aboriginal knowledge and oral history, and intangible cultural heritage values.

2.2 ACHAR Section 3.2.1 Ravensworth Massacre Site

This update (Canning 2020: 18) is not listed in the Glencore letter's list of ACHAR revisions, although the related update to the massacre site record (Canning 2020: 20) is listed.

The section summarises evidence relating to the attack on Alcorn's Hut in 1826, and concludes that:

"Based on these conclusions the site recorded as the 'Ravensworth Massacre Site' cannot have been within the area now defined as the Ravensworth Estate and that the name given to the massacre site is misleading in this regard. Refer to Section 3.3.1 (below) for further detail regarding the reported events and its recently updated AHIMS site card."

This conclusion in itself does not raise any issues, except that Canning and Dunn both suggest that those historical events were entirely unrelated to Ravensworth - which is not true, as there is a clear pattern of escalation in which the Alcorn's Hut incident plays an important part. They also conclude that this is the sole massacre or frontier violence event referred to or of concern to the PCWP Wonnarua, a misconception which any reasonable reading of Draper (2020: Sections 3 to 5) should have dispelled, but which has in fact only been reinforced in the updated ACHAR.

I draw attention also to the following paragraph of the ACHAR:

"In relation to the Aboriginal people that were killed in the Ravensworth area, there was no anecdotal evidence located of how their bodies were disposed (except for one person executed by the police who was buried and then later exhumed and thrown in the river). They may have been buried/burned where they were killed by their attackers or their bodies may have been left where they fell. In the case of the Aborigines it is probable that they were collected by relatives and buried in an area dictated by custom if that was still possible under the circumstances, or somewhere where it was safe to perform the appropriate ceremonies if that was not possible." (Canning 2020: 18).

This is an important admission that the ACHAR heritage consultants acknowledge that there were violent deaths of Wonnarua people during the colonial acquisition of this area, and that the consultants have no idea what happened to those people or where those bodies may be buried. Yet they dismiss out of hand PCWP families' oral history on this subject, as well as ignoring Casey and Lowe's (2019) heritage assessment in relation to the Aboriginal heritage significance of such events. This does not constitute objective research and assessment, in my opinion.

2.3 ACHAR Section 3.3 Dr Mark Dunn's Historical Research

I acknowledge that Dr Dunn has conducted significant historical research on the early colonial history of the Hunter Valley. At the same time, I note that his research on convict and Aboriginal experiences of that colonisation process is based purely on documentary sources, and is entirely lacking in any Wonnarua oral history research, despite his frequent acknowledgements that this is largely an unrecorded history. This for me is a major point of dissonance within his work.

Indeed, Dr Dunn also does not appear to be familiar with the existence or importance of Aboriginal oral history at all, or of the relevant provisions of the NSW ACHAR research and assessment process, or the Burra Charter and related AICOMOS professional practice guidelines regarding Aboriginal oral history and intangible cultural heritage. In all of his historic writings, including for this ACHAR, he reaches definitive conclusions about Wonnarua cultural history without any real consideration of the serious limitations of his documentary resources or the concomitant importance of oral history in Aboriginal communities.

Neither does the updated ACHAR consider the considerable gap between its conclusions regarding the Aboriginal heritage significance (including Dr Dunn's material) and the cultural heritage assessment by Casey and Lowe (2018), based upon both historical and archaeological data.

2.4 ACHAR Section 6.7 PCWP Cultural Values

This short section of the updated ACHAR report is deficient in two major respects.

First, the new section states that:

"In summary, the PCWP members who contributed their cultural values to the ACHAR expressed strong association with all Wonnarua country, but most particularly the area around Glennies Creek (which is outside the Project Area)." (Canning 2020: 48).

This statement somehow manages to ignore completely the PCWP oral history information recorded and reported in Draper (2020: Section 4.4), relating specifically to Ravensworth and its immediate environs. Here, a chronic inability to recognise and deal with oral history and intangible cultural heritage aspects in general is very evident. This dismissive statement in the updated ACHAR demonstrates the overwhelming bias towards archaeology/tangible (recorded) heritage and documentary history in the ACHAR, to the complete detriment of acknowledgement and consideration of intangible cultural heritage and oral history. The approach shown does not in my opinion meet the standards of the NSW ACHAR guidelines and described in the Burra Charter (AICOMOS 2013) and AICOMOS cultural heritage assessment practice notes (AICOMOS 2013a & b, 2017) - see Draper (2020: Sections 2 and 5). In this critical respect, the updated ACHAR completely fails to satisfy the requirements for cultural heritage assessment published by OEH (2011).

Second, the updated ACHAR unaccountably and rather alarmingly makes the startling claim in relation to my 2020 anthropology assessment report that:

"The full scope of work for this independent report is not known to Glencore;" (Canning 2020: 48).

This statement is completely false, and quite obviously so. The brief for the Draper (2020) report was agreed in advance by Glencore and PCWP, and the final version issued by Glencore is quoted in the introduction of that report (Draper 2020: 1), and subsequently was implemented step by step throughout the report, without any omissions or additions. This statement in the ACHAR is patently false and misleading.

In fact, this less-than-half-page ACHAR Section concerning "PCWP Cultural Values" contains nothing of the sort, instead dismissing the entire topic in four short paragraphs without ever once mentioning what they are, despite these values being clearly researched and reported in some detail in Draper (2020: Section 4). This comprehensive dismissal of the PCWP families as Traditional Owners or even as Aboriginal people with valid rights and interests in their own, well-demonstrated cultural heritage is not consistent with the OEH (2011) ACHAR principles and the Burra Charter (see Draper 2020: Section 2).

2.5 ACHAR Section 6.11.2 Draper Report (2020)

Canning (2020: 53) states that the Draper (2020) report "is a piece of work specifically commissioned by and for the PCWP", which is incorrect. ND&A was engaged by PCWP through Tocomwall to prepare this report because of Associate Professor Neale Draper's prior experience conducting anthropological connection research for the PCWP native title claim (Draper 2020: Section 1.3). However, the report ultimately was commissioned by Glencore, the brief was issued by Glencore, and the fieldwork was facilitated by Glencore (Draper 2020: Section 1.1). This misleading statement in the ACHAR sits alarmingly alongside the false statement immediately above (Section 2.4) that Glencore was ignorant of "the full scope of work for this independent report", apparently attempting to

undermine the Draper report through insinuating that its scope and contents somehow were unauthorised and inappropriate in some unstated manner.

Canning (2020) takes issue with the conclusion reached in Draper (2020) that while the PCWP represents authentic Wonnarua families, the other RAPs who did not record any cultural significance for the project area are not local Wonnarua Traditional Owner families at all.

"In this report, Draper (2020) essentially argues that the only set of valid Aboriginal cultural values in this part of the Hunter Valley are exclusively those of the PCWP people and that the conclusions of the original ACHAR apply only to the (other) 'non-Wonnarua people' (2020: 26) who constituted 31 of the 32 RAP's registering for the Project. It is unclear how Associate Professor Draper reaches this conclusion, given that he did not canvas 97% of the RAP's for the Project. His conclusion in his report that the PCWP are the only 'true' Wonnarua dismisses all other Aboriginal people who have been party to this Project, and appears to have been written as an attempt to assert a position to the Native Title Tribunal, rather than undertaking an objective and unbiased cultural values assessment of the project RAP's." (Canning 2020: 53).

The statement above amply illustrates the lack of discrimination on this important issue that pervades the ACHAR report. This is not a numbers/ percentage game, and it does not matter if 97% of the RAP respondents did not have anything to report - it only matters whether they are local Aboriginal Traditional owners for the area concerned, which they are not, based on the results of may fairly extensive research to date on this specific topic - as summarised in Draper (2020: Section 4.1 Cultural Identity and Traditional Country).

While I acknowledge that Dr Canning may not have access to reports prepared in relation to native title claims for the Federal Court (Draper 2018, 2020a), neither does he have licence to dismiss out of hand the results of such research. Neither has he conducted any research to ascertain whether or not the other RAPS comprise traditional owners or historical immigrants - and if the latter, when they arrived in the region and what actual links if any they may have to the locality of the assessment. Consequently, he is in no position to oppose and dismiss my conclusions in such a peremptory manner. I have done my homework on this subject and Dr Canning has not.

I appreciate that it would have been helpful if I had been able to present the results of that genealogical and historical research in detail for this matter, but that would have gone far beyond the agreed scope and resources for my report (Draper 2020) to provide a cultural values report for the PCWP, and could interfere with native title matters as well. It is clear that Dr Canning did not conduct any research of this kind in his ACHAR research, despite the fact that not all RAP submissions can be considered to be equal on face value, as described by the Burra Charter and Indigenous Cultural Heritage Management Practice Note (Australia ICOMOS 2013a: 3, cited in Draper 2020: 10).

The Burra Charter emphasises the important management role of people who do have significant cultural values in relation to a place (i.e. the PCWP), not those who do not (apparently the other, non-Wonnarua RAPs):

"Conservation, interpretation and management of a place should provide for the participation of people for whom the place has significant associations and meanings, or who have social, spiritual or other cultural responsibilities for the place." (Australia ICOMOS 2013: Article 12).

Yet, the PCWP are effectively dismissed at every turn by Canning (2020). In fact, I pointed out previously that one should not expect all Aboriginal people who respond to an ACHAR investigation to agree on matters of cultural heritage significance:

"Article 13 of the Burra Charter specifically acknowledges that co-existing and conflicting cultural values may apply to a specific situation:

"Co-existence of cultural values should always be recognised, respected and encouraged. This is especially important in cases where they conflict.

(Explanatory Note: For some places, conflicting cultural values may affect policy development and management decisions. In Article 13, the term cultural values refers to those beliefs which are important to a cultural group, including but not limited to political, religious, spiritual and moral beliefs. This is broader than values associated with cultural significance.)" (Australia ICOMOS 2013: Article 13).

In the current situation, this could apply to conflicting views reaching back to the conflicts created by European colonisation of the Hunter Valley in the 1820s, or the contrast between the high cultural heritage significance of the Ravensworth Estate for PCWP Wonnarua people in relation to their cultural identity and family history, as opposed to its lack of significance to other Registered Aboriginal parties. This contrast could be attributed to the fact that the other RAPS do not appear to be people of local descent or having any special knowledge of or family history in relation to this place." (Draper 2020: 9).

The focus here should be on the credentials, cultural values and concerns of those Aboriginal people, especially Traditional Owner families who do have cultural values and connections in relation to a study area, rather than ignoring them in favour of a majority of voluntary respondents who do not have such values and connections. In this respect, I must reiterate that the ACHAR report does not follow the appropriate guidelines, despite Dr Canning's unsupported appeal to the contrary (Canning 2020: 53). With reference to that statement by Dr Canning, I do not believe that I have anywhere indicated in Draper (2020) that I considered Casey and Lowe (2018) not to have followed OEH (2011) and Burra Charter (2013) guidelines, as asserted by Dr Canning.

In Draper (2020: e.g. 26) I quite explicitly did not criticise Dr Canning for not dealing with the cultural values of the PCWP, acknowledging that they insisted upon engaging with a specific anthropology assessment and not general community values meetings, contrary to the assertion in Canning (2020: 53). I do not see any relevance to Dr Canning's criticism that I reported on interviews with two or three people (Canning 2020: 53), considering the specific, very relevant content of those interviews, the short period available for such fieldwork (less than a week), and the complete lack of any interviews with any Aboriginal people in any of the other ACHAR reports for this matter.

2.6 ACHAR Section 6.11.3 OzArk Response to Draper Report

This section is not listed by Glencore in the July 2020 letter to registered stakeholders as an update.

There are a couple of points that need to be made about the OzArch comments included in Canning (2020: Section 6.11.3). First, with reference to possible burial sites around Ravensworth, Oz Arch doesn't know where all of the bodies are buried either (see the quote from Canning 2020: 18 in Section 2.2 above). Second, there remains a large gap that has not been acknowledged or addressed between the conclusions and Aboriginal significance assessments by Casey and Lowe (2018) and those of OzArk and Canning (2020). I reject completely the assertion (Canning 2020: 54) that previous archaeological work was not acknowledged and consider that it was given due consideration in Draper (2020).

I reached a similar conclusion to Casey and Lowe (2018) that the area around Ravensworth homestead has high significance in relation to further potential to yield archaeological information. In doing so, I took into account the work already accomplished by OZArk and others, but I do not consider that research to be definitive in dismissing such potential. I took this view particularly considering the possibilities that intangible cultural values only recently raised (Draper 2020: Sections 3-5) could have some physical, tangible correlates in the ground - a possibility previously recognised at a general level by Casey and Lowe (see Draper 2020: Sections 3.4 and 5 for summaries). I was not criticising the OzArk research as being deficient in any way, merely pointing out that there were additional considerations and that sub-surface archaeological testing inevitably only investigated a miniscule proportion of the land under assessment, in a landscape much modified since 1820.

The OzArk critique is incorrect in asserting that Wonnarua traditional burials "... were not interred in the ground", repeating the error in the ERM report from the unreferenced original source. Interment in this case does in fact mean buried in a shallow grave (which would be susceptible to being dug up by dingoes), with the grave (ie the burial) being covered by an arrangement of logs (that is: "the dead were interred in a sitting position, the grave being covered with logs to prevent wild dogs getting at the corpse" Canning 2020: 57). The term "interment" in fact means "the burial of a corpse in a grave or tomb, typically with funeral rites" (Google dictionary) and the passage quoted notes that the logs were placed over "a grave", not just piled on top of a corpse propped up in a seated position. Such shallow graves protected by a surface layer of logs or rocks are common throughout Aboriginal Australia. I should note also that conflict disposals of bodies might occur in any form of corpse disposal, rather than a traditional Wonnarua burial, depending on the circumstances (referring again to Canning 2020: 18, quoted in Section 2.2 above). It is likely that the perpetrators of any killings would seek to hide the evidence of their actions rather than advertise them.

I conclude that the OzArk response has more to do with ruffled feathers and misapprehensions about criticism of the quality of their work, which I certainly did not intend in reaching my own, independent conclusions based on all of the available information.

2.7 ACHAR Section 6.11.4 Dr Mark Dunn Response to Draper Report

My issue regarding Dr Dunn's response (Canning 2020: Section 6.1.13) is that it continues to privilege a partial and incomplete documentary record to the exclusion of any consideration of the Wonnarua oral-history material reported in Draper (2020), and that such an approach is entirely contrary to the OEH (2011) and ICOMOS/ Burra Charter guidelines. I cannot understand why such an otherwise diligent historian concerned with the unwritten history of the Hunter Valley seems to have such a disinclination to pursue or to give consideration to that unwritten (i.e. oral) history. Dr Dunn does provide useful additional information in this section, which clarifies some aspects of the development of the Ravensworth property and other matters such as the presence of the military and mounted police.

Dr Dunn pointed out that:

"While there is no doubt that Ravensworth was the scene of a number of attacks by Aboriginal warriors and retaliatory incidents by settlers, Ravensworth was only one of a collection of farms and estates that were caught up in the violence on the wider Hunter Valley frontier during the period 1825-1828." (Canning 2020: 61).

