Mamre South Precinct State Significant Development:

Aboriginal cultural heritage assessment report

FINAL REPORT

Prepared for Altis Property Partners and Frasers Property Industrial Constructions

28 March 2019

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Document information

Report to:	Altis Property Partners and Frasers Property Industrial Constructions
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Biosis project no.:	29083
File name:	29083.Mamre.South.SSD.ACHA.FIN01.20190328

Citation: Biosis (2019). Mamre South Precinct State Significant Development: Aboriginal cultural heritage assessment report. Report for Altis Property Partners and Frasers Property Industrial Constructions. Authors: A Vella and A Keevers-Eastman, Biosis Pty Ltd, Newcastle. Project no. 29083

Document control

Version	Internal reviewer	Date issued
Draft version 01	Dr Amanda Markham	26/02/2019
Draft version 01	James Cole	26/02/2019
Final version 01	James Cole	28/03/2019

Acknowledgements

Biosis gratefully acknowledges the contributions of the following people and organisations (listed alphabetically) in preparing this report:

- Altis Property Partners: Stephen O'Connor
- Frasers Property: Paul Solomon
- Deerubbin Local Aboriginal Land Council: Steve Randall.

Biosis staff involved in this project were:

- Matthew Smith (artefact analysis)
- Anne Murray (mapping).

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Glossary

ACHA	Aboriginal Cultural Heritage Assessment
AHIMS	Aboriginal Heritage Information Management System
CHMP	Cultural Heritage Management Plan
DA	Determining Authority
DECCW	Department of Environment, Climate Change and Water (now OEH)
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
ICOMOS	International Council on Monuments and Sites
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
NNTT	National Native Title Tribunal
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NTSCORP	Native Title Services Corporation
OEH	NSW Office of Environment and Heritage
RAPs	Registered Aboriginal Parties
SSD	State Significant Development
SEPP	State Environmental Planning Policy

Summary

Biosis Pty Ltd was commissioned by Altis Property Partners and Frasers Property Industrial Constructions to undertake an ACHA for the proposed SSD at 657-769 Mamre Road, Kemps Creek, NSW (Figure 1). This ACHA includes the details of the investigation, Aboriginal community consultation, and the assessment of Aboriginal cultural heritage undertaken for the purpose of this assessment. This assessment will support an application to the Department of Planning and the Environment (DPE) for an SSD approval (SSD 9522), and will be included within the within the Specialist Consultant Studies Compendium that is to accompany an EIS.

A search of the Aboriginal Heritage Information Management System (AHIMS) database identified seven Aboriginal cultural heritage sites registered upon the AHIMS register, within the study area; however, three of these sites (EPTA3 AHIMS45-5-3028, EPTA10 AHIMS45-5-3032 and EPTA11 AHIMS45-5-3033) have been incorrectly mapped on AHIMS and are actually located outside of the study area.

Consultation

The Aboriginal community was consulted regarding the heritage management of the project throughout its lifespan. Consultation has been undertaken as per the process outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a) (consultation requirements). The appropriate government bodies were notified and advertisements placed in the Western Weekender newspaper (19 October 2018), which resulted in the following Aboriginal organisations registering their interest in the project (Table 1):

Table 1 List of registered Aboriginal parties and group contact

Organisation	Contact person
Aboriginal Archaeological Service Inc	Andrew Williams
Barking Owl Aboriginal Corporation	Jody Kulakowski
Barraby Cultural Services	Lee Field
Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson
Darug Aboriginal Land Care	Desmond Dyer
Darug Boorooberongal Elders Aboriginal Corporation	Uncle Gordon Workman
Darug Custodian Aboriginal Corporation	Justine Coplin
Darug Land Observations	Anna Workman
Deerubbin Local Aboriginal Land Council	Steven Randall
Didge Ngunawal Clan	Lilly Carrol and Paul Boyd
Gulaga	Wendy Smith
Kamilaroi-Yankuntjatjara Working Group	Phil Khan
Kawul Cultural Services	Vicky Slater
Muragadi Heritage Indigenous Corporation	Jesse Johnson
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson

Organisation	Contact person
Tocomwall	Scott Franks
Wurrumay Consultancy	Kerry Slater
Yulay Cultural Services	Arika Jalomaki
Yurrandaali Cultural Services	Bo Field

A search conducted by the Office of the Registrar, *Aboriginal Land Rights Act 1983* did not identify Aboriginal Owners with land within the study area. A search conducted by the NNTT listed no Registered Native Title Claims, or Unregistered Claimant Applications; however they did identify one registered Indigenous Land Use Agreement:

- Gundungurra Area Agreement (ID: N2014/001)

This Registered Aboriginal Land Use Agreement was found to be outside of the proposed study area.

The NSW Native Title Services Corporation Limited (NTSCORP Limited) did not provide a list of names of Aboriginal people or organisations which may have an interest in the proposed development. It was advised, however, that NTSCORP had forwarded the notification onto relevant groups, individuals and organisations which may hold cultural knowledge pertaining to the study area.

Upon registration, Aboriginal parties were invited to provide their knowledge on the study area and comment upon the test excavation and assessment methodology. The responses did not comment on the values of the area but did provide comment on the proposed methodology, with Aboriginal Archaeology Service Inc., Barraby, Yulay, Didge Ngunawal, Darug Land Care and Murra Bidgee Mullangar all agreeing with the methodology. Responses from the Registered Aboriginal Parties (RAPs) are included in Appendix 3.

Site officers from Deerubbin Local Aboriginal Land Council, Didge Ngunawal and Darug Custodian Aboriginal Corporation participated in the test excavation program and did not provide comment on the study area with regard to the proposal.

The outcome of the consultation process was that the RAPs considered the study area to have a high level of cultural significance, although that significance was not clearly defined and specific examples were not provided. The results of the consultation process are included in this document.

Results

The ACHA assessment undertook background research for the proposed study area. Key considerations arising from the background research include:

- Artefact and PAD sites are the most likely site types to occur within the study area.
- Artefact assemblages of both surface and subsurface deposits are likely to be dominated by silcrete according to regional and local studies
- Due to the prevalent presence of fluvial soils and alluvial landforms throughout the extent of the study area, artefact sites have the potential to be widely dispersed due to flooding and deposition activities associated with the South Creek soil landscape and the formation of alluvial landforms with close proximity to South Creek
- Topsoil deposits also have the potential to and may have been subject to ploughing up to approximately 300 millimetres in depth.

Biosis undertook a field survey and subsurface test excavations in the study rea which identified nine Aboriginal heritage sites within the study area (Table 2). One of these sites consisted of a surface and subsurface artefact scatter on a high point within the gentle slope landform. A total of 666 artefacts were recovered from test excavations at this site and included a number of complete and broken tools including backed geometric microliths and Bondi points. This site (MSP-02) had a high density and contains artefacts types that are uncommon in the region and is of high scientific significance. Table 2 below also provides site specific recommendations for MSP-02.

Table 2 Site details

Site name	Site type	Significance	Type of harm before mitigated	Consequence of unmitigated harm	Consequence of mitigated harm	Site specific recommendations
MSP-01 (AHIMS 45-5-5187)	Artefact	Low	Direct	Complete loss of value	Impact cannot be avoided.	Surface salvage
MSP-02 (AHIMS 45-5-5188)	Artefact	High	Direct	Complete loss of value	Impact cannot be avoided.	Sub-surface salvage excavation and surface salvage
MSP-05 (AHIMS pending)	Artefact	Low	Direct	Complete loss of value	Impact cannot be avoided.	Destruction of site
MSP-06 (AHIMS pending)	Artefact	Low	Direct	Complete loss of value	Impact cannot be avoided.	Destruction of site
MSP-07 (AHIMS pending)	Artefact	Low	Direct	Complete loss of value	Impact cannot be avoided.	Surface salvage
MSP-08 (AHIMS pending)	Artefact	Low	Direct	Complete loss of value	Impact cannot be avoided.	Surface salvage
MSP-09 (AHIMS pending)	Artefact	Low	Direct	Complete loss of value	Impact cannot be avoided.	Destruction of site
MSP-10 (AHIMS pending)	Artefact	Low	Direct	Complete loss of value	Impact cannot be avoided.	Destruction of site
MSP-11 (AHIMS pending)	Artefact	Low	Direct	Complete loss of value	Impact cannot be avoided.	Destruction of site

Management recommendations

Strategies to manage impacts to heritage have been developed based on the archaeological (significance) of cultural heritage relevant to the project area and are influenced by:

- Predicted impacts to Aboriginal cultural heritage
- The planning approvals framework
- Current best conservation practise, widely considered to include:
  - Ethos of the Australia ICOMOS Burra Charter
  - The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b)

Prior to any impacts occurring within the project area and SSD Application Area, the following is recommended:

Recommendation 1: Further archaeological work in the form of surface salvage and salvage excavation at AHIMS site 45-5-5188/MSP-02 as a part of SSD approval

It is recommended that further archaeological work be conducted for AHIMS site 45-5-5188/MSP-02 in the form of salvage excavation to recover sub-surface artefacts which will be impacted as a part of the proposed development. This would be able to provide further information relating to the artefacts typology and material type, as well as the nature of the activities taking place at AHIMS site 45-5-5188/MSP-02. It is recommended that this be undertaken as a condition of the SSD approval. The salvage work for this particular area of the site would not hold up the development of the remaining areas of the estate.

Recommendation 2: Further archaeological work in the form of surface salvage AHIMS sites 45-5-5187/MSP-01, MSP-07 and MSP-08 as a part of SSD approval

It is recommended that further archaeological work be conducted for AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, MSP-07 and MSP-08 in the form of surface salvage to recover any surface artefacts which will be impacted as a part of the proposed development. It is recommended that surface salvage be undertaken as a condition of the SSD approval.

Recommendation 3: No further archaeological work is required for sites MSP-05, MSP-06, MSP-09, MSP-10 and MSP-11

It is recommended that no further archaeological investigation is required for Aboriginal sites MSP-05, MSP-06, MSP-09, MSP-10 and MSP-11 prior to development impacts.

Recommendation 4: Update AHIMS site cards for AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, and 45-5-5189/MSP-03 and lodge AHIMS site cards for newly identified sites MSP-05, MSP-06 and MSP-07, MSP-08, MSP-09, MSP-10, and MSP-11

It is recommended that the AHIMS site cards for previously identified AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, 45-5-5189/MSP-03 be updated to reflect the revised site descriptions following the test excavations discussed in this report.

It is also recommended that AHIMS site cards are prepared and lodged with AHIMS for newly identified sites MSP-05, MSP-06 and MSP-07, MSP-08, MSP-09, MSP-10 and that the site numbers be included in the final version of this report.

Recommendation 5: Preparation and lodgment of AHIMS site impact recording forms for 45-5-5187/MSP-01, 45-5-5188/MSP-02, 45-5-5189/MSP-03, MSP-05, MSP-06, MSP-07 and MSP-08, MSP-09, MSP-10 and MSP 11

It is recommended that AHIMS site impact recording forms are prepared and lodged with AHIMS for Aboriginal sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, 45-5-518/MSP-03, MSP-05, MSP-06, MSP-07 and MSP-

08 MSP-09, MSP-10 and MSP-11 within four months following completion of development impacts or as otherwise stated in SSD approval conditions.

Recommendation 6: Unexpected finds

Discovery of unanticipated Aboriginal objects

All Aboriginal objects and places are protected under the *National Parks and Wildlife Act 1974* (NPW Act). It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

Discovery of unanticipated historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977*. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Do not recommence work at that location unless authorised in writing by OEH.

1 Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Altis Property Partners and Frasers Property Industrial Constructions to undertake an ACHA for the proposed SSD at 657-769 Mamre Road, Kemps Creek, NSW (Figure 1). This ACHA includes the details of the investigation, Aboriginal community consultation, and the assessment of Aboriginal cultural heritage undertaken for the purpose of this assessment. This assessment will support an application to the Department of Planning and the Environment (DPE) for an SSD approval (SSD 9522), and will be included within the within the Specialist Consultant Studies Compendium that is to accompany an EIS.

This investigation has been carried out under Part 6 of the NPW Act. It has been undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) (the Code). The Code has been developed to support the process of investigating and assessing Aboriginal cultural heritage by specifying the minimum standards for archaeological investigation undertaken in NSW under the NPW Act. The archaeological investigation must be undertaken in accordance with the requirements of the Code

This assessment will be assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EP&A Act includes provisions for local government authorities to consider environmental impacts in land-use planning and decision making. Each Local Government Area (LGA) is required to create and maintain a Local Environmental Plan (LEP) that includes Aboriginal and historical heritage items. Local Councils identify items that are of significance within their LGA, and these items are listed on heritage schedules in the local LEP and are protected under the EP&A Act and *Heritage Act 1977.*

1.2 Study area

The study area is located immediately south of the Warragamba water pipeline, on the western side of Mamre Road, at 657-769 Mamre Road, Kemps Creek, NSW (Figure 1and Figure 2). The study area consists of five lots; Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

The study area is within the:

- Penrith City Council Local Government Area (LGA)
- Parish of Melville
- County of Cumberland.

1.3 Proposed development

This assessment has been formulated to assess impacts with regards to Aboriginal cultural heritage within the SSD application area (study area). The proposed development is for an industrial estate that will include earthworks and the development of industrial infrastructure. The study area will be subdivided into lots of 1 to 3 hectares and access to the new industrial estate will be provided via the new Southern Link Road, Bakers Lane, and from a new estate access road off Mamre Road, within the southern portion of the study area.

The proposed impacts for the industrial development will include vegetation clearance, demolition, bulk earthworks, subdivision, Construction of industrial infrastructure and buildings, and civil engineering works such as the construction of roads, stormwater drainages, sewer works, and water supply works.

The proposed works are shown in Figure 3.

1.4 Planning approvals

This assessment will support an SSD application to be assessed under Part 4 of the EP&A Act. In preparing this assessment, Biosis has taken into account the Secretary's Environmental Assessment Requirements (SEARs) for the project (SSD 9522) relating to Aboriginal heritage, specifically that the EIS must include:

> *An Aboriginal Cultural Heritage Assessment Report prepared in consultation with Aboriginal people and in accordance with Office of Environment and Heritage guidelines.*

Other relevant legislation and planning instruments that will inform this assessment include:

- NPW Act
- NSW *National Parks and Wildlife Amendment Act 2010*
- Infrastructure State Environmental Planning Policy 2007 (SEPP)
- Penrith Local Environmental Plan 2010 (LEP)
- Penrith Development Control Plan 2014 (DCP)
- State Environmental Planning Policy (Western Sydney Employment Area) 2009.

