

**Appendix A: Archaeological Report
259 Windermere Road, Windermere, NSW**

Prepared for NewPro 27 C/- Perception Planning

Prepared by Niche Environment and Heritage Pty Ltd | 26 October 2022



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Executive summary

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by Perception Planning on behalf of NewPro 27 ('the Proponent') to prepare an Aboriginal Cultural Heritage Assessment (ACHA) to inform a Development Application (DA) and Planning Proposal being prepared for the proposed rezoning and residential subdivision of land located at 259 Windermere Road, Windermere, New South Wales (NSW) (hereafter referred to as the 'Subject Area'). The rezoning and residential sub-division is proposed to allow for the future development of residential housing within the Subject Area. The Subject Area is located within the Maitland Local Government Area (LGA) and is situated within the boundaries of the Mindaribba Local Aboriginal Land Council (LALC) in the traditional lands of the Wonnarua (also spelt Wanaruah, Wonnaruah).

This Archaeological Report (AR) presents the results of an Aboriginal archaeological assessment completed to inform the proposed rezoning, residential subdivision and future development of the Subject Area. The AR is an integral part of the ACHA and will be included as an Appendix in the ACHA report and has been carried out in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (Department of Environment, Climate Change and Water NSW, 2010, [DECCW 2010] 'Code of Practice').

The ACHA report process and the AR assessment has included background archaeological and historical investigation, ongoing consultation with the Registered Aboriginal Parties (RAPs), an archaeological site inspection and an archaeological test excavation program.

Prior to this assessment, the Subject Area had been previously surveyed as part of an Aboriginal Object Due Diligence Assessment (DD) completed by Niche for the Project. The survey was undertaken on 7 March 2022 and covered 100% of the Subject Area. One (1) previously recorded Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) was identified to be located within the Subject Area and was reidentified during the survey. The DD concluded that further assessment, consultation and investigation of the Aboriginal heritage constraints via a test excavation program within the Subject Area was required prior to any development works in accordance with the *National Parks and Wildlife Act 1974* and National Parks and Wildlife Regulation.

A test excavation program was carried out over five (5) days from 22 to 26 August 2022 by Niche heritage consultants and representatives of the Registered Aboriginal Party (RAPs) resulting in the recovery of a total of 17 sub-surface Aboriginal stone artefacts from PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219).

Overall, the results of the archaeological assessments conducted within the Subject Area are consistent with the predictive model developed for the project in that:

- The site types and features (isolated artefacts and PADs) identified within the Subject Area are common within the region.
- The presence of surface artefacts is not a predictor of sub-surface archaeological deposits and vice-versa.
- The archaeology associated with the Subject Area is indicative of general background scatter associated with sporadic and/or infrequent use of the area by past Aboriginal groups with more intensive occupation sites located elsewhere in the landscape such as in locations closer to the Hunter River.

This assessment has determined that the proposed rezoning, subdivision and future residential development of the Subject Area has the potential to impact the following Aboriginal cultural heritage site registered on the Aboriginal Heritage Information Management System (AHIMS):

Portion of site to be impacted	AHIMS ID#	Site name	Site features
Whole	37-6-2219	PAD 2 Lochinvar URA	PAD with sub-surface Artefacts

Based on the results of the field assessment and archaeological test excavation, as documented in this AR, the Proponent will need to apply to the Heritage NSW of the Department of Premier and Cabinet (DPC) for an Aboriginal Heritage Impact Permit (AHIP) under s.90 of the *National Parks and Wildlife Act 1974*. The AHIP application would need to include an application to destroy the Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) located within the Subject Area. A care and control agreement should be arranged with the RAPs to determine the final location of the artefacts recovered during the test excavation program completed at the site.

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1. Introduction

1.1 Background and need for the project

This Archaeological Report (AR) presents the results of an Aboriginal archaeological assessment for 259 Windermere Road, Windermere, New South Wales (NSW), 2321 (Part Lot 1902 DP1112961) (Figure 1 and Figure 2; hereafter referred to as ‘the Subject Area’).

The Subject Area is located within the Maitland Local Government Area (LGA) and within the boundaries of the Mindaribba Local Aboriginal Land Council (LALC) in the traditional lands of the Wonnarua (also spelt Wanaruah, Wonnaruah).

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by Perception Planning on behalf of NewPro 27 (‘the Proponent’) to prepare an Aboriginal Cultural Heritage Assessment (ACHA) and Archaeological Report (AR) to inform a Planning Proposal (PP) and Development Application (DA) for the proposed rezoning and residential sub-division of the Subject Area (‘the Project’). This AR is an integral part of the ACHA and will be included as an appendix in the final document. The Proponent will be seeking an Aboriginal Heritage Impact Permit (AHIP) under s.90 of the *National Parks and Wildlife Act 1974* (NSW). This AR has been prepared in accordance with the following regulations and guidelines:

- *Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW Department of Environment, Climate Change and Water [DECCW], 2010a) (hereafter referred to as ‘The Consultation Guidelines’)
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) (hereafter referred to as ‘The Code of Practice’)
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (NSW Office of Environment and Heritage [OEH], 2011)
- *National Parks and Wildlife Act 1974* (NPW Act)
- *Applying for an Aboriginal Heritage Impact Permit: Guide for applicants* (OEH, 2011b)
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia International Council on Monuments and Sites [ICOMOS], 2013).

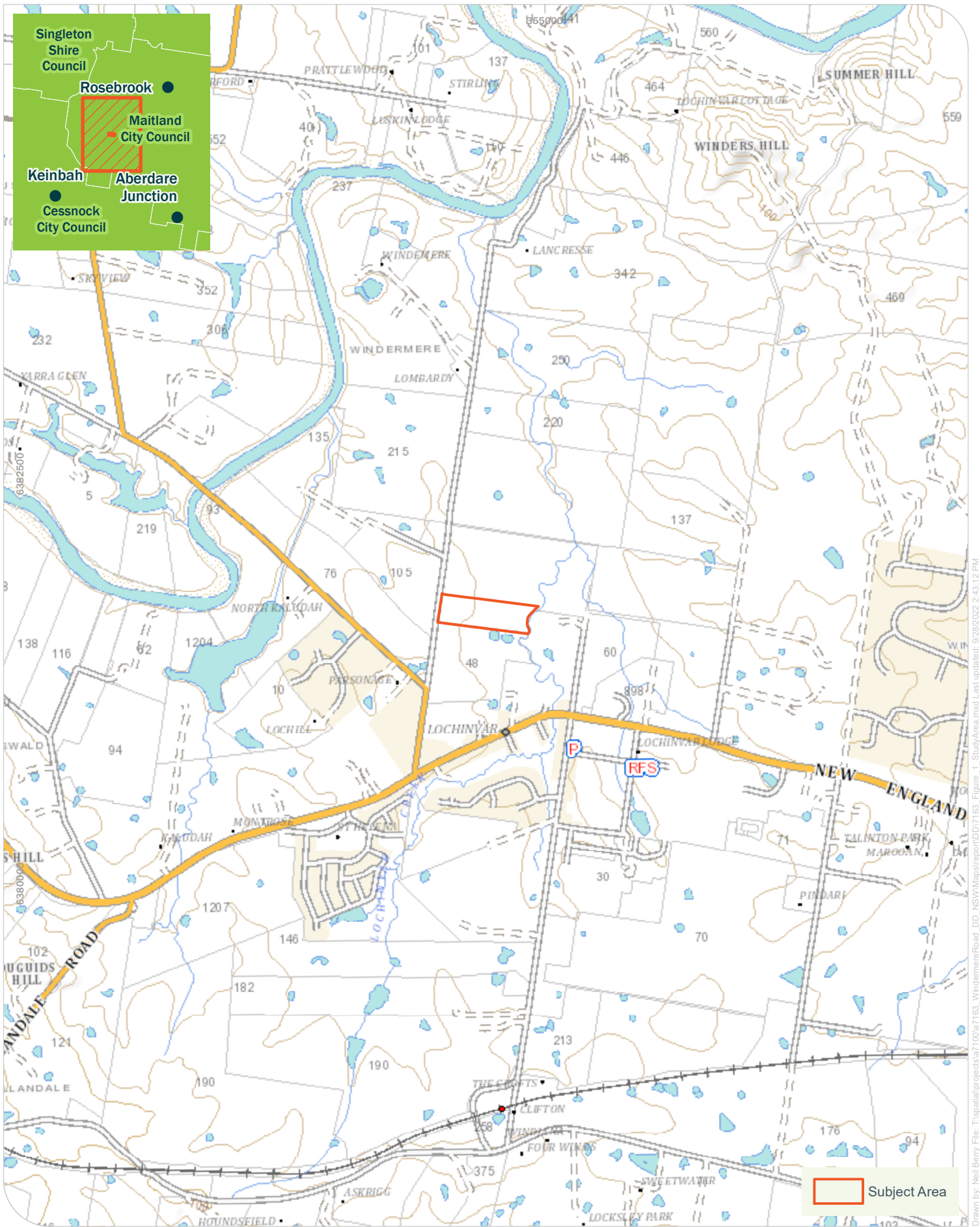
The need for the Aboriginal archaeological assessment undertaken as part of the ACHA and reported on in this AR, stems from the results of an Aboriginal Objects Due Diligence Assessment (DD) undertaken for the Subject Area in early 2022 by Niche (Niche 2022a; Appendix D of the ACHA). The DD assessment identified one (1) previously recorded Aboriginal cultural heritage site as being located within the Subject Area. The site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) consists of an area of archaeological potential located on a rise close to Lochinvar Creek. The site was revisited during the survey completed for the DD. As the proposed residential subdivision and future development of the Subject Area may impact this Aboriginal cultural heritage site it was recommended that a full ACHA including Aboriginal community consultation and a test excavation program be undertaken to determine the nature, extent and significance of any sub-surface Aboriginal objects associated with the site.

The objectives of the Aboriginal archaeological assessments undertaken to inform the ACHA were to:

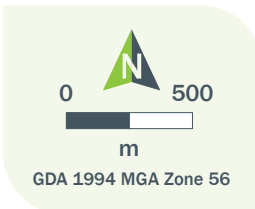
- Test the locations of the registered Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219)
- Increase ground surface visibility in the Subject Area
- Provide further information on the nature, significance and extent of any sub-surface archaeological deposit within the Subject Area

- Test the nature, significance and extent of any sub-surface archaeological deposit in relation to archaeologically sensitive landforms within the Subject Area (i.e. with distance from water).

The purpose of the test excavation is to provide further information on the Aboriginal cultural heritage values of the Subject Area. Test excavation was conducted under Part 3.1 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010.



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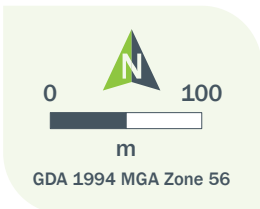
Niche PM: Ben Slack
Niche Proj. #: 7163
Client: Perception Planning

Location Map
259 Windermere Road Due Diligence Assessment

Figure 1



Drawn by: Neil Berry File: T:\spatial\projects\7100\7163_Windermere Road_DD_NSW\Maps\report\DD7163_Figure_2_SubjectArea.mxd Last updated: 9/28/2022 2:32:34 PM



Location of the Subject Area
259 Windermere Road Due Diligence Assessment

Niche PM: Ben Slack
Niche Proj. #: 7163
Client: Perception Planning

Figure 2

2. Investigator and contributors

The contributors to this AR and their project roles are listed in Table 1. The RAPs listed in Table 1 were consulted with and invited to provide advice on cultural heritage values during the assessment. Please note, two additional Aboriginal Stakeholders registered for this Project, however, they did not wish to have their contact details released. Full details on the consultation undertaken for the Project are provided in the ACHA.

Table 1: Contributors, affiliations, and contributions

Contributor	Affiliation	Contribution	Qualification
Ben Slack	Niche	Project Manager, Aboriginal Community Consultation, Quality Control, Test excavation and survey	BA (Archaeology)
Kate Morris	Niche	Aboriginal Community Consultation, Contributing Author, Test excavation	BA, BSc (Hons)
Riley Finnerty	Niche	Test Excavation, Artefact Analysis, Primary Author	BA (Hons)
Carly Todhunter	Niche	Contributing Author	BA, BSc (Hons)
Neil Berry	Niche	GIS, Mapping	BSc (Hons)
Matthew Zajackowski	Niche	GIS, Mapping	BSc (Hons)
Erin Daniel	Perception Planning	Client Contact, Client Review	NA
Registered Aboriginal Parties (RAPs)			
Contact Person	Organisation	Contribution	
Christine Paul	Aboriginal Native Title Consultants	Registered Aboriginal Party, document review	
Kerrie Brauer	Awabakal Traditional Owners Aboriginal Corporation	Registered Aboriginal Party, document review	
Tracey Skene and R Smith	Culturally Aware	Registered Aboriginal Party, test excavation and document review	
Paul Boyd and Lilly Carol	Didge Ngunawal Clan	Registered Aboriginal Party, document review	
Melissa Chown	Gallangabang Aboriginal Corporation	Registered Aboriginal Party, document review	
David Ahoy	Lower Hunter Aboriginal Incorporated	Registered Aboriginal Party, document review	
Tara Dever	Mindaribba Local Aboriginal Land Council	Registered Aboriginal Party, document review	
Ryan Johnson and Darleen Johnson-Carroll	Murra Bidgee Mullangari Aboriginal Corporation	Registered Aboriginal Party, document review	

Contributor	Affiliation	Contribution
Alan Paget	Ungooroo Aboriginal Corporation	Registered Aboriginal Party, document review
Maree Waugh	Wallagan Cultural Services	Registered Aboriginal Party, document review
Steven Hickey and S Braneley	Widescope Indigenous Group	Registered Aboriginal Party, test excavation and document review
Kathleen Steward Kinchela	Yinarr Cultural Services	Registered Aboriginal Party, document review
Restricted	Restricted	Registered Aboriginal Party, test excavation and document review
Restricted	Restricted	Registered Aboriginal Party, document review

3. Project Description

3.1 Project location

The Subject Area consists of 259 Windermere Road (Part Lot 1902 DP1112961), Windermere, NSW, 2321. The Subject Area is located approximately 2 km from the residential and commercial centre of Lochinvar and is situated within the Maitland Local Government Area (LGA) and within the boundaries of the Mindaribba Local Aboriginal Land Council (LALC) in the traditional lands of the Wonnarua (also spelt Wanaruah, Wonnaruah).

The Subject Area is situated approximately 1.5 km east of the Hunter River and approximately 2.6 km south of the Hunter River. The area is primarily composed of grass paddocks in a rural setting approximately 2 km north of the residential and commercial centre of Lochinvar. The Subject Area encompasses approximately 30 hectares (ha), with portions of the property presently zoned as a mixture of R1 (General Residential) and RU1 (Primary Production). The Subject Area is bound by Windermere Road to the west, Lochinvar Creek and rural land to the east and rural land to the north and south (Figure 2).

3.2 Proposed development description

Perception Planning on behalf of NewPro 27 ('the Proponent') are preparing a Planning Proposal (PP) and Development Application (DA) for the proposed rezoning and residential subdivision of the Subject Area to allow for future residential development ('the Project'). The PP is being prepared to rezone the residual RU1 zoned portion of the Subject Area to R1 General Residential while the DA seeks to subdivide the Subject Area into 96 residential lots to facilitate future residential development within the Subject Area. Further details of the activities associated with the proposed development are provided in the ACHA.

3.3 Potential for harm

The results of a previous Aboriginal Archaeological Assessment (Niche 2022; Appendix D of ACHA), as well as the desktop assessment and archaeological test excavation program undertaken as part of this report, have determined that the proposed redevelopment of the Subject Area will impact one (1) previously recorded Aboriginal cultural heritage site, PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) registered on the Aboriginal Heritage Information Management System (AHIMS). Details of the Aboriginal cultural heritage site identified as part of this assessment are provided in Figure 3 and Table 2.

Table 2: Details of the Aboriginal objects identified by this AR

Portion of site to be impacted	AHIMS ID#	Site name	Site features
Whole	37-6-2219	PAD 2 Lochinvar URA	PAD

4. Previous archaeological work

4.1 Heritage registers

4.1.1 Aboriginal Heritage Information Management System (AHIMS)

An extensive search of the AHIMS was conducted on 13 February 2022 (AHIMS Client Service ID 658883) for the following area encompassing latitude and longitude from: -32.705, 151.3814 to: -32.6327, 151.505 centred on the Subject Area. See Annex 1 and Annex 2 for details of the search results and Aboriginal cultural heritage sites within the search area.

In total, 108 Aboriginal cultural heritage sites are located within the AHIMS search area, of which one (1) is situated within the Subject Area. Aboriginal cultural heritage site, PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is situated within the eastern portion of the Subject Area and consists of a potential archaeological deposit (PAD) (Figure 3 and Figure 6). Further details of this site are provided below. No Aboriginal Places were identified within the AHIMS search area.

Within the wider search area, artefact (scatter or isolated) (n = 79) was the most common Aboriginal site feature documented on the AHIMS register (Table 3). The next most common was Artefact and PAD (n=14), PAD (n=5) and Axe Grinding Groove (n=2). Less common site features in the AHIMS search area include Aboriginal Ceremony and Dreaming (n=1), Aboriginal Resource and Gathering (n=1), Art and PAD (n=1), Art, Artefact and PAD (n=1), Artefact and Aboriginal Ceremony and Dreaming (n=1), Artefact, PAD and Quarry (n=1), Modified Tree (Carved or Scarred) (n=1) and PAD and Aboriginal Resource and Gathering (n=1).

Table 3: Summary of AHIMS site features within AHIMS search area

Site features	Total
Aboriginal Ceremony and Dreaming	1
Aboriginal Resource and Gathering	1
Art and PAD	1
Art, Artefact and PAD	1
Artefact (Isolated or Scatter)	79
Artefact and Aboriginal Ceremony and Dreaming	1
Artefact and PAD	14
Artefact, PAD and Quarry	1
Axe Grinding Groove	2
Modified Tree (Carved or Scarred)	1
PAD	5
PAD and Aboriginal Resource and Gathering	1
Total	108

Source: AHIMS Web Service 13/02/2022 Lat, Long From: -32.705, 151.3814 - Lat, Long To: -32.6327, 151.505 with nil buffer.

PAD 2 Lochinvar URA (37-6-2219)

As mentioned above, the AHIMS search identified a total of one previously recorded Aboriginal cultural heritage sites as being located within the Subject Area consisting of a PAD. The site is registered as PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) and is located in the eastern portion of the Subject Area, adjacent to Lochinvar Creek.

Table 4: Summary of Aboriginal cultural heritage sites proposed for harm

AHIMS ID	Site name	Site type	Zone	Easting	Northing
37-6-2219	PAD 2 Lochinvar URA	PAD	56	354720	6381415

PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) was originally recorded in 2009 by Mary Dallas Consulting Archaeologists and was identified during an Aboriginal heritage assessment associated with the Lochinvar Urban Release Area Study (Dallas 2007). A copy of the site card for PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is provided in Annex 2.

PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) consists of an area of archaeological potential within a grassed paddock west of Lochinvar Creek. The PAD occurs on flat ground approximately 50 m east from the incised creekbank of Lochinvar Creek (Figure 6). The creek banks were noted for appearing scoured and eroded and it was suggested that intermittent flooding was likely to occur in the area. The paddock contains limited surface exposure and while no stone artefacts have previously been identified on the surface, the area appeared to retain some original topsoil despite past disturbance in the surrounding areas from cultivation. The area of the PAD is identified in Plate 1. West of the area defined in red contained furrows from previous cultivation that has taken place there and has disturbed the ground to restrict its archaeological potential.

No information related to the cultural importance of the site to local Aboriginal communities was noted during the original recording of the site. As part of the management recommendations outlined on the AHIMS site card for the site, it was recommended that a test excavation be completed prior to any development of the area in order to determine the presence/absence of stone artefacts and the extent and significance of their occurrence.