This statement confirms that Ravensworth was associated with much more than a single incident of colonial violence, as emphasised by Canning (2020: 4-5). In relation to this statement and following comments by Dunn that Ravensworth was not the only focus of Hunter frontier violence, I also need to reiterate that my task was to research, record and assess PCWP cultural knowledge, values and heritage significance of Ravensworth, not to make a comparison of its significance to them in relation to other places in the Hunter Valley. Dr Dunn's criticism is misdirected. I note that in a Late Night Live Radio National interview on 8 June 2020, Dr Dunn stated that some properties like Ravensworth (the first of several mentioned) were attacked repeatedly, whereas friendly landowners such as the Ogilvie's at Merton were not attacked.

However, the topic here is the significance of Ravensworth to Wonnarua people, not an historian's judgement on its relative significance in the history of colonial conflict in the Hunter Valley. I do not get the impression from Dr Dunn's comments that he is considering this distinction, with respect to the purpose of the ACHAR process.

I should also note again that my assessment of the cultural heritage significance of Ravensworth is quite congruent with that of Casey and Lowe (2018), whose work is not mentioned by Dunn, and conveniently not the subject of a response to my report in Canning (2020), in the same manner as Dunn or OzArk.

I accept that Dr Dunn is more familiar with the written historical records than me, and so accept that the scattered and partial references of frontier violence around Ravensworth that I attempted to put into some sort of chronological order for my report may contain repeated references to single events. I have not had an opportunity to review the material in detail again, though I must say that I was not aware of any duplication at the time. I am grateful to Dr Dunn for this clarification, but I note that nonetheless he confirms that there are numerous documented events rather than the single event referring to Alcorn's Hut as claimed by Canning (2020). Canning and Dunn do not match up at all on this topic in my opinion.

With respect to the reported skull on display mentioned by Dunn (Canning 2020: 62) and the statement that this "cannot be assumed to be Ravensworth on the weight of evidence provided from the original source as suggested in the Draper report (pg 41)", he is completely mistaken. Dunn has failed to appreciate the crucial distinction that I have not claimed that there is conclusive evidence that this was at Ravensworth. Instead I have properly reported that Wonnarua people today believe that this may have been the case, and have pointed out this reference as being congruent with their oral history and possibly referring to Ravensworth. In fact, the relevant passage in my report (Draper 2020: 41) quite explicitly is part of my summary of the content of a video interview conducted at Ravensworth with PCWP member Scott Franks on 18 February 2020.

Dunn's claim that I questioned the idea of "200 warriors" at Merton at the Ogilvy property mistaken. I was not questioning the large number of Aboriginal men present at the time. Considering that all adult Aboriginal men could be referred to situationally as "warriors" (or equally as hunters, travellers, ceremonial participants, etc.), I specifically questioned Dunn's (2019: 9) description of them as a "war party". This ascribes to the gathering a purpose for assembling that for me is not evident from the evidence, that is all.

While Dunn refers several times (Canning 2020: Section 6.1.13) to Bowman as an estate owner who did not primarily live at Ravensworth during this period, he does not address the more pertinent matter of his role as a foundation landholder and person of considerable influence in the colony with respect to the occupation of this local area. He was instrumental in the brutal suppression of the Wonnarua, and the deployment of mounted police and military personnel in that process. This is the viewpoint from which Wonnarua people regard his property and historical legacy, which I have duly reported and commented upon, consistent with my brief and the guidelines for that process.

2.8 ACHAR Section 6.12 Conclusions

In his conclusions to the uniformly hostile responses to my 2020 Report, Dr Canning states:

"This ACHAR is based on the views and opinions of all 32 RAP's who have been involved and does not prioritise or favour the bona fides, position, or views of one group or individual above any other.

The majority of RAP's did not express any attachment to the Ravensworth Estate or the homestead. However, the Draper report (2020) ascribes the PCWP's broader attachment to other places in the region (such as Glennies Creek and its tributaries) directly to the Ravensworth Estate, when in fact much of this same area was assessed by the PCWP people during the Mt Owen ACHAR (2013) process with no significant cultural values arising in their reporting at that time. It is unclear what has changed in the intervening years to make Ravensworth Estate a focus of attention compared to several years ago when it was not." Canning 2020: 63)

This statement is unsatisfactory in several respects.

First, Dr Canning has incorrectly dealt with the matter of 32 Registered Aboriginal Party responses as if they were all of equal relevance to the ACHAR - as if it is somehow a matter of taking a majority vote on Aboriginal heritage significance. Nothing could be further from the truth, as made perfectly clear in the largely disregarded OEH (2011) and Burrup Charter (2013) and AICOMOS professional practice guidelines (AICOMOS 2013a & b, 2017. As detailed in Draper (2020: Section 2) to no avail, and partially quoted again in Section 2.5 above, the cultural heritage consultant conducting an ACHAR has the responsibility to identify knowledge holders and traditional owners and to provide proper consideration to their cultural knowledge, values, and beliefs. Instead, Dr Canning simply has dismissed views inconvenient to the development proponent because numerous other, unevaluated respondents had nothing to say, and implying that the null views have precedence because of weight of numbers. The status of the PCWP as traditional owners and local descendants with significant historical connections to Ravensworth was amply documented in my report (Draper 2020: Section 4), and I have done considerable research in relation to the cultural and historical affiliations of many of the respondent groups/ families who (not surprisingly) expressed no connection to the Ravensworth area.

What the PCWP may have submitted in a previous ACHAR for Mt Owen to the north is not relevant. In that case, as in many other Hunter Valley cultural heritage assessments, there was no anthropological cultural values report prepared for that ACHAR, which appears to have been primarily archaeological in nature (a common problem referred to in the Practice Note on the Burra Charter and Indigenous Cultural Heritage Management (AICOMOS 2013a, Draper 2020: 9-10). In the case of Glendell, there has been such a report (Draper 2020), and this reasonably could be concluded to constitute a significant difference between the two ACHAR processes, particularly where consideration of intangible cultural heritage values are concerned.

Canning, like Dunn above, also throws out a total 'red herring' by falsely claiming that my 2020 report is misleading on the grounds that it characterises Ravensworth as the primary focus "of the entire frontier". There is no reference to my report on this point, because I have not claimed any such thing. I have reported on the significance of Ravensworth to Wonnarua descendants who have strong cultural values in relation to Ravensworth, and have made my professional assessments on that basis, explicitly according to the ACHAR and ICOMOS guidelines. Previously, in their consideration of colonial cultural heritage, Casey and Lowe (2018) have reached quite similar conclusions based on considerable research and investigation. While my research and conclusions have been misrepresented by Canning (2020), Casey and Lowe's significance assessment simply has been ignored by the ACHAR report. Why is that?

The ACHAR uniformly is focussed upon known archaeology and written history, with a highly inappropriate disregard for intangible cultural heritage and oral history. This severely compromises its value as a balanced Aboriginal cultural Heritage Assessment Report, in my opinion.

In his final summary, Canning (2020: 63) does at least acknowledge that "... the key question is whether there are cultural values associated with the Project Area by the PCWP?" However, he immediately devalues this concern with the following statement:

"The few PCWP people consulted by Draper (2020) do consider that they hold certain spiritual, traditional, historical and contemporary cultural values over the Ravensworth Estate (2020: 53) despite the entire area not featuring highly in their cultural practices over the past 50 years compared to Glennies Creek and other areas further afield (2020:51-53)." (Canning 2020: 63).

This is far from a fair and objective appraisal of the research results and assessment provided in my 2020 report. The limitations of time and resources in terms of my report are clearly stated within. It is complete obsfucation to belittle the PCWP Wonnarua cultural values by making a completely facetious assertion about "the entire area not featuring highly in their cultural practices over the last 50 years" (see above). Where does this accusation come from and what is the evidence for it? Section 4 in Draper (2020) documents significant evidence to the complete

contrary, including the account of a women's mourning ceremony held at Ravensworth in the 1970s. This dismissive, false statement in the ACHAR also ignores the fundamentally important lesson that significant cultural values relating to a place may be based upon avoidance and perceived cultural danger, rather than habitual presence (and I note that Ravensworth is not normally publically accessible). The statement also fails to appreciate that intangible cultural heritage may include practices that occur away from a place (e.g. because of such avoidance), but which are symbolically or spiritually connected to that place (AICOMOS 2017: 3; Draper 2020: 14).

The Cultural Values assessment based on PCWP evidence (Draper 2020: Section 5) properly considers all of the factors highlighted by OEH (2011), the Burrup Charter (AICOMOS 2013) and the associated professional practice notes (AICOMOS 2013a & b, 2017, Draper 2020: Section 2). My review of the updated ACHAR (Canning 2020) only confirms and strengthens my view that this document does not achieve its required purpose with respect to Aboriginal cultural values, and remains critically deficient in its consideration of the fundamentally important aspect of intangible cultural heritage awareness and assessment.

2.9 ACHAR Section 7 Avoidance of Harm

Put simply, because the updated ACHAR (Canning 2020: Section 7) effectively dismisses the PCWP cultural values assessment (Draper 2020), the recommendations regarding avoidance of harm fail to address those cultural values or concerns in any meaningful way. Consequently, the ACHAR assessment of harm and associated mitigation represents a comprehensive failure to provide suitable recommendations of the management of harm to cultural heritage values and assets, in relation to the proposed development.

3 Bibliography

Australia ICOMOS 2013 The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance. Australia ICOMOS Incorporated

Australia ICOMOS 2013a *The Burra Charter and Indigenous Cultural Heritage Management*. Practice Note, Australia ICOMOS Inc.

Australia ICOMOS 2013b *Understanding and assessing cultural significance*. Practice Note, Australia ICOMOS Inc.

Australia ICOMOS 2017 *Intangible cultural heritage and place.* Practice Note, Australia ICOMOS Inc.

Canning, S. 2019 Glendell Continued Operations Project: Aboriginal Cultural Heritage Assessment Report. Report prepared by ACHM for Umwelt and Glencore.

Canning, S. 2020 Glendell Continued Operations Project. Aboriginal Cultural Heritage Assessment Report (updated 21/07/2020). Report prepared by ACHM for Umwelt.

Casey & Lowe 2018 Ravensworth Homestead Complex and Surrounds. Historical Archaeological Assessment & Archaeological Research Design. Report by Casey & Lowe Archaeology and Heritage to Glencore.

Draper, N. 2018 Anthropology desktop report prepared for Chalk & Behrendt Lawyers & Consultants, and the PCWP Native Title Applicants.

Draper, N. 2020 Glencore Glendell Continued Operations Coal Project, Aboriginal Cultural Heritage

Assessment. Anthropology Report on PCWP Cultural Values. Report by ND&A for Tocomwall Pty Ltd.

Draper, N. 2020 Wonnarua Native title Mediation: Review of Court Expert's Report NSD1680/13, NSD1093/12 and NSD/788/13 PCWP Native Title Claims. Report prepared for prepared for Chalk & Behrendt Lawyers & Consultants, and the PCWP Native Title Applicants.

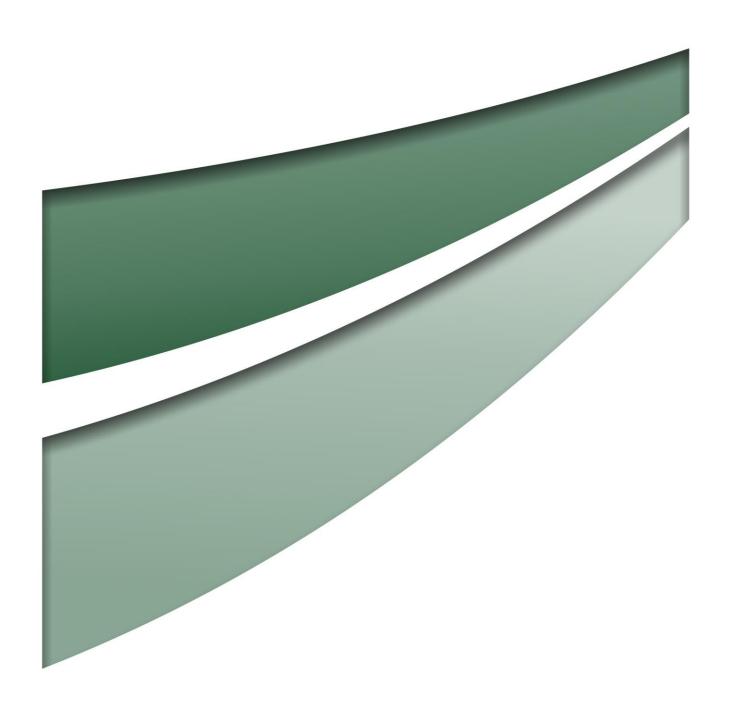
Dunn, M. 2019 *Ravensworth Contact History*. Report prepared for Umwelt Environmental & Social Consultants, NSW.

ERM 2004 (Cited in Canning 2020 - no reference available).

OEH 2011 Guide to investigating, assessing and reporting on Aboriginal cultural heritage in New South Wales. NSW Office of Environment and Heritage (now part of DPIE).

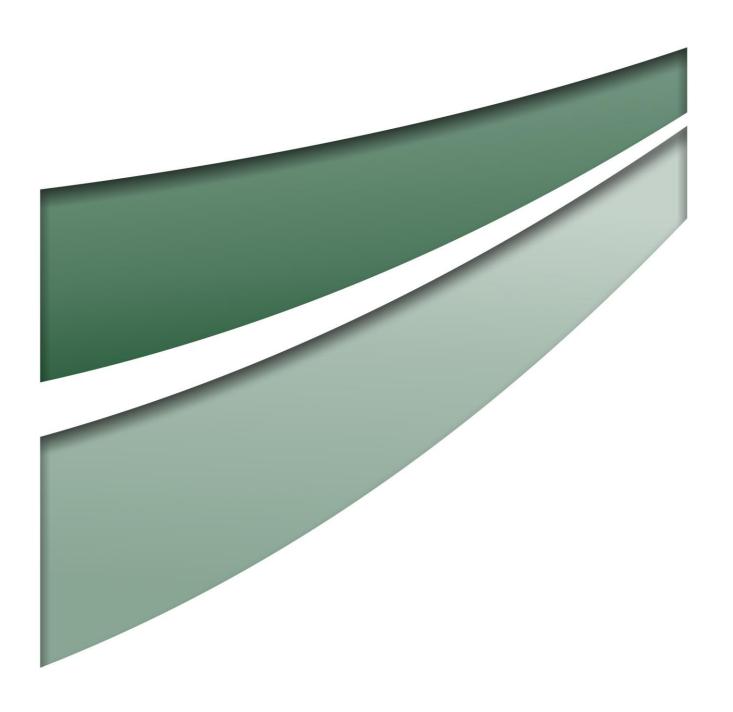
Sackett, L. 2019 Wonnarua Native Title Claims: Traditional Wonnarua Lands, Wonnarua Laws and Customs Concerning Rights and Interests in Lands and Waters, and Wonnarua Apicals. Anthropology expert desktop review for National Judicial Registrar – Native Title, Federal Court of Australia (final version).