1.5 Restricted and confidential information

Appendix 1 in the Archaeological Report contains AHIMS information which is confidential and not to be made public. This is clearly marked on the title page for the Attachment.

1.6 Aboriginal cultural heritage

1.6.1 General description

It is generally accepted that Aboriginal people have inhabited the Australian landmass for the last 50,000 years (Allen & O'Connell 2003, Clarkson et al. 2015). Dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken. The timing for the human occupation of the Sydney Basin is still uncertain. In NSW, according to Bowler et al. (2003), Aboriginal people have occupied the land for over 42,000 years. However, preliminary evidence presented by Biosis (2018) from a subsurface testing program in north-western NSW suggests Aboriginal people may have occupied the semi-arid zone of the region for 52,500 years.

Without being part of the Aboriginal culture and the productions of this culture, it is not possible for non-Aboriginal people to fully understand the meaning of site, objects and places to Aboriginal people – only to move closer towards understanding this meaning with the help of the Aboriginal community. Similarly, definitions of Aboriginal culture and cultural heritage without this involvement constitute outsider interpretations.

With this preface Aboriginal cultural heritage broadly refers to things that relate to Aboriginal culture and hold cultural meaning and significance to Aboriginal people (DECCW 2010a, p.3). There is an understanding in Aboriginal culture that everything is interconnected. In essence Aboriginal cultural heritage can be viewed as potentially encompassing any part of the physical and/or mental landscape, that is, 'Country' (DECCW 2010a, p.iii).

Aboriginal people's interpretation of cultural value is based on their 'traditions, observance, lore, customs, beliefs and history' (DECCW 2010a, p.3). The things associated with Aboriginal cultural heritage are continually and actively being defined by Aboriginal people (DECCW 2010a, p.3). These things can be associated with traditional, historical or contemporary Aboriginal culture (DECCW 2010a, p.3).

1.6.2 Tangible Aboriginal cultural heritage

Three categories of tangible Aboriginal cultural heritage may be defined:

- Things that have been observably modified by Aboriginal people.
- Things that may have been modified by Aboriginal people but no discernible traces of that activity remain.
- Things never physically modified by Aboriginal people (but associated with Dreamtime Ancestors who shaped those things).

1.6.3 Intangible Aboriginal cultural heritage

Examples of intangible Aboriginal cultural heritage would include memories of stories and 'ways of doing', which would include language and ceremonies (DECCW 2010a, p.3).

1.6.4 Statutory

Currently Aboriginal cultural heritage, as statutorily defined by the NPW Act, consists of objects and places which are protected under Part 6 of the Act.

Aboriginal objects are defined as:

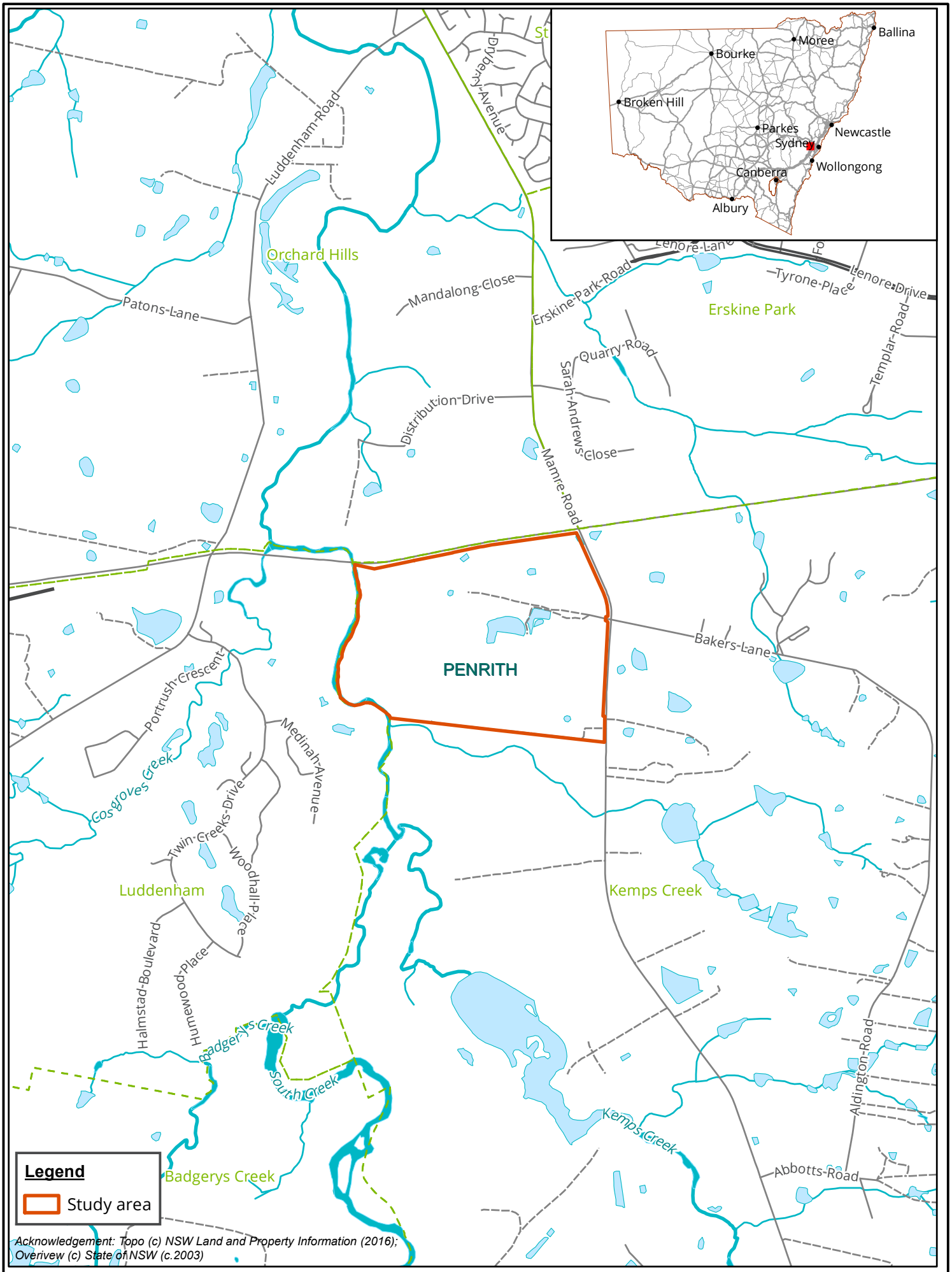
> *Any deposit, object or material evidence…relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains…*

Aboriginal places are defined as a place that is or was of special Aboriginal cultural significance. Places are declared under section 84 of the NPW Act.

1.6.5 Values

Aboriginal cultural heritage is valued by Aboriginal people as it is used to define their identity as both individuals and as part of a group (DECCW 2010a, p.iii). More specifically it is used:

- to provide a:
  - '*Connection and sense of belonging to Country*' (DECCW 2010a, p.iii).
  - Link between the present and the past (DECCW 2010a, p.iii).
- As a learning tool to teach Aboriginal culture to younger Aboriginal generations and the general public (DECCW 2010a, p.3).
- As further evidence of Aboriginal occupation prior to European settlement for people who do not understand the magnitude to which Aboriginal people occupied the continent (DECCW 2010a, p.3).



Acknowledgement: Topo (c) NSW Land and Property Information (2016); Overivew (c) State of NSW (c.2003)

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Figure 1: Location of the study area

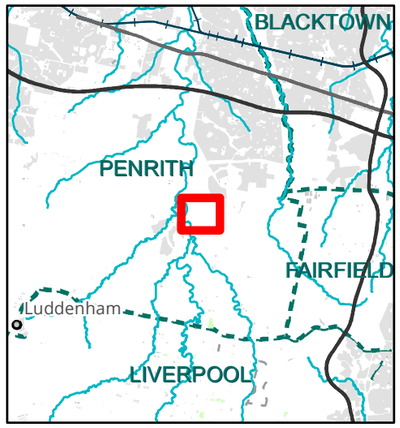
Matter: 29083
Date: 22 February 2019,
Checked by: AKE, Drawn by: AEDM, Last edited by: amurray
Location:P:\29000s\29083\Mapping\

0 250 500 750 1,000
Metres

N

Scale 1:25,000 @ A4, GDA 1994 NSW Lambert

Acknowledgements: Basemap © Land and Property Information 2016



Legend

Study area

Figure 2: Study area detail

0 50 100 150 200 250

Metres

Scale: 1:5,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

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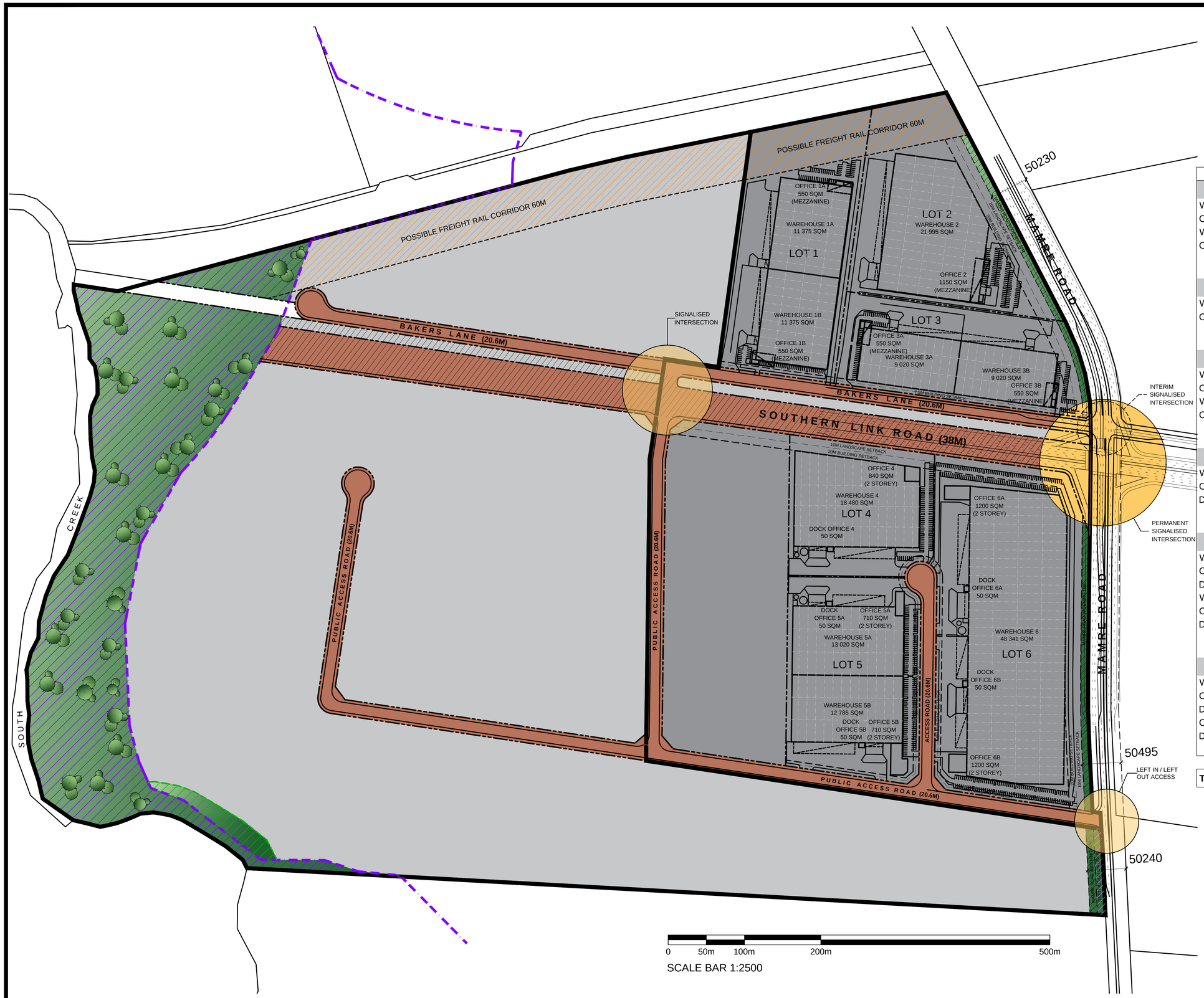
B	DA ISSUE	13.06.18
D	DA ISSUE	14.09.18
F	DA ISSUE	05.12.18
G	DA ISSUE	19.12.18
H	DA ISSUE	29.03.19
I	DA ISSUE	08.05.19



DEVELOPMENT AREAS		
LOT 1	5.1591 ha	
WAREHOUSE	1A	11375 SQM
OFFICE	1A	550 SQM
WAREHOUSE	1B	11375 SQM
OFFICE	1B	550 SQM
		23850 SQM
LOT 2	5.1304 ha	
WAREHOUSE	2	21995 SQM
OFFICE	2	1150 SQM
		23145 SQM
LOT 3	3.8821 ha	
WAREHOUSE	3A	9020 SQM
OFFICE	3A	550 SQM
WAREHOUSE	3B	9020 SQM
OFFICE	3B	550 SQM
		19140 SQM
LOT 4	3.2245 ha	
WAREHOUSE	4	18480 SQM
OFFICE	4	840 SQM
DOCK OFFICE	4	50 SQM
		19370 SQM
LOT 5	4.4970 ha	
WAREHOUSE	5A	13020 SQM
OFFICE	5A	710 SQM
DOCK OFFICE	5A	50 SQM
WAREHOUSE	5B	12785 SQM
OFFICE	5B	710 SQM
DOCK OFFICE	5B	50 SQM
		27325 SQM
LOT 6	8.7377 ha	
WAREHOUSE	6	48341 SQM
OFFICE	6A	1200 SQM
DOCK OFFICE	6A	50 SQM
OFFICE	6B	1200 SQM
DOCK OFFICE	6B	50 SQM
		50841 SQM
TOTAL	**30.63 ha**	**163671 SQM**

BULK EARTHWORKS STAGE BOUNDARIES

BE STAGE 1

BE STAGE 2

EXISTING FLOODPLAIN

PROPOSED ROADS

ALTIS PROPERTY PARTNERS

FRASERS PROPERTY

COMMERCIAL & INDUSTRIAL DIVISION
1 HOMEBUSH BAY DRIVE
BUILDING C, LEVEL 3
RHODES NSW 2138

PO BOX 3307
RHODES NSW 2138

PHONE 02 9767 2000
FAX 02 9767 2908

PROJECT
STATE SIGNIFICANT DEVELOPMENT APPLICATION PLAN FOR KEMPS CREEK

ADDRESS
MAMRE ROAD & BAKERS LANE
KEMPS CREEK

DRAWING TITLE
STATE BULK EARTHWORKS & BUILDING PLAN

SCALE	1:2500 @ A1
DRAWN	MP
CHECKED	JQ
DATE	08.05.19
JOB NUMBER	0000-00-000

DRAWING NUMBER: SSD-MRM-DA-001
ISSUE: I

01 – STATE SIGNIFICANT DEVELOPMENT APPLICATION PLAN
SCALE - 1:2500 @ A1

ALL LEVELS ARE INDICATIVE AND SHOULD BE READ IN CONJUNCTION WITH CIVIL ENGINEER'S DRAWINGS. FOR FINAL LEVELS OF ALL EARTHWORKS.