Plate 1: Map showing the extent of PAD 2 Lochinvar URA as detailed in the site card submitted by Mary Dallas and Paul Irish

4.1.2 Assessment of robustness AHIMS data

It must be noted that care should be taken when using the AHIMS database to reach conclusions about site prevalence or distribution. The distribution of registered sites does not reflect patterns of occupation, but rather is often indicative of survey coverage and conditions.

The Hunter Valley is one of the most intensively studied regions in NSW. Archaeological studies over the last few decades within and around Windermere have been initiated as a requirement of planning proposals for residential development and rezoning projects. To date, the main research questions addressed by these studies include the presence, absence, and distribution of sites, and broad characterisation of where the sites occur within the landscape and their association with certain environmental features (e.g. distance from water).

4.1.3 AHIP public register

A search was conducted of the Department of Planning, Industry and Environment (DPIE) Aboriginal Heritage Impact Permit public register on 14 February 2022, covering the 2010-2022 period. It was determined that potentially one AHIP has been registered over the current Subject Area or immediate surrounds.

The closest issued AHIP was for the Lochinvar Water and Sewer Mains (AHIP # C0001860; published 23/05/2016) that was issued to Hunter Water Corporation to undertake salvage excavations and community collection. The AHIP included existing sites within the present AHIMS search area, including LOC4 (AHIMS ID# 37-6-2225), Christopher Road Site (AHIMS ID# 37-6-2863), Lochinvar 1 (AHIMS ID# 37-6-1607), LCC1 and PAD (AHIMS ID# 37-6-2228) and Christopher Road 1 (AHIMS ID# 37-6-2213). LCC1 and PAD (AHIMS ID# 37-6-2228) is presently listed in AHIMS as being partially destroyed and Christopher Road 1 (AHIMS ID# 37-6-2213) is listed as destroyed.

Another residential subdivision located nearby at Christopher Road; Lochinvar was also covered by an AHIP issued on 1 August 2019. Issued to Urban Land and Housing Group Pty Ltd, the AHIP enabled community collection during stages 1-6 of the residential subdivision and is valid for a period of 10 years.

4.1.4 Other registers

Searches of the Australian World Heritage Database, the Commonwealth Heritage List, National Heritage List, State Heritage Register, State Heritage Inventory, Heritage NSW Library, Register of the National Trust of Australia, the Maitland Local Environmental Plan (LEP) (2011) and the Maitland Development Control Plan (DCP) (2011) were conducted on 14 February 2022.

The searches concluded that there are no recorded heritage items within or directly adjacent to the Subject Area.

The closest heritage listed item consists of 253 Windermere Road, Windermere, NSW, (Lot 2 DP 785039) (Item I239) which consists of an extensive property with a substantial sandstone residence which is listed in the Maitland LEP (2011) as having local heritage significance. The estate is associated with a prominent local landowner Thomas W. M. Winder (Section 6.2.3). This heritage item is located approximately 2 km to the north west of the current Subject Area, is not associated with an Aboriginal cultural heritage values and will not be impacted by the proposed development.

No heritage conservation areas were identified within or directly adjacent to the current Subject Area.

4.2 Previous heritage and archaeological assessments

4.2.1 Previous assessments associated with the Subject Area

Two Aboriginal heritage assessments have been undertaken within the Subject Area. A summary of these is provided in Table 5 below.

Table 5: Aboriginal heritage assessments within and/or covering the Subject Area

Author and year	Title and description
Mary Dallas Consulting Archaeologists, 2010	<p>Aboriginal heritage assessment and Management Plan. Portions of the Lochinvar Urban Release Area Lochinvar, Hunter Valley, NSW</p> <p>This report presents the results of an Aboriginal heritage assessment completed for a Planning Proposal for the Lochinvar Urban Release Area (URA), Lochinvar. This assessment covered the current Subject Area. The assessment included preliminary survey of a sample of areas proposed for the URA rezoning and resulted in the identification of Aboriginal cultural heritage sites including site PAD 2 Lochinvar URA</p>

Author and year	Title and description
	<p>(AHIMS ID# 37-6-2219). The assessment concluded that given the presence of drainage channels in the URA, as well as the proximity to the Hunter River, there is a likelihood that Aboriginal artefacts/significant areas may exist within the URA. In terms of site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219), it was recommended that a test excavation under a S87 permit be completed was recommended prior to any development of the area in order to determine the presence/absence of stone artefacts and the extent and significance of their occurrence. This assessment is of direct relevance to this AR as it provide specific details regarding the nature and location of the Aboriginal site located within the current Subject Area.</p>
<p>Niche Environment and Heritage 2022</p>	<p>Aboriginal Objects Due Diligence Assessment: 259 Windermere Road, Windermere, NSW</p> <p>This report presents the results of an Aboriginal Objects Due Diligence Assessment (DD) for the current Subject Area. The DD included a comprehensive survey which was undertaken on 7 March 2022 and covered 100% of the Subject Area. One (1) previously recorded Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) was identified to be is located within the Subject Area and was reidentified during the survey. The assessment DD concluded that further assessment, consultation and investigation of the Aboriginal heritage constraints via a test excavation program within the Subject Area was required prior to any development works in accordance with the National Parks and Wildlife Act 1974 and National Parks and Wildlife Regulation.</p> <p>This report is of relevance as it covers the current Subject Area and documents the need for the Aboriginal Cultural Heritage Assessment with which this Archaeological Report relates.</p>

4.2.2 Local archaeological assessments

Several heritage assessments have been undertaken within the vicinity of the Subject Area. While these reports mostly focus on the presence and absence of Aboriginal objects within a limited area of works, they provide an insight into the nature of the broader archaeological landscape and are useful in the development of a predictive model for the region. A summary of the most relevant heritage assessments undertaken in the surrounding region, as identified based on the search of the AHIMS report register and other archaeological reports. The heritage assessments presented in Table 6 below have occurred nearby to the Subject Area.

Table 6: Local archaeological assessments

Author and year	Title, description and relevance to Subject Area
<p>Ruig, J. 1997</p>	<p>Test Excavations on Penn Park, Lochinvar, NSW</p> <p>This report presents the results of a test excavation program that was triggered by a proposed rural residential subdivision at Lochinvar. The archaeological potential of the study area had been identified as part of a survey that was undertaken by Jill Ruig and a representative from the Mindaribba LALC in the year prior. The test excavation was conducted approximately 4 km south east of the current Subject Area.</p> <p>In total, 44 test pits were excavated. The excavation resulted in the identification of Penn Park 1 (AHIMS ID # 37-6-0989) which was subsequently registered in AHIMS. Two pits contained a single artefact and the limited nature of the assemblage presented difficulties in interpreting the nature of the occupation that took place. Both artefacts were produced from mudstone. The spatial distribution of the artefacts were confined to the northern bank of the creekline. Neither artefact displayed evidence of retouch or thermal alteration. The artefacts were identified 30 m apart.</p>

Author and year	Title, description and relevance to Subject Area
	<p>This report is of relevance to the current Subject as it contributes to the archaeological record of the region and assists in establishing a predictive model for the nature and distribution of Aboriginal sites for the local area.</p>
<p>Mary Dallas and Roslyn Kerr, 1997</p>	<p>Archaeological survey of proposed subdivision of rural land Lot 71, DP 573183, Rutherford Hunter Valley, NSW</p> <p>This report presents the results of a field survey conducted in transects with 50 m intervals was undertaken by a team of four. All drainage lines were inspected as well as areas of elevated level ground. Surface exposures and exposed creek sections were also surveyed. A geotechnical investigation was also undertaken to support the project.</p> <p>The survey predicted that sites would likely occur on flatter ground along ridge crests and along creek flanks. The survey resulted in the identification of one open camp site, two isolated finds and a PAD. The open camp site included 4 artefacts on the western edge of a dam and in an area of exposure at a depth roughly level with the dam wall. These artefacts were produced from a beige siltstone, red chert and yellow to red silcrete.</p> <p>The first isolated find was an orange silcrete flaked piece located at the base of a low spur at the creek headwaters. The second was a pink silcrete broken flake retrieved from a shallow deposit (test pit 10- 0-5 cm).</p> <p>The PAD was identified in a gently aggrading alluvial deposit. The conclusions of the investigation were that major and complex sites are likely to occur adjacent to permanently watered areas such as wetlands and swampy areas. Smaller camp sites could potentially occur in any setting however were most likely to be associated with less well watered areas, intermittent watercourses and elevated ground above these watercourses.</p> <p>This report is of relevance to the current Subject as it contributes to the archaeological record of the region and assists in establishing a predictive model for the nature and distribution of Aboriginal sites for the local area.</p>
<p>HLA-Envirosciences Pty Ltd, 2005</p>	<p>Preliminary Research Permit Application: Anvil Creek, Greta, NSW</p> <p>The Anvil Creek development area comprised an area of 4,232 hectares and included a planned village tourist and residential retreat. As part of the initial survey a number of sensitive landforms were identified with archaeological potential, including ridge crests, hillslopes and areas in the vicinity of lower and upper order streams.</p> <p>A total of 45 transects were examined within the study area. A total of 215 stone artefacts were documented as part of the survey. Almost all of the flaked artefacts were unretouched flakes (179) with only a small number (11) showing evidence of retouch. Although some sites appeared to be associated with raw material procurement, only 13 cores were identified. Slightly more than half of the assemblage (115) were produced from silcrete. Other common raw materials were mudstone and tuff. Quartz, petrified wood and sandstone artefacts were also identified.</p> <p>This report is of relevance to the current Subject as it contributes to the archaeological record of the region and assists in establishing a predictive model for the nature and distribution of Aboriginal sites for the local area.</p>
<p>McCardle Cultural Heritage Pty Ltd (MCH), 2010</p>	<p>Greta Rail Support Facility. Part 3A Indigenous Archaeological Test Excavation</p> <p>Two PADs were tested as part of the excavation program, one located on the southern banks of Sawyers Creek and the second on the northern bank. The excavation took place approximately 7 km west of the present Subject Area. A total of 41 test pits were excavated, 24 of which in PAD1 and 17 in PAD2.</p> <p>In total, 115 artefacts were identified. The majority of these (114) were identified at PAD1. The majority of the artefacts from PAD 1 (108) occurred in only two test pits.</p> <p>The artefact assemblage was found to be consistent with other assemblages found in the Hunter Valley, with silcrete the most frequently represented. All artefacts were identified in the</p>

Author and year	Title, description and relevance to Subject Area
	<p>upper 20 cm of the deposit. The report recommended a program of salvage at the two test pits with the highest concentrations, due to the significant numbers of artefacts that were identified.</p> <p>This report is of relevance to the current Subject as it contributes to the archaeological record of the region and assists in establishing a predictive model for the nature and distribution of Aboriginal sites for the local area.</p>
<p>McCardle Cultural Heritage Pty Ltd (MCH), 2011</p>	<p>Proposed Rosebrook Sand and Gravel Extension at Maitland Vale</p> <p>The purpose of the assessment was to determine any heritage constraints that may apply to a proposed extension to the Rosebrook sand and gravel extraction at an existing quarry in Maitland Vale (situated approximately 10 km east of the present Subject Area).</p> <p>Based on a regional model of the archaeological potential of the surrounding region, a survey was conducted that predicted the most common site types to be open artefact scatters and isolated finds. The survey was conducted on foot in 10 m transects, focused on areas of the highest ground surface visibility and at exposures (erosional features, river banks, tracks and cleared areas).</p> <p>A PAD area was identified extending from the edge of the Hunter River northwards and extending through an elevated terrace. The site extended approximately 100 m x 750 m. A test excavation program was proposed as the appropriate management strategy due to the extensive ground disturbance that was proposed.</p>
<p>Lucas, 2013</p>	<p>Hunter Estates: A Comparative Heritage Study of pre 1850s Homestead Complexes in the Hunter Region. Volume 1: Historical Context and Survey of Sites. State of NSW and the NSW Office of Environment and Heritage</p> <p>This study is an independent and comprehensive comparative heritage study of pre 1850s homestead complexes located throughout the Hunter Region. In order to achieve this outcome, this study first aims to contextualise the homestead complexes found in the area and provides an overview of the historic and cultural phenomenon of the Hunter Estate. The study was useful in understanding some of the impacts of European settlement on the environment and landscape of the region.</p>
<p>Hughes et.al. 2014</p>	<p>The Central Lowlands of the Hunter Valley, NSW: Why so few early sites have been found in this archaeologically rich landscape. Australian Archaeology (79):34-44.</p> <p>This study looked at the geomorphology of the region. Their study states that while the Central Lowlands are abundant in Holocene-aged open stone artefact concentrations, very few traces of Pleistocene occupation have been recorded. They argue that most archaeological material older than 10,000 years has either been completely removed or widely dispersed due to bioturbation. This analysis is useful for the current analysis as it discusses the formation processes of the landform units within the Subject Area and expected deposits.</p>

The immediate area surrounding the Subject Area has been the focus of numerous archaeological assessments over the past twenty (20) years. Syntheses of the earlier work in and around the Subject Area by archaeologists have set the groundwork for the archaeological characterisation of the region. Such studies highlight the inherent limitations of previous assessments with issues relating largely to the nature of past assessments which comprised of small study areas.

Archaeological assessments undertaken previously show that the most common site types to occur within the immediate surrounds of the Subject Area include Artefact sites (including isolated artefacts and artefact scatters) with or without PADs. Sites are often predicted to occur on flat ground along ridge crests and along creek flanks. The typical artefact types found are flaked artefacts predominantly made of silcrete and other raw materials such as mudstone, tuff, quartz, petrified wood, and sandstone artefacts. Overall, the

results of the field inspection, background research and literature reviews suggest that existing predictive models for the region can be applied to the Subject Area.

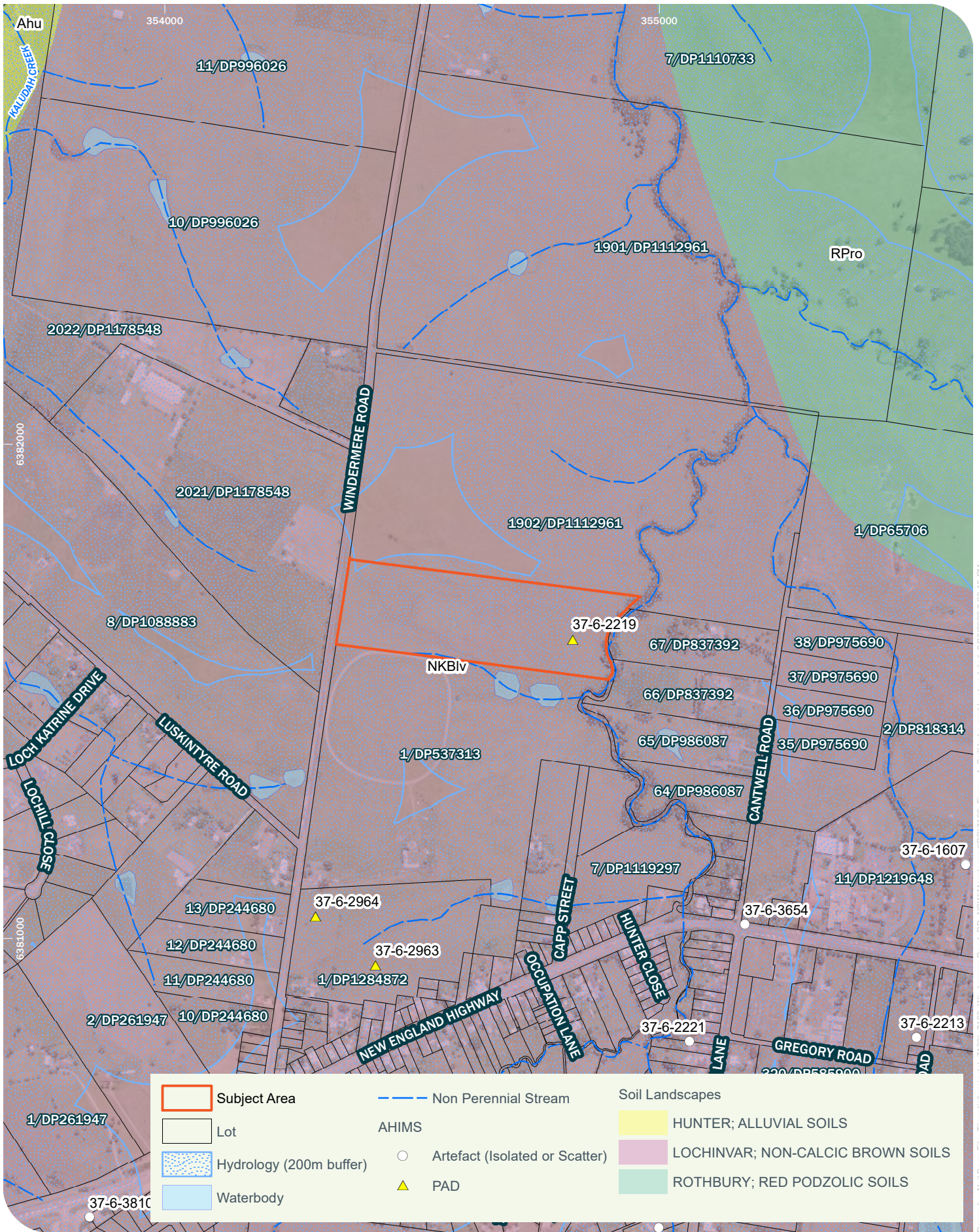
4.2.3 Regional archaeological assessments

Over 98% of Aboriginal archaeological sites recorded within the Hunter Valley to date are stone artefact scatters and isolated artefacts. Less common site types include painted and stencilled art in rock shelters, rock engravings and axe grinding grooves, rock shelters with occupation evidence, open shell middens on the coast, burials, scarred and carved trees, stone arrangements, stone quarries, and ceremonial sites (Lucas 2013:12).

The extent of archaeological research within the Hunter Valley, where the Central Lowlands are located, has revealed more than 3,500 sites (ERM 2004), and has helped to establish likely patterns of occupation and movement throughout the landscape. MCH (2011) states that, while a number of models have been developed for the Hunter Valley, the model developed by Kuskie and Kamminga (2000) is thus far the most widely accepted model. Kuskie and Kamminga (2000) explore short-term or extended long-term occupation, discuss the theme of occupational fluidity through time, and make some predictions about the likely location of different foraging and settlement activities and assemblage patterns. According to MCH (2011:48-50) the more transitory a group is within the environment the lower the expected complexity of a site.

A number of predictive models concerning Aboriginal occupation and settlement of the Hunter Region and Central Lowlands have been formulated and refined based on archaeological assessments undertaken in the region. According to RPS Group (2020: 9) the availability and occurrence of water primarily influenced the location of Aboriginal cultural heritage sites within the region stating that “sites will most commonly be found along permanent creeks and within and around swamp margins. Creek flats and banks are the topographical features most likely to contain sites”. RPS’s predictive modelling is in line with that provided by MCH (2011:44) for the nearby Farley Investigation Area. Both of these models consider previous regional models from Kuskie and Kamminga (2000) and Clarke and Kuskie (2006) and can be applied to the current Subject Area:

- Artefact scatters and isolated artefacts are the most likely site types to be encountered within the Subject Area. It is expected that archaeological cultural heritage sites will be found along watercourses, gentle slopes, hilltops and ridges
- Artefact density is likely to be greater within 50 m distance from a watercourse while lower density sites are expected within 100 m from watercourses
- Given the water sources available to the Subject Area, there is high potential for sites to occur, particularly low to medium density artefact scatters within 50 m of these watercourses
- Higher density scatters may be present along high order streams and swamp margins
- Any artefacts located are likely to be from the mid to late Holocene period
- The dominant raw material for artefacts is likely to be mudstone or silcrete, with small amounts of quartz, chert, petrified woods and other raw materials
- Sites are likely to be disturbed.