Tocomwall 2020 *Glendell Aboriginal Cultural Values Report*. Report by Tocomwall Pty Ltd for Glencore Coal Assets Australia and the Glendell Project ACHAR Application.



APPENDIX 4

Addendum to Move Methodology Report (Commercial in Confidence)



APPENDIX 5

Summary of investigation and due diligence work completed

Due Diligence Undertaken

For the Relocation of the Ravensworth Homestead and Associated Outbuildings

1. Introduction

The purpose of this document is to provide the reader with an understanding and appreciation for the level of work and nature of investigations and subsequent assessments completed by Mammoth Movers **[Mammoth]** to confirm the feasibility and to develop its approach to the design of an intact relocation for the Ravensworth Homestead and associated outbuildings.

Mammoth's investigations and assessment of the buildings and proposed routes have been comprehensive, culminating in over 770 hours of work including around 70 hours on site. Our analysis and findings have been presented to Glencore in 16 reports; with considerable engineering activities supporting the findings presented. Mammoth's investigation extended to the review in detail of 8 proposed final sites, both near and far, and the viability of the associated routes from the current site.

The evaluation effort has enabled Mammoth to develop a sound relocation option where potential risks and challenges are well understood; impractical or unsuitable options have been excluded and the proposed relocation methodology controls the remaining project risks. Our work has enabled the development of a feasible relocation option, supported not only by our experience, but that of some of the premier masonry movers from USA and Canada. These movers have significant experience in similarly complex relocation projects of historical buildings and have been involved in the evaluation of the project from the beginning and shall continue to be involved should the project proceed.

The development of the relocation option and a summary of the work completed is outlined in the following document.

1. Background

In March 2018 Mammoth was contracted by Glencore to investigate the feasibility of relocating the Ravensworth Homestead and its accompanying outbuildings (namely the Barn, Stables, Privy, Servants Kitchen and timber Cottage) from their current location east of Hebden Road to facilitate the mining of coal at the current site.

Upon establishing (after an initial site visit) that the relocation option was possible at a high level; Mammoth was further contracted to undertake extensive and staged due diligence to identify the appropriate methodology, constraints, risks and costs associated with the proposed relocation.

Over the period of approximately 1.5 years Mammoth has assessed the in-tact relocation option through three site visits, site investigations to determine the nature of the building construction, site and route constraints and a detailed desktop analysis.

In July 2018 Mammoth arranged for one of USA's most well-respected large masonry movers Larry Cline, to visit the buildings and review the proposed routes. The development of the relocation methodology and associated assessments was completed in consultation with Larry who has been involved in numerous masonry relocation projects of similar complexity, many of which are presented in our document MM-REP-RAVT-00014.



In December 2018, Mammoth presented its findings to Glencore management who, subsequently agreed that the relocation of the homestead in one piece was viable but agreed with Mammoth's recommendations that it be limited to the low risk sites, (namely nearby sites) where the relocation of the buildings was achievable in one piece rather than requiring sectioning of the buildings.

2. Due diligence summary

Table 1 provides a summary of due diligence undertaken by Mammoth to evaluate the feasibility, constraints, risks and optimal approach for the relocation of the Ravensworth Homestead and outbuildings. The summary is limited to those investigations undertaken by Mammoth and the analysis of route and rock surveys contracted by Glencore and undertaken by third parties.

Parallel investigations have been conducted by others to review the wider impact of the relocation and the mine project itself, such as heritage impact assessments. As Mammoth is not privy to the majority of these investigations and reports they are not captured in Table 1 though they contribute to the overall due diligence undertaken by Glencore into the relocation of the Ravensworth precinct.

In order to ensure a complete assessment of the relocation, Mammoth evaluated the building construction methods and weight, and determined the move techniques necessary to enable the safe excavation, jacking and relocation of the buildings. Mammoth's review assessed the potential impact on the buildings as a result of the relocation to the proposed sites; identifying the limitations imposed by the various routes, associated risks and necessary upgrades associated with the route to the proposed sites.

....the **smart** alternative to demolition

Description	Date	Objective	Findings	Recommendations
Initial site visit duration 1 day	14/3/18	Identify if the relocation of the buildings is feasible and to collect information to provide initial estimate of costs Relocation and re-establishment cost for Mammoth's scope of works excluding route costs;	Buildings could be relocated Weights of buildings and initial support platforms determined	Whilst buildings can be moved – further work required to determine constraints should the buildings be moved over the public road network – in particular the possible minimum track width of the dolly support system. Mammoth recommended further investigation into the track width
Discussion Paper Track width	24/4/18	Initial route assessments undertaken by Glencore determined that some routes to proposed new sites would require extensive travel over the public road including traversing of a network of differing road types, width and quality. Mammoth was contracted to determine the minimum track width of the loaded buildings as a comparison with the route width	 7.5 m track width is possible but results in high dolly loads and no room to move if loaded building weight is greater than estimated. 9.0 m track width is preferred in terms of flexibility, support arrangement and access under the building. An approximate maximum envelope was determined for the widest building (the servants kitchen) for comparison with the route clearance 	Minimum of 9.0 m track width for the relocation of the Servants Kitchen and the Main homestead if moved in one piece

....the **smart** alternative to demolition

Description	Date	Objective	Findings	Recommendations
Commercial in Confidence Structural relocation costing for Ravensworth Homestead Complex, Ravensworth, Hunter Valley	8/6/18	Provision of the costs for the relocation (excluding route costs) Provision of a provisional sum for bracings works as required to move the buildings Provision of a day rate for the relocation	Costing provided. Costs broken down for the relocation works with route costs broken into a per day rate based on project overhead and margin. Initial cost broken into details including: Pre-contract works Pre-project works Project allocated proportion of equipment and transport to and from site (incl. international shippage) Cost for preparation, loading and re-supporting of structures including: main house kitchen barn stable toilet block cottage Travel and accommodation Fuel Contingency (specific to project works) A provisional sum for bracing works was provided as the extent of bracing is route dependent and the route had not been determined at the time of preparing the initial cost estimate.	n/a



....the **smart** alternative to demolition

Description Date	Objective	Findings	Recommendations
2 nd site visit 23/7/18 Duration 1 day	Preliminary inspection of proposed routes and review of building construction together with Larry Cline from USA and Ian Stapleton (LSJ)	Detailed review of building construction and condition constraints identified for input into the methodology. Constraints included: Identification of double leaf stone walls with rubble cavity Investigation into the crawl space of the homestead revealing larger than expected footers and unusual joist/wall interface Investigation into homestead roof space. Identified the roof and ceiling support system and wall height extent – discovery of gabled walls Determination of the internal wall type on the homestead (at sections where plaster had dislodged) Identification of unusual closet arrangement adjacent to fireplace with filled rubble wall above the closet Investigation into kitchen roof space. Identified wall height extent – discovery of gabled walls Identification of the kitchen veranda details Identification of extended timber lintels in the kitchen (act as a shear plane in the building walls)	Gabled walls required recalculation of building weight.

....the **smart** alternative to demolition

Description Date	Objective	Findings	Recommendations
3 rd site visit duration 5 days	Detailed assessment of building's condition and traversing of the potential relocation routes to determine whether they can be negotiated	Determination of how plumb the walls are on each building and measurement of areas of significant lean including: Barn walls Barn quarters Western wall of the homestead Stable south-western wall General condition assessment of each building and identification of sections where structural integrity is compromised including: South-western wall of stables - lean and cracking North eastern wall of the stables - leaf delamination Barn quarters - significant footing movement and significant cracking and salt damp Identification of footing depth and condition Initial identification of bedrock in vicinity of Kitchen and Northeastern wall of the homestead. Identification of obstacles, which need to be removed from the buildings to enable their relocation. Initial route assessment for routes to 8 potential new sites ranging in length from 3km to > 95 km and identification of: Road camber and slope measurement, Track width and pavement type Road obstacles such as overhead wires, trees and culverts Route distance Road side infrastructure Route rest and check points Complex intersections or turns incorporating compound turns Creek crossings Railway crossings Bridge crossings	The relocation of buildings afar was not recommended based on impact to the road users, requirement for significant road upgrades and associated project risks related predominantly to the road geometry. Relocation afar required the division of the Main homestead, kitchen and barn into sections. This was not recommended. The discovery of bedrock lead to the recommendation for further investigation for rock around the buildings. LiDAR survey of the proposed routes was recommended to enable the evaluation of the routes against the loaded building geometry Initial bridge assessments were recommended based on the proposed dolly layouts and wheel loads

....the **smart** alternative to demolition

Table 1 – Due diligence undertaken by Mammoth Movers for the Relocation of the Ravensworth Precinct

Description	Date	Objective	Findings	Recommendations
Discussion Paper Ravensworth Homestead and Complex –Division of Buildings	1/10/18	Present the impact of the findings from the site visit of 17 August 2018 in terms of the need to divide three of the buildings into sections to accommodate relocation to proposed sites afar. Identify the proposed sectioning of the buildings and the associated impact on the buildings fabric in order to accommodate a smaller track width of 7.5 m or 6 m (as necessary to accommodate further afar moves or moves to Pokolbin)	Discovery of the gabled walls excluded the possibility of relocation of the homestead in one piece on a < 9 m track width as there was insufficient room to accommodate the weight of the building on the required number of dollies without breaching the Safe Working Load (SWL) of the dollies. Mammoth identified the impact of the division of the buildings to accommodate the route requirements and to avoid the overloading of dollies. The report identified the impact on the fabric of the buildings including the rebuild, repair and disassembly requirements and associated reasoning. The buildings would need to be divided as per the below: Main homestead –3 sections; Kitchen –2 sections; Stable –1 section; Barn –4 sections (assuming that the quarters (northern room) are not able to be disassembled) Cottage –1 section; Privy –1 section The report identified the optimal section points and additional works to be undertaken – such as temporary support walls and additional bracing requirements A comparison of in-tact/one piece building relocation versus sectioning or sensitive demolition and rebuilding was provided Risks associated with sectioning were identified	Mammoth identified that the sectioning of the buildings was not recommended but was required to achieve a 7.5 or 6 m track width as necessary to relocate the buildings further afar. Mammoth recommended that a local move was the best approach for: The lowest impact on the buildings Lowest project risk Mammoth determined that the relocation of the buildings in sections was less preferred to the relocation of the buildings in one piece or the complete disassembly, relocation and rebuild on the basis of the following subjective criteria: Heritage impact Cost Project Duration Building realignment Structural Integrity Impact on public and other stakeholders Temporary bracing Time to traverse route Route flexibility

....the **smart** alternative to demolition

Description	Date	Objective	Findings	Recommendations
Discussion Paper Ravensworth Homestead and Complex Site Visit Findings and Review – 17 August 2018	26/10/18	Document the "irregular" techniques used in the buildings construction and findings from the second site visit (23/7/18), and identify the impact of the findings on the relocation Undertake a high level review of route survey provided by Glencore Evaluate the practicality, physical impact and risks associated with the relocation in one piece along the existing road network	 The full gabled walls in homestead and kitchen resulted in too much weight for the buildings to be relocated in one piece using a running track width of 7.5m or less The double leafed construction could require treatment in the form of foam injection to prevent the loss of rubble between the wall leaves The imbedded floor joist support system in walls results in the inner wall leaf being supported on wood and creates a horizontal separation line. The floor needs to be temporarily removed and the voids under the internal leaf of wall filled with masonry to remove the separation line If move further afield the buildings will need to be moved in sections 	Relocation of the buildings is "possible" but not recommended to proposed sites further afield where the track width is limited to 7.5m or less due to: Double leaf construction; Requirement to split into sections, (impacting their structural integrity); Concentrated weight and equipment operating at or near its SWL; Challenging topography (including significant grades and changes of grade); Significant distances; Requirement to travel on significant public infrastructure; Need to adopt a constricted track width; Associated high pavement and bridge loads. A local (within 3-5km of the existing homestead site) intact move is feasible and practical assuming a minimum 9 m track width for the dollies

....the **smart** alternative to demolition

Description	Date	Objective	Findings	Recommendations
Objects to be removed prior to relocation Ravensworth Homestead Complex	31/12/18	Identify those items within the buildings which will need to be removed to enable the structures to be relocated as per Mammoth's methodology and as identified in the third site inspection on 17/8/18	List of 11 items of differing nature developed in consultation with the Heritage Architect including some "significant" items: • Flagstones • Homestead doors and floors The number of items to be removed is reduced if the buildings are relocated in one piece rather than in sections Items marked for removal are to be documented, numbered and sensitively removed for reinstatement at the recipient site in their original configuration, where of heritage significance.	n/a
Commercial in Confidence Review of Proposed Routes for the Relocation of Ravensworth Homestead Complex	22/1/19	Present the feasibility of the relocation of the Ravensworth Homestead Complex from its current site to proposed sites including local sites on Glencore land and sites further afield to the north (Hebden) and to the south at Broke, Singleton, Pokolbin and Hermitage Rd Desktop analysis of route information provided by Glencore including: LiDAR survey Topography overlays on route plans; and excel data providing slope vs chainage Provide detailed analysis of loaded building constraints, route constraints and their combination e.g. maximum slopes, camber and combined analysis with building Centre of Gravity (CofG), wall CofG, zone performance etc Provide an analysis of the expected time on route and significant obstacles on route	Relocation is possible to Broke, Singleton and Hebden assuming significant road preparation works are completed, and necessary approvals obtained. To do so, the Homestead, kitchen and Barn buildings will need to be relocated in sections. Moves to proposed Glencore sites are achievable in one piece. Moves to Hermitage Road and beyond (Pokolbin) are not possible due to restrictive road topography (significant slopes or camber or combination) on the Broke to Cessnock Road.	Moves to proposed Glencore sites (Picton's Lane and Bowmans Creek) are preferred on the basis that they: Result in lowest impact on the buildings; Have significantly lower technical risk; Will offer the lowest cost; Reduce the overall project complexity markedly

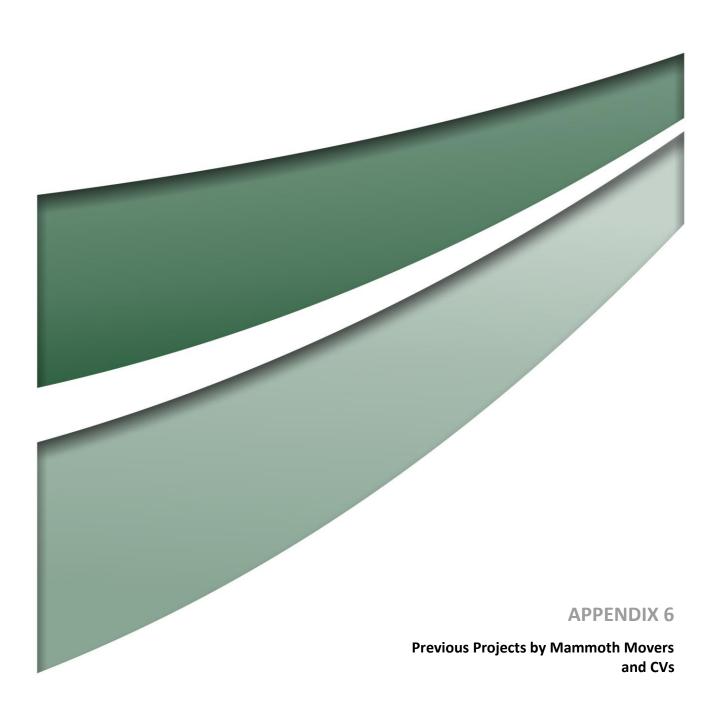
....the **smart** alternative to demolition