ALL LEVELS ARE TO BE +/- 1000mm.

2 Study area context

This section discusses the study area in regards to its landscape, environmental and Aboriginal cultural heritage context. This section should be read in conjunction with the archaeological report attached in Appendix 6. The background research has been undertaken in accordance with the Code.

2.1 Topography and hydrology

Topographically, the entire study area is located on a broad formation of alluvial plains/flats sloping very gently down toward South Creek from the lower slope landforms along the eastern boundary of the study area. Riparian corridors along creeklines are also present. The alluvial plains landform pattern is defined as having extremely low relief (Speight 2009, p.59). Shallow to deep alluvial stream channels are typically sparse to widely spaced, forming a unidirectional, integrated network. There may be frequently active erosion and aggradation by channelled and overbank stream flow, or the landforms can be relicts from these processes. Typical landform elements associated with alluvial plain landforms present within the study area include stream channels, levees, backswamps, and channel fill. Levees are very long, low, narrow, nearly level, sinuous ridges immediately adjacent to a stream channel built up by overbank flow; present on both sides of the stream channel as a result of periodic flooding and depositional events. During large floods the stream flows out of the channel and over the floodplain, resulting in both erosion and burial of cultural material. Old, abandoned channels also form an oxbow lake, or backswamp (Rapp & Hill 2006, p.69), and are present where deposits of fine silts and clays settle after a flood.

The geomorphological processes associated with alluvial plains are characterised by a high degree of sediment movement and deposition. It is therefore likely that Aboriginal artefacts will be present within an alluvial plain landform and they may have been displaced over time from their original location, or would be relatively intact after being deposited underneath new layers over time. Artefacts are most likely to be present within deep deposits formed by overbank flow within levees, the banks of backswamps and oxbow lakes.

South Creek flows north to south along the western boundary of the study area, as a sixth order perennial water source. A second order tributary of South Creek flows west to east adjacent to the southern boundary of the study area through a lower lying plain that extends south from the study area.

Stream order is recognised as a factor which assists the development of predictive modelling, and has seen extensive use in the Sydney region, most notably by (Jo McDonald Cultural Heritage Management Pty Ltd 2000, 2005a, 2005, 2006, 2008). Predictive models which have been developed for the region have a tendency to favour higher order streams as the locations of campsites as they would have been more likely to provide a stable source of water and by extension other resources which would have been used by Aboriginal groups.

The stream order system used for this assessment was originally developed by Strahler (1964), and works by adding streams together at their confluence to create a higher order stream, that is, two first order streams meet to form a second order stream, two second order streams meet to form a third order stream, and so on (Plate 1).

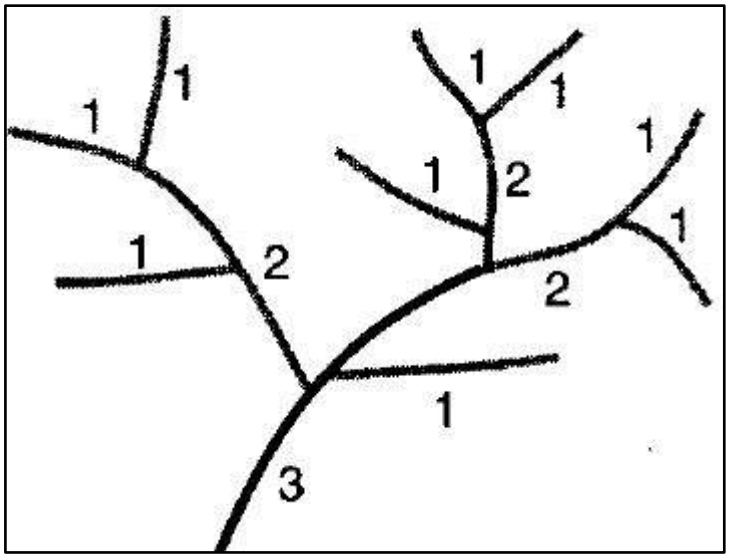


Plate 1 Diagram showing Strahler stream order (Ritter et al. 1995, p.151)

As stream order increases, so does the likelihood that the stream would be a perennial source of water. As a 6th order perennial water source, the proximity of South Creek can be considered a good indicator of the potential for Aboriginal occupation within the study area. Predictive modelling for the Cumberland Plains region suggests that artefact density and site complexity decreases in relation to decreasing Strahler order. Therefore, the artefact density and complexity of potential archaeological deposits will likely decrease with increasing distance from high Strahler order water sources, and subsequently with decreasing Strahler order (Jo McDonald Cultural Heritage Management 1997, Jo McDonald Cultural Heritage Management 2006, Dominic Steele Consulting Archaeology 2003, White & McDonald 2010).

2.2 Geology and soil landscapes

An understanding of both the underlying geological formations and soil landscapes within the vicinity of the study area can assist in predictive modelling. The study area is located within Cumberland Lowlands physiographic region that consists of low lying, gently undulating plains and low hills on Wianamatta Group shales and sandstones with a dense drainage net of predominantly northward flowing channels (Bannerman & Hazelton 1990a, p.2). The Wianamatta formation, which underlies the study area, tends to contain low relief landforms with well-developed drainage systems. This in turn makes water sources, which form an important part of the prehistoric landscape, easier to locate. These water sources can be good indicators of potential Aboriginal occupation.

The study area is contained within the Bringelly Shale formation. This formation consists of a shale (claystone and siltstone), carbonaceous claystone, laminate and fine to medium-grained lithic sandstone (Bannerman & Hazelton 1990a, p.3). Aboriginal artefact scatter sites are common across this formation, as are potential archaeological deposits (PADs). The presence of underlying shale deposits suggests that sites commonly found within sandstone formations, such as grinding grooves and rock shelters/rock art, are less likely to be present.

A small portion of the study area along South Creek, is situated upon Quaternary Alluvium formations, derived from the Wianamatta Group. This geological unit roughly underlies the South Creek soil landscape. It has been determined that Quaternary Alluvial deposits have the potential to contain a disproportionately higher number of cultural material (Attenbrow 2002, pp.49–50).

There are two soil landscapes that have been defined as occurring in the study area, Blacktown and South Creek (Bannerman & Hazelton 1990a). Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. Because they are defined by a combination of soils, topography, vegetation and weathering conditions, soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure.

Blacktown soil landscape covers the eastern topographies of the study area. The Blacktown soil landscape is a residual landscape and consists of gently undulating rises, broad rounded crests and gently inclined slopes with a gradient of less than 5%. Local relief within the Blacktown soil landscape is up to 30 metres and rocky outcropping is absent. The soils are shallow to moderately deep at less than 100 centimetres, and can be hard setting with moderate erodability. Dominant soils consist of shallow to moderately deep (less than 100 centimetres) red and brown podzols on crests and on well drained topographies, and deep (150 to 300 centimetres) yellow podzolic soils and soloths on lower slopes and drainage lines (Bannerman & Hazelton 1990b, p.28). The dominant soil characteristics for the Blacktown landscape are summarised below in Table 3. The upper topsoil - *bt1,* is occasionally absent on crests and hill slopes, but boundaries between the soil materials are usually clear. Due to their age and slow accumulation residual soil landscapes have reasonable potential to contain archaeological deposits in an open context, such as stone artefacts derived from occupation sites. Other occupational evidence may include scarred trees where remnant vegetation survives. However, slow accumulation and high impact of extensive land clearing (usually associated with pastoral and housing development) during more recent times often results in the poor preservation of archaeological material. Associated soil landscapes that occur in association to the Blacktown soil landscape include the South Creek soil landscape which occurs along drainage depressions.

Table 3 Blacktown (*bt)* soil landscape characteristics (Hazelton & Tille 1990, pp.28–30)

Soil Material	Description
Blacktown 1 (*bt1*) - Friable brownish-black loam	Friable brown loam to clay loam with a moderately pedal subangular block structure and rough-faced porous fabric ped fabric. This soil material generally occurs as a topsoil (A horizon). Peds are well defined and range from 2-20 millimetres. Rounded iron indurated fine gravel-sized shale fragments and charcoal fragments sometimes occur as inclusions. Soil colour is brownish black (10YR 2/2), and can also range from dark reddish brown (5YR 3/2) to dark yellowish brown (10yr 3/4). Soil varies from moderately acidic to neutral.
Blacktown 2 (*bt2*) - Hardsetting brown clay loam	Hardsetting brown clay loam to silty clay loam, with an apedal massive to weakly pedal structure and porous earthy fabric. Occurs as an A^2 Horizon soil deposit. Peds range from 20-50 millimetres. Platy, iron indurated gravel sized shale fragments are common, with rare inclusions of charcoal and roots. Soil colour is predominately dark brown (7.5YR 4/3), but can range from dark reddish brown (2.5YR 3/3) to dark brown (10YR 3/3). Soil acidity varies from moderately acidic to slightly acidic.
Blacktown 3 (*bt3*) - Strongly pedal, mottled brown light clay	Brown light to medium clay with strong pedal polyhedral or subangular-blocky structure and smooth faced dense ped fabric that occurs as a subsoil (B horizon). The soil texture increases with depth and peds range from 5-20 millimetres. Fine to coarse gravel sized shale fragments are a common inclusion and often occur within stratified bands, with roots and charcoal rarely being present. Soil colour is brown (7.5YR 4/6), and can range from reddish brown (2.5YR 2/6) to brown (10YR 4/6). The pH of this soil material varies from strongly acidic to slightly acidic.
Blacktown 4 (*bt4*) - Light grey plastic mottled clay	Plastic light grey silty clay to heavy clay with moderately pedal polyhedral to subangular blocky structure, and smooth-faced dense ped fabric, that occurs as a deep subsoil

Soil Material	Description
	deposit overlying shale bedrock (B^3 or C Horizon). Peds range between 2-20 millimetres. Inclusion consists of weathered ironstone concretions and rock fragments. Gravel sized shale fragments and roots occur occasionally, but charcoal is rare within this soil deposit. Red, yellow and brown mottles are present and soil colour is usually light grey (10YR 7/1) or sometimes greyish yellow (2.5YR 6/2). Soil acidity ranges from strongly acidic to moderately acidic.

South Creek soil landscape dominates the western portion of the study area and is associated with drainage depressions and alluvial flats within the area (Bannerman & Hazelton 1990a, pp.68–71). The South Creek soil landscape is characterised as a fluvial soil landscape situated on flat to gently sloping alluvial plains with a gradient of less than 5%, and a local relief of up to 10 metres, with intermittent terraces or levees present. Soils are generally very deep (135-190 centimetres) layered sediments over bedrock or relief soils, with red and yellow podzoilic soils being predominant upon terraces, with some structured grey clays, leached clay and yellow solodic soils also occurring. In areas adjacent to drainage lines where soil evolution has occurred structured plastic clays and structured loams can also be present (Bannerman & Hazelton 1990b, pp.68–69).. On high terraces South Creek 1 (*sc1*) and South Creek 2 (*sc2*) soils are usually absent and the soils consist of up to 190cm of stratified light to medium clay over shale bedrock (*sc3*) (Bannerman & Hazelton 1990a, p.70). Pockets of sand or clayey sand also occur as splay or flat deposits from alluvial overflow on floodplains. This is a dynamic landscape associated with active floodplains, resulting in both soil erodibility and deposition. In depositional phases streams may be partially or completely blocked by sedimentation. Fine sands and finer fractions, such as silts and clays are indicative of very low-energy regimes like overbank floodplain deposits (Rapp & Hill 2006, p.69). This soil landscape therefore varies in many areas from erosion to deposition and has the potential to disturb soil sequencing and potentially archaeological deposits. During periods when erosion and deposition do not occur, there are stable surfaces for human occupation. Artefacts in these deposits may have been buried soon after human occupation and may be in their primary context (i.e. *in situ*). Characteristics of dominant soil materials within the South Creek soil landscape are summarised in Table 4.

Table 4 South Creek (*sc*) soil landscape characteristics (Bannerman & Hazelton 1990b, p.69)

Soil Material	Description
South Creek 1 (*sc1*) – Brown apedal single-grained loam	Brown sandy loam to sandy clay loam with a porous and earthy fabric, and a single-grained apedal structure, usually occurring as a topsoil (A horizon). Roots are abundant in surface layers, while small angular or rounded gravels of 2-6 millimetres may occur; other inclusions, such as charcoal, do not occur. Colours range from a dull reddish brown 95YR 4/3) to dull yellowish brown (10YR 4/3), and are generally moderately acidic but can vary between strongly to slightly acidic.
South Creek 2 (*sc2*) – Dull brown clay loam	A hard setting dull brown clay loam to sandy clay loam, usually featuring an apedal massive structure and porous, earthy fabric, occurring as a topsoil (A horizon). There may be occasional areas of weak structure which contain small (2-5 mm) rough-faced subangular blocky peds. Roots are rare and stone and other inclusions do not occur. Colour is generally a dull brown (7.5YR 5/4), but can vary from greyish brown (5YR 4/2) to yellowish brown (10YR 5/6). Ranges from moderately acidic to neutral acidity.
South Creek 3 (*sc3*) – Bright brown clay	A bright brown light to medium clay with a strong pedal structure and dense smooth-faced angular blocky or polyhedral ped fabric (20-50mm in size), usually presenting as a subsoil (B horizon). Occasionally contains enough levels of sand to be classified as a sandy clay. Usually whole coloured, ranging from reddish brown (3YR 4/8) to bright yellowish brown (10YR 5/1), with highly variable pH levels from extremely acidic to neutral. Yellow or grey mottling can occur, and may occupy up to 15% of material volume. Where this madeira presents as a topsoil there may be roots. Small subrounded or subangular gravel (2-20mm) can make up to 50% of the volume, and no charcoal is present.

2.3 Climate and rainfall

The Badgerys Creek AWS (site number: 067108) weather station is located approximately 8.8 kilometres from the study area and provides climate and rainfall data. Summer mean average temperatures reach highs of 30.1°C, and lows of 15.5 °C (BOM 2018). During winter temperatures reach highs of 17.5 °C, and lows of 4.1 °C (BOM 2018). The highest mean rainfall is recorded during February with 98.5mm, and the lowest mean rainfall is recorded in July with 22.6mm (BOM 2018).