5. Landscape context

5.1 Preamble

Understanding the environmental context of an area is requisite in any Aboriginal archaeological and cultural heritage investigation (Department of Environment, Climate Change and Water NSW, 2010a). The nature and distribution of Aboriginal archaeological sites are closely related to the environmental context. This section provides a broad overview of the environmental setting of the Subject Area and describes the Land Systems that are contained within it. Land Systems, when considered with the levels of past land use and modification, are a useful tool in identifying environmental proxies for the likely preservation and burial of Aboriginal objects in a landscape and resources that may have been available to Aboriginal people; such as the presence of water, stone for the manufacture of stone tools and plant species.

5.2 Topography and landforms

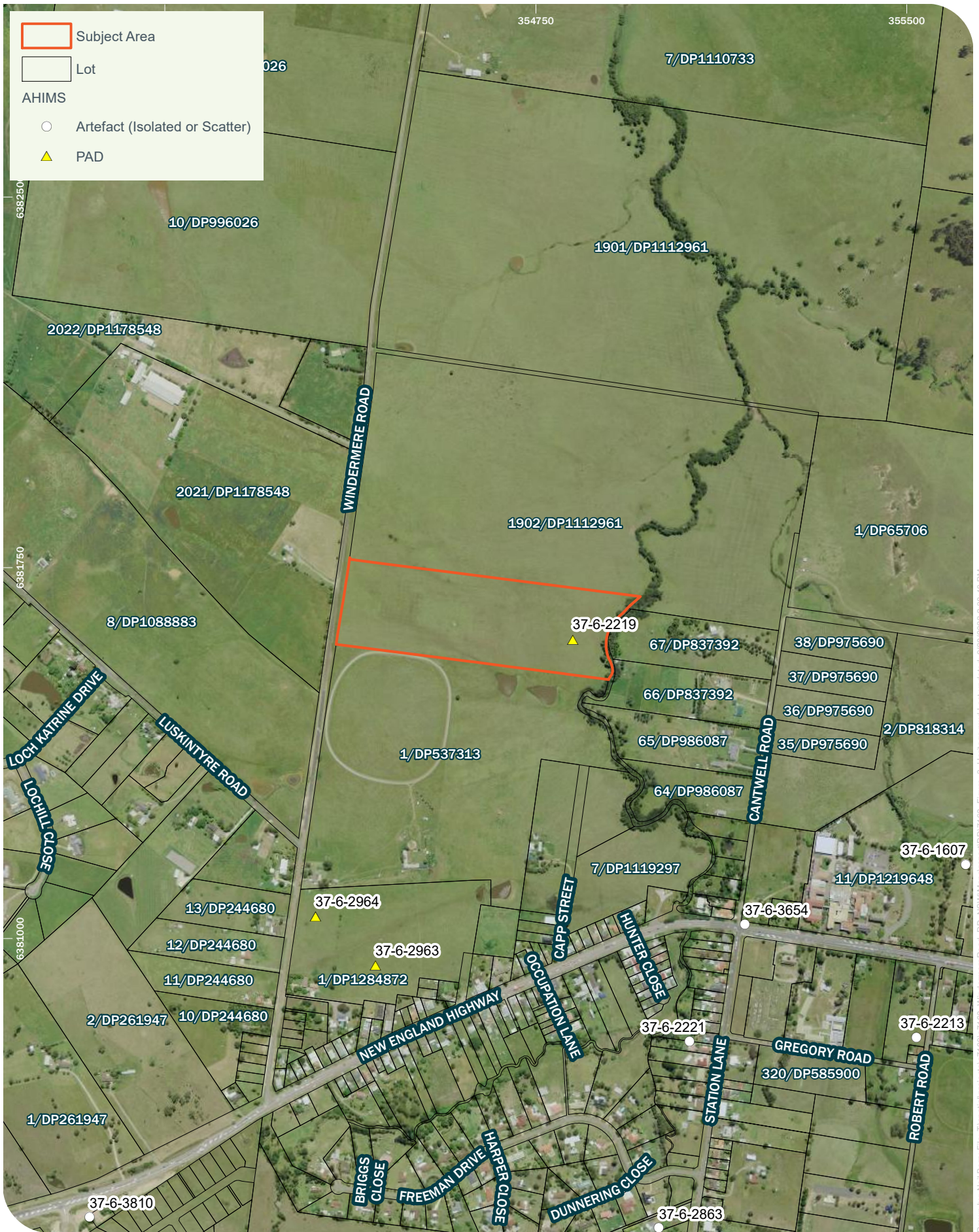
The Subject Area is situated on relatively level floodplain grasslands within an area of rolling low hills adjoining the Hunter River. The surrounding region is exposed to intermittent flooding with numerous significant weather events resulting in extensive flooding (WMA 2019).

The surrounding area comprises undulating rises with elevation ranging from 20 – 80 m. Local relief is approximately 20 m, with slope gradients between 4 – 6%. Average slope lengths are 800 – 1,000 m and drainage lines occur at 400 – 800 m intervals.

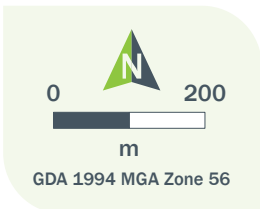
5.3 Geology and soils

The Subject Area sits atop the Lochinvar soil landscape (NKB-lv) (Figure 4) which includes non-calcic brown soils (Db1.12) on gentle slopes and brown podzolic soils (Db2.11, Db1.41) on steeper areas (DPIE 2020). Yellow solodic soils (Dy2.12) are also present on mid to lower slopes of steeper hills and in some drainage lines. The non-calcic brown soils comprise a dark brown silty clay loam topsoil and brown medium clay subsoil that gradually transitions to yellowish brown heavy clay. The brown podzolic soils typically comprise a brown to brownish black light sandy clay loam to silty clay loam topsoil and brown sandy to medium clay subsoil. Some orange and grey mottling (up to 30%) can occur in the subsoil in areas of poor drainage. An A₂ horizon can occur, containing bleached horizon of bright brown sandy loam, to a depth of 35 cm. Yellow solodic soils comprise a dark brown loam and can contain a thin, sporadically bleached A₂ horizon. The topsoil has a clear transition to a yellowish-brown light clay subsoil that becomes a medium clay at lower depths. The topsoil can be hardsetting and has been affected by grazing activities that have occurred over extended periods. The fertility of the Lochinvar Soil Landscape is low to moderate, and the soils are generally moderately permeable. Minor gully erosion occurs throughout the landscape and is most severe in areas where yellow solodic soils occur.

Geologically, the Subject Area occurs within the Lochinvar Formation (Pd_{al}) and specifically the Lochinvar Formation- basalt (Pd_{alb}) constituent unit. The Lochinvar Formation is the basal unit in the Dalwood group, and underlies the Allandale Formation, the Rutherford Formation and the Farley Formation. The Lochinvar Formation is early Permian in age and is dated between 298.9 – 251.9 MA (Osborne 1949). It typically contains basalt, siltstone, mudstone, shale and sandstone. The Formation is poorly exposed however some exposures are known to occur in Gosforth, Mindaribba Basin and Cranky Corner Basin (Rattigan and McKenzie 1969). The Lochinvar Formation is 835 m deep and is dominated by a coarsening-upward sequence of mudstone and sandstone with interbedded basalt flows. This geological unit is associated with a number of raw materials that were exploited to produce stone tools. No sources of raw material, however, are known to occur within the current Subject Area.



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Location of AHIMS Sites and Heritage Items
259 Windermere Road Due Diligence Assessment

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Figure 4

5.4 Hydrology

The Subject Area is situated on alluvial flats within the Lochinvar Creek Catchment. The Catchment drains northwards through tributaries and the Lochinvar Creek into the Hunter River. A number of tributaries are located west and south of the Subject Area (Figure 4). The eastern portion of the Subject Area adjoining Lochinvar Creek drops sharply into the eroded creek gully.

The Hunter River is in close proximity to the Subject Area. Due to bends, the river is approximately 1.5 km west and approximately 2.6 km north of the Subject Area. The seasonal creeks and perennial Hunter River would have provided abundant riverine food, medicinal and tool resources.

5.5 Climate and vegetation

Australia's climate has changed little during the past 10,000 years, though it was becoming slightly wetter until 5,000 years ago (Australian Museum 2018). Australia's climate has been drying the last 5,000 years; influencing changes in plants, animals and environments. The climate of the Subject Area consists of mild summers and cool winters with an average maximum of 24°C and an average minimum of 15°C based on temperature records from 2021-2022. Between 1911-1920, the average maximum was 24°C and the minimum was between 9-12°C. The conditions in the region of the Subject Area are moderate and would have had sufficient rainfall for year-round occupation of the region throughout the Holocene period, with a modern average of 1,500 mm annually (BOM 2022).

Much of the area has been cleared for grazing pastures and farming, however, portions of Eucalypt woodland remain comprising white box (*Eucalyptus albens*), silvertop stringybark (*E. laevopinea*), yellow box (*E. melliodora*) and red gum (*E. camaldulensis*).

5.6 Past land-use and disturbance

Since the early 19th century, the Subject Area has been extensively cleared and utilised for grazing. During the 20th century, aerial photographs depicting the property demonstrate the extent of vegetation clearance that had taken place. The earliest record in 1961 identify the rural character of the landscape (Plate 2).

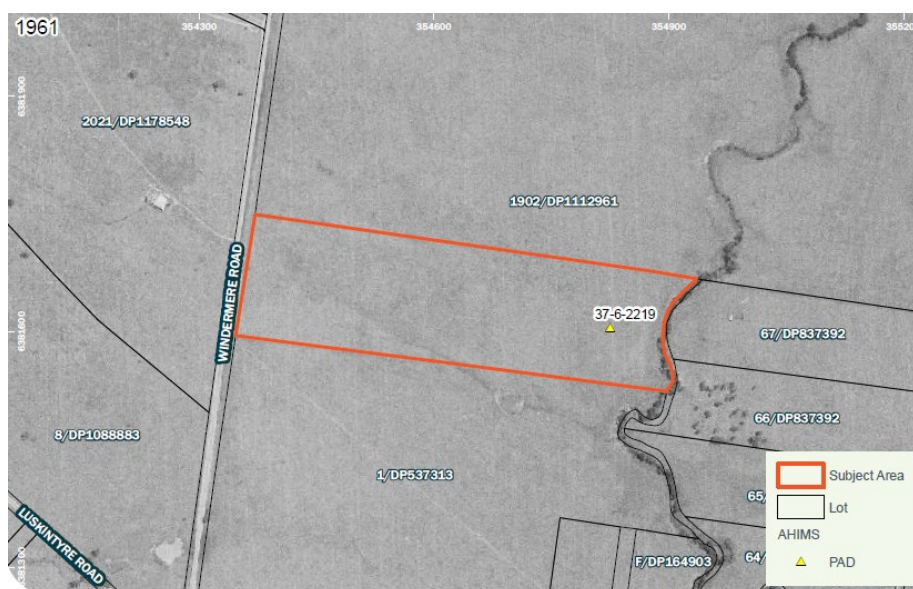


Plate 2: Portion of 1961 aerial over the Subject Area (Niche 2022)

Fence lines present in proximity to the Subject Area are clearly defined, as is an eroded gully and dam to the north east in close proximity to Lochinvar Creek. No patches of vegetation can be identified in the

aerial, though the Lochinvar creek is tree lined. East of Lochinvar Creek and within the property are the sole mature trees that can be seen. A clearly defined track running north west from the New England Highway to the north western boundary of the property can be seen.

In a 1976 aerial (Plate 3) the rural character of the property can be clearly seen. No built structures can be identified on the property. The dam situated to the south of the property appears to have a drainage line running south west through the Subject Area. Another drainage line connected to the Lochinvar Creek on the north eastern corner is also apparent.



Plate 3: Portion of 1976 aerial over the Subject Area (REF)

The Subject Area appears to have been heavily cleared of vegetation and has been utilised primarily as grazing land. Furrows identified during a site inspection of the property in 2009 (Dallas and Irish 2009) west of PAD 2 Lochinvar URA (AHIMS # 37-6-2219) confirm this.

The Lochinvar Creek and its associated catchment has experienced a long history of significant flooding resulting from heavy rainfalls and on-flow effects resulting from flooding in the nearby Hunter River. When the capacity of local creeks and drainage channels are exceeded by heavy rains, flooding can occur. In large events with high levels of flooding in the Hunter River, inundation in the Lochinvar catchment can be extensive. Flooding in the northern portion of the catchment is also affected by local tributary creeks (including Greedy Creek). Lochinvar Creek is the main waterway that conveys water from the catchment northwards to the Hunter River. In the *Lochinvar Flood Study* produced for Maitland City Council, a number of major flooding events were identified in March 1977, February 1990, June 2007, April 2015 and January 2016 with each event affecting the Lochinvar catchment. Flood mitigation efforts including the rebuilding of the New England Highway Bridge at Lochinvar Creek in 1978 incorporated an increased waterway area and channel works to assist with managing water flow. The channel works included widening the creek for 30 m upstream of the bridge as well as a revegetation program (WMA Water 2019).

Table 7: Historical mapping and aerial photos

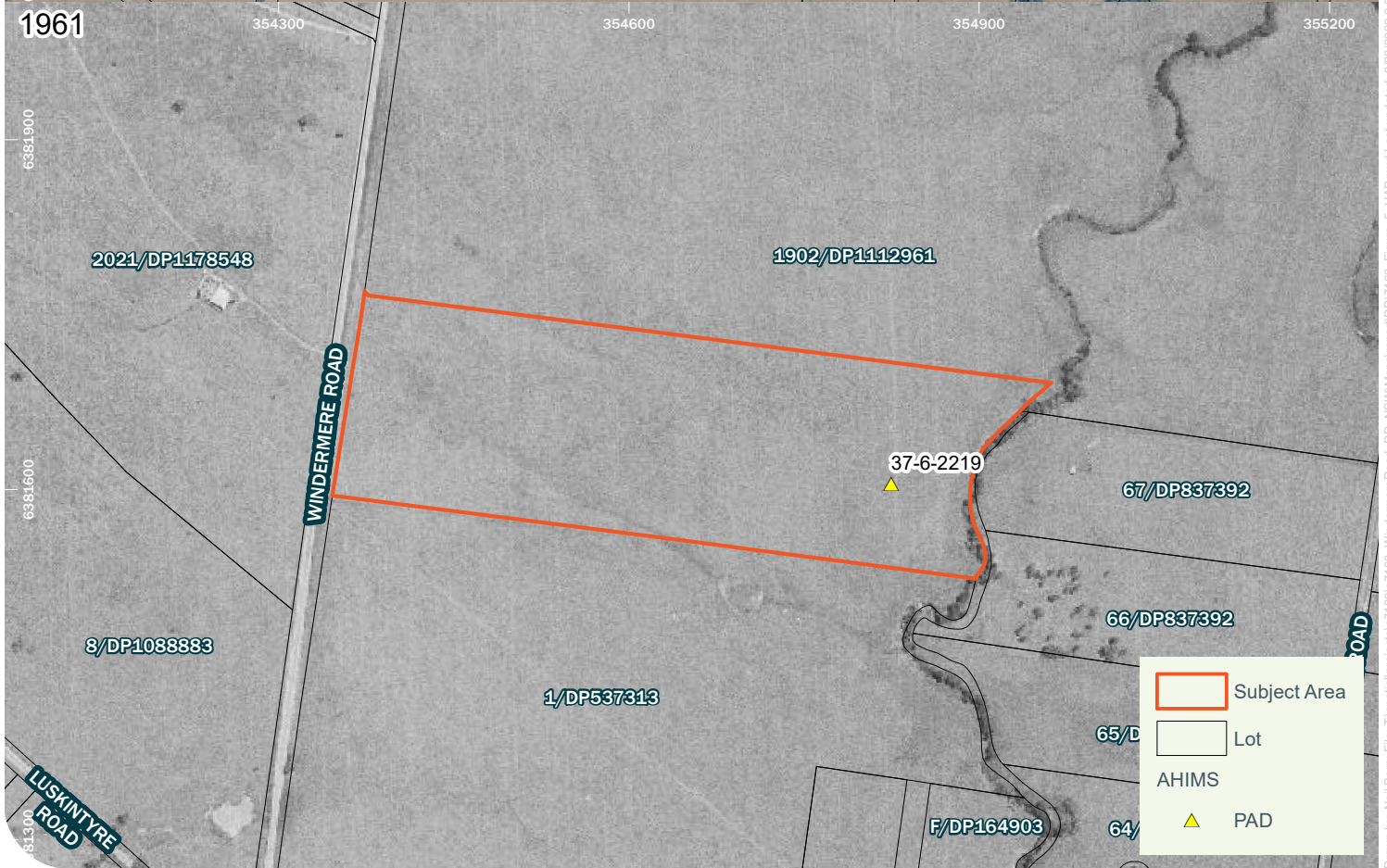
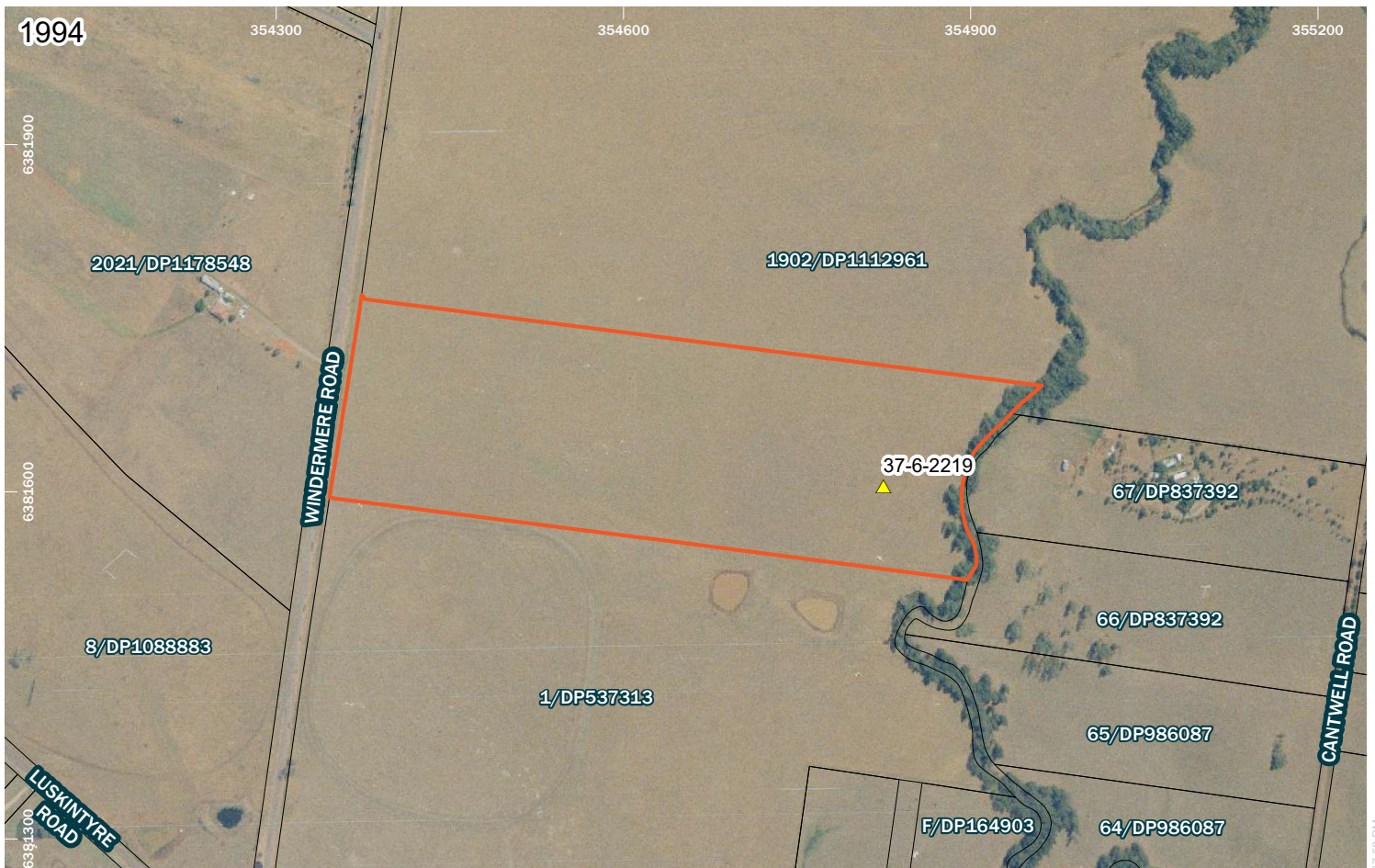
Year	Description
1961	Historical aerial photo indicates that the area has been extensively cleared of vegetation for grazing purposes (Figure 5). Historical disturbance includes the construction of a dam, access tracks and fencing.
1976	A number of exposures are present within the Subject Area, related to historical land use practices and natural erosion.