Description	Date	Objective	Findings	Recommendations
Commercial in Confidence Methodology for the Relocation of Ravensworth Homestead Complex	23/1/19	Present a detailed description of the methodology to be adopted for each of the buildings for the one piece relocation of the Ravensworth Homestead precinct	Review of identified areas of bedrock and development of solutions to overcome Identification and recommendation of the building cutlines (i.e. the horizontal plane at which the building is separated from its foundation). Provision of preliminary load plans Identification of the treatment of technically important/sensitive building construction elements to mitigate risk, such as the double leaf wall, the floor joist inset, delaminating walls etc Step by step methodology outlining how the buildings shall be moved and reinstated including techniques employed and equipment details	n/a
Commercial in Confidence +/-10% Costing for the Structural Relocation of Ravensworth Homestead Complex	15/1/19	Costings based on detailed methodology	n/a	n/a
Commercial in Confidence High level breakdown of costs for the relocation of the Ravensworth Homestead Complex	11/2/19	Provide further clarity and enable high level interrogation of the costings presented	n/a	n/a
Methodology for the Relocation of Ravensworth Homestead Complex	14/2/19	Methodology description on the relocation of the Ravensworth Homestead precinct Report for inclusion in project Environmental Impact Statement (EIS) with IP sensitive sections removed	High level description of the methodology to be adopted to move the buildings	n/a



....the **smart** alternative to demolition

Description	Date	Objective	Findings	Recommendations
Review of Proposed Routes for the Relocation of Ravensworth Homestead Complex	14/10/19	Identify the feasibility of the relocation of the Ravensworth Homestead Complex from its current site to proposed sites including local sites on Glencore land and sites further afield to the north (Hebden) and to the south at Broke, Singleton, Pokolbin and Hermitage Rd Including analysis of loaded building constraints, route constraints and their combination e.g. maximum slopes, camber and combined analysis with building CofG, wall CofG, zone performance etc Based on previous detailed route review with IP sensitive sections removed for inclusion in EIS.	Relocation is possible to Broke, Singleton and Hebden assuming significant road preparation works are completed, and necessary approvals obtained. Moves to proposed Glencore sites are also achievable. Moves further afield to Hermitage Road and beyond (Pokolbin) are not possible due primarily to restrictive road topography on the Broke to Cessnock Road.	Moves to proposed Glencore sites are preferred both technically and from a project risk viewpoint.





															*
Project No.	Project Name/title	Location	Photo of move	Photo in final position	Heritage listed		Year Relocated	Why Relocated	Building construction (e.g. stone or brick)	No. of storeys	Approx weight of building (tonnes)	Building dimensions (Length x width) (m)	Approximate distance moved (m)	Total time for the relocation component	Details/complications/challenges and mitigation strategies
1	King of Prussia Inn	Pennsylvania, USA			Yes	1719	2000	Road expansion	Constructed of locally available stone and a weak mortar of lime, sand and clay	3		15 m x 10 m	730 m	2 days	This project presented several challenges: The walls were quite thick, varied in thickness 610 to 760 mm, with the vast majority of the weight of the structure around the perimeter. There was no uniformity in the size and shape of the stone. Mortar offered virtually no adhesion. One massive fireplace was on one end wall with a smaller cooking flue on the other end. The lower members of the open beam roof system no longer offered any real resistance to wall spreading. The route the building had to travel was fairly narrow, curb lined paved roads. Three 90 degree turns were also part of the route. Extensive bracing and tension cables were used to secure the walls inside and out to prevent movement. Steel cables were wrapped around the entire structure and tensioned in order to put the walls into compression. In order to create a uniform line of separation and support, the wall was gradually de-constructed with drills, saws and small chipping hammers, creating pockets first for primary steel support, then secondary support. As the openings were formed, temporary pads with grout packing were installed and shored in place to create the uniform line of support. Once all the steel framework was installed the initial lift was gradually executed, stopping often to add additional support where needed. As soon as all of the structure was supported, jacking pressures were recorded and calculations were made to create a long, narrow doily foot print consisting of 21 dollies on heavy transfer beams, in order to negotiate the narrow route. All of the hard turns required stopping, physically resetting each doily to perform a hub turn, completing the turn and then resetting the dollies. Concern for the road surfaces required timber mats to cover the entire travel path, leapfrogging them along the route. The building was set on a CMU (besser block) wall with poured cells. Some of the original stone was used to fill in the area between the new wall and the bottom of the uneven building wall. This became the reveal line on the b
				W. State											The original building consisted of two buildings sharing a common roof with a passageway between the two. In the 1860's the roof was removed, the walls were heightened and the sides enclosed, creating a single two story structure.
2	Jeremiah Clemens House	Alabama, USA			Yes	1835	2004	Downtown expansion	Locally made brick and fine brown clay for mortar	2	515 tonne	18 m x 14 m	800 m	3 days	The building's foundation consisted of trenches dug in the clay soil and filled with rock rubble. The walls were extremely fragile, literally bricks stacked up. The building had suffered substantial damage from roof leaks which resulted in degradation of many of the bricks. Two large fireplaces were set along the centreline of the building on internal brick walls. These fire place flues also became access points for water damage. The connections between the old and new walls were separating in several locations. Before excavation under the building could begin, heavy angle irons were placed on the corners with cushioned material underneath. Seven cable strands were wrapped around the building, incorporating brace timbers in between and tensioned using turn buckles in order to stabilize the very weak walls. Both fireplace flues were braced up from the roof. Because of the fragile condition of the building, the process of loading the building onto the support steel was done progressively using a combination of steel beams and banding to create a support structure. External and internal beams and steel banding were installed ahead of the crosser openings being made. These beams provided additional support of the walls between the cross beams. As each opening was completed a cross beam was installed and pre-tensioned between the cross steel and main beams, becoming part of the support of the building.
															Once support steel was installed, the building was then jacked up and 17 dollies were installed. The move required one hard turn where dollies were reset to make the turn and
3	Horticultural Building	Ontario, Canada			Yes	1914	2012	Horticultural park	Brick	1	1540 tonne	55 m x 37 m	152 m	3 days	The plan was to move the building east to the far side of the park and place on a two story underground parking garage. The park boundaries narrowed travelling east which resulted in the need for the north 12 m of the building to be cut off and demolished. The remaining structure was 55 m long and had a 2000 sgm footprint. The building has two distinct components; a flat roofed two story entrance hall made of brick and concrete and a gable roofed exhibition hall noted for the column free open design. The exhibition hall has riveted steel trusses and steel columns embedded in a two course brick wall. Inspection of the structure determined that additional load had been placed on the roof trusses over the years and the steel columns and the brick walls were completely independent of each other, yet both shared support of the roof system. This condition created concerns regarding the stability of the roof system. Since this move would be sideways with a slight fall to the south, there were lateral integrity concerns. An intricate design of steel trusses was installed inside the hall on top of the internal main beams, in lieu of conventional crossbeams, because of the great span wall to wall. These trusses were attached to the steel columns at two points. Lateral bracing was installed truss to truss and additional members installed to reinforce the roof system. The side walls were supported on ladder beams between inner and outer main beams. Once the steel support system was in place the building was jacked up and transfer beams and dollies were installed. A total of 48 dollies supported a 1540 tonne load. Because of the great variation in weight in this building, three different weight values were used for each of the three zones. Before the building could be moved over the completed parking garage, a significant amount of shoring was installed to allow for the weight of the building to pass over the garage. To control the sideways movement of the building as it
															traveled to the new site, two power units were used to maintain proper alignment as the building was moving.
	Oneida Stake							High school	Freestone with sand and						The Academy is constructed with stone that was mined in a local mission with a double leaf wall and rubble fill in the wall cavity. The mortar was locally made from a lime and sand mixture. The lumber making up the floor systems and partitions was harvested and sawn by members of the church. Over time the walls and mortar had deteriorated, causing movement in the stone walls and one corner had actually cracked off. The interior floors represented the only diaphragms in the 2 % story structure. Over time the timbers in the floor system dried and shrank, allowing the walls to bulge outward. The transition line between the nicely hewn stone and the smaller rubble type stone and mortar foundation was actually well above the bottom of the timbered floor system. The following remedies were performed on the building to prepare the structure for relocation. Bands of wooden timbers were wrapped around the structure at the first and second
4	Academy	Idaho, USA			No	1895	2003	expansion	lime mortar	2.5	1500 tonne	24 m x 18.5 m	5 blocks	4 days	floors. Holes were drilled through the timbers and walls with steel cables and turn buckles installed. Tensioning these cables brought the walls back into plumb. Cracks in the walls were filled with new mortar and a fluid grout was pumped into the wall cavity in selected locations to stabilise the base and rubble fill. The damaged corner and a few other spots were sprayed with gunite and fiber to strengthen those sections. Gunite was also shot onto the backside of the foundation wall. Because of a desire to keep the original floor system intact, a decision was made to establish a cut line on the foundation wall and the footings were cut off in sections and shoring jacks installed to temporarily support the building. Support steel was gradually installed as the cutting and footing removal proceeded. With everything installed, the building was jacked up and transfer beams and bracing steel was installed along with 41 dollies to carry the 1500 tonne load. Even with power dollies
			- 11 - 15 - 15 - 15 - 15 - 15 - 15 - 15												and air brakes, the move was challenging with multiple grade changes and side sloping roads.
															The Gem theatre is a two level theatre built of brick. The theatre shares a common wall and lobby with an older structure called the Century Club theatre. Although the Gem theatre had experienced recent renovations and was structurally in very good shape, the Century theatre was in very poor shape. The Century, a basic rectangular structure with tall, massive brick and sandstone walls, had been mostly gutted for renovation and then abandoned. A failed roof system and the extreme Detroit winters had severely deteriorated the structure. Major work on the brick walls was the first step in this project. Mortar was cut out and new grout installed. Some sections were taken down and relaid. Major steel reinforcement on the interior walls was required. Engineers and architects designed a steel framework which became a permanent part of the structure, becoming wall and new floor supports.
5	Century and Gem theatre	Michigan, USA			Yes	1903 and 1927	1999	Baseball stadium development	Brick and stone	2 and 4	2450 tonne	32m x 30 m	563 m	4 days	A framework of steel beams was placed under both buildings in order to lift them as one unit. The buildings were elevated approximately 2.7 m in order to install the transport equipment and roll out on grade. Seventy one dollies were installed on transfer beams in three zones to super the 250 ton load. Even though the Century theatre made up less than a quarter of the total foot print of the structures it represented more than half the total weight. This forced 41 of the dollies to be placed in one corner of the move platform and caused the loads on these dollies to be much higher than the other dollies. Due to this situation, a heavy layer of fill dirt was spread on all the streets over which the buildings traveled. The move predated the general use of hydraulically powered dollies and 4 large excavators and 2 large buildozers, along with 1000's of metres of cable and pulleys were used to move the building.
															At the midpoint of the move route a 90 degree turn had to be made. This was complicated by the fact that internal attachment points for the cables on both sides of the structure had to be continuously relocated to maintain a true radial force to turn the building. The densely packed dollies in the heavy area of the building had to be constantly reset as they would begin to engage each other in the confined area. Many large buildings surrounded the area, further complicating the process. For a short time this building was the heaviest structure to be moved on pneumatic tyres in the world.
															The Signal Box relocation was the first relocation of a masonry building on pnuematic tyres in Australia and was a finalist in the Engineers Australia Awards for that year. The building construction offered a number of challenges with racks of equipment imparting point loads through individual columns into footing pads located within the floor plan of the building and a post construction unreinforced slab poured between the lines of equipment which all needed to be supported from above to enable the building to be excavated. A temporary trusswork of chains was installed within the building to transfer the equipment loads (and second storey slab weight) from the base of the rack columns to the external walls of the building prior to it being dug out.
6	Hornsby Signal Box	NSW, Australia		THE PETER STATE	Yes	1928	2007	Rail expansion	Full brick, lime mortar	2	320 tonne	22 m x 8 m	130 m	1 day	Excavation of the building required the identification and termination of over 100 power and communication cables into and out of the building with excavation limited to the two narrow ends of the building due to an operational trainline within 1 m of one side of the building and approximately 20 essential service fibre optic cables located on the opposite side and within 3 m of the building. Railway rion had been installed within the buildings concrete footings (both within the building footprint and under the perimeter walls) which presented a problem for their demolition. The move methodology was adjusted to enable the installation of the support steel in the restricted space between the underside of the ground floor slab and the top of the concrete footers with pockets being cut out in the footer for the main beams only.
			TO TO TO	The state of the s											The relocation route, though short was tight with the building being moved past existing infrastructure with only millimetres to spare and all within an operating rail corridor (and not in a possession). The building was moved up a ramp and rotated into position using a hub turn at the new site as there was insufficient room to spot the building directly above the new foundation as due to adjacent infrastructure constraining the approach to the new site.
															The three story brick and stone double house has 2 large fireplaces. The height of building meant it had a high centre of gravity. This was of some concern because one section of the route had a 6.5% slope. Although the brick and stone were substantially weathered, the mortar was mostly intact. The preparation of the structure for lifting went smoothly.
7	Armstrong House	Minneapolis, USA			Yes	1886	2001	Transit expansion	Brick and cut stone	4 plus basement	770 tonne	16.5 m x 20 m	800 m	9 days	Upon lifting the structure, it was discovered that construction of the upper walls was completely different from the first story. The first story consisted of three courses of brick, while the next two stories were made up of two independent courses with a rubble filled void in between. This discovery delayed the relocation by a month. The internal plaster was removed from the walls, holes were drilled through the walls and threaded rods installed with plywood plates reinforced with lumber on each side. The walls were then compressed and tied to the opposing walls. Once the building was set down, the final remedy for the hollow walls was a grid of steel pins drilled and epoxied in place tying both courses together. The move of the Armstrong house was an extremely technical event. The building was loaded on 24 dollies. There were four compound turns along the route which took a day or
															The move of the Armstrong nouse was an extremely technical event. The building was loaded on 24 dolles. There were four compound turns along the route which took a day or more for each turn. The section with the 6.5% of slope required four pieces of equipment attached to cables and blocks to maintain holdback on the building. Numerous reconfigurations of the dolly system to keep them within operational tolerances were required.

23/06/2020

MM-REP-RAVT-00014 Previous Projects Table Rev 0 230620

MATTHEW MANIFOLD

B Eng (Hons)



PROFILE

TELEPHONE MOBILE 040 373 4234

EMAIL matthew.manifold@mammothmovers.com

SUMMARY OF EXPERIENCE

Matthew has over twenty five years project management and mechanical engineering experience in high value projects working for global engineering firms on projects up to half a billion USD. Over the past 10 years Matthew has filled project management roles in parallel with his role in our structural moving business. Prior to this he worked as a system engineer on technical tender preparation, review and coordination; contract negotiation and claim management. In the early stages of his engineering career Matthew focused on design engineering and testing. He has significant interface management knowledge from his technical lead roles in various consortia in Australia and overseas.