2.4 Landscape resources

The Cumberland Plains region would have provided an abundance of natural resources able to be utilised in a variety of ways by Aboriginal people. Plant fibres were twisted into string, which was used for many purposes, including the weaving of nets, baskets and fishing lines. String was also used for personal adornment. Bark was used in the provision of shelter; a large sheet of bark being propped against a stick to form a gunyah (Attenbrow 2002, pp.113–114).

Current aerial photography shows that beyond the riparian corridor, the study area has been extensively cleared ,except for a few small stands of remnant vegetation throughout the area. Remnant vegetation within the study area is likely to include a mixture of native Flora associated with the Blacktown and South Creek soil landscapes, and introduced species. Vegetation within the South Creek soil landscape reflects the soil landscapes frequent inundation, which supports common tree species such as the broad-leaved apple *Angophora subvelutina,* Cabbage Gum *Eucalyptus amplifolia,* and Swamp Oak *Casuraina glauca*. Tall spike rushes (such as *Eleocharis sphacelata, Juncus usilatus* and *Polygonum*), have the potential to occur where

channels are silted. Upon elevated streambanks tall shrubland consisting of paperbarks, *Melaleuca* species, and tea trees, *Leptospermum* species may also occur. However, the South Creek soil landscape has been extensively cleared, and as a direct result is now dominated by noxious weeds, such as Blackberry *Rubus vugalris* (Bannerman & Hazelton 1990b, pp.68–69).

The Blacktown soil landscape would have typically supported open-forest and open-woodland that has been extensively cleared since European contact. Originally the Blacktown soil landscape would have featured woodland and open-forest of Forest Red Gum *Eucalyptus tereticornis,* Narrow-leaved Ironbark *Eucalyptus crebra,* Grey Box *Eucalyptus molucanna,* and Spotted Gum *Corymbia maculata* (Bannerman & Hazelton 1990b, p.29).

Animal products were also used for tool making and fashioning a myriad of utilitarian and ceremonial items. For example, tail sinews are known to have been used to make fastening cord, while 'bone points', which would have functioned as awls or piercers, are often an abundant part of the archaeological record. Brush-tailed Possums were highly prized for their fur and could be fashioned into a cloak (Attenbrow 2002, p.117).

The accessibility of water is a strong indication as to the likelihood for the presence of Aboriginal sites. Rivers, creeks and waterholes provide sources of fresh drinking water, whilst also supplying a habitat for fish and shellfish resources. The presence of permanent water sources would have also attracted a number of animals to the area, that would have been hunted by Aboriginal people (Attenbrow 2002, pp.62–76). Native Fauna that could have been present in the study areas includes, but is not limited to the Australian Brush Tail Possum *Trichosurus vulpecula*, Short-beaked Echidna *Tachyglossus aculeatus*, Swamp Wallaby *Wallabia bicolor*, Rainbow Lorikeet *Trichoglossus moluccanus*, Kookaburra *Dacelo novaeguineae*, Australian Magpie *Cracticus tibicen*, Water Dragon *Intellagama lesueurii*, and Eastern Blue-Tongue *Tiliqua scincoides*.

2.5 European land use history

The Orchard Hills area is best known for its World War II defence establishment, located approximately four kilometres north-west of the current study area. Historically, the area along Mamre Road has been used for farming and pastoral practices, as well as the establishment of large estates, such as Mamre House, approximately three kilometres north of the current study area (Thorpe 1986). As such it would not be unreasonable to expect the study area had undergone disturbance from activities such as ploughing and grazing. It is firmly established in both Aboriginal and historical archaeology (Brooks et al. 2009, Steinberg 1996) that agriculture, and in particular ploughing, causes extensive disturbance to the upper levels of soil profiles on many sites, with Steinberg claiming that this disturbance extends to approximately 30 centimetres below the surface. These activities disturb the original context of archaeological deposits, redistributing their contents across the ploughed area and disrupting the stratigraphic profiles of the area.

The study area encompasses three initial grants from the 18 December 1805, made up of two 300 acre grants to Ezekiel/Edward Wood (Kingswood) and Richard Fitzgerald (Restitution Farm), and a portion of a 360 acre grand to James Scott (Plate 2). All grants appear to have been historically used as farms, however Richard Fitzgerald was a notable convict with associations with both John MacArthur and Lachlan Macquarie. There is the potential for the study area to contain remains of early homesteads dating to the early nineteenth century.

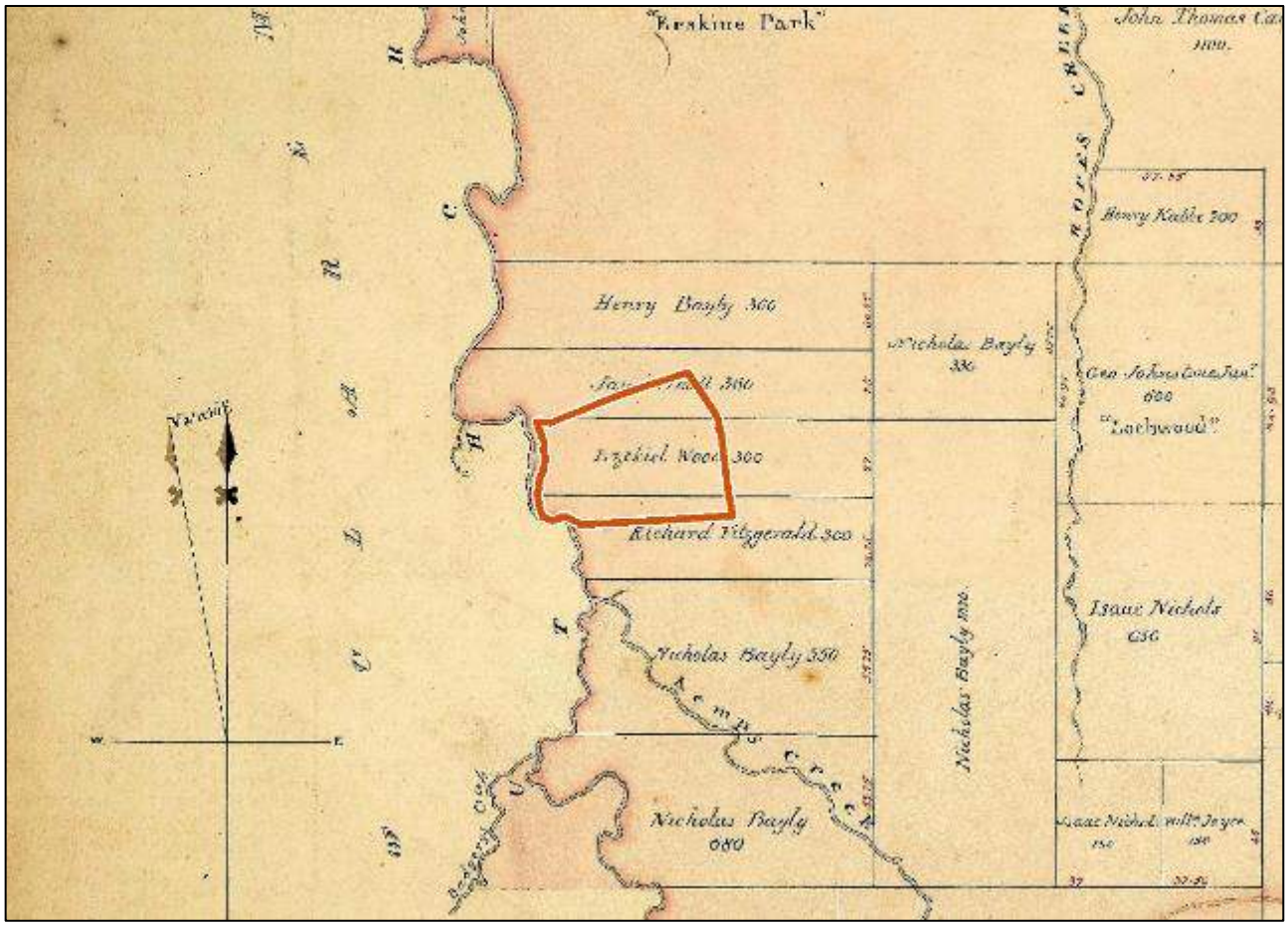


Plate 2 **Excerpt from Parish Map of Melville, showing land grants in the vicinity of the study area (NSW LPI 2015)**

3 Aboriginal cultural heritage context

3.1 Ethnohistory

It is generally accepted that Aboriginal people have inhabited the Australian landmass for the last 50,000 years (Allen and O'Connell 2003, Clarkson *et al* 2015). Dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken. The timing for the human occupation of the Sydney Basin is still uncertain. While there is some possible evidence for occupation of the region around 40,000 years ago, the earliest known radiocarbon date for the Aboriginal occupation of the Sydney Basin is associated with a cultural/archaeological deposit at Parramatta, which was dated to 30,735 ± 407 BP (Jo McDonald Cultural Heritage Management Pty Ltd 2005a, 2005b).

Archaeological evidence of Aboriginal occupation of the Cumberland Plains indicates that the area was intensively occupied from approximately 4000 years BP (Dallas 1982). Such 'young' dates are probably more a reflection of the conditions associated with the preservation of this evidence and the areas that have been subject to surface and subsurface archaeological investigations, rather than actual evidence of the Aboriginal people prior to this time.

Our knowledge of Aboriginal people and their land-use patterns and lifestyles prior to European contact is mainly reliant on documents written by non-Aboriginal people. These documents are affected by the inherent bias of the class and cultures of their authors, who were also often describing a culture that they did not fully understand - a culture that was in a heightened state of disruption given the arrival of settlers and disease. Early written records can however be used in conjunction with archaeological information and surviving oral histories from members of the Aboriginal community in order to gain a picture of Aboriginal life in the region.

Despite a proliferation of Aboriginal heritage sites there is considerable ongoing debate about the nature, territory and range of pre-contact Aboriginal language groups in the greater Sydney region. These debates have arisen largely because, by the time colonial diarists, missionaries and proto-anthropologists began making detailed records of Aboriginal people in the late 19th century; pre-European Aboriginal groups had been broken up and reconfigured by European settlement activity. The following information relating to Aboriginal people on the Cumberland Plains is based on such early records.

There is some confusion relating to group names, which can be explained by the use of differing terminologies in early historical references. Language groups were not the main political or social units in Aboriginal life. Instead, land custodianship and ownership centred on the smaller named groups that comprised the broader language grouping. There is some variation in the terminology used to categorise these smaller groups; the terms used by Attenbrow (2002) will be used here. Attenbrow (2002, p.34) suggests that a total of four dialects were spoken in the Sydney region:

- Darug coastal dialect/s - the Sydney Peninsula (north of Botany Bay, south of Port Jackson, west to Parramatta), as well as the country to the north of Port Jackson, possibly as far as Broken Bay
- Darug hinterland dialect - on the Cumberland Plain from Appin in the south to the Hawkesbury River in the north; west of the Georges River, Parramatta, the Lane Cove River and Berowra Creek
- Dharawal - from south side of Botany Bay, extending south as far as the Shoalhaven River; from the coast to the Georges River and Appin, and possibly as far west as Camden,
- Gundungurra - southern rim of the Cumberland Plain west of the Georges River, as well as the southern Blue Mountains.

Early interactions between local Aboriginal groups in the Sydney region and European settlers varied in nature between peaceful and hostile. It was not long before the effects of colonisation proved detrimental to local groups, with farming practices employed by the settlers removing land that had until that point been used for subsistence (Attenbrow 2002).

Early observers made no note of the language of the local groups, and it was not until the latter part of the nineteenth century that the name Darug was used. Matthews (1901, p. 155, cited by Attenbrow 2002, p.32) stated that "The Dharuk speaking people adjoined the Tharrawal on the north, extending along the coast to the Hawkesbury River, and inland to what are now Windsor, Penrith, Campbelltown, and intervening towns". Subsistence activities varied based on the local landscapes, with Darug groups closer to the coast employing different food sources and means of hunting in order to survive, compared to those further inland (Kelleher Nightingale Consulting 2010, p.10).

After the arrival of European settlers the movement of Aboriginal people became increasingly restricted. European expansion along the Cumberland Plain was swift and soon there had been considerable loss of land to agriculture. This led to violence and conflict between Europeans and Aboriginal people as both groups sought to compete for the same resources (Brookes & Associates et al. 2003, p.16). At the same time diseases such as small pox were having a devastating effect on the Aboriginal population. Death, starvation and disease were some of the disrupting factors that led to a reorganisation of the social practices of Aboriginal communities after European contact. The formation of new social groups and alliances were made as Aboriginal people sought to retain some semblance of their previous lifestyle.

3.2 Aboriginal heritage located in the study area

A search of the AHIMS database (Client Service ID: 397126) identified six Aboriginal sites have previously been recorded within the study area and are summarised in Table 5. Test excavations of the study area have also identified an additional six Aboriginal sites which are described below.

Table 5 AHIMS sites located within the study area

AHIMS site no	Site name	Site type
45-5-5187	MSP-01	Artefact
45-5-5188	MSP-02	Artefact
45-5-5189	MSP-03	Artefact
45-5-3028	EPTA3	Artefact
45-5-3032	EPTA10	Artefact
45-5-3033	EPTA11	Artefact

3.2.1 MSP-01 (AHIMS 45-5-5187)

MSP-01 (AHIMS 45-5-5187) consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located in a disturbed context and consists of a silcrete flake (Plate 3, Plate 4).

The nearest recorded natural water source is South Creek, located approximately 900 metres to the west of the isolated find. A large depression located approximately 350 metres to its west also appears to been subject to frequent inundated.