5.7 Synthesis

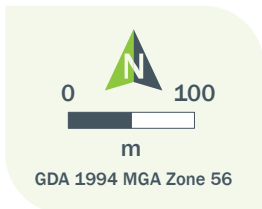
Water is one of the most important resources to human occupation in a landscape and is considered the primary factor for the prediction of Aboriginal sites potential presence in a landscape. Across NSW, there is a strong correlation to the presence, frequency and density of Aboriginal objects with the abundance and permanency of water sources. Areas within 200 m of water are identified by the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010c) as landscape features likely to indicate the presence of Aboriginal objects.

The Subject Area is located along Lochinvar Creek and is approximately 1.2 km south-east of the Hunter River and is thus considered to be located within primary and secondary resource zones described by Kuskie and Kamminga (2000) for the region. The landscape of the Subject Area is comprised of alluvial floodplains associated with Lochinvar Creek and occurs in proximity to the Hunter River offering permanent fresh water. Occupation in this area would have involved hunting and gathering activities by small to possibly large groups of people.

The archaeological potential of the Subject Area has been affected by natural and human-induced processes in the past. The floodplains have been exposed to historical flooding events, resulting in the accumulation and erosion of soils present. The historical use of the Subject Area for grazing land has also impacted the ground surface, namely the construction of dams, fences, access tracks and the trampling and exposure of soils present.



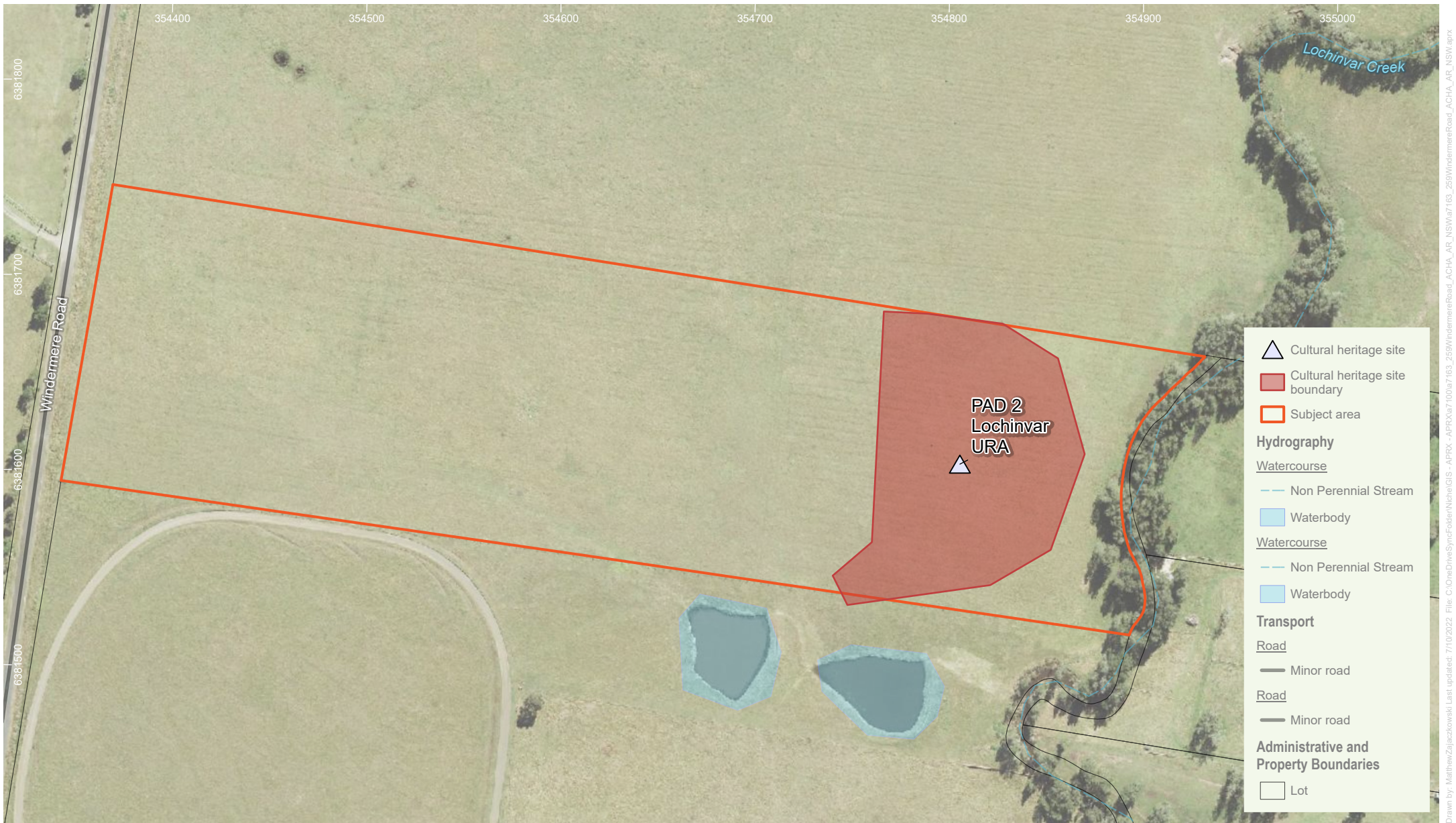
	Subject Area
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AHIMS	
	PAD



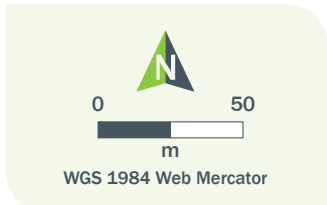
Historical aerial photographs
259 Windermere Road Due Diligence Assessment

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Client: Perception Planning

Figure 5



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Client: Perception Planning

**Extent of PAD (37-6-2219) within the Subject Area
259 Windermere Road ACHA and AR**

Figure 6

World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community/public/NSW_Imagery: © Department of Customer Service 2020/Terrain: Multi-Directional Hillshade: Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User Community| Watercourses, Waterbodies, Road and Rail alignments, Protected areas of NSW © Spatial Services 2021. | Niche uses GDA2020 as standard for all project-related data. In order to ensure that data from numerous sources and coordinate systems is aligned, on-the-fly transformation to WGS1984 Web Mercator Auxilliary Sphere is used in the map above. For ease of reference, the grid tick marks and labels shown around the border of the map are presented in GDA2020, using the relevant MGA zone.

6. Regional character

6.1 Regional archaeological context

It is now proposed that Aboriginal occupation of Australia dates back at least 65,000 years based on results from Madjedbebe, a rockshelter located in northern Australia (Clarkson et al. 2017). Occupation of the Central Lowlands, where the Subject Area is located, has been dated to at least 20,000 years, possibly longer (Lucas 2013:11). Work in the Central Lowlands has aimed to understand the nature of Aboriginal occupation and determine the nature of land use. This theme often seeks to identify and explain archaeological patterning in site type, content and distribution. General theories have been developed outlining the relationship between land use patterns and the resulting archaeological evidence. The vast majority of Aboriginal archaeological sites recorded within the Hunter Valley to date are stone artefact scatters and isolated artefacts (98%). Less common site types include painted and stencilled art in rock shelters, rock engravings and axe grinding grooves, rock shelters with occupation evidence, open shell middens on the coast, burials, scarred and carved trees, stone arrangements, stone quarries, and ceremonial sites (Lucas 2013:12).

The extent of archaeological research within the Hunter Valley, where the Central Lowlands are located, has revealed more than 3,500 sites (ERM 2004), and has helped to establish likely patterns of occupation and movement throughout the landscape. Reports mentioned in Section 4.2 show results which supports the archaeological models for the area.

MCH (2011) states that, while a number of models have been developed for the Hunter Valley, the model developed by Kuskie and Kamminga (2000) is thus far the most widely accepted model. Kuskie and Kamminga (2000) explore short-term or extended long-term occupation, discuss the theme of occupational fluidity through time, and make some predictions about the likely location of different foraging and settlement activities and assemblage patterns. According to MCH (2011:48-50) the more transitory a group is within the environment the lower the expected complexity of a site. Table 8 has been taken from MCH (2011) and is an adaptation of Kuskie and Kamminga (2000) with additional information in relation to sites and distance from water.

Table 8: Site descriptions (after Kuskie and Kamminga 2000 in MCH 2011:66)

Occupation pattern	Activity location	Proximity to water	Proximity to food	Archaeological expectations
Transitory movement	All landscape zones	Not important	Not important	<ul style="list-style-type: none"> Assemblages of low density and diversity Evidence of tool maintenance and repair Evidence for stone knapping
Hunting and/or gathering without camping	All landscapes	Not important	Near food resources	<ul style="list-style-type: none"> Assemblages of low density and diversity Evidence of tool maintenance and repair Evidence for stone knapping High frequency of used tools
Camping by small groups	Associated with permanent and temporary water	Near (within 100 m)	Near food resources	<ul style="list-style-type: none"> Assemblages of moderate density and diversity Evidence of tool maintenance and repair

Occupation pattern	Activity location	Proximity to water	Proximity to food	Archaeological expectations
				<ul style="list-style-type: none"> Evidence of stone knapping & hearths
Nuclear family base camp	Level or gently undulating ground	Near reliable source (within 50 m)	Near food resources	<ul style="list-style-type: none"> Assemblages of high density and diversity Evidence of tool maintenance and repair and casual knapping Evidence for stone knapping Heat treatment pits, stone lined ovens Grindstones
Community based camp	Level or gently undulating ground	Near reliable source (within 50 m)	Near food resources	<ul style="list-style-type: none"> Assemblages of high density and diversity Evidence of tool maintenance and repair and causal knapping Evidence for stone knapping Heat treatment pits, stone lined ovens Grindstones and ochre Large area >100 sqm with isolated camp sites

6.2 Post-1788 ethnology and history

According to Tindale’s catalogue of Australian Aboriginal (1974) groups, the current Subject Area falls within the boundaries occupied by the Wonnarua tribal group. The Wonnarua tribal group is also known as Wonnaruah, Wannarawa, Wonarua, Wonnah Kuah.

6.2.1 Historical sources - environment

A number of early historical sources describe the Wonnarua peoples’ cultural practices, implements, resources and land use (through a colonial lens). In 1884, Lieutenant Breton described their ‘excursions’ in New South Wales, Western Australia and Tasmania undertaken between 1830-1833. In New South Wales, Breton travelled through Newcastle, Maitland and the Hunter Region and describes the flora, fauna, and landscape. Breton supposedly describes the local Aboriginal peoples; however, no specific groups or individuals are discussed regarding Maitland or the Hunter Region; rather, general statements are made in reference to the people of ‘New Holland’ [Australia] (Breton 1884:186).

In regard to the flora and landscape during 1830-1833, Breton writes:

“Much has been said of the park-like scenery of the Hunter; but I really cannot speak quite favourably of it. After riding no great distance from St. Hiliers, that fine description of landscape, so much of which we had traversed from the time we left the Wollombi, entirely disappeared; much of the soil was indifferent, or worthless, the grass scanty, the forest unsightly, and the latter part of the ride, nearly twenty miles, uninteresting; nor could I perceive any improvement in the general features of the scenery all the way to Maitland, thirty-six miles farther. There is undoubtedly fine land on both sides of the river; but instead of speaking such laudatory terms respecting the mere aspect in the country watered by it, writers and travellers would do much better to state simply, that most, perhaps all, of the grants on its banks form excellent farms, leaving the scenery out of the question, for it will bear no comparison whatever with that which we had seen previous to our coming upon it. Even in regard to the quality of the land it is far inferior, as within a given distance there is much less good soil than we had found during the preceding part of our journey. Go where you will on this stream, the distance will be but short, excepting in a few instances, before ironstone and sand, with the usual concomitants of ugly gum trees, are met with; however, the settlers have more than sufficient good land to supply their wants, and there is no scarcity of grass, though not equal to that on Gammon Plains. I have heard this termed the finest agricultural district in the

colony; but in 1829, many of the crops had failed, and likewise during the three preceding seasons, so as not to produce seed for the following year [...]. I should consider it a fine sheep country, and maize and tobacco thrive uncommonly; indeed grain also grows extremely well, but in dry seasons it is liable to fail. Frost sometimes injures the maize [...]" (Breton 1884:117-119).

"There are fords as low as Maitland; and even when the weather has not been remarkably dry, the river may be crossed in several places almost dry-shod. [...] From the Liverpool range to Newcastle, nearly 120 miles, the entire country is clothed with wood; but it may generally be termed open forest as far as Maitland. The last is now the principal township on the Hunter, and is rapidly increasing in size; but the situation is particularly ill chosen; not that the government are to blame, for the township properly so called, where the courthouse and jail are, is some way out of the reach of floods; but on account of the facility with which boats can be loaded or unloaded, the proprietors of the ground have erected their houses on the bank of the river, also of a creek that falls into it. [...] There are some alluvial flats in the vicinity, but not so much good soil as I had been led to expect, from the high-flown accounts given me of this part of the Hunter [sic]" (Breton 1884:120-121).

"The native fruits of the country are the cherry, raspberry, currant, and gooseberry" (Breton 1884:285).

"The principal trees in the colony are the following: -

Iron bark (*Eucalyptus resinifera*), used for building, but more for fencing.

Blue gum (*Eucalyptus piperita*), used for ship-building and wheelwrights.

Black-butted gum, the same.

Grey gum, for fencing, building, &c. &c.

String bark, for boards, and building purposes.

Box, for wheelwrights, ploughs, &c.

The last are also varieties of the eucalyptus

Forest oak (*Casuarina torulosa*), Swamp oak (*Casuarina paludosa*), for shingles and cabinet work.

Cedar (*Cedrela Australis*), for cabinet work.

Turpentine (*Tristania albica*), boats, &c.

Sassafras, sometimes three feet in diameter, for flooring (it is not common).

Mountain ash, two kinds, for carriage work.

Sallow, for gig-shafts.

Pear (*Xylomelum pyriforme*), for gun-stocks.

Apple (*Angophora laceolata*), for boards and building purposes.

Currajong, bark used for making cordage.

White cedar (*Melia azederach*), for boards and boat-building" (Breton 1884:279-280).

"Several kinds of acacia are found in the colony, and a considerable quantity of gum might be procured from this tree; but it is entirely neglected, though perhaps not inferior in some respects, to the gum Arabic. Acacias have often been observed to spring up on spots lately cleared, surrounded by forest, and many miles from the nearest place where this tree is known to grow (such is likewise the case with couch-grass), but how to account for this is no easy matter. [...] The trees attain a surprising height, the stems sometimes rising from fifty to eighty feet or more, with a few straggling branches on the top, which have a most uncouth appearance, the entire height of the tree being scarcely under 140 feet, and often exceeding that" (Breton 1884:281-282).

While Breton's writing includes personal opinions, they describe the landscape of Maitland (as altered by colonists), and list species present in the area between 1830-1833. Another early traveller who recounts their 'voyage' through Hunter River, Newcastle and Maitland in 1857 describes the area similarly.

"One Saturday afternoon, I looked into a book-seller's window in George-street, [sic] and my attention was attracted by a pamphlet, which contained an account of the Hunter River, and the country round Maitland,

by a clergyman then residing in the latter locality. On the back of the book there was a quotation from Scripture: - Deuteronomy Chap. 8th, and part of the 7th, and the whole of the 8th verse. This passage was applied to describe the fertility of that part of the country. It reads thus: - 'A land of brooks of water, of hills; a [sic] land of wheat, and barley, and vines, and figtrees, and pomegranates; a land of oil olive, and honey.' [sic]" (Askew 1857:237-238).

"Along its [Hunter River] banks a low bright green scrub drooped over into the water and far in the distance on each side of us, nothing could be seen but sky and forest. As we glided along, picturesque looking iron-bark huts presented themselves to our view, surrounded by cleared plots of land devoted to agriculture. [...] Some of the clearings had tall trees still standing upon them leafless and bare as they had been left by the clearing fires. Their gaunt bolls, scorched and riven, presented a strange contrast to the giant forms of the white gum-tree and the graceful wattles near them, unscathed by the life-destroying blaze [...]" (Askew 1857:242-243).

"A few more turns of the river brought us opposite the beautiful residence of Count Hickey. The house was surrounded by fine gardens, the trees were laden with fruit, and the adjoining land was in the highest state of cultivation. [...] Raymond Terrace, the first calling-place for the steamer after Newcastle, is a small place with a good inn and a few private dwellings. [...] The Hunter river scenery became still more fascinating as we neared Morpeth. In some places luxuriant crops of yellow grain were growing down to the water's edge" (Askew 1857:243-244).

"I decided on going to Maitland. The distance from Newcastle to that place, by road is twenty miles, and by river forty. [...] I chose the road, and took a seat in the mail cart. [...] The road, for the first two miles, had many windings, and was overhung by immense gum and iron-bark trees, giant cedars, and graceful wattles" (Askew 1857:293).

"There is ample room for a large population between Maitland and Morton Bay. The land for hundreds of miles round is the richest in the world, either for pasturage or agriculture. Thousands of sheep, horses and cattle roam about the immense plain, and hundreds never return to their owners, straying into the mountainous regions of New England, they become wild, and afford sport for the Australian hunter" (Askew 1857:305).

Both Breton (1884) and Askew (1857) note the early occupation and use of the land by farmers for crop and grazing agriculture. Yet both also note the areas unutilised in the early nineteenth century:

"On the opposite side of the creek, behind the town, there is one of the thickest vine brushes in New South Wales, so that it is difficult to penetrate even a few yards" (Breton 1884:122).

"Turning to the north, the lovely Hunter, like a silvery thread, may be seen wending its devious way to the ocean, everywhere spreading beauty and blessing its path. Again, to the south, there are dark looking glens and valleys, covered with thick tangled wildwood, where tall giants of the forest, which the devouring bush-fire and the axe of the pioneer had left, still grace the landscape and shelter the rude savages yet lingering in these wilds" (Askew 1857:263).

"We came next to a steep hill, called Iron Bark Brow, at the bottom of which there is a small creek and swampy ground. [...] Many of the large trees we passed presented splendid specimens of the stag-horn fern, growing upon them, about fifty feet from the ground" (Askew 1857:297).

Breton (1884) and Askew (1857) also described in great detail the climate of the area, the soils and fauna present in the early nineteenth century.

"More than once during last summer (1832-33), the thermometer rose to 98 deg. In the shade, and 88 deg. In the coolest room in the house. Yet such is the atmosphere of this country, that with the thermometer at 96 deg. in

the shade (there was no hot wind at the time) [...] The winter is represented to be delightful [...]. The temperature, during that season, is seldom below 50 deg. Some writers have pretended to form registers of the temperature, number of rainy days, &c. &c.; but in such a peculiar climate these can never be correct, unless the result of observations during a long series of years" (Breton 1884:293-294).