Matthew has worked in Germany, Switzerland, USA and the Middle East (Qatar) and has spent as much time on site or in factories as he has in the office resulting in a practical approach to his roles and problem solving. He holds operator certificate of competency (CoC) for a diverse range of machinery and is competent in the German language.

Matthew is the majority share holder and Managing Director of Mammoth Movers; a company which specialises in the relocation of brick and stone buildings in one piece (including heritage buildings) utilising technology conceived and developed in USA. The company undertakes the turnkey relocation and re-establishment of masonry buildings on projects ranging from \$25K to > \$20million AUD and has been recognised as a finalist in the Engineers Australia engineering awards. Matthew has worked on and/or managed over 30 moving projects in Australia and overseas.

Matthew Manifold 1 Pager Page 1 of 6

A selection of moves Matthew has worked on with Mammoth Movers or in conjunction with other structural moving companies

University Mansion – Greensboro – North Carolina



Private House - Hamptons - New York



Matthew Manifold 1 Pager Page 2 of 6

Private House - Fort Pierce - Florida



Commercial Office building – Sacramento - Florida



Matthew Manifold 1 Pager Page 3 of 6

Private House – Arcadia - Florida



Boat House - Palm Island - Florida



Matthew Manifold 1 Pager Page 4 of 6



Signal box makes Mammoth Move

A HISTORIC signal box in Sydney's northern suburbs was relocated in one piece by specialist moving technology last month. The movement of the 320t brick and fibreboard structure was undertaken by Mammoth Movers as part of the NSW Government's extensive upgrade of Hornsby Railway Station.

Mammoth Movers spokesperson Matthew
Manifold says the only solution until now would
have been either to demolish the building or to
undertake a time consuming and expensive heritage deconstruction and rebuild. "A building
such as this would be very difficult to de-construct because the signalling machinery inside it
is integral to the structure," he says. "By using
Mammoth Movers, they were able to relocate
the building and its contents in one piece, with
no risk to the structural integrity of the building
or the delicate and fragile machinery inside it."



The relocation of the solid masonry building was the first time such a move was completed in Australia.

The Hornsby Signal Box was moved approximately 150m. Mammoth Movers had spent several months preparing for the relocation which involved securing the structure for excavation and uplifting, preparation of the new site, and securing an access route. "While relocating prefabricated buildings is routine, the technology required to move solid masonry buildings has been used internationally for some time, but has not been used previously, in Australia," Manifold says.

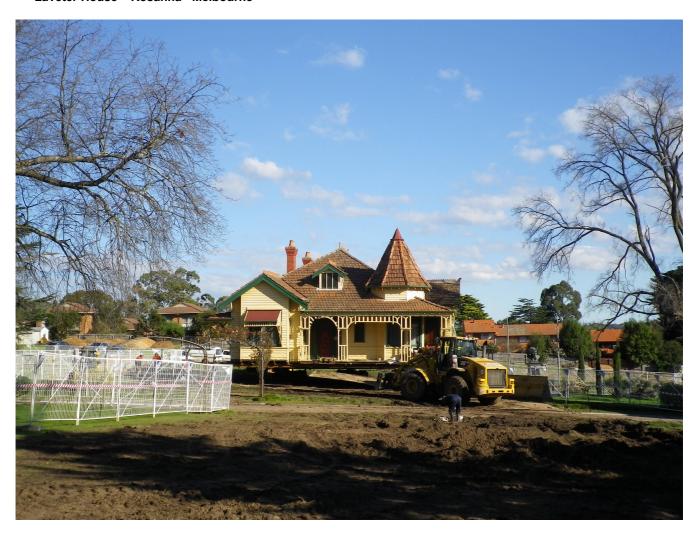
The unique techniques employed by Mammoth Movers meant the only limit on size or weight of the structure being moved was site access and the availability of a suitable transport route. These techniques open up a range of cost-effective and time saving construction or relocation alternatives for building and construction, heritage, government, property developers and even home renovators.

(See page 14 for details on the Building Moving Process.)

Construction Contractor Nov 2007

Matthew Manifold 1 Pager Page 5 of 6

Laveter House - Rosanna - Melbourne



Matthew Manifold 1 Pager Page 6 of 6

LARRY CLINE



CONTACT

TELEPHONE MOBILE

+1 941 809 4494

EMAIL

I.e.cline@gmail.com

SUMMARY OF EXPERIENCE

Larry Cline has over 45 years of experience in the structural moving industry. He has accomplished more than one hundred historical moves.

Larry specializes in moving structures that are especially challenging, due to their weight, dimensions, location and/or overall condition. Larry has assisted in numerous historical relocation projects throughout the United States and further afield. Some examples of these projects include:

- THE 250 YEAR OLD KING OF PRUSSIA INN, PENNSYLVANIA, USA, WITH EXPERT HOUSE MOVERS OF MARYLAND.
- THE SALEM BAPTIST CHURCH, SALEM, MASSACHUSETTS, USA WITH EXPERT HOUSE MOVERS OF MARYLAND
- THE 170 YEAR OLD CLEMONS HOUSE, HUNTSVILLE, ALABAMA, USA WITH DON KENNEDY AND SONS HOUSE MOVERS
- THE 100 YEAR OLD BRICK OFFICE BUILDING, PORT HURON, MICHIGAN, USA, WITH DEITZ MOVING ENGINEERS
- THE KINGSTON-LANGFORD MANSION, FT. MYERS, FLORIDA, USA WITH FDSM
- THE HORNSBY SIGNAL BOX, SYDNEY, AUSTRALIA, WITH MAMMOTH MOVERS
- THE 100 YEAR OLD HORTICULTURE BUILDING, OTTOWA, CANADA, USA WITH CDS BUILDING MOVERS
- THE 100 YEAR OLD HELMSLY MANSION, MIAMI, FLORIDA, USA WITH BROWNIE AND SONS MOVING ENGINEERS

Historical moves typically require special care and attention to details, with many procedures required that are normally outside the scope of routine structure relocation. Larry is highly experienced in these procedures.

Larry Cline 1 Pager Page 1 of 6

Some typical moves Larry has worked on in conjunction with other structural moving companies

The Kingston Langford Mansion



The Clemons House



Larry Cline 1 Pager Page 2 of 6

Czech Museum



King of Prussia Inn



Larry Cline 1 Pager Page 3 of 6

Schifter Mansion – Martha's Vineyard



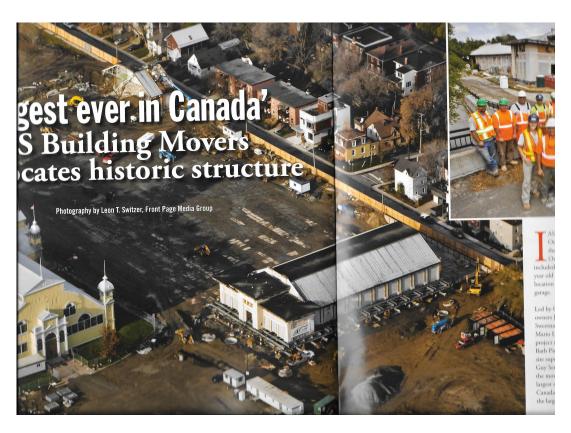
Catholic Convent



Larry Cline 1 Pager Page 4 of 6

Horticulture Building





Larry Cline 1 Pager Page 5 of 6

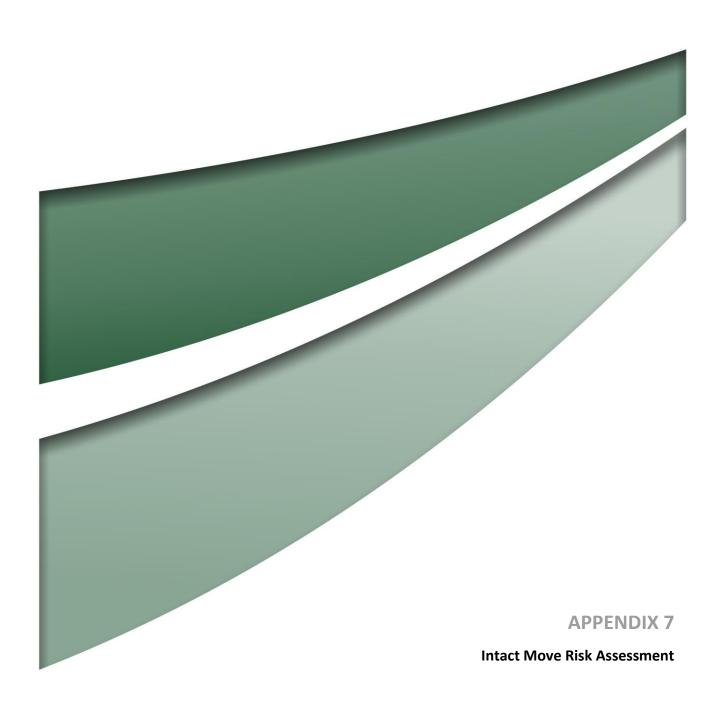
Salem Baptist Church



Helmsley Mansion



Larry Cline 1 Pager Page 6 of 6



Date of Risk Identification: 20 July 2020	Location: Hebden Rd, Ravensworth, NSW	Register Name: Construction Specific Activities	Register No.: MM-REP-RAVT-00015 – Rev 1
Project: Ravensworth Homestead	Risk Identification Team: Matthew Manife (Glencore), Nathan Donegan (Glencore), Ian	old (Mariinotti), Edity Clinic (Mariinotti), Chanc Coott	Scope: Heritage and building impacts only (safety, schedule and cost impacts to be captured in formal risk assessment at Contract Signing)

Risk Category /			
Activity	Hazard	Risk treatment strategies	Comments
Site access	Cess Vandalism and theft Building to be secured with site exclusion fencing with only authorised personnel permitted access.		
		Contractors equipment will always be locked and where possible stored out of sight in secure containers. Alternate site may be selected for storage of equipment prior to it being needed on site	
		The site and building support system to be left in a safe stage at end of each day with multiple redundancy in support system (such as additional wedging) to ensure the building(s) safety	
		If this is deemed a potential threat then CCTV and night lighting to be considered.	
		In critical times security patrols may be considered.	
Excavation works	Damage to or loss of	All practicable archaeological recording and salvage will occur before any excavation works.	
	archaeological finds	Archaeologist presence on site during the move preparation works (including removal of floors and excavation works) to record and salvage archaeological finds	
		Development of an unexpected finds protocol to manage the unexpected discovery of potential relics during initial ground disturbance. This should include details of what constitutes an archaeological relic for the Project, stop work procedures, procedures for contacting a suitably qualified archaeologist to assess the find, and processes for notification and consultation with the Heritage Council of NSW.	
		An historical archaeological induction for the site must occur for all personnel undertaking work across the site that will involve surface disturbance activities. The induction should include a brief history of the site, provide and discuss a copy of the heritage / archaeological exclusion zones (where applicable) and details of how to deal with unexpected finds.	
Damage to	Damage to underground	All services to be identified as part of a comprehensive Dial before you dig survey/DSS of the route.	
infrastructure	infrastructure (e.g. services or culverts) due	Install steel road plate over known infrastructure / services, which are potentially susceptible prior to transport to prevent bogging (if unsealed) or to ensure even distribution of weight. Generally, this should not be required but may be in some circumstances.	
	to traversing of the building	Relocate underground services where protection is not practical – none identified at this stage.	
	5	Note that the majority of the relocation is being undertaken over rural paddocks with minimal underground infrastructure making this risk minimal. An engineered fit for purpose road is to be prepared to facilitate the transport of the buildings to the new site – this road will be designed to accommodate any underground services or infrastructure on route e.g. culverts on route will be designed to accommodate the loaded building weights. In addition, sequencing of the works will minimise crossing of any existing underground services as Telstra services and underground power will be redundant through utility relocation works completed prior to the building move.	



Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to infrastructure	Overhead wires/Electrocution	The proposed relocation route and sequencing of the works will eliminate existing overhead power constraints along Hebden Road as the existing lines along will be removed and relocated prior to the building move.	
		A detailed route survey shall be undertaken prior to building move to identify any unexpected overhead wiring prior to relocation and heights determined or service removed as necessary to accommodate the loaded height of the buildings and appropriate clearances as determined by asset owner and legislation. Survey of building has been undertaken to enable the calculation of the loaded building heights.	
Damage to	Bridges	No bridges are present on the proposed route.	
infrastructure		One creek (York Creek) to be crossed – however this will be traversed with infill and culverts as part of purpose built road to be built to required specifications and based on Movers load plan.	
Damage to	Route obstructions	The buildings are to be relocated along a purpose built road with sufficient clearance	
infrastructure		The route will not be accessible to public traffic as it is proposed to be located on Glencore land at the time of the building move	
		Mover to carry required tools or have relevant personnel on stand by for removal of potentially tight obstacles, e.g. trimming of trees noting that all obstacles will be identified and the route planned out prior to commencement of the relocation	
Damage to infrastructure	Bogging	Check long range weather forecast and plan each move within appropriate weather window. Postpone or delay move in the case of bad weather	
		Move to be undertaken along purpose built fit for purpose road engineered for the loaded tyre loads	
		Mover to carry steel plate on standby to lay down and distribute if there are areas where it is impractical to prepare an engineered road e.g. areas with deep alluvial soils	
Damage to infrastructure	Pavement and roads	Damage to the infrastructure as a result of the relocation can be managed by protection of susceptible elements. For example, road edges for the entrance and exit to the sites noting that there will be no section of public road to be crossed for the moves themselves (with Hebden Road being relocated prior to the move and the existing road being decommissioned).	
		The Purpose built road includes a pavement designed to accommodate the wheel loads imparted on it during the moves or where additional ground improvement is required, steel plate will be used to distribute the wheel loads.	
Damage to	Some of the shrubs and	Operators made aware of significant plants to be protected through site briefing and use of barrier tape or similar demarcation.	
gardens	trees proposed to be	Where possible, plants to be salvaged are to be removed prior to building works and cared for in temporary nursery.	
	transferred die whatever precautions are taken	A horticulturalist is being consulted to advise on the best approach to relocating the different plants, including storage in a temporary nursery during the building relocation works.	

Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to Structure during preparation to move	Existing building components with current poor structural integrity fail during move	An assessment has been completed to identify any serious damage (e.g. due to salt damp or failed/moved foundations) that could restrict the intact movement of the building. The areas identified are limited to those sections which are already structurally unstable and would require rebuilding in their current position or propping in the near future to prevent collapse. The only section of building that requires a dismantle and rebuild approach will be the southernmost section of the stables building. Also chimneys will be sensitively removed to the roofline and rebuild once the building relocation is complete Further potential of the ability to move the proposed buildings and components has been assessed by a heritage structural engineer and has been confirmed Pre-move stabilisation works will be completed for other parts of the buildings as informed by a heritage structural engineer in consultation with the building mover In the movers professional opinion with the exception of those elements identified for sensitive dismantling and rebuilding, and any support/mitigation/restoration work identified as being required prior to the move, the buildings are able to be relocated in their current condition	The areas requiring substantial rectification are limited to: 1. The western wall of the northern end of the barn which is already modified from its original design and would be locally reinstated prior to the relocation in line with the original; and 2. The western wall of the southern end of the stable building which is currently propped and significantly out of plumb – this section would also be rebuilt together with the remaining walls of the southern section of the stable but at the new site with the roof to be relocated as one piece prior to the rebuild 3. Chimneys
Damage to Structure during preparation to move	Installation of bracing	All bracing has been designed to be installed in sections, which can be carried into the buildings by two men and connected when in position. The support bracing for the main barn structure will be lifted into position in sections using a loader as there is sufficient room to enable the controlled installation with machine assistance by a competent operator with spotter. Bracing will be fixed into the walls with pins which will later be removed and the localised damage to the plaster patched	
Damage to Structure during preparation to move	Damage to timber flooring during salvage	Flooring is hardwood and not tongue and groove enabling individual boards to be removed without damage. Some flooring has been taken up in previous repair works and replaced with minimal impact	
Damage to Structure during preparation to move	Damage to skirtings during salvage	Removal and replacement is often done during restoration works. Some skirtings have already been refixed.	

Mammoth Movers Pty Ltd

Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to Structure during preparation to move	Damage to stone floors during salvage	Flags are reasonably thick and appear to be strong The stones can be undermined using the excavation equipment to enable them to be lowered and drawn out under the walls rather than lifting them out as traditionally is necessary. This has been found to be far more effective in conserving stones in the past as does not cause the compression of any fines between the flagstones which have compacted over time Matching stone is available at the site to replace any pieces that crumble and large pieces can be crated and reinstated.	
Damage to Structure during preparation to move	Loss of mortar when flagstones are relocated	Colonial flagstones do not have mortar joints – no loss of material	
Damage to Structure during preparation to move	Loss of bedding when flagstones are removed	Bedding mix for the existing flagstones will be analysed (usually only old plaster and sand), recorded and reproduced at the recipient site Archaeological records can be taken internal to the building prior to or during the excavation where required	
Damage to Structure during preparation to move	Floors and skirtings not be reinstated as existing	Components will all be numbered, tracked and reinstated as per existing configuration.	



Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to Structure during preparation to move	Some of the structures supported on the existing floors would be damaged by dismantling	There are very few items which will be removed in order to facilitate the move. The full list of items is provided below for reference: Doors in the homestead and the servant's kitchen* Shelf in the servant's kitchen* End panel in the servant's kitchen* Kitchen* Skirting boards in the homestead Woolshed fitout in the end of the stables* Toilet boxes in the Privy Cupboard in the servant's kitchen A wooden upright in the barn and a partition Cobblestones/Flagstones in all buildings In the main these items can be removed and reinstated as a whole although it is expected that some items (those identified with *) are not original and are therefore not of high significance Items shall be removed by experienced tradesmen.	
Damage to Structure during excavation	Excavation machinery impacts building structure	Trained and competent operators skilled in excavation of masonry buildings Generally two spotters used when excavating the structure including: • external spotter adjacent to the structure in direct line of site with the machine operator to relay required movements and to identify proximity to building; and • internal spotter within the structure to confirm location of digging equipment and avoid collision with temporary supports All equipment inspected daily against prestart checklist	
Damage to Structure during excavation	Rock hammering causes vibration cracking in building and loss of plaster sections or other elements	Large machine mounted jack hammering will not be undertaken in close proximity to the buildings – the buildings will be separated from the foundation through low impact methods such as drilling, sawing, undermining and small hammers rather than larger high impact tools. Foundation blocks will be worked out rather than knocked out. Should bedrock be required to be removed to enable installation of beams, small machine mounted hammers and other low impact methods will be used in close proximity of the buildings rather than larger skidsteer or excavator mounted breakers. The buildings will be monitored at all times during rock excavation	



Risk Category /	Hazard	Risk treatment strategies	Comments
Damage to Structure during excavation	Undermining of walls causes loss of loose core fill material	Foam filling of cavity above cutline will be achieved through the injection of foam to bind loose core material at base Where necessary formwork and grout will be used to bind the face of the stones in pockets where the support beams will be installed. Further, banding will be used as required to further cradle and support the base of the wall in order to contain rubble fill material.	Comments
Damage to Structure during excavation	Undermining of walls causes loss of wall blocks and foundation support	Excavation of foundation walls will be progressive with the incremental support of the walls as the foundations are removed using cribbing, shoring jacks and underwall banding.	
Damage to Structure during excavation	Excavation floods during works (extreme weather event), weakening foundation material leading to movement	The excavation shall be planned to minimise the flow of water under the building including the use of moat style drainage around the building perimeter where required. Water will be diverted to an outside settlement pond or tank for latter disposal. Progressive excavation of foundation walls with the installation of temporary supports designed for the relevant loads (rather than large scale excavation) will protect rubble trenches from settlement resulting from rain event flooding, noting that much of the original footing will be left in place during excavation and installation of beams – with the removal of the footers being staggered.	
Damage to Structure during excavation	Unknown ground conditions cause unexpected movement of building or machinery	Pre-excavation pot-holing and investigation (once floors removed, sub-floor archaeological investigation completed and vegetation cleared from around buildings) Excavation around the outside of the building to be gradual and parallel to the building walls, taking small cuts until the required depth is reached – resulting in gradual exposure of any issue Existing septic tanks or underground water tanks to be identified (and where necessary removed) prior to the commencement of excavation on site. Removal of floors inside the main homestead will expose any potential concerns in terms of footings or other supporting systems prior to the building excavation.	
Damage to building during steel installation	Uncontrolled movement of steel impacting building structure	Trained and competent operators and spotter used when installing steel Spotter(s) used and trained personnel to manoeuvre/control steel into position Ground conditions outside building to be confirmed/inspected prior to installation of steel – i.e. checking for spongy ground and uneven surfaces Steel to be grounded on cribbing or rollers for installation to prevent uncontrolled movement.	



Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to building during steel installation	Steel not able to adequately support wall structure leading to cracking / deformation	Preliminary calculations have been completed on building weight and sizing of required support steel to determine the move methodology and building cut-lines for the Project approval process. Detailed building weight calculations and design of the steel support platform will be completed prior to purchase of steel. Suitable contingencies in the building weight shall be assumed. Steel will be sized by suitably qualified engineer with appropriate safety factors and will be quality controlled during manufacture / installation Standard QA practices adopted in terms of review of engineering calculations Weight of the wall and load on steel structure confirmed at commencement of jacking through jack pressures and confirmed against estimated values used to size the steel during the design phase.* Elastic bending of steel removed through wedging enabling the mover to determine that the building has been "picked" (supported) by the steel.*	* The hydraulic (jacking) pressures are applied gradually through the incremental displacement of the jacks. The applied load is monitored as the building weight is transferred from the foundations to the jacks. At this point the building support frame (steel) has already been prestressed using wedging so the elastic bending in the steel has been taken up and the steel support frame is rigid under the weight of the building. The building is slowly "picked" off its foundation as the jacks are raised at the initial lift. This presents as a hairline crack in the mortar joint at the cutline. The jacking process is halted and the building external and internal walls are confirmed to all be separating together (i.e. raising in unison). Uniform cracking indicates that the full weight of the building has been taken up by the support steel however the building is parted approximately a millimetre above its original foundations. Any non-elastic deformation (i.e. failure) in the steel or residual elastic bending not taken up by the wedging will be evident at this point due to inconsistency in the cracking around the building cutline. In this case the pressures are checked, and the wedging and support frame is checked. Any residual elastic bending in the steel is removed through the driving in of the wedges locally until the load is fully transferred. Should there be a local failure in the steel the building would be returned to the foundation. Complete separation of the building from the foundation is confirmed through physical gauges around the building, inspection of the cracking at the cutline, visual inspection of the steel and equipment, and through the pressures displayed on the jack machine gauges.

Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to building during steel installation	Point loading on individual blocks overloads stone capacity leading to cracking / spalling	Support beams shall be located sufficiently close together to better spread the support provided to the above walls and avoid large spans of stonework between beams and extended unsupported bridging of stone walls Packing timbers (or if necessary grout) will be used to ensure full distribution of beam load across the thickness of the wall and to distribute the load across the wall pocket Banding will be employed to transfer the wall loads between the support beams into the beams directly rather than relying on the point load interface between the wall and the support beam. I.e. support of the wall weight will be achieved along the length of the wall (I.e. a distributed load) rather than at select points.	
Damage to building during steel installation	Building element condition deteriorates during works (e.g. surrounding stone disintegrates during drilling to install bracing / steelwork)	Investigations completed to date confirm building methods and concepts and have shaped the approach to the methodology including the proposed approach to bracing and support* Pins (through-ties) to be installed through walls in selected areas of concern to prevent separation during move Window section integrity to be maintained through the installation of temporary blockwork to prevent "parallelogramming" (blockwork installed to stone reveals and sill while leaving window furnishings in place) Door section integrity to be maintained through the installation of temporary blockwork (removal of door leaves and the installation of temporary blockwork within the door opening whilst leaving the door jamb in position). The buildings shall be monitored as the supporting system is installed and throughout the entire relocation process. Where weak materials are encountered during installation, stop and modify methodology to suit noting that inevitably on a move of this type, issues will be encountered. These issues will be resolved by individual assessment and application of mitigation measures relevant to the problem discovered	* For example one room in the main homestead included a section where the plaster was removed which revealed the nature of the stonework underneath and indicated a good rock bed to pin the bracing to, noting that the bracing itself is designed to support the building with connection to the main steel and does not rely on connection of the bracing to the walls. Examples of other considerations into the planning of the methodology which were determined through the investigations include the nature of the rubble filled wall which was evident at one of the window frames in the stable and the wall embedded floor joist in the main homestead. These elements have been considered in the proposed methodology and mitigation measures implemented (as detailed later in this risk list)



Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to the building during jacking	Subsidence when transferring from the jacks to the moving platforms (dollies)	Cribbing and/or steel plate or plywood is installed under dollies as they are placed under the building to spread the load on the dolly into the ground underneath. Incremental change out of jacks for dollies enables monitoring of the hydraulic pressures in each dolly support ram as it is installed under the building.* Once all dollies within a zone are installed under the building the dollies are linked hydraulically. This removes any susceptibility to subsidence of a single (or multiple) dollies as the system is designed to accommodate changes in the terrain traversed.	* The transfer of the raised building from the unified jacking system to the dollies is gradual, i.e. one dolly at a time and is monitored through the Jack machine pressures. The dolly positions are determined by equilibrium calculations to ensure the location of each dolly accommodates the weight load being supported by the jacks it is replacing. The load is transferred to each dolly by extending the vertical dolly ram under the load platform and the pressure of the dolly ram is monitored in parallel with the pressure in the jacks it is replacing. In simplistic terms the pressure in the dolly ram will increase and the pressure in the jacks it is replacing will decrease as the load is transferred to the move platform. Dolly locations replicate the jacking points so as to maintain the deflection of the support steel and avoid the change in the load applied to the building through the support system. Any subsidence in the dollies is taken up by extension of the dolly ram to maintain the load/pressure and is monitored through the jack machine pressures during the change over from Jacks to dollies.
Damage to building during raising or lowering	Building unevenly jacked, leading to tilt and damage of building	All support steel will be engineered to take the weight of the building(s) incorporating safety factors Steel will be prestressed to take up load and induce the maximum elastic bending in the steel prior to jacking. Sufficient cribs and jacking equipment will be placed under the building to support the building weight load and ensure weight distribution into the soil (as determined through prior calculation). Jack machine pressure gauges will be used to confirm the weight upon jacking and avoid overloading of support/jacking equipment Unified jacking will be used to ensure all jacks lift at the same rate Pressure gauges in the jack machine enable the constant and instantaneous monitoring of the status of each jack, (with a variation in the pressure on a jack indicating a change in load and problem to be resolved) Additional gauges and indicators (over and above those incorporated in the jack circuit) will be installed around the building perimeter and within the building to confirm the building is raising as one and the building is remaining level	



Risk Category /	Hazard	Risk treatment strategies	Comments
Damage to building during raising or lowering Damage to building during raising or lowering	Failure of jack leading to sag / deflection of building element Failure of jack leading to overload of other jacks and cascading collapse of jacks	Risk treatment strategies The support frame is designed with a sufficient safety factor to absorb isolated jack failures. Jack numbers and spacing also have a redundancy. As the structure is elevated jacking cribs are progressively caught up to prevent possibility of a major drop due to failure of a jack Jack pressures are reported instantaneously at the jack machine and a jack failure is evident from the gauges – i.e. the line of sight to the jack itself is not required. Noting that the jack machine operator is focussed on the jack machine as his primary indicator of the progress and state of the building with others watching the jacking equipment and hoses, etc under the building. Jacks sized with factor of safety to accommodate individual jack failure. The jacking system isolates and monitors jacking points. With a redundancy in the number of jacks, no cascading event is possible. Monitoring and control of jack and support system at jack machine and at the jack point As the structure is elevated jacking cribs are progressively caught up to prevent possibility of a major drop due to failure of a jack	Comments
Damage to building during raising or lowering	Failure of hydraulics leading to loss of pressure to jacks and sudden drop of building	Lowering to safe state (or wedging at the current height) will be employed should a failure occur Hoses and jacks rated for duty Jack machine has pressure relief valve to prevent overload of the jacking circuit Should a leak occur it will be immediately obvious from the jack machine pressure gauges Jacking of the building is achieved through synchronising of a number of jacking cylinders which in themselves are not hydraulically linked (i.e. do not share the same oil on the pressure side) therefore it is not possible for there to be a wholesale failure only the failure of one hose or circuit As the structure is elevated jacking cribs are progressively caught up to prevent possibility of a major drop due to failure of a jack Lowering to safe state (or wedging at the current height) will be employed should a failure occur Jacks are modular and individual jacks can be changed out at any point during the raising or lowering of the building(s) Monitoring and control of jack and support system at jack machine and at the jack point	
Damage to building during raising or lowering	Failure or settlement of ground beneath jack during loading, leading to uneven raising of structure (e.g. jacks on rock don't sink while jacks on clay sink)	Pressurisation of the jacking system is a gradual event which removes blocking compression and initial settlement from the equation. Monitoring the pressure gauges in the system gives instant information from the individual jacking points with respect to the crib holding the imparted load allowing for corrections and remedies. Alternative gauges are also installed around the building as secondary checks on the progression of the building Preliminary geotechnical investigation of the site has found the foundation material to be stiff clay and weathered rock and significant settlement is not expected.	



Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to building during raising or lowering	Building raised or lowered too quickly leading to disruption of structure	The Jacking system elevates and lowers very slowly eliminating this concern. All movement is controlled. The Jack machine, when paired with the crib jacks is physically unable to raise or lower the building "too quickly" noting that the raising and lowering is "a slow event"	
Damage to building during raising or lowering	Uneven support of building due to incorrect height of cribbing	Building retained on jacks and wedged off on cribbing as safety measure during raising and lowering – the relative height of cribbing columns is not relevant to the even support of the building with variation in the crib heights taken up through the employment of shims and wedges	
Damage to building during raising or lowering	Cribbing fails during jacking or lowering leading to sag / deflection of building elements	Cribbing material chosen for its physical properties including structural strength, compressibility etc and quality controlled during manufacture to Australian grading standards – designed with safety factor Cribbing inspected for flaws as installed Cribbing columns designed to ensure distributed load on individual cribs and dispersion through cribbing columns Failure of one crib will not impact the entire cribbing column due to the layout of the crib which distributes the load across all cribs within the crib column	
Damage to building during raising or lowering	Flooding of original or recipient site leading to loss of cribbing and building	The site layout (original and final) shall be planned to minimise the flow of water under the building delivery of the works including the use of moat style drainage around the building perimeter where required. Water will be diverted to an outside settlement pond or tank for latter disposal. Cribbing will be loaded with the building weight making "washing away" unlikely Undermining of cribbing at recipient site avoided as will be based on a concrete slab foundation Plywood will be employed at the original site at the base of the cribbing column if there is concern of undermining of individual cribs due to water	
Damage to building during raising or lowering	Jacks lowered unevenly due to jack malfunction (e.g. single jack seizes during lowering and remains in extension)	Jacks sized with factor of safety to accommodate individual jack failure. The jacking system isolates and monitors jacking points. With a redundancy in the number of jacks. Monitoring and control of jack and support system at jack machine and at the jack point Jacks are modular and can be changed out if there is a malfunction	
Damage to building during raising or lowering	The jacks may reach the limit of their extensions.	The cribbing dimensions are designed to ensure that jacks are set in multiples which prevent over-extension. The jack machine will recognise if a jack reaches its full extension or beds out during lowering due to the corresponding change in the pressure read for the jack. If a jack reaches its full extension all jacks will be chocked and the jack reset with packers	



Risk Category /	Hazard	Risk treatment strategies	Comments
Damage to	Loss of building footings	Visible footings, currently both above ground and shallow buried will be retained and moved together with the building.	
		The loss of some of the deeper buried footings is inevitable given the shallow bedrock revealed in investigations in some areas and the varied depth of the footing across each building.	
building during raising or lowering		Stones can be salvaged during excavation and representative display produced at the recipient site.	
Talloung or lowering		A selection of footings (to full depth) <i>may</i> be able to be picked up between the support beams using banding but the practicality of this can only be determined during the project when the footings are excavated and the bedrock topography is fully understood	
	The subfloor walls	Investigations suggest that stone pieces are quite large.	
Domaga to	crumble when	Should it be necessary, grouting and banding can be used to avoid point loading and distribute the load over a bigger surface area.	
Damage to building during raising or lowering	transferring to the steel support platform	Transfer to the steel is gradual and slow with progressive application of load either through hydraulics, tensioning of banding or the driving of wedges. The start of a localised failure will be detected immediately and methodology adapted accordingly	
		Any walls which are structurally unsound will be repaired prior to the commencement of the relocation (i.e. localised repair/rebuild, crack stitching, etc)	
	Pinched hydraulic hose	The hoses shall be checked prior to and during each lift or lowering step.	
Damage to building during	during raising or lowering	Jacks shall be installed with hoses pointing away from the cribs to "push" the hoses away from the crib and minimise the possibility of pinching	
moving		A pinched hose will be recognised immediately due to pressure rise at the jack machine	
		Any damaged hose will be replaced with the original hose to be discarded.	
Damage to	Failure or settlement of ground beneath dollies during movement, leading to uneven	The transport platform is designed to accommodate uneven ground conditions and settlement through a number of methods including but not limited to hydraulic travel in the dolly rams, articulated barrel bush on the front axle of each dolly, the physical dimensioning of the dolly footprint relative to the load point on the hydraulic zone and the zoning of dollies resulting in the building(s) "floating on a cushion of oil"	
building during moving	support of structure (e.g. dollies sink in soft spot	A preliminary design of the proposed relocation route has been completed and includes sufficient width, gentle grades and road pavement designed in accordance with parameters required by the Mover	
	in pavement)	Areas of concern in terms of soil stability will be treated either through an engineered road or use of steel plates to enable traversing of the building(s)	



Risk Category / Activity	Hazard	Risk treatment strategies	Comments
	Road geometry (longitudinal slope, cross grade, or combination)	Dolly layout and support platform designed to accommodate the road geometry of the purpose built road with the platform limitations informing the acceptable road geometry. A preliminary design of the load platform and associated constraints has been developed and used to develop the proposed relocation route in line with the geometrical requirements (with gentle grades and minimal cross-slope)	
	causes tilt of building over limits	The moving platform utilises a 3 point support system (zoning) which protects the integrity of the support plane of the structures. Because this system is made up of hydraulic cylinders in closed circuits, this platform can be adjusted to maintain the attitude of the structure within the limits of the roadway specifications.	
Damage to building during		Split zone redundancy will be employed to avoid racking of the building when moving over areas of considerable cant (i.e. traverse slope across the route)	
moving		The building centre of gravity is low relative to the support base width, it can't physically tip off if the route is maintained within the applicable geometry limits	
		Support frame elements are connected to ensure a fixed platform	
		The road geometry has been designed to restrict the tilting of the building(s) so as to maintain the centre of gravity of the individual walls within the footprint of the individual wall leaves, whilst allowing for the correction in the tilting of the building using the vertical hydraulics in the support system	
	The platform carrying the building will rack (twist) and cause	The design of the platform and particularly the zoning of the hydraulics will take into consideration any potential for twisting of the support frame (e.g. as a result of changing cant or camber in the road). The road itself has also been designed to minimise grades and cant which reduces this risk.	
Damage to building during moving	damage	The moving platform utilises a 3 point support system (zoning) which protects the integrity of the plane of the structures. Because this system is made up of hydraulic cylinders in closed circuits, this platform can be adjusted to maintain the attitude of the structure within the limits of the roadway specifications.	
		While the structure is on the dollies and in a 3 point zone system, split zones can be used to ensure that the support plane is maintained in areas of high cant	
	Pinched hydraulic hose	Hoses shall be provided with sufficient length to support the possible range of movement of the dolly	
Damage to building during	during transport causes it to rupture	All hoses shall be fed to the dollies from above the load platform with the hoses between dollies or to power packs installed over the steel to keep them from dangling into the range of movement	
moving		Zip ties will be used to group hosing together and to tie them out of way.	
		The hoses shall be monitored during the move with regular checks on route	



Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to building during moving	The vertical hydraulic cylinders in the dollies reach the limit of their extension or bed out causing racking of the building	Dollies are monitored during the move Design specifications on the move route protect against over extension. The prepared road will be built within mover specifications to ensure that the variation in the level of the road across the platform within a zone is within the limits of the dolly hydraulic cylinder float	
Damage to building during moving	Building impacts other structure while moving	Road designed of suitable width and clear zones checked prior to movement No public traffic or third party access will be available to the proposed transport route which will be located on Glencore land. There will be no direct interaction with mining traffic as mining operations traffic will be controlled through separation. All interfacing mine personnel will be briefed and made aware of the move(s) prior to the move occurring.	
Damage to building during moving	Building impacts powerlines while moving	Relocation of Hebden Road overhead powerlines prior to building move There are no other powerlines on the route. In general overhead obstructions will be addressed in the roadway design specifications, providing a minimum height criteria. (refer also to risk category ""Damage to infrastructure" – Hazard "Overhead wires/Electrocution")	
Damage to building during moving	Flooding of creek crossing during relocation leading to building loss	Monitoring of weather and forecast and planning of creek crossing works to avoid storm events Creek culvert design to be adequate to accommodate storm events	
Damage to building during moving	Vibration during movement leads to collapse of structure	Relocation method is slow with minimal dynamic loading component e.g. vibration. (The transport equipment is powered by hydraulic drives which provide a very smooth, slow and controllable moving platform which minimizes vibration issues and ensure low jerk rate.) Constant observation of building condition during relocation Support framework to provide adequate support under the building walls to prevent localised loss of stone or rubble Prepared/graded road to the Mover specifications	



Risk Category /	Hazard	Risk treatment strategies	Comments
Damage to building during moving	Vibration during movement leads to settlement and disruption of loose core fill and differential distribution of loose fill and varying support of wall leaves (e.g. core fill settles at bottom of wall leaving top with no internal bracing)	Foam filling of cavity above cutline will be achieved through the injection of foam to bind loose core material at base Where necessary formwork and grout will be used to bind the face of the stones in pockets where the support beams will be installed. Use of through-ties in pre-move stabilisation and tie stones in construction of the building restrict downward movement of the core fill Investigation revealed the rubble filled cavity to be relatively narrow and the rubble to be relatively coarse. This will result in the bridging of the rubble in the cavity along the height of the wall. The bridging shall be further improved by the uneven arrangement of the outer and inner leaf stones in the cavity due to varying stone sizing and the use of tie stones in the construction of the dual leaf wall system Building movement is slow with minimal dynamic loading and vibration imparted on the building due to the hydraulic drives built into the underlying dollies used to move the building rather than an independent pull or push system.	
Damage to building during moving	A dolly ram is overstressed traversely which causes catastrophic failure	Geometry of the road within specified limits to prevent the possibility of this situation Orientation of the rams relative to vertical is monitored during the move Ball joint on the top of each ram prevents the imparting of a twisting load on the top of the ram Rams are rated for 100 ton loading but will not be loaded to more than the dolly rating of 40 ton	
Damage to building during moving	One or more dolly tyres burst or go flat	This will not impact the building as is no different to the wheels going into a hole. In this case the dolly will be changed out to avoid delay with additional dollies being transported along the route as a contingency.	
Damage to building during moving	Dolly is overloaded	The building weight on the dolly will be calculated from known weights as determined during the jacking process (and read off the jack machine pressure gauges) The dollies will not be loaded above their SWL The transfer of the load onto each dolly is gradual, taking the weight from temporary supports and the weight will be monitored through the jack machine pressure gauges and confirmed to be within the dolly limits Dollies are overdesigned for their application	
Damage to building during moving	The stone walls will delaminate when being transported due to vibration	A combination of bracing, banding and epoxy foam will be used to protect the most fragile sections of the structure. Use of through-ties in pre-move stabilisation and tie stones in construction of the building restrict delamination movement. The transport equipment is powered by hydraulic drives which provide a very smooth, slow and controllable moving platform which minimizes vibration issues and jerk rate.	

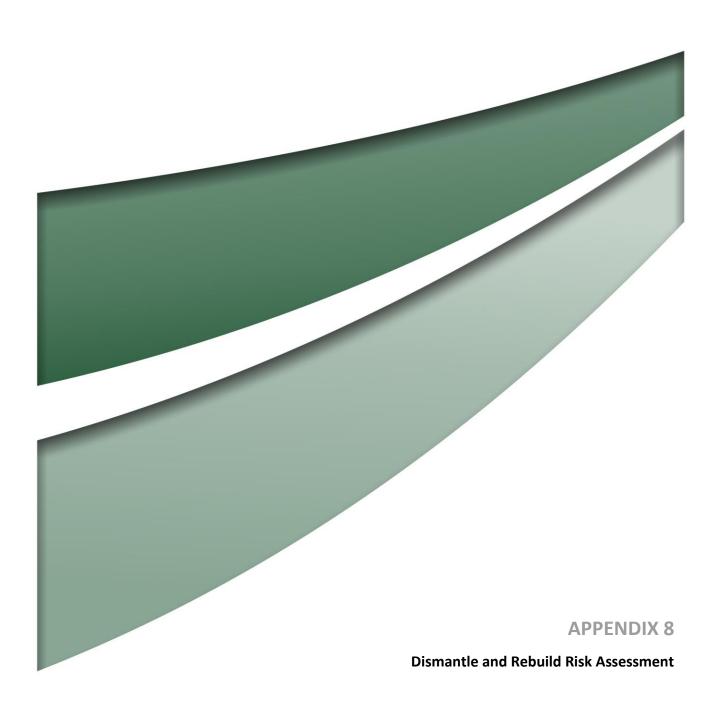


Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to building during moving	The wall plaster will become drummy or fall off during lifting or transport	A combination of bracing and temporary supports will be used to protect the most fragile sections of the structure. The transport equipment is powered by hydraulic drives which provide a very smooth, slow and controllable moving platform which minimizes vibration issues and jerk rate. The stress imparted by the weight of the building will be transferred into the load platform rather than relying on the integrity of the building itself to resist the stress i.e. the weight will be supported where it is located and there will be no reliance on the building being "self supporting". All support steel will be prestressed to take out elastic bending to ensure the building is fully supported and prevent stress being transferred into the building.	
Damage to building during moving	The ceiling plaster will become drummy or fall off during lifting or transport	There are no original lath and plaster ceilings. The plaster ceilings in the Privy and Stable are reconstructions and look strong, but in any case they are of slight significance. The transport equipment is powered by hydraulic drives which provide a very smooth, slow and controllable moving platform which minimizes vibration issues and jerk rate. The stress imparted by the weight of the building will be transferred into the load platform rather than relying on the integrity of the building itself to resist the stress.	
Damage to building during moving	The gabled roof structures may go out of plumb and also push the walls out	Steel brace work and cabling will provide security to the gables limiting +/- movement. Imposed limits on the move platform attitude, acceleration/deceleration, (inertia) and speed (vibrations) during relocation will protect against artificial forces on the structure. (The route will be designed so that the centre of gravity of each leaf of the gable walls does not move outside of the base of the wall and therefore there is no reliance on the cohesion of the stones and mortar)	
Damage to building during moving	The ceiling joists are not connected to the wall plates and rafters and are not able to retain the top plates adequately from spreading.	Steel brace work and cabling will provide security to the gables limiting +/- movement. Imposed limits on the move platform attitude, acceleration/deceleration, (inertia) and speed (vibrations) during relocation will protect against artificial forces on the structure. Practically the joists will only see the current downward loads they experience and the move methodology does not rely upon them resisting traverse loadings	
Damage to building during moving	The existing white anted timbers in the roofs may disintegrate	Any forces generated in the roof system during the move process will be substantially less than what would be expected from a normal wind and rain event. If these timbers are eventually to be replaced then this could be scheduled to occur prior to the relocation.	