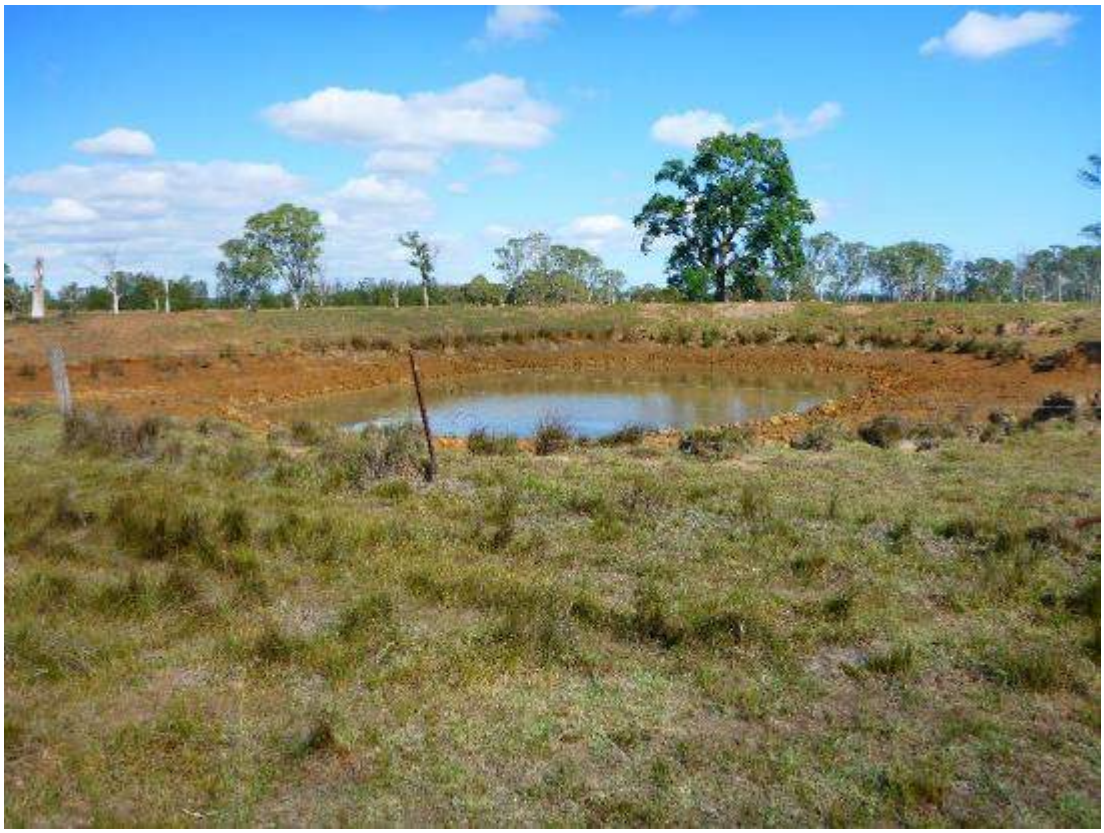


Plate 3 Location of site 45-5-5187/MSP-01, view facing west

Plate 4 Silcrete complete flake identified at 45-5-5187/MSP-01

3.2.2 MSP-02 (AHIMS 45-5-5188)

AHIMS 45-5-5188/MSP-02 consisted of a single surface artefact, which test excavations revealed to be of a highly significant subsurface deposit located across a flat within Lot 22 DP 258414. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of 666 artefacts (Plate 5, Plate 6).

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. There is also a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

Test excavations at this site extends down to the edge of South Creek and indicates that AHIMS 45-5-5188/MSP-02 and AHIMS 45-5-5189/MSP-03 are part of the same site. As a result AHIMS 45-5-5188/MSP-02 and AHIMS 45-5-5190/MSP-03 have been combined into one site AHIMS 45-5-5189/MSP-02. The AHIMS sites cards for both sites will be subsequently updated. A total of 666 sub-surface artefacts were identified across AHIMS 45-5-5188/MSP-02 and it was found that artefact densities decreased closer to South Creek, with dispersed, low density deposits present along the alluvial flats.

Plate 5 Location of site 45-5-5188/MSP-02, view facing north

Plate 6 Silcrete complete flake identified at site 45-5-5188/MSP-02

3.2.3 MSP-03 (AHIMS 45-5-5189)

AHIMS 45-5-5189/MSP-03 consists of a surface artefact scatter located across a flat and gentle slope landform within Lot 22 DP (Plate 7). The site is located approximately 100 metres west of the recorded location of AHIMS site EPTA10. Based upon the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammer stone.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

Test excavations at this sites identified a low density sub-surface deposit located on a high point within the gentle slope landform. This site extends down to the edge of South Creek and indicates that AHIMS 45-5-5189/MSP-03 and AHIMS 45-5-5188/MSP-02 are part of the same site. As a result AHIMS 45-5-5189/MSP-03 and AHIMS 45-5-5188/MSP-02 have been combined into one site AHIMS 45-5-5188/MSP-02. The AHIMS sites cards for both sites will be subsequently updated (see Plate 5 for location of AHIMS 45-5-5188/MSP-02).

Plate 7 Silcrete complete flake identified at site 45-5-5189/MSP-03

3.2.4 MSP-05 (AHIMS Pending) (E: 294016 N: 6254604)

MSP-05 consists of a low density sub-surface artefact scatter located on a gentle slope landform in OA2 (Plate 8). The site is located approximately 750 metres east of South Creek. A total of five artefacts were recovered from four test pits across 5793 metres squared. These artefacts consisted of one complete flake, one longitudinal flake fragment and three angular fragments. One piece of angular fragment. Two pieces of angular fragment recovered from this site displayed evidence of potlidding and cremated fracturing, suggesting heat shatter.

Plate 8 North facing view of MSP-05

3.2.5 MSP-06 (AHIMS Pending) (E: 294126 N: 6254552)

MSP-06 consists of a low density sub-surface artefact located on a gentle slope landform in OA2 (Plate 9). The site is located approximately 800 metres east of South Creek and covers 619 square metres. Two artefacts were recovered from two test pits and consisted of a silcrete angular fragment and a silcrete proximal flake.

Plate 9 West facing view of MSP-06

3.2.6 MSP-07 (AHIMS Pending) (E: 294146 N: 6254469)

MSP-07 consists of an isolated sub-surface artefact located on a gentle slope landform in OA2 (Plate 10).The site is located approximately 750 metres east of South Creek and covers 162 square metres. One artefact was recovered from this site consisting of an indurated mudstone tuff (IMT) angular fragment.

Plate 10 North facing view of MSP-07

3.2.7 MSP-08 (AHIMS Pending) (E: 294155 N: 6254417)

MSP-08 consists of an isolated sub-surface artefact located on a gentle slope landform in OA2 (Plate 11). The site is located approximately 750 metres east of South Creek and covers 152 square metres. One artefact was recovered from this site consisting of a quartz bipolar flake

Plate 11 View of MSP-08

3.2.8 MSP-09 (AHIMS Pending) (E: 294469 N: 6253984)

MSP-09 consists of a low density sub-surface artefact scatter located on a gentle slope landform in OA1. The site is located approximately 1 kilometre east of South Creek and has an area of approximately 4027 metres squared (Plate 12) A total of seven artefacts were identified at this site. They consisted of one complete flake, one distal flake, one proximal flake, three angular fragments and one Bondi point fragment.

Plate 12 West facing view of MSP-09

3.2.9 MSP-10 (AHIMS Pending) (E: 294548 N: 6253896)

MSP-10 consists of a low density sub-surface artefact scatter located on a gentle slope landform in OA1. The site is located approximately one kilometre east of South Creek and has an area of approximately 2569 metres squared (Plate 13). A total of nine artefacts were identified at this site, comprising one complete flake, one distal flake, one proximal flake, and six pieces of angular fragment.

Plate 13 South facing view of MSP-10

3.2.10 MSP-11 (AHIMS Pending) (E: 293382 N: 6254091)

MSP-11 consists of a low density sub-surface deposit located on a gentle slope landform in OA3. The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site (Plate 14).

Plate 14 View of MSP-11

3.2.11 EPTA3 (AHIMS 45-5-3028), EPTA10 (AHIMS 45-5-3032), EPTA11 (AHIMS 45-5-3033)

The site cards for AHIMS sites EPTA3 (AHIMS 45-5-3028), EPTA10 (AHIMS 45-5-3032), and EPTA11 (AHIMS 45-5-3033), were reviewed and discrepancies were identified regarding the location of these AHIMS sites. According to the site cards, EPTA3 (AHIMS 45-5-3028), EPTA10 (AHIMS 45-5-3032), and EPTA11 (AHIMS 45-5-3033) were recorded in March 2005 by Navin Officer during the archaeological subsurface testing program carried out upon CSR Lands, at Erskine Park (Plate 15). The location of the AHIMS site was noted upon the site cards to be at Lenora Lane, Erskine Park, to the north-west of the study area. A field survey carried out by Biosis on the 30 April 2018 attempted to relocate AHIMS sites EPTA3 (AHIMS 45-5-3028), EPTA10 (AHIMS 45-5-3032), and EPTA11 (AHIMS 45-5-3033) within the current SSD application area (Biosis Pty Ltd 2018b). No evidence of previous test excavations was identified at the site locations provided upon the AHIMS database. It can therefore be determined that the coordinated of these AHIMS sites are incorrect and they are not located within the current study area.

Plate 15 Location of CSR lands assessed by Navin Officer (2005). The location of Lenore Lane is indicated by the blue arrow

3.3 Interpretation of past Aboriginal land use

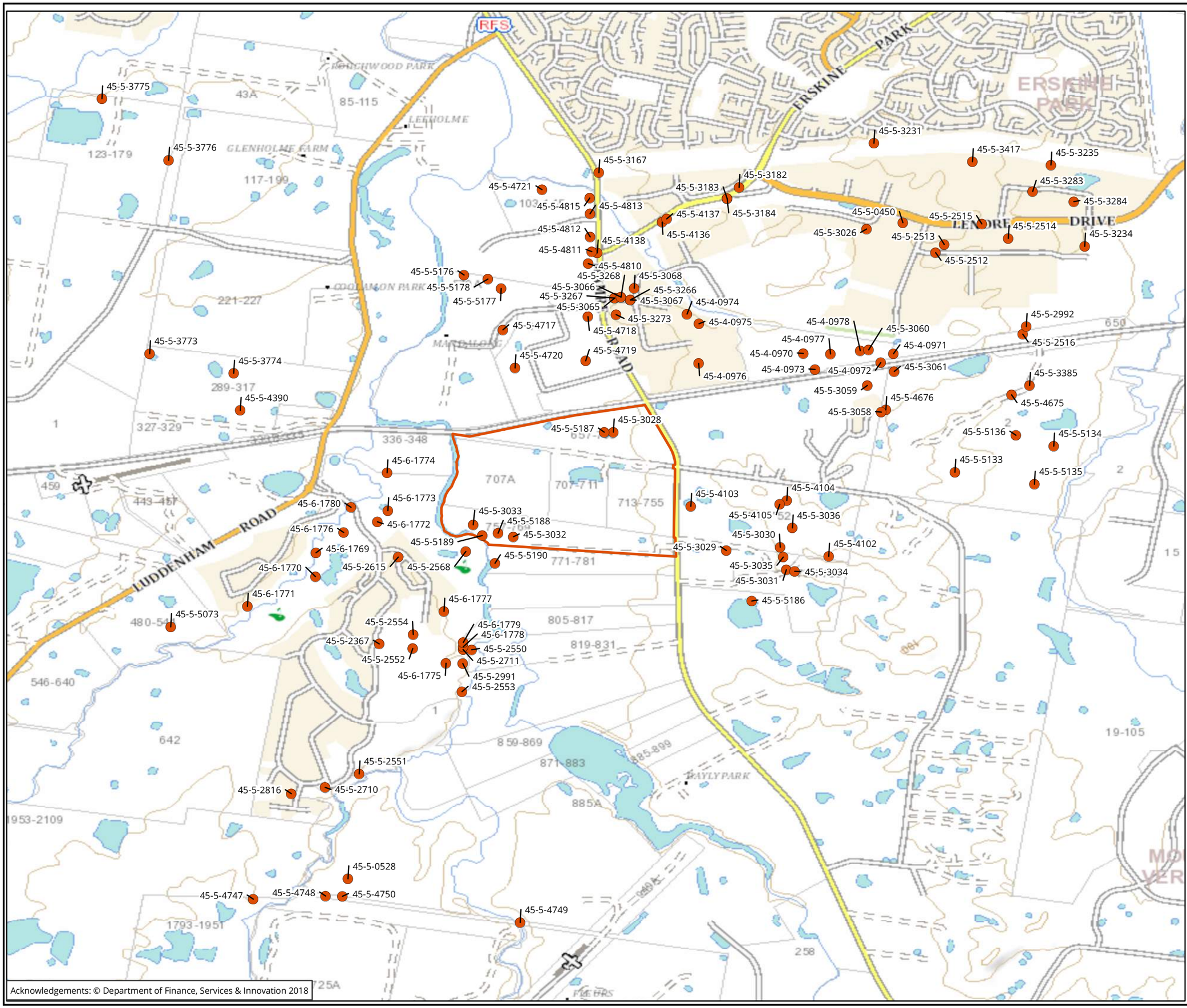
A review of previous archaeological assessments undertaken in the Cumberland Plain area indicates that Aboriginal occupation of the region was wide ranging and intensive from approximately 4,000 years BP (M Dallas 1982). The Aboriginal people of the Cumberland plan region appear to have utilised all landforms present within the region, however occupation appears to have been concentrated within level raised areas in close proximity to reliable water sources (Kohen, J. 1986, Haglund and Associates 1989, Smith 1988, Jo McDonald Cultural Heritage Management Pty Ltd 2006b, Jo McDonald Cultural Heritage Management Pty Ltd 2007a, Jo McDonald Cultural Heritage Management Pty Ltd 2007b, Jo McDonald Cultural Heritage

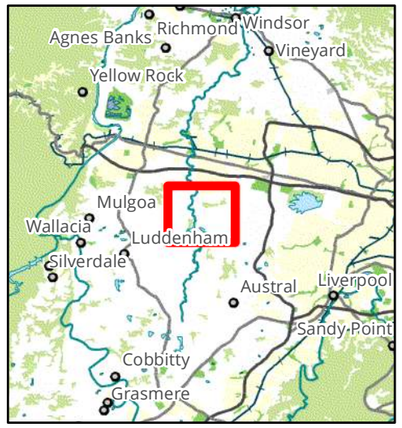
Management Pty Ltd 2007c, Dibden 2003). Previous predictive modelling conducted for the Cumberland Plain and Leppington region indicates that the most important factor for site distribution in this landscape is distance to water (White, B & McDonald, J 2010, McDonald, J. & Rich, E. 1993, Brayshaw McDonald Pty Ltd 1994, AMBS 2012). Site size and complexity has been demonstrated to increase with proximity to permanent water sources. Isolated artefacts and small Aboriginal sites are more likely to be identified within proximity to lower order water sources, and at greater distances from a water source. However larger artefacts sites have been recorded as occurring up to 250 metres from a permanent water source (Brayshaw McDonald Pty Ltd 1994, pp.20–21, AMBS 2012, p.56). Higher order, or permanent streams are likely to have been preferred locations for occupation or campsites as they would have provided a stable source of water and by extension other resources which would have been used by Aboriginal groups (Jo McDonald Cultural Heritage Management 2000, p.19).