"The whole of New Holland [Australia], as far as is known, is liable to droughts, and these constitute the principal, perhaps only decided, objection to the climate. The last, distinguished by the title of 'The Great Drought,' lasted *four years*, [sic] (1826, 27, 28, 29); and many of the settlers were nearly ruined by it. [...] Sometimes tremendous hail-storms occur, and hailstones have fallen as large as *pullet's eggs*, [sic] killing lambs and poultry, and cutting up the corn most completely" (Breton 1884:296).

"The Hunter rises rapidly after heavy rain, even to the height of fifty feet; but I am not aware that the floods have been attended with any destruction of property; and from the nature of the country on both sides of the river, there does not appear any danger of this happening, unless where persons have placed their houses, &c. [sic] in such situations that they necessarily incur some hazard" (Breton 1884:119-120).

"Close to the township there is a lake or lagoon, several miles in circuit; it was dried up during the 'great drought,' but was soon filled again. It has frequently occurred in this colony that large ponds, of some depth when first discovered, -(as the streams are styled by courtesy *rivers*, so these ponds are termed *lakes*)- [sic] and of an extent equal to that near the township, have suddenly disappeared; and it is said that a gentleman- called his farm after his own cognomen, with the addition of a word denoting the presence of a piece of water; the two together forming the name of one of our finest lakes in Cumberland. The *mere* name remains, but the *mere* water is gone [sic]" (Breton 1884:122).

"A large proportion of the forest-trees are decayed in the heart, so that it is no uncommon circumstance to cut down four or five before one is found fit for use, unless for fencing. May not this be caused by the fires which prevail every year, for the grass being ignited, scorches the bark of the tree, and driving the sap to the heart, causes a superabundance in that particular part? It has often excited my surprise that even a single tree should escape from the tremendous fires which so frequently occur! The fire almost always runs up the bark to the topmost branch, making the tree as black as charcoal; yet it goes on flourishing, although every succeeding year brings a recurrence of the same scorching, and, occasionally, twice in the same season: sometimes, indeed, the tree is destroyed, and nothing remains but a huge black and hollow stump. It often happens that a shrub, or young tree, is so effectually charred externally, nally, [sic] that a person naturally infers it must have perished, but in the course of a few weeks it will throw out leaves, and as some of these shrubs are naturally lively green, the contrast between the green and black is rather singular" (Breton 1884:282-283).

"[...] there is something very striking in the forests of New Holland, where one so often observes a soil composed of nothing whatever save sand, or sand and ironstone, with scanty herbage insufficient to conceal it. And even where the soil is of good quality, the herbage is not always over-luxuriant" (Breton 1884:283-284).

"The white hawk, that rare bird, I saw only once, at the Hunter's River" (Breton 1884:269).

"At Dalwood, an estate on the Hunter, where I passed several highly agreeable days, there occurred a singular instance of the familiarity of the swallow [...]" (Breton 1884:274).

"Towards evening, I went to the Fitz Roy pillar, and a broad track of country in the direction of Maitland was on fire. The heat from thence was great, and the atmosphere around me felt not unlike the hot air nigh a furnace mouth. In the distance, the flames shot upwards like vast forked tongues of fire, with a red and lurid glare. Smoke and ashes were tossed to and for by the wind. During the pauses of the gale, I could see the appalling waves of desolating fire roll on to the verge of the horizon. The awful conflagration before me brought to mind the description of the 'Black Thursday' of February 1851, so called because of the terrible bush-fire which on that day spread much ruin and desolation in the colony of Victoria" (Askew 1857:277).

“The Hunter is a quarter of a mile in breadth a short distance from Newcastle. Some miles above is the little island of Mosquito, famed for its fine fruit. There are several flats or shallow places in the river, which steamers have great difficulty in passing when the river is low. These flats abound with mud oysters; and prawns, crabs, crayfish, and lobsters are caught in great numbers. The Sydney market to a great extent is supplied from this source” (Askew 1857:241-242).

Both authors detailed a hot summer with bushfires and the cold winter and its influence on crops during the early- and mid-nineteenth century. A number of birds and riverine and estuarine fauna were described as so abundant that the seafood from the mudflats supplied the Sydney market after colonisation.

6.2.2 Historical sources – Aboriginal land use and life

Breton (1884) and Askew (1857) describe the practices of the Wonnarua (Wanaruah, Wonnaruah) people as relayed to them, and their own experiences with locals. The authors lacked an understanding of the purposes of the cultural practices and what they entailed, and these limitations are evident in their descriptions. Nevertheless, some information of Aboriginal life in the area in the early nineteenth was noted.

Lieutenant Breton describes tree-climbing and hunting:

“Acacias [...] attain a surprising height [...] the entire height of the tree being scarcely under 140 feet, and often exceeding that. One would imagine that a tree of this height, and too large to be grasped (they may frequently be seen from five to ten feet in diameter), would be utterly inaccessible, yet a New Hollander [Aboriginal Australian] will easily ascend the loftiest in the forest! While the great toe of each foot rests on a notch, and the left hand is employed to steady the person with the assistance of another notch, the right hand is used for cutting one above; the native then holding the tomahawk with his teeth ascends one step, and thus he proceeds until he attains the summit! In the meantime his companions wait patiently at the foot of the tree, prepared to knock on the head any animal that may attempt to escape; or by applying smoke at a hole below, drive it upwards, when the black who has ascended is sure to secure it. In this manner they capture opossums, flying squirrels, &c.” Breton (1884:281-282).

Miller 1886 and Fawcett 1898 described the customs, practices and implements of the Wonnarua (Wanaruah, Wonnaruah) people as relayed to them in much greater detail; however, they again had a very limited understanding of the purposes of cultural practices and what they entailed.

Miller writes:

“The Wonnarua language is more nearly related to that of the Hawkesbury than to any other; at the same time it has many words found in the Wiiratheri, and some which were used by the Sydney tribe. Mr. Miller, from whom I received my information concerning the Wonnarua tribe, tells me that when he first knew them, they occupied the Hunter and all its tributaries within ten miles of Maitland to the apex of the Liverpool Ranges, an area which he sets down at two thousand square miles. My informant also points out that he lived in the Hunter River district for several years, having settled there in 1841. At that time, he says the tribe numbered about 500 individuals, but it is now almost extinct, the result of increased infanticide, debauchery, diseases introduced by the Whites, exposure to rain (which the aborigines [sic] avoided in great measure before we interfered with their modes of life), bronchitis, and rheumatic fever. Their clothing used to be an opossum-skin cloak, and a girdle of spun opossum hair next to the skin, and their principal ornament a nautilus shell cut into an oval shape and suspended from the neck by a string. They also anointed the person on gala occasions with a mixture of red ochre and fat, and lived in bark *mia-miams* [sic] like those in use in all the southern portions of the continent. Their effects were the ordinary spears, wommera, shields, and war-boomerangs, and also the boomerang which returns when thrown into flights of ducks and other birds with very good results. The boomerang used in fights does not return. They had also bags made of platted swamp-grass; *koolaman* or wooden bowls, two or three feet long, for holding water at the camp, tomahawks 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 of flint with which they skinned animals. For food they got the kangaroo and the emu, which they killed with spears and captured with nets, besides the other animals and reptiles found in their country; as also a variety of roots, one of which was that of the water-lily. These they roasted in the usual way, or baked in the heaps of cinders and stone (or cinders and lumps of clay) usually called earth ovens. The young of both sexes were prohibited from eating certain sorts of meat. They had also at about sixteen years of age to undergo the ceremonies of having a tooth knocked out, the septum of the nose pierced, and the painful operation of being scarred on the back, shoulders, stomach, and occasionally on the legs. At the same age the males were *made young men* [sic] with many secret ceremonies" (Miller 1886:352-353).

"The Wonnarua had some idea of a Great Spirit, but what the idea was my informant does not know. They had, too, a custom of daubing their hands and feet with a compound of fat and red ochre, and then impressing them on the sides of caves. The canoes were sheets of bark, cut from suitable trees in such a manner as to give a little elevation to the sides and ends. Fish they caught with nets and three-pronged spears. The average height of the men Mr. Miller estimates at five feet six inches, though some of them were upwards of six feet, and the women at five feet. As a rule, their hair was long and lank, one or two being curly and woolly. The dead were interred in a sitting posture, the grave being covered with logs to prevent wild dogs getting at the corpse. Their wars were the results of trespasses on their lands by neighbouring tribes (generally the Kamilaroi tribes) [sic] and the abduction of females. They had a salutation on meeting which was '*anigunya*,' the meaning of which is not stated. The old men, as usual, used to talk over the affairs of the tribe, and generally persuaded its members to adopt their views, which Mr. Miller looks on as a sort of government; but no authority existed. * [...] *Englishmen generally seem with difficulty to realise the idea of a people living entirely without government as our Blacks do, and not unfrequently dub some intelligent man of a tribe King Billy or King Tommy" (Miller 1886:353-354).

"In cases of sickness, certain impostors [sic] in the tribe used to pretend to extract bits of stick or stone from the seat of pain with their mouths; for rheumatism the skin was scarified; the gums bled for toothache, and hot stones applied to relieve various sorts of pains. Wounds were plastered with wet clay, and bleeding staunched by the application of a sort of spongy bark" (Miller 1886:35).

Miller (1886) provides information supplied to them by an informant who lived in the Hunter River area in the mid-1800s. The information includes descriptions of the everyday clothing and adornment worn by Wonnarua (Wanaruah, Wonnaruah) peoples in the mid nineteenth century and very likely earlier, and the ceremonial dress for various practices. Descriptions of everyday bags, bowls, canoes and stone tool implements are provided including materials and manufacture. Beliefs, medical practices, food and cooking methods are also noted.

Fawcett (1898) also provides detailed descriptions, similarly to Miller's. No references are listed in Fawcett's articles, though he likely referred to Miller as a source as they use many of the same numbers, words, phrases and details:

"The Wonnah-ruah tribe of aborigines [sic] inhabited [inhabit] the Hunter River district in New South Wales. Their tribal district had an area of upwards of 2000 square miles, and included all the country drained by the Hunter River and its tributaries. Fifty years ago they mustered a large population, totalling between five and six hundred individuals. Half a century of British debauchery, diseases, and vice, and their accompaniments, have almost wiped them out altogether. [...] To preserve some account of their customs and daily life, as they were before the intrusion of the white man, has caused me to compile these notes, and for much of the information contained herein I am greatly indebted to correspondents and friends" (Fawcett 1898:152).

The above quote closely resembles the first four sentences of the first Miller (1886:352-353) quote. Given the similarities, Fawcett quotes that too closely resemble Miller's will be excluded but noted. As Fawcett does provide further detail in some areas, this will be highlighted.

Great detail is provided on camps, structures, food and cooking methods:

“[similar descriptions of physical appearances] 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. They had no permanent settlements, but roamed about from place to place within their tribal district, in pursuit of game and fish, which was their chief sustenance, making use periodically of the same camping grounds, generation after generation, unless some special cause operated to induce them to abandon them. In choosing their site, proximity to fresh water was one essential, some food supply a second, whilst a vantage ground in case of attack from an enemy was a third important item” (Fawcett 1898:152).

“A couple, or three, forked sticks, a few straight ones, and some sheets of bark, stripped from trees growing nearby, supplied the requisites for the construction of their home. The forked sticks were thrust into the ground, and the straight ones placed horizontally in the forks. The sheets of barks were then set up against the horizontal poles in a slanting position, the bark of the structure being towards the windy point of the compass. The sides were frequently enclosed for further shelter, but the front was generally open. Before each one was a small fire, which was seldom allowed to go out, and which was used for warmth, or to cook by” (Fawcett 1898:152).

“The daily work of the men consisted in hunting kangaroos, wallabies, and other animals, and the manufacture of weapons. The daily life of the women consisted in fishing for mullet and whiting, in gathering oysters and other shell fish, in digging for roots, in carrying wood and water, and in keeping the fires alight and cooking.

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 found in their district. They used also a variety of bush fruits and roots, one of the latter being that of the water-lily.

Their mode of cooking was very simple. The animals or birds were roasted on the embers until their hair or feathers were charred off, when they were covered over with ashes and embers, and some fresh sticks piled over and around it. After being about half cooked the animal or bird was taken out, and an opening made in the body. This was stuffed with clean grass, and the whole was returned to its place in the ashes for a little while longer. It was then taken out, and the flesh was consumed all hot and juicy. A shell, or the sharp splinter of a stone, served as a knife. When the animals were skinned for the sake of their fur they were generally wrapped up in leaves before being placed in the ashes. The roots were either roasted or baked into a kind of bread.

The gastronomic propensities of many of the aborigines was remarkable, some of them being able to put the whole of a large kangaroo – skin, body, and entrails – out of sight. They had laws regarding the use of food which were very imperative. They 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 older men only. Emus and black snakes were also reserved for special individuals and seasons” (Fawcett 1898:152).

Fawcett further describes how the hunting of food occurred and the implements used for hunting and other activities. They also offer local names for some of the animals and objects:

“Their mode of obtaining food varied according to the animals hunted. Kangaroos and wallabies were hunted by battues. The grass in certain districts was first burnt off, and about a month afterwards, when the young grass had sprung again, these animals all congregated there to eat the sweet young pasturage. A day for a grand hunt was then fixed at early dawn of the day in question the men and boys took their boomerangs (burragan), clubs, and spears (durrane), and set out for this spot. There they formed a circle around the unconscious game, cautiously, silently, and slowly gradually closing in upon them, until the ring became so contracted that the animals became alarmed. In try to break through they were met by the hunters, who by their loud cries so confused and bewildered the animals that they became an easy prey to the aborigines [sic]. The wallabies (the smaller and

more active creatures of the two), were either clubbed or speared as they tried to dart through the lines of the hunters, whilst the kangaroos driven to within a narrow circle, were easily killed by a boomerang or spear. The dead and wounded animals were next collected together, as were also all of their weapons. A large fire was next made on the 'field of battle,' in which as much game as could be eaten on the spot was cooked. When the meal was finished the hunters returned to their camp, more or less laden with the slaughtered game. Sometimes kangaroos and wallabies were captured by means of nets. The emu (murrin) was also caught by means of a net. Fish (makroo) of various kinds, including eels (kannung), were caught with nets (turrila) and three pronged spears (mattock)" (Fawcett 1898:153).

"The weapons and implements used by the Wonnah-ruahs consisted of the ordinary spear (durrane), wommera or throwing stick (werrewy), shield (kooreil or murrybye), boomerang (the war boomerang – tootoo-kera – which does not return, and was used in fights), and the boomerang which returns when thrown (burragan), and which was used for throwing into flights of ducks and other birds, with good results, and partly used as a toy or article of amusement, tomahawks or hatchets (mogo), made of a rudely sharpened stone of a hard dark colour, which was first chipped out and then ground to an edge, and fitted to a handle, (the iron hatchet was called a mundabong), knives made of flint, used for cutting up meat, chips of flint or shells were used in skinning animals, clubs, yamsticks, bags (buakal), made of platted swamp grass, and wooden bowls (koola-man or koka) from two to three feet long, for holding water in the camp. They also made nets (turrila) for catching fish. Their canoes (buba) were simply sheets of bark cut from suitable trees in such a manner as to give a little elevation to the sides and ends" (Fawcett 1898:153).

"Both girls and boys used to troop about together in care of the women until they were twelve or thirteen years of age. They soon learned to catch fish, to cut out the grubs from decayed trees, to dig for yams, or to hunt for bandicoots, rats, and other small animals. The boys soon used to imitate their elder male friends and relatives by making toy boomerangs or clubs, or spears, and by constant practice soon became very skilful in throwing at targets or knocking down birds. They used to be greatly praised for their cleverness, and rewarded by well fashioned weapons made by older men. The girls often adorned themselves with flowers, bone or reed ornaments, and shell necklaces. Under the instruction of the older women they learnt how to fish, or to search for fruits or roots, to sew skins for thread, and to plait bags and small nets" (Fawcett 1898:153).

Fawcett (1898) describes medical resources and practices, and clothing materials very similarly to Miller (1886) previously quoted. However, Fawcett (1989) also details marriage systems and bora ceremonies.

6.2.3 Historical sources – interactions (contact and massacres)

In 1824-25, Thomas White Melville Winder, a wealthy local landowner with extensive landholdings, acquired some 4,000 acres of land near Lochinvar and named his estate Windermere. His sandstone residence situated north west of the present Subject Area is listed in the Maitland Local Environmental Plan (LEP) (2011) as having local heritage significance. By 1828, Winder was the recipient of 7,400 acres in the Hunter Valley and stood as one of the most substantial landowners in the district.

In the early years, Winder exported cedar from around the Hunter and grazed cattle, with the assistance of three convicts. He saw the Hunter River as a commercial opportunity, offering an alternative to the overland route via Wollombi which was notoriously challenging to navigate (HAFS 2019). As part of this land grant, Winder also claimed to have secured a ten-year monopoly on all coal extracted from the Newcastle penal settlement, apart from what was required for government use. In subsequent years in February 1826 the Colonial Government under Governor Darling protested the arrangement, though he had only received 600 of the 2,000 tons that had been specified (Purnell n.d.). They denied the existence of any formal agreement and transferred the monopoly to the Australian Agricultural Company.

It can be inferred from Winder's extensive land ownership in the area that he would have interacted with local Aboriginal groups who had been dispossessed of their traditional lands. The period in which Winder

was granted land in the district was a tumultuous time as the frontier of the colony moved westwards and wealthy merchants sought to capitalise on the natural assets of the country including cedar timber, vast stretches of prime grazing land, the advantages of transport along the Hunter River and undoubtedly too, the attractiveness of land adjoining the Hunter as a country estate. Over time, many more convicts were assigned to Winder to work his land and to take care of his extensive herds of cattle. Whether Winder was the subject of retaliatory attacks by local Aboriginal groups who had been dispossessed of their land is not clear, though numerous confrontations were known to occur at this time.

Askew (1857) described both positive and negative everyday interactions with local Aboriginal people:

“We now arrived at Morpeth, where two omnibuses and several light carts were in waiting to convey passengers to Maitland.

In the midst of the bustle incidental to landing, two natives [sic] came on board to help in removing their luggage ashore. One of the firemen, the most brutal of the lot, who annoyed us so much on the previous night, had a great antipathy to the natives, by whom he said he was once nearly murdered. When this man saw these poor harmless creatures come on board, he struck the foremost down with his fist, and with as little compunction as if he had been felling a bullock. The other native jumped upon the wharf to avoid similar treatment. The more compassionate of the crew lifted up the poor bleeding native, who was severely cut above the left eye, and carried him ashore. Several passengers remonstrated with the brute for his cruelty, but he seemed so exasperated at the sight of the natives, that they were obliged to be got out of his way, for fear of further mischief. [...] The two natives we saw in the morning were dancing a corobory [sic] before the open door of a neat cottage” (Askew 1857:245-248).

“I decided on going to Maitland. [...] I chose the road, and took a seat in the mail cart. [...] The driver was a fine young fellow – a native, and the best whip in the colony. [...] the next stoppage was at Hexham post-office. An old native, the last of his tribe, wall-eyed and nearly blind, came to the side of the mail cart, not to beg – but to speak to the driver, whom he knew. He seemed highly pleased with the little girl, and still more when he was told she was a native like himself. His only covering was an old blanket, and in his face, there was perceptible none of that low cunning, which is so peculiarly characteristic of savage tribes. On the contrary, his countenance was indicative of frankness and intelligence.” (Askew 1857:293-299).

Despite Askew’s evident racial biases, he depicts the amicable interactions with Aboriginal workers in addition to the confronting everyday casual violence people faced by being present.