Risk Category /			
Activity	Hazard	Risk treatment strategies	Comments
Damage to building during moving	The white anted ceiling battens in the house that hold the metal ceilings give way due to vibrations	The transport equipment is powered by hydraulic drives which provide a very smooth, slow and controllable moving platform which minimizes vibration issues. If desired it is possible to sheet these over with plasterboard to secure them to sound ceiling joists. This would then be the basis of reconstructing the appearance of the plastered ceilings in the completed work.	
Damage to building during moving	The existing slate roof is damaged by the vibration	The transport equipment is powered by hydraulic drives which provide a very smooth, slow and controllable moving platform which minimizes vibration issues and jerk rate.	
	The loaded buildings may get out of control on	A preliminary design of the proposed relocation route has been completed and includes gentle grades designed in accordance with parameters required by the Mover	
Damage to	a steep incline	The slope of the final route design will be agreed with the Mover and the proposed road produced to a controlled survey to ensure the slopes encountered are within limits of the support structure, the buildings being transported and the equipment capacities.	
building during		The hydraulic motors on the dollies will be utilised as brakes when moving down a slope	
moving		The trailer dollies have air brakes which can be used if need be on a slope	
		Brake vehicles (i.e. articulated loaders or dump trucks) can be used to control the load on a steep slope	
		The route will be finalised and agreed and appropriate methodology as per the above adopted on a case by case basis depending on the slope.	
	The building will go out	A bracing diaphragm will be installed at floor level to prevent the parallelogramming of the structure being moved.	
Damage to building during	of plumb during transport and be damaged.	Bracing would also extend to the top of wall where necessary to support the building if it needed to move up a steep section however this is not required for this move due to the ability to build a fit for purpose road. (The route will be designed so that the centre of gravity of each leaf of the walls does not move outside of the base of the wall and therefore there is no reliance on the cohesion of the stones and mortar)	
moving		Support frame elements are connected to ensure a fixed rigid platform and hydraulic zoning employed to maintain the plane – i.e prevent transfer of stress into sections of the structure being relocated.	
		The transport equipment is powered by hydraulic drives which provide a very smooth, slow and controllable moving platform which minimizes vibration issues and jerk rate	
Damage to	The inclines on the route may be too steep.	The road will be purpose built and designed to present slopes which can be managed by the propulsion equipment and will not subject the buildings to sideways (tilting) loads which they can not accommodate.	
building during moving/Schedule		Additional pull power (tow vehicles) will be on standby and used to assist the movement up steeper inclines where necessary	
		Internal bracing will be employed within the buildings as necessary to support the gabled walls and prevent leaning of the walls. A bracing diaphragm will also be installed at floor level to ensure the building remains in square.	

Risk Category / Activity	Hazard	Risk treatment strategies	Comments
Damage to building during lowering	Ground at the recipient site fails during lowering causing deflection of the building	The recipient site will have a raft slab designed by a suitably qualified engineer which considers loading of the building in final position as well as jacking loads to ensure adequate structural performance of the slab.	Note: Where other risks exist both in lowering and in raising of the building, these are documented in the "Damage to building during raising or lowering" risk category prior.
Damage to building during removal of steel and temporary supports	Building not adequately supported prior to removal of temporary supports, leading to building deformation	A reinforced concrete raft slab and foundations with reinforced concrete block dwarf walls forming the permanent support for the building will be designed by a suitably qualified engineer with quality control during construction. The design will be in accordance with Australian Standards considering the geotechnical conditions of the site and the nature of the building. Releasing of the temporary supports requires the building to be fully supported on the permanent support – if this is not the case the temporary support will remain loaded and can not be removed.	
Damage to building during removal of steel and temporary supports	Permanent supports constructed at incorrect level leading to uneven support of building structure	The structure shall be lowered and levelled on the move platform. The supports shall be designed to support overall building cutline profile with grouting and packing constructed directly to the profile of stonework prior to removal of temporary supports, eliminating transitional distortion. This is achieved by referencing the distance between the underside of the existing walls to the slab and building the final supporting foundation walls up to ensure the same gap between the new support and the underside of the walls to be supported. i.e. The foundation support is designed on site to accept the building under wall profile The final support of the building on the permanent support is achieved through the grouting of the interface to ensure there is no gap or potential for uneven support or inadequate transfer of the building load to the foundations.	
Damage to building during removal of steel and temporary supports	Removal of support steel in uncontrolled manner leading to damage to building fabric	All loads are removed from the support steel prior to removal from the structure The steel will be pulled out from under the building and therefore it will follow the machine pulling it. The steel removal is therefore controlled as the leading end is dragged in tension rather than pushed in compression Trained and competent personnel involved in steel removal	







Date: 19/05/2020

Risk Identification Team: Shane Scott (Glencore), Nathan Donegan (Glencore), Brad Snedden (Glencore), Martyn Lambourne (HSR Aust), Keith McAllister (HSR Aust)

Scope: Dismantle, Transport and Rebuild of the Ravensworth Homestead in Broke

Risk item - What has occurred	Caused by - How it has occurred	Risk treatment/Control
Damage to building during dismantling works	Improper recovery of building materials / components (e.g incorrect dismantle methodology used to recover stonework leading to cracking, spalling or splitting)	Trained and competent personnel with heritage specific trades and supervision. Detailed Safe Work Method Statement defines Methodology; Tools & Equipment to be used in dismantle process.
	Building component not properly separated prior to recovery (e.g. fixings from timber not removed leading to splitting or damage of connection point)	Trained and competent personnel with heritage specific trades and supervision. Sequence of deconstruction to include initial removal of fixings for components
	Damage to adjacent fabric component due to deviation from dismantle methodology.	Trained and competent personnel with heritage specific trades and supervision. Where damage to adjacent critical component is likely, locally installed protection will be in place.
	Building fabric is more degraded than expected (e.g. when recovering stone it crumbles or timber beam has significant rot or pest attack leading to failure)	Full visual survey undertaken, then if unexpected decay is encountered, work is to stop and revised sequence of deconstruction of fabric element, method of recovery as well as requirement to recover is reassessed.
	Lack of understanding of structure/construction method leading to improper sequence of dismantling and collapse (e.g. removal of support before supported material is removed)	During initial documentation of building, structural components to be identified by structural engineer. Development of deconstruction methodology requires structural engineering input and approval by engineer and architect.
	Loss of fabric component as a necessary part of the relocation process (e.g. internal plaster lost from walls during recovery of stone, original fixings, nails, etc that are not recoverable)	Recording of fabric components and preservation of samples for later display. Suitable and sympathetic replacement of lost material during reconstruction in consultation with heritage architect (e.g. matching mix design and method of application for plaster). Extensive samples of workmanship and materials signed off prior to dismantle process.





Risk item - What has occurred	Caused by - How it has occurred	Risk treatment/Control
Damage to building components during handling and loading	Materials damaged during loading onto pallets leading to damage.	Trained and competent personnel to undertake the works Materials handling safe work method statement to specify how each main component is handled (e.g. timber may be by hand, stone by machine) and what support is required. Specialist tools and equipment to be utilised for lift (softening for lifting straps etc.). Softening and protection between each fabric item as per methodology.
	Equipment used to handle materials impacts materials (e.g. forklift type impacts stone)	Trained and competent personnel, softening and correct palletising to be undertaken to ensure no damage during process.
	Unexpected movement of materials during handling or loading (e.g. materials slip off pallet while loading)	Trained and competent personnel, tie down of loads / wrapping on pallets prior to loading pallets. All pallets wrapped securely prior to lifting onto transport. Spotter used when loading critical components.
	Loading equipment fails under load	Loading equipment sized to weight of pallet with sufficient factor of safety. Maximum amount of bundled components to be defined as part of the safe work method statement (e.g. X number of stones to a pallet or Y number of floorboards to a bundle).
Damage to building components during transportation	Loss of unsecured load	Personnel involved with transporting materials to be trained and competent in securing of loads. Load to be adequately secured and checked by driver prior to movement.
	Unexpected movement of materials during transport leading to materials impacting materials (e.g. stone sliding to impact stone)	Personnel involved with transporting materials to be trained and competent in securing of loads. All components to have softening placed between them. Load to be adequately secured and checked by driver prior to movement.
	Materials not supported correctly leading to damage (e.g. improper support of truss components leading to vibration damage during transport)	Loading and transport plan for materials to be developed in consultation with structural engineer and architect (e.g. stone on pallet in one layer, trusses stored vertically in framed box, etc). Materials to be supported during transport as per the plan.
	Traffic incident during transport leads to loss or damage of load (e.g vehicle rollover, vehicle impact, sudden stop or evasive action)	Trained and competent drivers with suitable licence class. Fit For Work policy (including fatigue management and drug and alcohol testing).



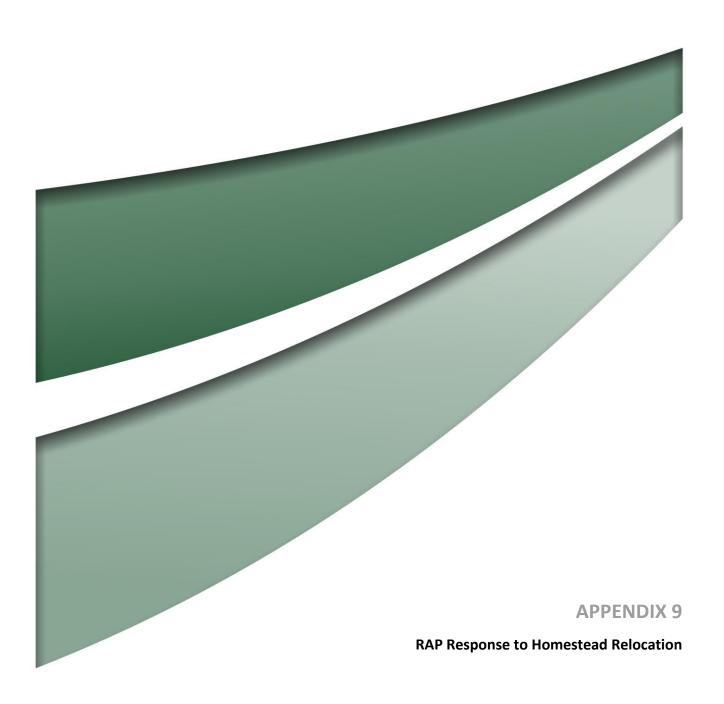


Risk item - What has occurred	Caused by - How it has occurred	Risk treatment/Control
Damage to building components during storage	Weather sensitive components exposed to weathering effects (e.g. interior timber trims left in sun / rain)	Storage plan for materials to be developed in consultation with structural engineer and architect (e.g. timber stored to ensure all above ground in dry environment, materials wrapped in plastic, etc).
	Pest attack on building components	Visual inspection on dismantle to ascertain any potential pest damage. Timber stored off ground. Routine inspection of materials (3 monthly) during project to identify any pests. Pest treatment if required.
	Vandalism	Materials stored in secured area (e.g. shed, locked compound, etc). Security provided at site (CCTV, drive by inspection, etc).
	Materials not supported correctly leading to damage (e.g. improper support of truss components and timber leads to bowing / sagging)	Storage plan for materials to be developed in consultation with structural engineer and architect (e.g. Timber supported at multiple points as specified by engineer to resist bowing/sagging).
Damage to building components during re-build	Materials dropped during manual handling leading to damage	Trained and competent personnel. Materials handling safe work method statement to specify how each main component is handled (e.g. timber may be by hand, stone by machine) and what support is required.
	Equipment used to handle materials impacts materials (e.g. forklift type impacts stone)	Trained and competent personnel, spotter used when loading critical components, operatives who dismantle will rebuild to ensure consistency and familiarity with fabric elements.
	Improper treatment of building fabric (e.g. scaling of friable stone results in unusable material)	Trained and competent personnel with heritage specific trades and supervision. Gradual treatment of materials, assessment of fabric item prior to potential task being undertaken. Minimum thickness / size of materials to be defined by structural engineer.
	Improper installation of building materials (e.g. wrong method used or wrong fixings leading to overstress and damage)	Trained and competent personnel with heritage specific trades and supervision. Safe work method statement defines method to be used in reconstruction.





Risk item - What has occurred	Caused by - How it has occurred	Risk treatment/Control
Incorrect reconstruction of buildings	Lack of building records (building arrangement not known)	Comprehensive building information model to be developed prior to deconstruction and updated during deconstruction with labelling of materials consistent with the model and pallet tracking system in place so that it can be easily understood where individual components fit back in and in what sequence.
	Loss of building records (recorded arrangement of building not available)	Backup processes to be implemented at inception of the project including both server and local based backups.
	Incorrect building records (building arrangement recorded incorrectly)	Quality control process to be implemented at inception of project that includes development of the building information model.
	Incorrect replacement of materials (e.g. stone replaced when not identified as needing replacement)	Building information model will define replacement materials with works audited regularly against the model.
	Incorrect replacement material used (e.g. degraded pink sandstone replaced with yellow sandstone)	Replacement materials to be approved by heritage architect following extensive samples pre construction.
	Lack of suitable replacement materials (e.g. matching stone not available at open quarries)	Alternate sources of materials, including remnant stone on site to be explored during project inception as backup during the project.
	Incorrect building practices used (e.g. wrong grade of fixings, lack of reinforcement in slab, etc)	Trained and competent personnel with heritage specific trades and supervision.
		Specifications will define grade of fixings, etc.
Poor structural performance of buildings		Quality management plan defining hold points to be developed at project inception.
	Loss of strength of materials (e.g. stone assumed to be 30MPa degrades to 15MPa or timber framing degrades due to weathering / rot)	Stone porosity and strength testing to be undertaken for existing material pre construction.
	Poor quality replacement materials lead to structural defects	Replacement material specifications to be defined by architect / engineer post material testing.





Wonnarua Nation Aboriginal Corporation

Ground Floor 254 John St Singleton

PO Box 3066, Singleton Delivery Centre NSW 2330

Phone: 02 6571 8595 Fax: 02 6571 8551

Mobile: 0412 593 020

Web Site: www.wonnarua.org.au Email: wonnarua@bigpond.com

ABN: 50 012 829 925

19 August, 2019

Document Reference Detail Written By: Page

WNAC_FeedbackLetter_StewartEwen_19August2019V1.docx Mr Laurie Perry (CEO - Wonnarua Nation Aboriginal Corporation) 1 (of 1)

Dear Sirs,

MATTER:

The WNAC Preliminary Initial Feedback & Development Support Status

PROJECT:

Village Square, Broke

The Wonnarua Nation Aboriginal Corporation represents the Wonnarua People, the Traditional Landowners of the Hunter Valley. The Wonnarua Nation Aboriginal Corporation focuses on nurturing the history and culture of the Wonnarua Nation, improving the health and education of its members and managing investments to sustain the Corporation's work.

To this end the WNAC has been made aware of, and subsequently met with a principal of the proposed development of a Village Square in Broke and as such we write to you to express our preliminary initial support.

We have been provided with a copy of the Architectural plans and artist impressions (and attached to this correspondence) detailing how the development proposal would be positioned on the Crown Land at the intersection of Milbrodale and Wollombi Roads, Broke.

We acknowledge and value the fact that such a development has the potential to generate regional employment and act as a centre for tourism to further show the complete history of indigenous culture, indigenous occupation and habitation in the "Hunter Valley Region".

Should the proposal proceed, we would like the opportunity to add more detailed input to the development as it progresses along an assessment pathway within the respective authorities. Given this development is proposed on community land, transparency of ownership and management of the project vehicle will be paramount.

Although the WNAC are happy to provide preliminary support for the proposal, we have a clear mandate to positively influence any local tourism infrastructures to provide accurate input for the cultural aspects of the Aboriginal Tourism Infrastructures for the region. As such the WNAC insists on the opportunity to provide further input for the indigenous arts and crafts shop within the proposed building on a commercial basis.

Yours Sincerely

The Wonnarua Nation Aboriginal Corporation

Mr. Laurie Perry

CEO Wonnarua Nation Aboriginal Corporation

Attachments: Architectural Plans and Artist Perspectives