The study area is bounded by South Creek, a sixth order perennial watercourse, and a second order creek line to the south of the study area. The presence of a higher order creekline, along with one lower order creekline located within close proximity to the study area indicates that water resources, and by extension food resources were readily accessible from the study area (Jo McDonald Cultural Heritage Management 2000, p.19).

Part of the study area is situated within the Blacktown soil landscape, which is a residual soil landscape. Due to their age and slow accumulation, residual soil landscapes have reasonable potential to contain archaeological deposits. However, aerial imagery indicates that a large portion of the study area has been subject to previous ground disturbance from development activities and vegetation clearance. These previous disturbances have likely impacted on the preservation of archaeological deposits potentially present within the study area.

Test excavations undertaken within the study area have identified a high density, relatively intact subsurface deposit present at OA3. Long term camp sites contain the most diverse artefact assemblages as they were home to the widest range of activities such as food production, craft activities, and tool manufacture (McDonald et al. 2018, p.23). This suggests that the site was well situated in the landscape to support long-term occupation. The study area is located on an elevated landform situated in an alluvial creek terrace in close proximity to South Creek and contained possible evidence that backed artefact manufacturing activities were likely occurring at the site suggestive of long term occupation. Two low density artefacts scatters were also identified at OA1 and OA2. These sites are located further away from South Creek, compared to OA3 and were therefore less suitable areas of occupation.





Legend

- Study area
- AHIMS record

Figure 4: AHIMS records near the study area

NOT TO BE MADE PUBLIC

0 250 500 750 1,000 1,250

Metres

Scale: 1:25,000 @ A3

Coordinate System: GCS GDA 1994

biosis

Biosis Pty Ltd

Ballarat, Brisbane, Canberra, Melbourne, Sydney,Wangaratta & Wollongong

Matter:
Date: 19 February 2019,
Checked by: amurray, Generated by: amurray
Location:P:\29000s\29083\Mapping
29083_ACHA_F4_AHIMS.mxd

4 Aboriginal community consultation

Consultation with the Aboriginal community has been undertaken in compliance with the consultation requirements as detailed below. A consultation log of all communications with RAPs is provided in Appendix 1.

4.1 Stage 1: Notification of project proposal and registration of interest

4.1.1 Identification of relevant Aboriginal stakeholders

In accordance with the consultation guidelines, Biosis Pty Ltd notified the following bodies regarding the proposal:

- OEH Greater Sydney
- NSW Native Title Services Corporation Limited (NTSCORP Limited)
- Office of the Registrar, Aboriginal Land Rights Act 1983 of Aboriginal Owners
- National Native Title Tribunal (NNTT)
- Deerubbin Local Aboriginal Land Council (DLALC)
- Penrith City Council
- Greater Sydney Local Land Services.

A list of known Aboriginal stakeholders in the Sydney region was provided by OEH (a copy of this response is provided in Appendix 2 and includes:

- Aboriginal Archaeological Service Inc
- Amanda Hickey Cultural Services
- Barking Owl Aboriginal Corporation
- Badu
- Biamanga
- Bidjawong Aboriginal Corporation
- Bilinga Cultural Heritage Technical Services
- Billinga
- Butucarbin Aboriginal Corporation
- Corroboree Aboriginal Corporation
- Cullendulla
- Darug Aboriginal Cultural Heritage Assessments
- Darug Boorooberongal Elders Aboriginal Corporation
- Kamilaroi-Yankuntjatjara Working Group
- Kawul Cultural Services
- Merrigarn Indigenous Corporation
- Minnamunnung
- Muragadi Heritage Indigenous Corporation
- Murra Bidgee Mullangari Aboriginal Corporation
- Mununga
- Munyunga Cultural Heritage Technical Services
- Murramarang
- Murrumbul
- Murrumbul Cultural Heritage Technical Services
- Nerrigundah

- Darug Custodian Aboriginal Corporation
- Darug Land Observations
- Darug Tribal Aboriginal Corporation
- Deerubbin Local Aboriginal Land Council
- Dharug
- Dhinawan-Dhigaraa Culture & Heritage Pty Ltd (Ricky Fields and Athol Smith)
- Didge Ngunawal Clan
- DJMD Consultancy
- Ginninderra Aboriginal Corporation
- Goobah Developments
- Gulaga
- Gunjeewong Cultural Heritage Aboriginal Corporation
- Gunyuu
- Gunyuu Cultural Heritage Technical Services
- HSB Consultants
- Jerringong
- Nundagurri
- Pemulwuy CHTS
- Rane Consulting
- Thauaira
- Tocomwall
- Thoorga Nura
- Wailwan Aboriginal Digging Group
- Walbunja
- Walgalu
- Warragil Cultural Services
- Widescope Indigenous Group
- Wingikara
- Wingikara Cultural Heritage Technical Services
- Wullung
- Wurrumay Consultancy
- Yerramurra
- Yulay Cultural Services

A search conducted by the Office of the Registrar, *Aboriginal Land Rights Act 1983* did not identify Aboriginal Owners with land within the study area. It was recommended that Biosis contact Deerubbin LALC to identify stakeholders.

A search conducted by the NNTT listed no Registered Native Title Claims, or Unregistered Claimant Applications; however they did identify one registered Indigenous Land Use Agreement:

- Gundungurra Area Agreement (ID: N2014/001).

This Registered Aboriginal Land Use Agreement was found to be outside of the proposed study area.

The NSW Native Title Services Corporation Limited (NTSCORP Limited) did not provide a list of names of Aboriginal people or organisations which may have an interest in the proposed development. It was advised, however, that NTSCORP had forwarded the notification onto relevant groups, individuals and organisations which may hold cultural knowledge pertaining to the study area.

Penrith City Council responded advising that contact me made with Deerubbin LALC, and provided contact details for Steve Randall of Deerubbin LALC.

Greater Sydney Land Services responded advising that contact be made with OEH in order to obtain a list of registered aboriginal Stakeholder who may hold an interest in the study area.

4.1.2 Public notice

In accordance with the consultation guidelines, a public notification was placed in the following newspaper:

- The Western Weekender (19 October 2018).

The advertisement invited Aboriginal people who hold cultural knowledge to register their interest in a process of community consultation to provide assistance in determining the significance of Aboriginal object(s) and/or places in the vicinity of the study area. A copy of the public notice is provided in Appendix 2.

4.1.3 Registration of Aboriginal parties

Aboriginal groups identified in Section 4.1.1 were sent a letter inviting them to register their interest in a process of community consultation to provide assistance in determining the significance of Aboriginal object(s) and/or places in the vicinity of the study area. In response to the letters and public notice, a total of 20 groups registered their interest in the project. Responses to registration from Aboriginal parties are provided in Appendix 3. A full list of Aboriginal parties who registered for consultation is provided below:

- Aboriginal Archaeological Services Inc
- Barking Owl Aboriginal Corporation
- Barraby Cultural Services
- Corroboree Aboriginal Corporation
- Darug Aboriginal Land Care
- Darug Booroberongal Elders Aboriginal Corporation
- Darug Custodian Aboriginal Corporation
- Darug Land Observations
- Didge Ngunawal Clan
- Deerubbin Local Aboriginal Land Council
- Gulaga
- Kamilaroi-Yankuntjatjara Working Group
- Kawul Cultural Services
- Muragadi Heritage Indigenous Corporation
- Murra Bidgee Mullangari Aboriginal Corporation
- Tocomwall
- Wailwan Aboriginal Digging Group
- Wurrumay Cultural Services
- Yulay Cultural Services
- Yurrandaali Cultural Services

4.2 Stage 2: Presentation of information about the proposed project

On 12 November 2018 Biosis provided RAPs with details about the proposed development works (project information pack). A copy of the project information pack is provided in Appendix 3.

No comments from RAPs were received during this stage of the consultation.

4.3 Stage 3: Gathering information about cultural significance

4.3.1 Archaeological assessment methodology information pack

On 12 and 13 November 2018, Biosis provided each RAP with a copy of the project methodology pack outlining the proposed Aboriginal cultural heritage assessment process and methodology for this project. RAPs were given 28 days to review and prepare feedback on the proposed methodology. A copy of the project methodology pack is provided in Appendix 4.

Comments from RAPs were received at this stage of the consultation.

Barraby Cultural Services (13/11/2018), Yurrandaali Cultural Services (19/11/2018), Yulay Cultural Services (19/11/2018), and Murra Bidgee Mullangari (21/11/2018), all responded via email, agreeing with the proposed assessment methodology.

Kawul Cultural Services confirmed via email on the 13 November 2018, that the project methodology had been received, however, provided no further comment.

Didge Ngunawal responded to the project methodology on the 13 November 2018. Didge Ngunawal agreed with the proposed methodology and stated that they held relevant cultural knowledge of the Kemps Creek and Badgerys Creek area.

Darug Aboriginal Land Care responded to the project methodology on the 17 November 2018 via email, stating that they agreed with the proposed methodology, and asked that native plants be used within the study area. It was strongly recommended that the 'stop works' procedure be followed throughout the course of the proposed works should Aboriginal cultural heritage items be identified. In regards to the care and management of Aboriginal artefacts recovered during the assessment, it was recommended that artefacts be reburied on site, and that any rock shelters or scarred tree sites be preserved and recorded. If artefacts were unable to be reburied on site it was suggested that they be displayed by a local museum or within the Old Parramatta Gaol.

Aboriginal Archaeology Service Inc. responded to the project methodology on the 4 December 2018, provided comment upon the care and management of Aboriginal artefacts recovered during the assessment. Aboriginal Archaeology Service Inc. stated that they agreed with the project methodology, and suggested that any artefacts recovered should be displayed in a museum, local library, or local government building; or otherwise be reburied in close proximity to the site.

4.4 Stage 4: Review of draft Aboriginal cultural heritage assessment report

Following completion of the draft ACHA, a copy of this report was provided to RAPs for review and comment on 28 February 2019. RAPs were given 28 days to review and prepare feedback on the draft report, with comments closing on 28 March 2019. A copy of the mailout and responses received are provided in Appendix 5.

DALC responded on 26 March 2019 stating that they had no objections to the planned development and agreed with the methodology. They asked that native plants be used in the landscape and any artefacts recovered during development be salvaged and reburied on site. If the artefacts could not be safely reburied, DALC asked that they be given to a local museum, displayed as part of the development or donated to the old Parramatta Gaol.

DLO responded on 13 March 2019 stating that they 'support the methodology for the proposed industrial estate including earthworks and the development of industrial infrastructure'. In relation to any artefacts recovered during development, they asked that they be reburied on Country, within the bounds of the study area.

Biosis notes both groups' preferences regarding reburial on Country as the preferential outcome for recovered artefacts. Where long term care and control is concerned, Biosis will try to ensure reburial on Country is completed.

The other two groups, Barking Owl (1 and 5 March 2019) and Muragadi (1 March 2019), contacted Biosis as they could not access the link to the ACHA and AR. Biosis provided each group with the option to have a hard copy mailed, and an alternative link to access the files was emailed to them.

No other responses were received.

5 Aboriginal cultural significance assessment

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community and archaeological (scientific) values. This report will assess the cultural values of Aboriginal sites in the study area. Details of the scientific significance assessment of Aboriginal sites in the study area are provided in Appendix 6.

5.1 Introduction to the assessment process

Heritage assessment criteria in NSW fall broadly within the significance values outlined in the Australia International Council on Monuments and Sites (ICOMOS) *Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS 2013) (the Burra Charter). This approach to heritage has been adopted by cultural heritage managers and government agencies as the set of guidelines for best practice heritage management in Australia. These values are provided as background and include:

- **Historical significance** (evolution and association) refers to historic values and 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, a historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives *in situ*, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.
- **Aesthetic significance** (Scenic/architectural qualities, creative accomplishment) refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.
- **Social significance** (contemporary community esteem) refers to the spiritual, traditional, historical or contemporary associations and attachment that the place or area has for the present-day community. Places of social significance have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities can experience a sense of loss should a place of social significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with local communities.
- **Scientific significance** (Archaeological, industrial, educational, research potential and scientific significance values) refers to the importance of a landscape, area, place or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.

The cultural and archaeological significance of Aboriginal and historic sites and places is assessed on the basis of the significance values outlined above. As well as the Burra Charter significance values guidelines, various government agencies have developed formal criteria and guidelines that have application when assessing the significance of heritage places within NSW. Of primary interest are guidelines prepared by the Australian

Government, the NSW OEH and the Heritage Branch, and the NSW Department of Planning and Environment. The relevant sections of these guidelines are presented below.

These guidelines state that an area may contain evidence and associations which demonstrate one or any combination of the Burra Charter significance values outlined above in reference to Aboriginal heritage. Reference to each of the values should be made when evaluating archaeological and cultural significance for Aboriginal sites and places.

In addition to the previously outlined heritage values, the OEH *Guidelines to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) also specify the importance of considering cultural landscapes when determining and assessing Aboriginal heritage values. The principle behind a cultural landscape is that 'the significance of individual features is derived from their inter-relatedness within the cultural landscape'. This means that sites or places cannot be 'assessed in isolation' but must be considered as parts of the wider cultural landscape. Hence the site or place will possibly have values derived from its association with other sites and places. By investigating the associations between sites, places, and (for example) natural resources in the cultural landscape the stories behind the features can be told. The context of the cultural landscape can unlock 'better understanding of the cultural meaning and importance' of sites and places.

Although other values may be considered – such as educational or tourism values – the two principal values that are likely to be addressed in consideration of Aboriginal sites and places are the cultural/social significance to Aboriginal people and their archaeological or scientific significance to archaeologists and the Aboriginal community. The determinations of archaeological and cultural significance for sites and places should then be expressed as statements of significance that preface a concise discussion of the contributing factors to Aboriginal cultural heritage significance.

5.2 Cultural (social significance) values

Cultural or social significance refers to the spiritual, traditional, historical and/or contemporary associations and values attached to a place or objects by Aboriginal people. Aboriginal cultural heritage is broadly valued by Aboriginal people as it is used to define their identity as both individuals and as part of a group (DECCW 2010a, p.iii). More specifically it provides:

- a '*connection and sense of belonging to Country*' (DECCW 2010a, p.iii)
- a link between the present and the past (DECCW 2010a, p.3)
- a learning tool to teach Aboriginal culture to younger Aboriginal generations and the general public (DECCWa 2010 p.3)
- further evidence of Aboriginal occupation prior to European settlement for people who do not understand the magnitude to which Aboriginal people occupied the continent (DECCW 2010a, p.3).