A number of massacres occurred throughout the region, however there is only one well-documented one in the Maitland area. In 1827, it was reported that a shepherd on EG Cory's estate at the Paterson River in the Hunter Valley killed a dog belonging to Wonnarua (Wanaruah, Wonnaruah) people who then allegedly retaliated by burning his corn crop and wounding him (Ryan et al. 2022). The shepherd then gathered other estate workers and murdered twelve Aboriginal people and wounded a number of others (Ryan et al. 2022). In 1877, fifty years later, the manager of the Cory estate admitted he was present during the massacre and that the twelve people were murdered because they stole some corn cobs to eat (Ryan et al. 2022).

Another threat to life for Aboriginal people in the Hunter Valley during this time included the effects of diseases such as measles, smallpox and syphilis which spread through the population with no natural resistance. The threat of disease was exacerbated by the starvation experienced by the population due to the widespread disruption of traditional food-gathering practices and access to resources. The widespread granting of private land throughout the Hunter Valley prevented individuals from accessing areas which were previously used for hunting. Land clearing practices exacerbated the issue as the loss of brush cover

reduced the vitality of native animal populations. In 1845, McKinley, a magistrate in the Dungog area, highlighted the issue:

“The ordinary means of subsistence had diminished on account of the brushes having been cleared, which native game and vegetables formerly abounded in and were easily obtained” (McKinley in Wilson-Miller 2005).

Despite the significant changes that were rapidly brought to the Aboriginal people of the region, they maintained a sense of community, traditional customs and practices, cultural knowledge and continue/d to care for significant sites and the land in general.

6.3 Synthesis of local and regional character of Aboriginal land use and its material traces

The Subject Area is located in the Central Lowlands, a physiographic region of Maitland characterised by its open undulating hilly landscape with alluvium rich soil underlain by the sedimentary geology. While occupation of the Australian continent has been dated to around 65,000 years, occupation for the Central Lowlands is dated to around 20,000 years. Hughes et.al. (2014) state that while the Central Lowlands is abundant in Holocene-aged Aboriginal cultural heritage sites, very few traces of Pleistocene occupation have been recorded. They argue that most archaeological material older than 10,000 years has either been completely removed or widely dispersed due to events of bioturbation (2014:34).

Past Aboriginal land use indicated by the results of previous archaeological work in the region (reviewed in Section 4 of this report) suggests that artefact scatters and isolated artefacts are by far the most common archaeological cultural heritage site type occurring in the region, with these site types usually located within close proximity to water. The number of sites as well as artefact volume decrease with distance from water. Aboriginal sites are usually found on landforms such as creek lines, crests/ridges, and slopes. According to MCH (2011:32) there also appears to be a secondary peak in site numbers and artefact volumes at distances over 100 m from water.

The Subject Area is potentially reminiscent of an occupation site linked to other known sites within the landscape (see AHIMS search results for the closest known sites). Previous assessments confirm that the low density (<1 artefact/m²) of surface artefacts does not appear to be an indicator of subsurface potential within the region.

7. Predictions

Based on the environmental setting of the Subject Area, existing archaeological information and site types known to occur within the region, the following conclusions may be drawn:

- Patterns of Aboriginal land use and occupation of the region, to identify those landscape areas where material was likely to have been deposited.
- Distribution of known sites within the Subject Area and broader Central Lowlands, to identify the landforms known to contain archaeological materials (and patterning of those materials).
- Geomorphic evolution, including soil characteristics, of the Subject Area, to identify those natural processes that may have affected the archaeological resource.
- Likely detection of archaeological materials within the Subject Area, considering the nature of the resource (surface/ sub-surface materials) and ground surface visibility constraints.
- The nature of past land use within the Subject Area to consider the likely level of integrity of any Aboriginal objects found.

Based on these criteria, the following predictions concerning the presence or absence of Aboriginal cultural heritage site types have been formulated specific to the Subject Area:

- Artefact scatters and isolated artefacts are the most likely Aboriginal site types to occur on very gently to moderately inclined slopes in close proximity to Lochinvar Creek.
- PADs are likely to occur where soil profiles remain intact and occur in proximity to Lochinvar Creek, low hills and hill crests.
- The occurrence of sub-surface material is not predicated on finding Aboriginal objects upon the surface and vice versa.
- Culturally modified trees (scarred or carved) are unlikely to occur within the Subject Area due to historic clearing of vegetation and the absence of remnant woodland areas.
- Axe grinding grooves are unlikely to occur within the Subject Area due to the absence of sandstone exposures.
- Aboriginal burials, though rare, may occur within the Subject Area due to the presence of suitable soils landscapes (deep, soft sediments, such as Aeolian or alluvial deposits). Burials would only be visible as surface expressions if they had been exposed by erosion or as the result of animal or human activities.
- Aboriginal places are places of cultural significance to Aboriginal people. No Aboriginal Places have been declared within the Subject Area or listed on AHIMS (<https://www.heritage.nsw.gov.au/about-our-heritage/aboriginal-cultural-heritage/>).

Although the Subject Area has seemingly remained undeveloped, the clearing of vegetation and agricultural land use within the area has been extensive and may have impacted the integrity of the soil profile and consequently the likelihood of finding *in-situ* artefacts in some areas. The results of the test excavation program have shown that low densities of artefacts do occur sub-surface, however these deposits have also been impacted by previous grazing activities.

Caution must be taken when using predictive models as archaeological investigations continue to reveal patterns and information that challenge current understandings. As such, these models must continue to be assessed, tested and refined based the results from present and future investigations. The following section of this report looks at the sampling strategy and field methods used in the Aboriginal archaeological assessment of the Subject Area.

8. Sampling strategy

8.1 Archaeological survey

The purpose of the field survey was to assist in the identification of cultural heritage values and to record a representative sample of the material traces and evidence of Aboriginal land use that are visible at or on the ground surface, or exposed in sections or visible as features and to identify those areas where it can be inferred that, although not visible, material traces or evidence of Aboriginal land use have a likelihood of being present under the ground surface (potential archaeological deposits [PADs]) (DECCW, 2010b).

The entire Subject Area was inspected on foot on 7 March 2022 and reidentified PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219).

8.2 Test excavation

The proposed sub-surface test excavation methodology is informed by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010) and industry best practice. Based on the predictions developed for the region, a sampling strategy was developed for the test excavation of the Subject Area which aimed to sample those areas identified during the surface survey as having potential for subsurface archaeological deposits.

The PAD within the Subject Area was targeted but the entirety of the PAD was spatially represented, with 15 50x50 cm test pits. All data was recorded in accordance with the Code of Practice with the methodology outlined in Section 9.

The test excavations were conducted between 22 August – 26 August 2022 with three RAP groups and two archaeologists.

9. Field methods

9.1 Assessment methodology

An assessment methodology was developed and is outlined below and presented in Appendix B of the ACHA.

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

- Aboriginal community input – this was sought throughout the project via the consultation process, participation in archaeological fieldwork and other correspondence.
- Archaeological research – this included landscape characterisation, analysis of previous archaeological works in the region, field survey and test excavations.

9.2 Sensitive cultural information – Management protocol

During the consultation process the proponent and Niche provided the opportunity for the RAPs to provide cultural information, including a statement of the value of identified sites and other matters. Information will be accepted at any point during the project prior to the finalisation of the ACHA and AR.

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

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

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

No sensitive or restrictive material was provided by the RAPs to Niche to be included within the ACHA or archaeological report.

9.3 Archaeological and cultural heritage survey field methods

A comprehensive site survey was completed on 7 March 2022. The survey covered the entire area including the PAD. Opportunistic inspection of exposures and a systematic survey across the Subject Area was undertaken during the survey.

The survey methodology is outlined below:

- A hand-held non-differential GPS unit was used to record all tracks and appropriate site data for the survey with spatial data recorded in terms of Datum and grid co-ordinates (i.e. Zone, Easting, Northing) as per Requirement 8b of The Code.

- Representative photographs were taken of survey units, different visibility levels, exposures and disturbed areas.
- All Aboriginal sites, artefacts and/or features identified during the survey were flagged and their location recorded using a hand-held non-differential GPS unit. The context of flagged sites, artefacts and/or features were additionally photographed, and the following details recorded on recording forms: description, photographic recording, context of the recorded site sketched, and the boundary/extent recorded using a hand-held non-differential GPS unit.
- Different types and levels of exposure were recorded. Exposure was defined as an estimate of the area which has a likelihood of revealing buried artefacts and/or deposits. Exposure is represented as a percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground.
- Archaeological visibility was recorded, defined as the amount of bare ground on the exposures which might reveal artefacts or other archaeological materials.
- Effective survey coverage area was also recorded (the area of the survey unit multiplied by the visibility percentage and exposure percentage and given in either square meters or hectares) as per Requirement 9 of The Code.

9.4 Test excavations

The test excavation was carried out over five days from 22 to 26 August 2022 by personnel listed in Table 1. The test excavation methodology was prepared in accordance with Requirements 16 and 17 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). The approach for the testing program is outlined below and includes:

The test excavation involved excavation of 50x50 cm test pits in a rough grid layout over the entirety of the PAD and was conducted by Niche consultants and representatives of the RAPs.

The PAD was test excavated by hand with the aim to:

- Establish the stratigraphy of potential subsurface deposits.
- Identify the presence or absence of Aboriginal objects.
- Collect radiocarbon dating samples if present.
- Collect soil samples.
- Assist in the identification of archaeologically sterile unit should that occur within the impact footprint.
- Determine the extent of the subsurface deposit through the placement of test pits outside the recorded boundaries of the Aboriginal cultural heritage site.

The approach for the testing program included:

- Test excavation pits measured 50x50 cm and were laid out to target areas designated for impact by the proposed works. The exact locations within the PAD were guided by on-the-ground observations of best placement at the time of the test excavation program. The exact locations were determined by the Excavation Director, based on advice of the field team and RAPs. These locations were subject to change as further information become available.
- The excavation pits were hand excavated.
- Excavation was carried out using 5 cm spits for the first test pit and then 10 cm spits for each test pit thereafter, until the following was encountered:
 - Rock.
 - Groundwater.
 - Where it would be considered that digging any deeper would be unsafe.

- Where sufficient information has been recovered to understand the extent, nature and significance of the archaeological deposits.
- Three consecutive layers of sterile spits.
- All excavated material was weighed prior to sieving to allow for the provision of proportional weights for analysis of shell or faunal bone if it is identified.
- All excavated material was dry sieved through nested 5 mm and 3 mm mesh.
- Sediment was retained for backfilling of test pits.
- If specific archaeological features such as hearths were identified, the feature was excavated stratigraphically, photographed and drawn.
- Photographic recording of each pit was taken.
- Scaled drawings of each test pit were completed.
- GPS readings were taken at each test pit location.
- A provision was made to allow for the expansion of test pits if there was:
 - A high density of artefact frequencies.
 - Unusual or uncommon raw materials or artefact types.
 - Artefact manufacture areas.
 - Suitable dating samples.
 - Where it would be especially informative for assessment of value and significance of the site.
- Test pits were back filled by Niche as soon as practicable after excavation. Backfilling utilised original soil.

Recovered Aboriginal objects were recorded, analysed and stored (short-term) at the Niche Parramatta Office in a locked cabinet. Long term storage solutions or reburial will need to be determined prior to the completion of the ACHA.

9.4.1 Sample collection

All material recovered from the test pits was dry sieved using, at a minimum, a 5 mm mesh size.

All cultural material or environmental samples recovered were carefully bagged and labelled with a unique identifier and stored in a suitable container for short storage.

A full record and catalogue of the artefacts was prepared post-excavation in accordance with Requirement 19 and 20 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b).

Artefact analysis and the preparation of a catalogue was conducted by Niche.

9.4.2 Short- and long-term storage of artefacts

Artefacts recovered during excavation were temporarily held at the Niche Parramatta Office in a locked cabinet.

The long-term storage and management of artefacts recorded during the test excavation program will require placing artefacts back on site at completion of works unless the RAPs agree to a Care Agreement. Consultation with the RAPs regarding options for the long-term storage and management of these artefacts is ongoing.

9.4.3 Stone artefact attribute recording and analysis

An analysis of the artefact assemblage was carried out by Riley Finnerty (Niche heritage consultant). Variables noted include provenance information, raw material type, presence of cortex, artefact type,

maximum size and oriented size measures for complete and modified artefacts, weight, flake shape, flake platform, core type, evidence of heat treatment and core flaking pattern.

10. Results

10.1 Survey coverage and conditions

A total of 8.2 ha was surveyed on 7 March 2022, resulting in 100% coverage of the Subject Area. The survey covered associated landforms including drainage lines (creeks), hill slopes and a crest. The ground surface exposures that were encountered were inspected for any Aboriginal stone objects that may be present, and trees along the creek line were inspected for any signs of cultural modifications.

Surface visibility was extremely low due to dense grass coverage (Plate 4). The Activity Area abuts Lochinvar Creek which contained flowing water at the time of the inspection, the creek line was also the only area to contain trees; none exhibited evidence of cultural modifications (Plate 5).

The registered PAD area comprises a raised area overlooking Lochinvar Creek. Although surface visibility was extremely low, the landform and nearby creek line indicates this area contains the potential for sub-surface archaeology (Plate 6). Outside of the registered PAD there was evidence of earthworks and pastoral/grazing activities. Considering this and the distance to water, these areas are likely to contain low-nil archaeological potential (Plate 7).



Plate 4: View north showing surface visibility



Plate 5: Lochinvar Creek, view north



Plate 6: Register PAD area, view east



Plate 7: View west within Activity Area

As required by The Code of Practice, survey units, landforms and effective survey coverage are summarised in Table 9.

Table 9: Survey coverage and landform summary

Survey unit	Entire Subject Area
Landform/s	Flood plain / elevated terrace
Survey Unit Area (m ²)	82,000
Visibility (%)	10
Exposure (%)	10
Effective Coverage Area (m ²)	820
Effective Coverage (%)	1%
Number of newly identified sites	0
Number of previously recorded sites	1
Site types identified (registered)	PAD

No new Aboriginal heritage sites were identified within the Subject Area during the survey. One (1) previously recorded Aboriginal heritage site (PAD 2 Lochinvar URA, AHIMS ID# 37-6-2219) was reidentified.

10.2 Archaeological subsurface testing

A total of 15 test pits were excavated (Figure 7). A total of 18 Aboriginal artefacts were recovered during the excavation (see Annex 3). All artefacts were recovered from within the boundaries of the previously registered site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219). The majority of the artefacts identified during the test excavation are complete or broken flakes (n= 11; 61.1%) and are made from silcrete (n=12; 66.7%). The analysis and discussion of these results is presented below. Each test pit has been described in detail and the descriptions are included in Annex 4. Sample section and base photographs are also presented in Annex 4.

The typical soil profile comprised:

- A1 horizon – loose dark brown loamy topsoil with regular grass roots and having a diffused horizon to lower boundary. This layer can contain patches of clay as evidence of previous disturbance – approximate depth 0-6 cm.
- A2 horizon – compact, yellowish brown loamy clay or silty clay, with grass roots and often containing charcoal flecks and gravels. Diffusing horizon to lower boundary – approximate depth 6-20 cm.
- B horizon – compact yellow clay (sometimes with a sand content)- approximate depth from 20 cm.

10.2.1 Test pits

A total of 15 test pits were excavated across the extent of PAD 2 Lochinvar URA, (AHIMS ID# 37-6-2219) (Figure 7) at approximately 30 m spacing where site conditions allowed. The objective of this spacing was to establish the nature of the soil profile across the landform within the Subject Area and to determine the intactness and artefact density for locations across the PAD. Test pits were excavated to an average of 3 spits (20-30 cm) at which point a sterile clay horizon was typically encountered. A summary of the data for the excavated test pits is provided in Annex 4.

10.2.2 Artefact distribution

A total of 18 artefacts were recovered during the test pit program. The distribution of test pits and artefacts is illustrated in Figure 7.

Artefacts were recovered from 8 of the 15 test pits excavated. The majority of artefacts were located in Test Pit 12 (n=6) with the remaining artefact-bearing test pits (including Test Pit 5, 6, 8, 10, 11, 13 and 15) associated with only 1 or 2 artefacts. Test Pit 6 (n=1), Test Pit 10 (n=2), Test Pit 11 (n=2) and Test Pit 15 (n=2). Test Pit 6 yielded the highest number of artefacts, comprising 6 of the 18 artefacts identified (33.3%). Of the test pits that did yield artefacts, half of the pits yielded 2 artefacts (Test Pits 6, 10, 11 and 15) and just under half yielded 1 artefact (Test Pits 5, 8 and 13). The majority of artefacts were recovered from spit 2 (10-20 cm) (n= 12; 66.7%), with fewer artefacts present in spit 1 (0-10cm) (n=4; 22.2%) and spit 3 (20-30cm) (n=2; 11.1%).

Based on the small sample of recovered artefacts, it is difficult to make robust conclusions on what the subsurface distribution of artefacts may mean in terms of past Aboriginal land use. They are however very representative of artefact assemblages for the surrounding region in terms of artefact types and raw material patterning and support the predictive model of transient land-use resulting in low density occupation with sporadic focal points targeted in areas of high/dependable resource availability.

10.2.3 Artefact density

A comparison of the artefact density associated with PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) compared to a range of sites in the surrounding area is presented in Table 10. The average artefact density at PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is 4.8 artefacts per square meter with the maximum potential artefact density being 24 artefacts per square meter in association with test Pit 6. While the artefact density for site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is higher than that reported for Penn Park 1 (AHIMS ID# 37-6-0989) and PAD1 (AHIMS ID#37-6-2165), it is relatively low compared to PAD 2 (AHIMS ID#37-6-2165) and other sites in the Hunter Valley region where average artefact densities have been reported to be up to 1,200 artefacts per square meter at sites such as AHIMS ID# 38-4-0376 (Kuskie pers communication referenced in Dallas and Kerr 1997: 10).