It is acknowledged that Aboriginal people are the primary determiners of the cultural significance of Aboriginal cultural heritage. During consultation no specific information was provided by RAPs in regards to the cultural values of the study area; however, there are a number of Aboriginal sites within and in the vicinity of the study area and it is widely acknowledged that the Cumberland Plain has high cultural significance to Aboriginal people.

5.3 Historic values

Historic significance refers to associations a place or object may have with a historically important person, event, phase or activity to the Aboriginal and other communities. The study area is not known to have any historic associations.

5.4 Archaeological (scientific significance) values

An archaeological scientific assessment was undertaken for the study area and is presented in detail as part of the attached Archaeological Report (Appendix 6). Test excavations have been conducted within the study area and have identified one high density artefact deposit (45-5-5189/MSP-03) and seven low density artefact scatters (45-5-5187/MSP-01, 45-5-5188/MSP-02, MSP-05, MSP-06, MSP-07, MSP-08, MSP-09 and MSP-10.

45-5-5189/MSP-02 has been assessed as having high archaeological significance due to the large number of artefacts recovered within the site and the relatively intact nature of the archaeological deposits which are an uncommon occurrence in the Cumberland Plain.

Sites 45-5-5187/MSP-01, 45-5-5188/MSP-03, MSP-05, MSP-06, MSP-07, MSP-08, MSP-09 and MSP-10 have been assessed as having low archaeological significance due to the low numbers of artefacts identified within these sites which are a common occurrence, along with the higher levels of disturbances noted in the soil profile.

5.5 Aesthetic values

The study area has undergone disturbances from its use as agricultural land. The study area has largely been cleared of trees with large portions of the study area having been ploughed in the past. The surrounding land to the north and to the west have also been developed for industrial and recreational use. The development surrounding the study area has resulted in a loss of aesthetic value, however; the study area is located in close proximity to South Creek and possesses minimal development within its boundary. The site therefore has moderate aesthetic values.

5.6 Statement of significance

The significance of sites was assessed in accordance with the following criteria:

- requirements of the Code
- the Burra Charter
- *Guide to investigating and reporting on Aboriginal heritage.*

The combined use of these guidelines is widely considered to represent the best practice for assessments of Aboriginal cultural heritage. The identification and assessment of cultural heritage values includes the four values of the Burra Charter: social, historical, scientific and aesthetic values. The resultant statement of significance has been constructed for the study area based on the significance ranking criteria assessed in Table 6.

Table 6 Significance assessment criteria

Site name	Criteria	Ranking
MSP-01 (AHIMS 45-5-5187)	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	TBC
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site is low density, disturbed and a common occurrence in the region and is therefore of low archaeological value.	Low
	Aesthetic – the site is located in semi-rural lands which have been cleared but remain relatively undisturbed. The site has moderate aesthetic value.	Moderate
MSP-02 (AHIMS 45-5-5188)	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	TBC
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site has a high density, is relatively intact and is an uncommon occurrence in the region. It has high scientific significance	High
	Aesthetic – the site is located in semi-rural lands which have been cleared but remain relatively undisturbed. The site has moderate aesthetic value.	Moderate
MSP-05 (AHIMS pending)	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	TBC
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site is low density, disturbed and a common occurrence in the region and is therefore of low archaeological value.	Low
	Aesthetic – the site is located in semi-rural lands which have been cleared but remain relatively undisturbed. The site has moderate aesthetic value.	Moderate
MSP-06 (AHIMS pending)	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	TBC
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site is low density, disturbed and a common occurrence in the region and is therefore of low archaeological value.	Low

Site name	Criteria	Ranking
	Aesthetic – the site is located in semi-rural lands which have been cleared but remain relatively undisturbed. The site has moderate aesthetic value.	Moderate
MSP-07 (AHIMS pending)	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	TBC
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site is low density, disturbed and a common occurrence in the region and is therefore of low archaeological value.	Low
	Aesthetic – the site is located in semi-rural lands which have been cleared but remain relatively undisturbed. The site has moderate aesthetic value.	Moderate
MSP-08 (AHIMS pending)	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	TBC
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site is low density, disturbed and a common occurrence in the region and is therefore of low archaeological value.	Low
	Aesthetic – the site is located in semi-rural lands which have been cleared but remain relatively undisturbed. The site has moderate aesthetic value.	Moderate
MSP-09 (AHIMS pending)	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	TBC
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site is low density, disturbed and a common occurrence in the region and is therefore of low archaeological value.	Low
	Aesthetic – the site is located in semi-rural lands which have been cleared but remain relatively undisturbed. The site has moderate aesthetic value.	Moderate
MSP-10 (AHIMS pending)	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	TBC
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site is low density, disturbed and a common occurrence in the region and is therefore of low archaeological value.	Low

Site name	Criteria	Ranking
MSP-11 (AHIMS pending)	Aesthetic – the site is located in semi-rural lands which have been cleared but remain relatively undisturbed. The site has moderate aesthetic value.	Moderate
	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	TBC
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site is low density, disturbed and a common occurrence in the region and is therefore of low archaeological value.	Low
	Aesthetic – the site is located in semi-rural lands which have been cleared but remain relatively undisturbed. The site has moderate aesthetic value.	Moderate

5.6.1 Statement of significance for MSP-01 (AHIMS 45-5-5187)

MSP-01 consists of an isolated artefact found on the northern bank of a dam. It is located in a disturbed context, is low density and a common site type in the region. It has been assessed with low scientific significance.

5.6.2 Statement of significance for MSP-02 (AHIMS 45-5-5188)

MSP-02 consists of a low density surface and high density subsurface artefact scatter on a high point within the gentle slope landform. A total of 666 artefacts were recovered from test excavations and included a number of complete and broken tools including backed geometric microliths and Bondi points. It is possible that tool manufacture was occurring at this site. The artefact deposit at MSP-03 has a high density and contains artefact types that are uncommon in the region. It has undergone some disturbance due to ploughing but site is of high scientific significance.

5.6.3 Statement of significance for MSP-05

MSP-05 consists of a low density sub-surface artefact scatter found on a gentle slope landform. The site consists of five artefact and is a common site type in the region. This site has been assessed with low scientific significance.

5.6.4 Statement of significance for MSP-06

MSP-06 consists of a low density sub-surface artefact scatter found on a gentle slope landform. The site consists of two artefact and is a common site type in the region. This site has been assessed with low scientific significance.

5.6.5 Statement of significance for MSP-07

MSP-07 consists of an isolated angular fragment found on a gentle slope landform. The site is a common site type in the region and has been assessed with low scientific significance.

5.6.6 Statement of significance for MSP-08

MSP-08 consists of an isolated quartz bipolar flake found on a gentle slope landform. The site is a common site type in the region and has been assessed with low scientific significance.

5.6.7 Statement of significance for MSP-09

MSP-09 consists of a low density sub-surface artefact scatter found on a gentle slope landform. The site consists of seven artefacts and is a common site type in the region. This site has been assessed with low scientific significance.

5.6.8 Statement of significance for MSP-010

MSP-10 consists of a low density sub-surface artefact scatter found on a gentle slope landform. The site consists of nine artefacts and is a common site type in the region. This site has been assessed with low scientific significance.

5.6.9 Statement of significance for MSP-011

MSP-11 consists of a low density sub-surface deposit found on a gentle slope landform. The site consists of nine artefacts and is a common site type in the region. This site has been assessed with low scientific significance.

6 Development limitations and mitigation measures

As previously outlined, the project proposes to develop the study area into an industrial estate that will include earthworks and the development of industrial infrastructure. The study area will be subdivided into lots of 1 to 3 hectares and access to the new industrial estate will be provided via the new Southern link Road, Bakers Lane, and from a new estate access road off Mamre Road, within the southern portion of the study area.

6.1 Predicted physical impacts

The proposed works will include impacts to Aboriginal sites from vegetation clearance, demolition, bulk earthworks, subdivision, construction of industrial infrastructure and buildings, and civil engineering works such as the construction of roads, stormwater drainages, sewer works, and water supply works.

A summary of impacts is provided below in Table 7.

Table 7 Summary of potential archaeological impacts

AHIMS site No.	Site name	Significance	Type of harm	Degree of harm	Consequence of harm
45-5-5187	MSP-01	Low	Direct	Total	Total loss of value
45-5-5188	MSP-02	High	Direct	Total	Total loss of Value
Pending	MSP-05	Low	Direct	Total	Total loss of value
Pending	MSP-06	Low	Direct	Total	Total loss of value
Pending	MSP-07	Low	Direct	Total	Total loss of value
Pending	MSP-08	Low	Direct	Total	Total loss of value
Pending	MSP-09	Low	Direct	Total	Total loss of value
Pending	MSP-10	Low	Direct	Total	Total loss of value
Pending	MSP-100	Low	Direct	Total	Total loss of value

6.2 Management and mitigation measures

Ideally, heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of 'doing as much as necessary, as little as possible' (Marquis-Kyle & Walker 1994, p.13). In cases where conservation is not practical, several options for management are available. For sites, management often involves the salvage of features or artefacts, retrieval of information through excavation or collection (especially where impact cannot be avoided) and interpretation.

Avoidance of impact to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable. As noted above, the proposed works cannot avoid impacts to the archaeological sites identified within the study area.

Avoidance of impact to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable. As noted above, the proposed works cannot avoid impacts to the archaeological sites identified within the study area.

The design plans provided by Altis Property Partners and Frasers Property Industrial Constructions indicate that impacts to the archaeological sites identified during this assessment cannot be avoided by the proposed development. The vast majority of the development footprint is contained to areas of low archaeological potential and previous disturbance. However, 13 of the 30 proposed lots will impact on Aboriginal sites within the study area and complete or partial avoidance is not viable.

It is not feasible for the proposed works to completely avoid impacts to these sites; therefore the following mitigation measures, which considered the principles of ecologically sustainable development (ESD) and intergenerational equity in their design, are proposed below.

Further archaeological work should be undertaken prior to development in the form of salvage excavations and surface salvage for site 45-5-5188/MSP-02 which has been assessed with high scientific significance. The site comprised a high density of sub-surface artefacts within transects 1-14 indicating that this area may have been subject to either repeated use of the area over time or a focused concentration occurring within this one area. In addition, the site showed a high density of artefacts which is commonly seen on the Cumberland Plain. The southern portion of the site (transects 1-14) revealed high artefact density as well as a higher proportion of non-silcrete artefacts and formal tool types. This possibly indicates specific activities concentrated within one portion of the site and should be further investigated. Further investigation in the form of salvage excavation would also allow a larger assemblage to be recovered and analysed, which would not only increase current understanding of the site but also increases our knowledge of Aboriginal occupation in the local area and on the Cumberland and ensures that any scientific and cultural information that is obtained can be accessed and used by future generations. For this reason, salvage excavation and surface salvage collection following the development of an appropriate salvage methodology in consultation with RAP groups is considered an appropriate management measure given that the proposed development impacts are unavoidable in this location.

AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, along with newly recorded sites MSP-07 and MSP-08 comprise ether low density surface artefacts or single isolated artefacts, all of which have been assessed as being of low archaeological, scientific and cultural significance. It is recommended that surface salvage of these sites is undertaken.

Aboriginal sites MSP-05, MSP-06, MSP-09 and MSP-10 consist of low density artefact deposits. Impacts to these sites cannot be avoided by the proposed works. These sites have been tested as part the current test excavation programs. The artefacts recovered during the test excavations have been catalogued and analysed which has further contributed to our current knowledge of Aboriginal archaeological site types and distributions within the study area and on the Cumberland Plain. The test excavations have increased our current understanding of Aboriginal occupation in the region and will contribute to the scientific and cultural information available to future generations. Further testing and salvage of these sites is not recommended.

7 Recommendations

The recommendations below respond specifically to the wishes of the RAPs. Recommendations regarding the archaeological value of the site, and the subsequent management of Aboriginal cultural heritage is provided in the archaeological report (Appendix 6).

Recommendation 1: Further archaeological work in the form of surface salvage and salvage excavation at AHIMS site 45-5-5188/MSP-02 as a part of SSD approval

It is recommended that further archaeological work be conducted for AHIMS site 45-5-5188/MSP-02 in the form of salvage excavation to recover sub-surface artefacts which will be impacted as a part of the proposed development. This would be able to provide further information relating to the artefacts typology and material type, as well as the nature of the activities taking place at AHIMS site 45-5-5188/MSP-02. It is recommended that this be undertaken as a condition of the SSD approval. The salvage work for this particular area of the site would not hold up the development of the remaining areas of the estate.

Recommendation 2: Further archaeological work in the form of surface salvage AHIMS sites 45-5-5187/MSP-01, MSP-07 and MSP-08 as a part of SSD approval

It is recommended that further archaeological work be conducted for AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, MSP-07 and MSP-08 in the form of surface salvage to recover any surface artefacts which will be impacted as a part of the proposed development. It is recommended that surface salvage be undertaken as a condition of the SSD approval.

Recommendation 3: No further archaeological work is required for sites MSP-05, MSP-06, MSP-09, MSP-10 and MSP-11

It is recommended that no further archaeological investigation is required for Aboriginal sites MSP-05, MSP-06, MSP-09, MSP-10 and MSP-11 prior to development impacts.

Recommendation 4: Update AHIMS site cards for AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, and 45-5-5189/MSP-03 and lodge AHIMS site cards for newly identified sites MSP-05, MSP-06 and MSP-07, MSP-08, MSP-09, MSP-10, and MSP-11

It is recommended that the AHIMS site cards for previously identified AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, 45-5-5189/MSP-03 be updated to reflect the revised site descriptions following the test excavations discussed in this report.

It is also recommended that AHIMS site cards are prepared and lodged with AHIMS for newly identified sites MSP-05, MSP-06 and MSP-07, MSP-08, MSP-09, MSP-10 and that the site numbers be included in the final version of this report.

Recommendation 5: Preparation and lodgment of AHIMS site impact recording forms for 45-5-5187/MSP-01, 45-5-5188/MSP-02, 45-5-5189/MSP-03, MSP-05, MSP-06, MSP-07 and MSP-08, MSP-09, MSP-10 and MSP 11

It is recommended that AHIMS site impact recording forms are prepared and lodged with AHIMS for Aboriginal sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, 45-5-518/MSP-03, MSP-05, MSP-06, MSP-07 and MSP-08 MSP-09, MSP-10 and MSP-11 within four months following completion of development impacts or as otherwise stated in SSD approval conditions.

Recommendation 6: Unexpected finds

Discovery of Aboriginal objects

All Aboriginal objects and places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

Discovery of unanticipated historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977*. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Do not recommence work at that location unless authorised in writing by OEH.