Table 10: Comparison of artefact densities at sites in the local region

Site	Total # test pits	Total artefacts	Total area excavated m ²	Highest No. artefacts per pit	Average artefact density per m ²	Highest artefact density per m ²	Reference
PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219)	15	18	3.75 m ²	6	4.8 artefacts / m ²	24 artefacts / m ²	Current report
Penn Park 1 (AHIMS ID# 37-6-0989)	44	2	11 m ²	1	0.18 artefacts / m ²	4 artefacts / m ²	Ruig, 1997
PAD 1 (AHIMS ID# 37-6-2165)	24	114	6 m ²	80	19 artefacts / m ²	320 artefacts / m ²	MCH, 2010
PAD 2 (AHIMS ID# 37-6-2164)	17	1	4.25 m ²	1	0.24 artefacts / m ²	4 artefacts / m ²	MCH, 2010

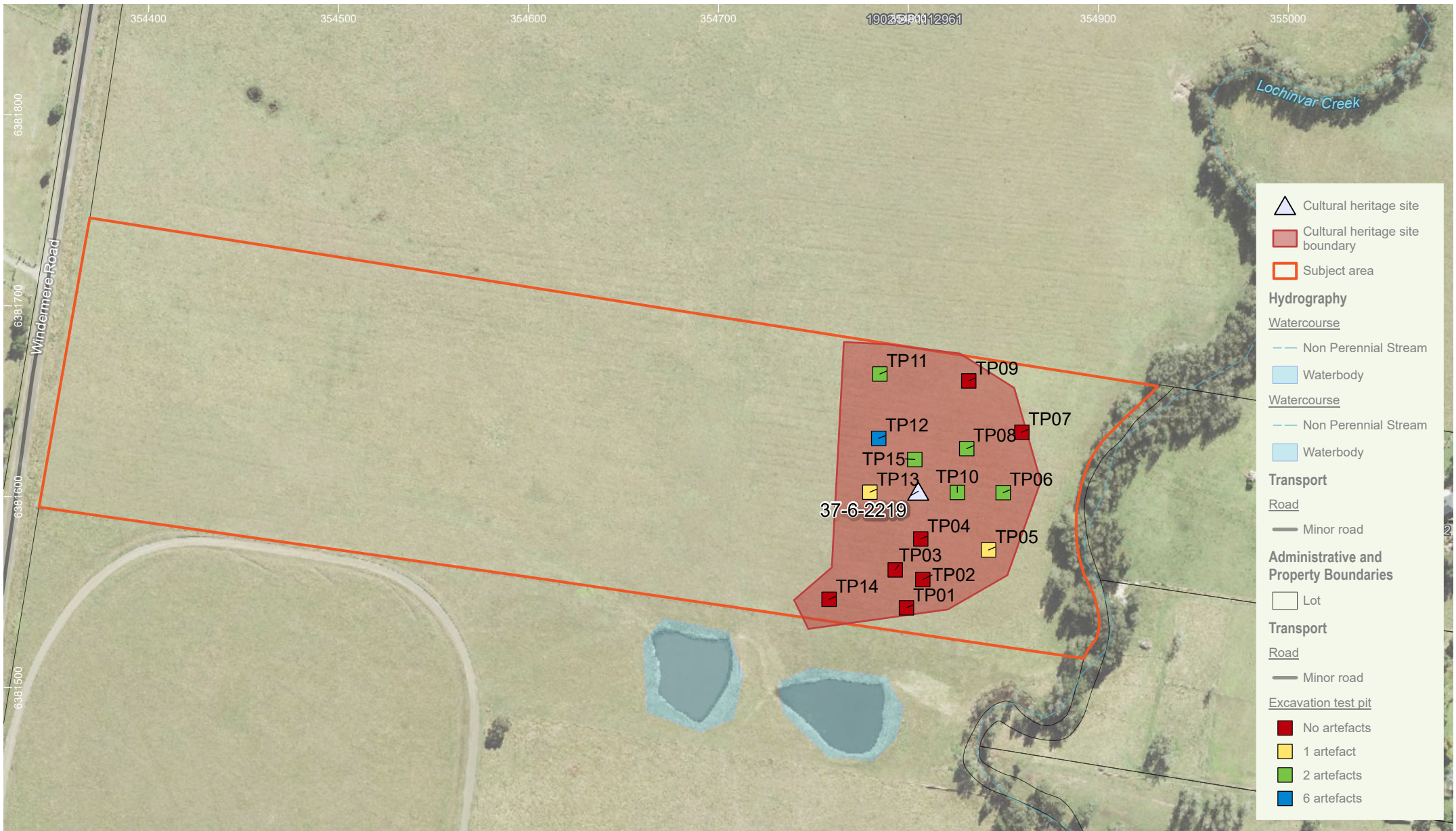
10.2.4 Artefact assemblage

The artefact assemblage comprised 18 artefacts and included complete and broken flakes, a red silcrete core and angular fragments. Flakes (broken and unbroken) are the most common artefact type observed, accounting for 61.1% (n=11) of the assemblage. Overall, usewear was observed on 5 of the artefacts or 27.8% of the assemblage. One yellow silcrete complete flake displayed backing on the dorsal side and usewear on the left lateral margin. No other evidence of retouch was observed amongst the assemblage, however two pink silcrete flakes (one complete and one distal flake) were possibly heat treated. The presence of a backed artefact indicates that the assemblage can be typologically dated to the mid-to-late Holocene, most likely relating to use of the area within the last 5,000 years.

Cortex is largely absent across the assemblage, with most of the artefacts retaining 0% cortex (n=15; 83.3%), though two artefacts retained 25-50% (11.1%) and one retained 0-25% (5.6%)

The most common raw material observed across the artefact assemblage was silcrete (n=12; 66.7%), followed by indurated mudstone/tuff (IMT) (n=5; 27.8%). Amongst the silcrete artefacts, the raw material varied between a fine-grained silcrete (n=8; 44.4%) and a medium-grained silcrete (n=4; 22.2%).

Overall these results support the predictive model developed for the Subject Area and the wider region more broadly, which predicted that small, low-density background scatters are likely to be present given the landform and proximity to Lochinvar Creek. This site type is representative of the most common site type for the region – a low density artefact scatter, indicative of short-term occupation of the landscape and consistent with general background scatter associated with transitory movement (see Kuskie and Kamminga 2000) during the mid-to-late Holocene. The raw material composition (i.e. silcrete and IMT dominant) in addition to the assemblage technological component (i.e. dominated by unretouched flakes and broken flakes) are typical of the local region.



11. Scientific values and significance assessment

11.1 Assessment framework

The Burra Charter (Australia ICOMOS, 2013) defines the basic principles and procedures to be observed in the conservation of important places. It provides the primary framework within which decisions about the management of heritage sites in Australia should be made. The Burra Charter defines cultural significance as being derived from the following values summarised in Table 11 below.

Table 11: Values as outlined by the Burra Charter

Value type	Description
Aesthetic Value	Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.
Historic Value	Historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. 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 <i>in-situ</i> , or where the setting are substantially intact, than where it has been changed or evidence does not survive. However, some events or association may be so important that the place retains significance regardless of subsequent treatment.
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 (conservation value), and on the degree to which the place may contribute further substantial information.
Social 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 and individuals can experience a sense of loss should a place of social or cultural value be damaged or destroyed.

The NSW Aboriginal cultural heritage regulatory framework supports the significance assessment of Aboriginal archaeological sites and provides guidelines for this salvage report within the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011). The guide outlines two main themes in the overall Aboriginal cultural heritage significance assessment process namely, the identification of the cultural/social significance of Aboriginal objects and/or places to Aboriginal people and the identification of the scientific (archaeological) significance to the scientific/research community. These themes encapsulate those aspects of the Burra Charter that are of relevance to Aboriginal objects and places.

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

This approach encapsulates those aspects of the Burra Charter that are relevant to Aboriginal archaeological sites. The guidelines specify the following criteria for archaeological significance, as paraphrased in Table 12.

Table 12: Criteria specified for archaeological significance

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

11.2 Assessment of archaeological significance

The overall archaeological value of PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is considered low. Assessment of each of the criteria for archaeological (scientific) value is presented below.

11.2.1 Research potential

Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is one of the most common Aboriginal cultural heritage site types within the Hunter Valley region consisting of a low-density sub-surface artefact scatter indicative of short-term occupation of the landscape and consistent with general background scatter associated with transitory movement (see Kuskie and Kamminga 2000) during the mid-to-late Holocene. The raw material composition (i.e. silcrete and IMT dominant) in addition to the assemblage technological component (i.e. dominated by unretouched flakes and broken flakes) are typical of such assemblages in the local region. Given the low density of the sub-surface artefact assemblage, the time and economic cost of recovering a significant sample size from the site is unviable when considered against potential gains. The assemblage is notable, however, for preserving a relatively high proportion of artefacts with use-wear (27.8% of artefacts are recorded as being associated with use-wear). While the presence of use-wear typically contributes to the research potential of a site due to its ability to potentially address questions relating to artefact use through use-wear and/or residue analyses and the types of behaviour that occurred on-site, the over-all low number of artefacts in the assemblage means that the sample of artefacts with use-wear is relatively low (n=5). Evidence for disturbance, the shallowness of the soil profile and the lack of culturally derived charcoal/hearths limits the dating potential of the site, and thus reduced the overall research potential of the site.

Based on this assessment Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is assessed as being of **low research potential values**.

11.2.2 Representativeness and rarity

Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219). Is representative of one of the most frequent Aboriginal cultural heritage site types (i.e. an Open Camp Site comprising of low-density background scatter) in the region. This site type and the patterning of raw materials and artefact types is common within the region. The site does not present any differing or additional representative values of its material or site class type. The large number of these site types that are still present within similar landscape contexts, though potentially associated with higher numbers of artefacts means that the current site is not rare or unique in terms of its general composition and density.

Based on this assessment Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is assessed as being of **low representativeness and rarity value**.

11.2.3 Education potential

Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) does not contain any surface expressions of artefacts. The results of test excavations revealed a low-density sub-surface assemblage of artefacts. This excavated assemblage, however, lacks any significant component of formal tool types with only a single backed artefact identified and not additional retouch artefact reported. Other than the presence of one core, no additional evidence for the on-site manufacture of artefacts was identified. Overall, there is little value in the recovered Aboriginal objects to demonstrate aspects of the technical production of artefact types, or the material manifestation of different forms of landscape utilisation and past behaviour.

Based on this assessment, Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is considered to have **low educational values**.

11.2.4 Aesthetic

The Subject Area, including location of Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219), has been heavily modified through the clearing of vegetation, its use for grazing and from

periodic flooding events resulting in the accumulation and erosion of soils. The Subject Area is situated on alluvial flats within the Lochinvar Creek Catchment and Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is positioned on flat ground approximately 50 m east from the incised creekbank of Lochinvar Creek. The Subject Area does not contain any prominent elevated landforms or features that would have been focal points within the broader landscape that would have attracted intensive occupation. Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is not associated with any surface artefacts and does not contain any salient features or identifiable values that would represent any significant aesthetic values.

Based on this assessment, Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) is considered to have **low aesthetic significance values**.

11.3 Draft assessment of cultural significance

Heritage NSW emphasises the importance of considering cultural landscapes when determining and assessing Aboriginal cultural values. The reason for this is that *‘For Aboriginal people, the significance of individual 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’* (DECCW 2010).

No information related to the cultural importance of the site to local Aboriginal communities was noted during the original recording of the site. The archaeological investigations within the Subject Area have resulted in the identification of a low density of Aboriginal archaeological material in a sub-surface context adjacent to Lochinvar Creek. This material is indicative of short-term occupation and transient movement through the landscape during the mid-to-late Holocene. The low number of artefacts recovered from most test pits is consistent with general background scatter.

Despite the transient nature of the behaviour likely responsible for the low-density assemblage, Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) holds high cultural significance to the local Aboriginal community. The stone artefacts recovered from the site during the test excavation program are valued for providing a tangible link to the past. This sentiment is reflected in a statement received from RAP group Yinarr Cultural Services who explained that:

“In general all areas that are to be surveyed and impacted on are highly significant and sacred to our people within the community; our descendants not only travelled through these various areas but are still in the area today with many paintings and stories that have been handed down.” (Correspondence from Yinarr Cultural Services dated 7 June 2022).

This assessment of cultural significance is consistent with the contemporary view held by Aboriginal people that all Aboriginal objects and sites are important within the region due to their interconnectivity with the natural landscape and past occupation of the region.

This draft statement of cultural significance will be updated following the completion of Stage 4 of the consultation process and will consider any additional information relating to the cultural significance of the Subject Area including Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219).

12. Impact assessment

12.1 Potential for harm to Aboriginal heritage sites

The Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) requires that both direct and indirect harm to Aboriginal objects and Aboriginal places be considered. Generally, direct harm refers to occasions where an activity physically impacts a site or objects and therefore affects the heritage values possessed by the site or objects (e.g. disturbance of the ground surface or soil units in areas where known Aboriginal objects exist or in areas that require further investigation to confirm the presence or absence of Aboriginal objects or cultural value). Indirect harm is usually taken to mean harm stemming from secondary consequences of the activity and may affect sites or objects as an indirect consequence of the activity. Examples of such indirect harm are increased visitors to a site, or increased erosion in an area as a result of an activity.

Table 13: Impact assessment summary

Site name	Type of harm (Direct/Indirect/None)	Degree of harm (Total/Partial/None)	Consequence of harm
PAD 2 Lochinvar URA (AHIMS # 37-6-2219)	Direct disturbance from activities associated with the subdivision and future development of the area.	Total harm.	Total loss of value

13. Management and mitigation measures

The proposed development, which involves the Torrens title subdivision of the Subject Area to create 96 Allotments to allow for the future residential development of the Subject Area, including the construction housing, roads and associated infrastructure, would directly impact the soil profile of the entire Subject Area.

In its current layout, the proposed subdivision and development of the Subject Area (including future activities undertaken as a result of the subdivision) would harm the following Aboriginal site:

- PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219)

An Aboriginal Heritage Impact Permit (AHIP) will be required to undertake the proposed activity as it would result in harm to Aboriginal objects.

Management measures are warranted to mitigate the loss of value to the Aboriginal sites that would result from the proposed subdivision and development activities. Management and mitigation measures are required to ensure continued compliance with the *National Parks and Wildlife Act 1974*.

Consideration and discussion of management and mitigation options is provided in Table 14.

Given the low conservation and research value of the identified Aboriginal site, the application for an AHIP to consent to destroy is considered to be appropriate, and the completion of this ACHA and the test excavation program undertaken as part of this, are considered to be sufficient mitigation in this case.

Table 14: Consideration of management and mitigation strategies

Management Risk / Impacted Value	Strategies considered	Response
Management Risk - Compliance	AHIP	<ul style="list-style-type: none"> An AHIP will be required to undertake the proposed activity as it will result in harm to Aboriginal objects.
Management Risk - Compliance	Entering into a Care and Control Agreement with the Registered Aboriginal Parties to determine the keeping place of Aboriginal objects collected during the Archaeological assessments undertaken as part of the AHCA and reported on in this AR	<p>Long term storage and care of Aboriginal Objects recovered during the ACHA is required under S.89 of the <i>National Parks and Wildlife Act 1974</i> through a Care and Control Agreement.</p> <ul style="list-style-type: none"> Provision should be made to return Aboriginal objects to RAPs entitled to, and willing to accept possession, custody or control of the Aboriginal object in accordance with Aboriginal tradition.
Management Risk - Compliance	Completion of Aboriginal Site Impact Recording Forms	<ul style="list-style-type: none"> An Aboriginal site impact recording forms (ASIFS) will need to be completed and submitted to the AHIMS register for PAD 2 Lochinvar URA (AHIMS # 37-6-2219) when harm has occurred as a result of the proposed activity under any future AHIP.
Management Risk – Compliance and Unexpected Finds (excluding human remains)	Communication to employees, site visitors, contractors and landowners	<ul style="list-style-type: none"> All workers should be inducted into the Subject Area, so they are made aware of their obligations under the <i>National Parks and Wildlife Act 1974</i> and any conditions of any future AHIP prior and during and after construction activities.
Management Risk – Unexpected Finds – human remains	Stop work and follow procedure for discovery of suspected human remains	<ul style="list-style-type: none"> All workers should be inducted into the Subject Area, so they are made aware of their obligations under the <i>National Parks and Wildlife Act 1974</i> and any conditions of any future AHIP prior and during and after construction activities. In the unlikely event that suspected human remains are encountered during construction, all work in the area that may cause further impact, must cease immediately. The location, including a 20 m curtilage, should be secured using barrier fencing to avoid further harm. The NSW Police must be contacted immediately. No further action is to be undertaken until the NSW Police provide written notification to NewPro 27. If the skeletal remains are identified as Aboriginal, NewPro 27 or their agent must contact: <ul style="list-style-type: none"> the Heritage NSW’s Enviroline on 131 555; and Representatives of the RAPs. No works are to continue until Heritage NSW provides written notification to the proponent or their Agent.

Management Risk / Impacted Value	Strategies considered	Response
Impacted Cultural/ Education Value	Avoidance/Conservation	<ul style="list-style-type: none"> Considering the low educational value of the identified Aboriginal site PAD 2 Lochinvar URA (AHIMS # 37-6-2219) and its similarity to several other sites within the Hunter Region, complete avoidance as a management option is unjustified and unfeasible.
	Ongoing consultation	<ul style="list-style-type: none"> Registered Aboriginal Parties should continue to be consulted in accordance with the guidelines and any conditions of future AHIPs.
Impacted Scientific (archaeological) / Research Value	Avoidance/Conservation	<ul style="list-style-type: none"> Considering the low conservation and scientific/ research value of the identified Aboriginal site PAD 2 Lochinvar URA (AHIMS # 37-6-2219), and its similarity to several other sites within the Hunter Region, complete avoidance as a management option is unjustified and unfeasible.
	Subsurface salvage	<ul style="list-style-type: none"> Subsurface salvage collection was considered as a management option to mitigate impacts to research values but was not adopted due to the low artefact count (n=18) and the low research value of the deposit.
Impacted Representativeness/ Conservation Value	Avoidance/Conservation	<ul style="list-style-type: none"> Considering the low conservation and representative value of the identified Aboriginal site PAD 2 Lochinvar URA (AHIMS # 37-6-2219), and its similarity to several other sites within the Hunter Region avoidance as a management option is unjustified and unfeasible.
	Subsurface salvage	<ul style="list-style-type: none"> Subsurface salvage was considered as a management option to mitigate impact to conservation values but was not adopted due to the low artefact count (n=18), low research, scientific and education value and high number of similar representative Aboriginal objects from similar settings in Keeping Places and Museums.
Impacted Aesthetic Value	Avoidance/Conservation	<ul style="list-style-type: none"> PAD 2 Lochinvar URA (AHIMS # 37-6-2219) is considered to have low aesthetic values, however, RAPs commented on the beauty of the country during test excavations. The site is similar to several other sites within the Hunter Region and avoidance as a management option is unjustified and unfeasible.
	Sub-surface salvage collection	<ul style="list-style-type: none"> Subsurface salvage collection was considered as a management option to mitigate impacts to conservation of aesthetic values but not adopted as there are several other similar sites in the Hunter Region and this PAD is disturbed.
Impacted Conservation value – rarity/ threatened resource	Avoidance/Conservation	<ul style="list-style-type: none"> The conservation and rarity value of the identified Aboriginal PAD 2 Lochinvar URA (AHIMS # 37-6-2219) is low as it is similar to several other sites within the Hunter Region. Avoidance as a management option is unjustified and unfeasible.
	Sub-surface salvage collection	<ul style="list-style-type: none"> Subsurface salvage collection was considered as a management option to mitigate impacts to conservation values of a threatened resource but not adopted on the grounds that the archaeological deposits within the Subject Area are not a rare and are disturbed.

14. Conclusions and recommendations

Part 6 of the *National Parks and Wildlife Act (1974)* provides protection for all Aboriginal objects and declared Aboriginal places from harm. Harm is defined as destroying, defacing, damaging or moving an object from the land. An Aboriginal Heritage Impact Permit (AHIP) is a legal document that grants you permission to harm Aboriginal objects or declared Aboriginal places and sets out any conditions you must comply with. An AHIP is required to disturb any Aboriginal objects or places.

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

Table 15: Recommendations

Recommendations	
Aboriginal Heritage Impact Permit	
1.	<p>The Proponent should continue to consult with the RAPs in regard to the Project in accordance with the <i>Aboriginal cultural heritage consultation requirements for proponents 2010</i> and in accordance with any conditions of any future AHIPs.</p> <p>Consultation may include, but is not limited to:</p> <ul style="list-style-type: none"> • Finalisation of ACHA • Long-term storage/reburial of any material recovered during excavations • Any AHIP application/s • Unexpected finds <p>Project updates should be sent to all RAPs every 6 months at a minimum to ensure the consultation associated with this ACHA remains active and can be used to support any future AHIP application/s.</p>
2.	An application for an Aboriginal Heritage Impact Permit (AHIP) inclusive of the Subject Area and AHIMS ID#37-6-2219 will be required to undertake the proposed activity as it will result in harm to Aboriginal Objects.
3.	A Care and Control Agreement will be required with the Registered Aboriginal Parties to determine the keeping place of Aboriginal sites identified within the Subject Area.
General	
4.	All workers and contractors associated with the residential subdivision and future development of the Subject Area should be inducted, so they are made aware of their obligations under the <i>National Parks and Wildlife Act 1974</i> and any conditions of any future AHIP prior to, during and after construction works.
5.	Site card information for the AHIMS registered Aboriginal cultural heritage site PAD 2 Lochinvar URA (AHIMS ID# 37-6-2219) should be updated in the AHIMS database with revised site descriptions. An Aboriginal Site Impact Recording Form (ASIRF) will be required to be submitted upon implementing any future AHIPs within the Subject Area.
6.	<p>In the unlikely event that suspected human remains are encountered during construction, all work in the area that may cause further impact, must cease immediately and:</p> <ul style="list-style-type: none"> • The location, including a 20 m curtilage, should be secured using barrier fencing to avoid further harm. • The NSW Police must be contacted immediately. • No further action is to be undertaken until the NSW Police provide written notification. • If the skeletal remains are identified as Aboriginal, the Proponent or their agent must contact: <ul style="list-style-type: none"> ▪ the Heritage NSW's Enviroline on 131 555 and representatives of the RAPs. ▪ No works are to continue until Heritage NSW provides written notification.

Recommendations

7.

The Proponent should not publicise the location of Aboriginal cultural heritage sites or other cultural information without prior consent from the Aboriginal community. This includes the public distribution of any mapping, AHIMS data and/or cultural information contained within this report.

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Annex 1: AHIMS extensive search

Annex 2: AHIMS site cards

Annex 3: Artefact Data

This Annex provides the data compiled for artefacts recovered during the test excavation program at PAD 2 Lochinvar URA (AHIMS # 37-6-2219).

ID	Pit	Spit	Depth (cm)	Material	Colour	Data class	Completeness	Termination	Cortex	Cortex type	L (mm)	W (mm)	Th (mm)	Notes
1	8	2	10-20	MED SILCRETE	RED	SPLITL FLAKE	BROKEN	HINGE	0%	N/A	34.5	29.3	8.8	Usewear along left margin and distal termination
2	5	2	10-20	FINE SILCRETE	RED	FLAKE	COMPLETE	HINGE	0%	N/A	21.9	25.9	6.4	Usewear on distal margin
3	10	1	0-10	MED SILCRETE	REF	CORE	COMPLETE	N/A	25-50%	WATER-ROLLED	29.4	22.71	20.6	
4	10	2	10-20	FINE SILCRETE	RED	ANGULAR	FRAGMENT	N/A	0%	N/A	25.5	29.6	0.43	
5	11	3	20-30	MUDSTONE	YELLOW	DEBRIS	FRAGMENT	N/A	0%	N/A	11.9	8	1.2	
6	11	3	20-30	MUDSTONE	YELLOW	ANGULAR	FRAGMENT	N/A	25-50%	ROUGH	29	16.3	56	
7	12	2	10-20	IMT	YELLOW	PROXIMAL	BROKEN	N/A	0%	N/A	22.6	13.6	6.4	
8	12	2	10-20	FINE SILCRETE	PINK	DISTAL	BROKEN	FEATHER	0%	N/A	21.2	13.9	5.3	
9	12	2	10-20	FINE SILCRETE	PINK	FLAKE	COMPLETE	FEATHER	0%	N/A	16.67	16.33	4.6	Flaked (snap) on lateral margin. Usewear on lateral margin
10	12	2	10-20	FINE SILCRETE	GREY	ANGULAR	FRAGMENT	N/A	0%	N/A	13.5	5.1	1.1	
11	12	2	10-20	FINE SILCRETE	GREY	MEDIAL FLAKE	BROKEN	N/A	0%	N/A	11.8	11.4	2	
12	12	2	10-20	FINE SILCRETE	GREY	PROXIMAL FLAKE	BROKEN	N/A	0%	N/A	5.8	7.5	0.38	Snapped termination. Flaking on right dorsal lateral

ID	Pit	Spit	Depth (cm)	Material	Colour	Data class	Completeness	Termination	Cortex	Cortex type	L (mm)	W (mm)	Th (mm)	Notes
														margin. Crushed platform
1 3	6	1	0-10	MED SILCRETE	RED	FLAKE	COMPLETE	PLUNGE	0-25%	ROUGH	29.6	26.3	9	Flaked plain platform with cortex at termination. Large cobble inclusion
1 4	6	1	0-10	MED SILCRETE	RED	FLAKE	COMPLETE	FEATHER	0%	N/A	20.3			
1 5	15	2	10-20	FINE SILCRETE	YELLOW	FLAKE	COMPLETE	HINGE	0%	N/A	48.1			Backing on dorsal side. Usewear on left lateral margin
1 6	15	2	10-20	IMT	YELLOW	ANGULAR	FRAGMENT	N/A	0%	N/A	15			
1 7	13	1	0-10	IMT	YELLOW	FLAKE	COMPLETE	FEATHER (SNAP)	0%	N/A	26.39			Usewear on lateral margin. Snaped termination. Small errailure scar on bulb

Annex 4: Test excavation data

This Annex provides the data compiled as part of the test excavation program at PAD 2 Lochinvar URA (AHIMS # 37-6-2219).

Test Pit 1 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 16: Test Pit 1 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown silty clay	Friable	Roots and grass, charcoal fragments	No artefacts.
2	10	20	Dark brown silty clay	Firm	Roots, charcoal fragments and gravel	No artefacts.
3	20	30	Dark yellowish brown silty clay transitioning to compact clay	Firm/compact	Some small grass roots, gravel	No artefacts. Excavation eased due to sterile clay base.



Plate 8: General location photo of test pit 1



Plate 9: End of excavation of test pit 1



Plate 10: Photo of northern wall section of test pit 1

Test Pit 2 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 17: Test Pit 2 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown loamy topsoil with small pedal clay inclusions	Loose	Roots, grass, gravels <2%, charcoal flecks and orange clay	No artefacts.
2	10	20	Dark brown loamy soil with clay inclusions transitioning to brown sandy clay loam	Friable	Roots, charcoal flecks and orange clay	No artefacts.
3	20	30	Brown clay loam transitioning to compacted reddish brown loamy clay	Firm/ compact	Roots, small charcoal flecks and ironstone gravel	No artefacts. Excavation eased due to sterile clay base.



Plate 11: General location photo of test pit 2



Plate 12: End of excavation of test pit 2



Plate 13: Photo of northern wall section of test pit 2

Test Pit 3 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 18: Test Pit 3 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown loamy topsoil	Loose	Roots, charcoal flecks	No artefacts.
2	10	20	Transition into yellowish brown mottled loamy clay	Friable	Roots, charcoal flecks	No artefacts.
3	20	28	Compacted yellow mottled loamy clay transitioning to yellow clay	Compact	Rootlets	No artefacts. Excavation eased due to sterile clay base.

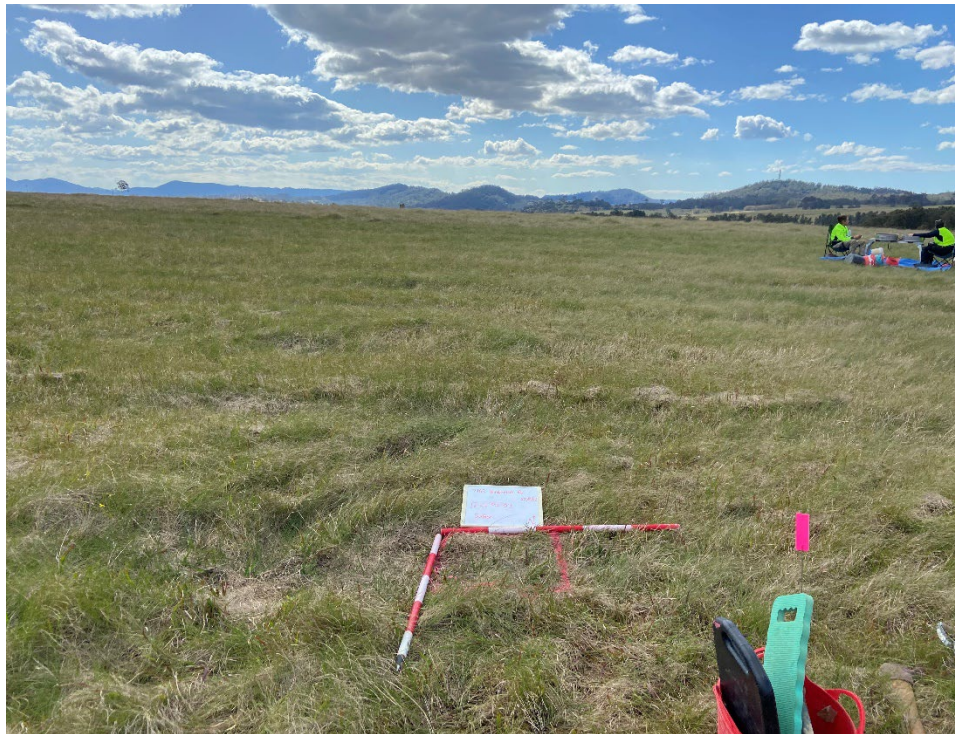


Plate 14: General location photo of test pit 3



Plate 15: End of excavation of test pit 3



Plate 16: Photo of northern wall section of test pit 3

Test Pit 4 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 19: Test Pit 4 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown mottled silty clay	Firm	Roots, charcoal flecks	No artefacts.
2	10	20	Dark brown mottled silty clay	Compact	Roots	No artefacts.
3	20	30	Dark brown mottled silty clay	Compact	Roots, subangular gravels (<30%)	No artefacts. Excavation eased due to sterile clay.



Plate 17: General location photo of test pit 4



Plate 18: End of excavation of test pit 4



Plate 19: Photo of northern wall section of test pit 4

Test Pit 5 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 20: Test Pit 5 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown mottled silty clay	Firm	Roots, worms, gravels	No artefacts.
2	10	20	Dark brown mottled silty clay	Compact	Roots	Complete red silcrete flake. Excavation eased due to sterile clay.



Plate 20: General location photo of test pit 5



Plate 21: End of excavation of test pit 5



Plate 22: Photo of northern wall section of test pit 5

Test Pit 6 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 21: Test Pit 6 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown loamy topsoil with small clay inclusions at base	Loose	Roots, clay balls (1-2mm)	Two red silcrete complete flakes.
2	10	20	Dark brown friable sandy clay loam transitioning to a yellowish-brown sandy clay	Firm	Roots, clay balls (1-2mm)	No artefacts.
3	20	24	Yellow brown sandy clay with higher clay content in NE corner	Compact	Rootlets	No artefacts. Excavation eased due to sterile clay.



Plate 23: General location photo of test pit 6



Plate 24: End of excavation of test pit 6



Plate 25: Photo of northern wall section of test pit 6

Test Pit 7 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 22: Test Pit 7 summary

X U	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes/ Inclusions
1	0	10	Dark brown loamy topsoil	Loose	Roots, ironstone gravel, worms	No artefacts.
2	10	20	Transition from sandy clay loam to yellowish-brown sandy clay	Firm	Roots, ironstone gravels	No artefacts. Excavation ceased as sterile clay base reached.



Plate 26: General location photo of test pit 7



Plate 27: End of excavation of test pit 7



Plate 28: Photo of northern wall section of test pit 7

Test Pit 8 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 23: Test Pit 8 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown silty clay	Compact	Roots, frequent gravels 1-5 mm	No artefacts.
2	10	20	Dark brown clay	Compact	High root content, ants, gravels (<5%)	Broken red split flake.
3	20	29	Dark brown to yellowish-brown clay	Compact	Small rootlets, gravels (<2%)	No artefacts. Excavation ceased as sterile clay base reached.



Plate 29: General location photo of test pit 8



Plate 30: End of excavation of test pit 8



Plate 31: Photo of northern wall section of test pit 8

Test Pit 9 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 24: Test Pit 9 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown sandy loamy topsoil, transitioning to yellow mottled sandy clay	Loose	Roots	No artefacts.
2	10	18	Dark brown sandy loam, transitioning to firm yellow sandy clay	Firm	Roots	No artefacts. Excavation ceased as sterile clay base reached.



Plate 32: General location photo of test pit 9



Plate 33: End of excavation of test pit 9



Plate 34: Photo of northern wall section of test pit 9

Test Pit 10 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 25: Test Pit 10 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown sandy loamy topsoil	Loose	Roots, charcoal fragments	Complete red silcrete core.
2	10	20	Light brown sandy loam transitioning to yellowish-brown sandy clay loam	Friable	Roots, charcoal fragments	Red silcrete angular fragment.
3	20	23	Compacted yellowish-brown sandy clay	Compact	Roots	No artefacts. Excavation ceased as sterile clay base reached.

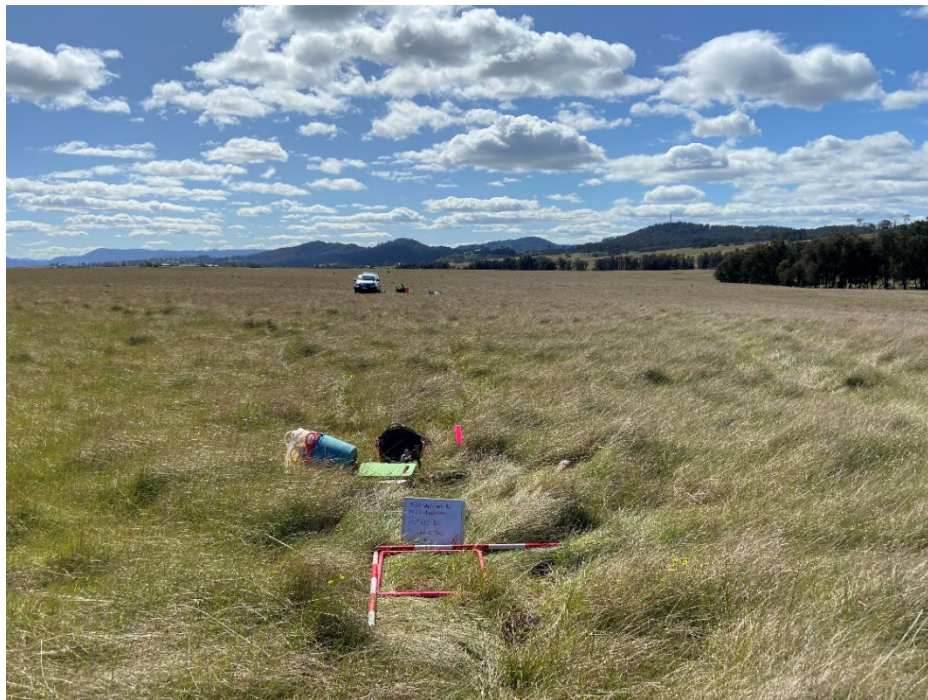


Plate 35: General location photo of test pit 10



Plate 36: End of excavation of test pit 10



Plate 37: Photo of northern wall section of test pit 10

Test Pit 11 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 26: Test Pit 11 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown sandy loamy topsoil	Loose	Roots	No artefacts.
2	10	20	Brown sandy loam with patches of degraded stone/clay	Friable	Roots, charcoal flecks	No artefacts.
3	20	30	Transition to yellow alluvial sand	Firm	Roots, small gravels (10%)	One yellow mudstone debris fragment and one yellow mudstone angular fragment.
4	30	37	Transition to firm yellowish-brown sandy clay	Firm	Roots	No artefacts. Excavation ceased as sterile clay base reached.



Plate 38: General location photo of test pit 11



Plate 39: End of excavation of test pit 11



Plate 40: Photo of northern wall section of test pit 11

Test Pit 12 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 27: Test Pit 12 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown fine sandy clay with bright orange clay mottles	Compact	Roots, worms	No artefacts.
2	10	20	Dark brown fine sandy clay, mottled	Compact	Roots, worms	One yellow IMT broken proximal flake, one pink silcrete broken distal flake, one pink silcrete complete flake, one grey silcrete angular fragment, one grey silcrete broken medial flake, one grey silcrete broken proximal flake.
3	20	28	Yellowish-red clay	Compact	Roots	No artefacts. Excavation ceased as sterile clay base reached.



Plate 41: General location photo of test pit 12



Plate 42: End of excavation of test pit 12



Plate 43: Photo of eastern wall section of test pit 12

Test Pit 13 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 28: Test Pit 13 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown sandy topsoil, transitioning to lighter-brown sandy clay loam	Loose	Roots, worms	One yellow IMT complete flake.
2	10	15	Transition to light-brown compact sandy clay with some yellow mottling	Compact	Roots	No artefacts. Excavation ceased as sterile clay reached.



Plate 44: General location photo of test pit 13



Plate 45: End of excavation of test pit 13



Plate 46: Photo of northern wall section of test pit 13

Test Pit 14 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 29: Test Pit 14 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown clay	Compact	Roots, worms	No artefacts.
2	10	15	Lighter slightly yellowish-brown clay	Compact	Roots, worms	No artefacts. Excavation ceased as sterile clay reached.



Plate 47: General location photo of test pit 14



Plate 48: End of excavation of test pit 14



Plate 49: Photo of northern wall section of test pit 14

Test Pit 15 – PAD 2 Lochinvar URA (AHIMS # 37-6-2219)

Table 30: Test Pit 15 summary

XU	Start depth (cm)	End depth (cm)	Sediment description	Sediment consistency	Inclusions / Disturbance	Notes / Inclusions
1	0	10	Dark brown fine sandy clay with orange mottling	Compact	Roots, charcoal flecks	No artefacts.
2	10	20	Dark brown fine sandy clay with orange mottling transitioning to dark yellowish-brown clay	Compact	Roots	One yellow silcrete complete flake and one yellow IMT angular fragment.
3	20	28	Dark yellowish-brown clay	Compact	Roots, charcoal flecks	No artefacts. Excavation ceased as sterile clay reached.



Plate 50: General location photo of test pit 15

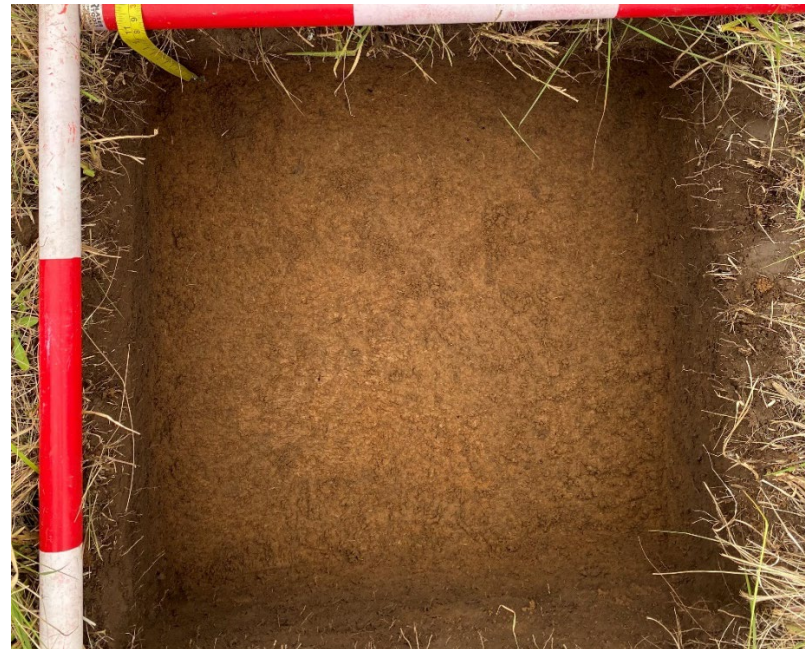


Plate 51: End of excavation of test pit 15



Plate 52: Photo of northern wall section of test pit 15

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Wildlife Schools and training

Heritage management

Aboriginal heritage

Historical heritage

Conservation management

Community consultation

Archaeological, built and landscape values

Environmental management and approvals

Impact assessments

Development and activity approvals

Rehabilitation

Stakeholder consultation and facilitation

Project management

Biodiversity offsetting

Offset strategy and assessment (NSW, QLD, Commonwealth)

Accredited BAM assessors (NSW)

Biodiversity Stewardship Site Agreements (NSW)

Offset site establishment and management

Offset brokerage

Advanced Offset establishment (QLD)