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Appendices

Appendix 1 Consultation log

Stage 1 – Notification of project proposal and registration of interest

Step 1- Identification of Aboriginal people/parties with an interest in the proposed study area.

Organisation contacted	Date and type of contact	Date and type of response	Response details
OEH Greater Sydney Office	03/10/2018, email	08/10/2018, email	Provided list of stakeholders
Native Title Services CORP Limited	03/10/2018, email	-	-
National Native Title Tribunal	03/10/2018, email	05/10/2018, email	Provided search results, identifying one registered Indigenous Land Use Agreement
Office of the Registrar, Department of Aboriginal Affairs	03/10/2018, email	09/10/2018, email	Advised to contact Deerubbin LALC
Penrith City Council	03/10/2018, letter	09/10/2018, email	Advised that Deerubbin LALC is the relevant contact
Greater Sydney Local Land Services	03/10/2018, letter	04/10/2018, email	Advised to contact OEH
Deerubbin Local Aboriginal Land Council	03/10/2018, email	25/10/2018, email	Registered for project
Native Title Services CORP Limited	20/02/2019, phone	20/02/2019, phone	Spoke with George Tonna to confirm that the notification was received, and the relevant Aboriginal stakeholders had been notified

Step 2- Public advertisement

The public notice was published in The Western Weekender on the 19 October 2018. A copy of the advertisement is provided in Appendix 2.

Step 3- Registration of interest.

The registration period ran from the 24 October 2018 to 7 November 2018. Leeway was given to Aboriginal parties/groups who provided responses shortly after the close of this period and they have been registered as Aboriginal parties for consultation.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Amanda Hickey Cultural Services	24/10/2018, email	-	-

Organisation contacted	Date and type of contact	Date and type of response	Response details
Barking Owl Aboriginal Corporation	24/10/2018, email	02/11/2018, email	Registered an interest in the project
Biamanga	24/10/2018, email	-	-
Bilinga Cultural Heritage Technical Services	24/10/2018, email	-	-
Billinga	24/10/2018, email	-	-
Butucarbin Aboriginal Corporation	24/10/2018, email	-	-
Corroboree Aboriginal Corporation	24/10/2018, email	24/10/2018	Registered Interest in the project
Cullendulla	24/10/2018, email	-	-
Darug Boorooberongal Elders Aboriginal Corporation	24/10/2018, email	24/10/2018, email	Registered an interest in the project
Darug Custodian Aboriginal Corporation	24/10/2018, email	26/10/2018, email	Registered an interest in the project
Darug Land Observations	24/10/2018, email	30/10/2018, email	Registered an interest in the project
Deerubbin Local Aboriginal Land Council	24/10/2018, email	25/10/2018, email	Registered an interest in the project
Dharug	24/10/2018, email	-	-
Dhinawan-Dhigaraa Culture & Heritage Pty Ltd (Ricky Fields)	24/10/2018, email	-	-
Didge Ngunawal Clan	24/10/2018, email	24/10/2018, email	Registered an interest in the project
DJMD Consultancy	24/10/2018, email	-	-
Ginninderra Aboriginal Corporation	24/10/2018, email	-	-
Gulaga	24/10/2018, email	27/10/2018, email	Registered an interest in the project
Gunjeewong Cultural Heritage Aboriginal Corporation	24/10/2018, email	-	-
Gunyuu	24/10/2018, email	-	-
Gunyuu Cultural Heritage Technical Services	24/10/2018, email	-	-
Jerringong	24/10/2018, email	-	-
Kawul Cultural Services	24/10/2018, email	13/11/2018, email	Registered an interest in the project

Organisation contacted	Date and type of contact	Date and type of response	Response details
Mununga	24/10/2018, email	-	-
Munyunga Cultural Heritage Technical Services	24/10/2018, email	-	-
Murramarang	24/10/2018, email	-	-
Murrumbul	24/10/2018, email	-	-
Murrumbul Cultural Heritage Technical Services	24/10/2018, email	-	-
Nerrigundah	24/10/2018, email	-	-
Nundagurri	24/10/2018, email	-	-
Pemulwuy CHTS	24/10/2018, email	-	-
Rane Consulting	24/10/2018, email	-	-
Thauaira	24/10/2018, email	-	-
Thoorga Nura	24/10/2018, email	-	-
Wailwan Aboriginal Digging Group	24/10/2018, email	25/10/2018, email	Registered an interest in the project
Walbunja	24/10/2018, email	-	-
Walgalu	24/10/2018, email	-	-
Warragil Cultural Services	24/10/2018, email	-	-
Widescope Indigenous Group	24/10/2018, email	-	-
Wingikara	24/10/2018, email	-	-
Wingikara Cultural Heritage Technical Services	24/10/2018, email	-	-
Wurrumay Consultancy	24/10/2018, email	12/11/2018, email	Registered an interest in the project
Yerramurra	24/10/2018, email	-	-
Yulay Cultural Services	24/10/2018, email	24/10/2018, email	Registered an interest in the project
Darug Aboriginal Land Care	24/10/2018, email	26/10/2018, email	Registered an interest in the project
Badu	24/10/2018, mail	-	-
Bidjawong Aboriginal Corporation	24/10/2018, mail	-	-
Darug Aboriginal Cultural	24/10/2018, mail	-	-

Organisation contacted	Date and type of contact	Date and type of response	Response details
Heritage Assessments			
Darug Tribal Aboriginal Corporation	24/10/2018, mail	31/10/2018, email	Registered an interest in the project
Dhinawan-Dhigaraa Culture & Heritage Pty Ltd (Athol Smith)	24/10/2018, mail	-	-
Goobah Developments	24/10/2018, mail	-	-
HSB Consultancy	24/10/2018, mail	-	-
Merrigarn Indigenous Corporation	24/10/2018, mail	-	-
Minnamunnung	24/10/2018, mail	-	-
Muragadi Heritage Indigenous Corporation	24/10/2018, mail	09/11/2018, email	Registered an interest in the project
Murra Bidgee Mullangari Aboriginal Corporation	24/10/2018, mail	09/11/2018, email	Registered an interest in the project
Tocomwall	24/10/2018, mail	31/10/2018, email	Registered an interest in the project
Wullung	24/10/2018, mail		
Kamilaroi-Yankuntjatjara Working Group	24/10/2018, mail	07/11/2018, letter	Registered an interest in the project
Aboriginal Archaeology Service Inc.	24/10/2018, mail	06/11/2018, email	Registered an interest in the project
Yurrandaali Cultural Services	-	24/10/2018, email	Registered an interest in the project
Barraby	-	24/10/2018, email	Registered an interest in the project

Stage 2 – Presentation of information about the proposed project

Step 1- Provision of project information pack

A copy of the information pack is provided in Appendix 3 and a copy of the covering email is provided following.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Didge Ngunawal Clan	12/11/2018, email	-	-
Darug Boorooberongal Elders Aboriginal Corporation	12/11/2018, email	-	-
Wailwan Aboriginal	12/11/2018, email	-	-

Organisation contacted	Date and type of contact	Date and type of response	Response details
Digging Group			
Darug Custodian Aboriginal Corporation	12/11/2018, email	-	-
Darug Aboriginal Land Care	12/11/2018, email	-	-
Gulaga	12/11/2018, email	-	-
Darug Land Observations	12/11/2018, email	-	-
Murra Bidgee Mullangari Aboriginal Corporation	12/11/2018, email	-	-
Muragadi Heritage Indigenous Corporation	12/11/2018, email	-	-
Aboriginal Archaeological Service Inc	12/11/2018, email	-	-
Tocomwall	12/11/2018, email	-	-
Barking Owl Aboriginal Corporation	12/11/2018, email	-	-
Barraby Cultural Services	12/11/2018, email	-	-
Wurrumay Consultancy	13/11/2018, email	-	-
Yulay Cultural Services	13/11/2018, email	-	-
Yurrandaali Cultural Services	13/11/2018, email	-	-
Corroboree Aboriginal Corporation	13/11/2018, email	-	-
Darug Tribal Aboriginal Corporation	13/11/2018, email	-	-
Deerubbin Local Aboriginal Land Council	13/11/2018, email	-	-
Kamilaroi-Yankuntjatjara Working Group	13/11/2018, email	-	-
Kawul Cultural Services	13/11/2018, email	-	-

Stage 3 – Gathering information about cultural significance

Step 1- Provision of project methodology pack and consultation meeting

A copy of the methodology pack is provided in Appendix 4 and a copy of the covering email is provided following.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Didge Ngunawal Clan	12/11/2018, email	13/11/2018, email	Agreed with methodology and stated that they held recent cultural knowledge of the Kemps Creek and Badgerys Creek region
Darug Boorooberongal Elders Aboriginal Corporation	12/11/2018, email	-	-
Wailwan Aboriginal Digging Group	12/11/2018, email	-	-
Darug Custodian Aboriginal Corporation	12/11/2018, email	-	-
Darug Aboriginal Land Care	12/11/2018, email	17/11/2018, email	Agreed with methodology, and asked that native plants be used in the within the landscape. Asked that the stop works procedure be adhered to should Aboriginal cultural heritage items be uncovered during the proposed works. It was asked that all artefacts recovered during the assessment be reburied on site out of harm's way, and that any rock shelters or scarred tree sites be preserved and recorded. If artefacts were unable to be reburied on site it was suggested that they be displayed by a local museum or within the Old Parramatta Gaol.
Gulaga	12/11/2018, email	-	-
Darug Land Observations	12/11/2018, email	-	-
Murra Bidgee Mullangari Aboriginal Corporation	12/11/2018, email	21/11/2018, email	Agreed with methodology
Muragadi Heritage Indigenous Corporation	12/11/2018, email	-	-
Aboriginal Archaeological Service Inc	12/11/2018, email	04/12/2018, email	Agreed with methodology, and suggested that any artefacts recovered during the assessment be displayed in a museum, local library, or local government building, or otherwise be reburied in close proximity to the site
Tocomwall	12/11/2018, email	-	-
Barking Owl Aboriginal	12/11/2018, email	-	-

Organisation contacted	Date and type of contact	Date and type of response	Response details
Corporation			
Barraby Cultural Services	12/11/2018, email	13/11/2018, email	Agreed with methodology
Wurrumay Consultancy	13/11/2018, email	-	-
Corroborree Aboriginal Corporation	13/11/2018, email	-	-
Yulay Cultural Services	13/11/2018, email	19/11/2018, email	Agreed with the methodology
Yurrandaali Cultural Services	13/11/2018, email	19/11/2018, email	Agreed with the methodology
Corroboree Aboriginal Corporation	13/11/2018, email	-	-
Darug Tribal Aboriginal Corporation	13/11/2018, email	-	-
Deerubbin Local Aboriginal Land Council	13/11/2018, email	-	-
Kamilaroi-Yankuntjatjara Working Group	13/11/2018, email	-	-
Kawul Cultural Services	13/11/2018, email	13/11/2018	Indicated that the methodology had been received

Stage 4 – Review of draft report

Following completion of the DRAFT ACHA, and copy of this report was provided to RAPs for review and comment. RAPs were given 28 days to provide comments.

Step 1- Provision of draft report for review

Organisation contacted	Date and type of contact	Date and type of response	Response details
Aboriginal Archaeological Service Inc.	28 February 2019, email	-	-
Barking Owl Aboriginal Corporation	28 February 2019, email		Indicated that they could not access the link. A link was re-sent to them and Jody responded with 'Perfect thanks Ashley'.
Barraby Cultural Services	28 February 2019, email	-	-
Corroborree Aboriginal Corporation	28 February 2019, email	-	-
Darug Aboriginal Land Care	28 February 2019, email	26 March 2019, email	DALC responded on 26 March 2019, stating the following: "The Darug Aboriginal Land care/ Uncle

Organisation contacted	Date and type of contact	Date and type of response	Response details
			Des Dyer, has no objections to the planned development. We have read your report and agree with the recommendations, in your report. We agree with your Methodology. We ask that native plants be used in the landscape. We ask that while the development is in progress if any Artefacts are uncovered that work stops until the Artefacts can be salvaged and moved. We make Recommendation that this is strongly heard to for projects !!!!! We ask that all artefacts be reburied on site out of harm's way, that any rock cravens, and scared tree be preserved, were possible, and be recorded. If not Care and control of Artefacts are put in the local museum, or displayed in the foyer of new building with signage on where they came from. If not we would like to see them in the old Parramatta Goal.... The Darug Aboriginal Land care have and always will hold all land specific social, spiritual and have a responsibility to look after the plants , animals creeks rivers on Darug land has cultural values to our organisation.' We are Traditional Owner, our members have lived on Darug land for most of their lives and worked in the area. We have been doing Cultural Heritage Assessments for over 20 years and still do today.
Darug Boorooberongal Elders Aboriginal Corporation	28 February 2019, email	-	-
Darug Custodian Aboriginal Corporation	28 February 2019, email	-	-
Darug Land Observations	28 February 2019, email	13 March 2019, email	Anna responded stating 'please find attached letter in reply to the draft Aboriginal Cultural Heritage Assessment and Archaeological Report

Organisation contacted	Date and type of contact	Date and type of response	Response details
			for the proposed industrial estate, located at 657-769 Mamre Road, in Kemps Creek. Look forward to working with you on this project.' The letter stated: 'Darug Land Observations Pty Ltd (DLO) has reviewed the draft Aboriginal Cultural Heritage Assessment and Archaeological Report, and supports the methodology for the proposed industrial estate including earthworks and the development of industrial infrastructure of Lots X & Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414 and Lot 34 DP 1118173, located at 657-769 Mamre Road, in Kemps Creek. In relation to the long-term storage of recovered artefacts, we believe that the recovered artefacts should be re-buried on Country (the study area). Furthermore, Darug Land Observations Pty Ltd would like to be involved in the further archaeological test excavations and all other forms of works to be carried out on the site.'
Darug Tribal Aboriginal Corporation	28 February 2019, email	-	-
Deerubbin Local Aboriginal Land Council	28 February 2019, email	-	-
Didge Ngunawal Clan	28 February 2019, email	-	-
Gulaga	28 February 2019, email	-	-
Kamilaroi-Yankuntjatjara Working Group	28 February 2019, email	-	-
Kawul Cultural Services	28 February 2019, email	-	-
Muragadi Heritage Indigenous Corporation	28 February 2019, email	1 March 2019, email	Indicated that they could not access the link. Biosis replied asking whether they wanted a hard copy sent or if the problem had resolved itself. No reply

Organisation contacted	Date and type of contact	Date and type of response	Response details
			was given. A courtesy email and new link was sent to them on 27 March 2019.
Murra Bidgee Mullangari Aboriginal Corporation	28 February 2019, email	-	-
Tocomwall	28 February 2019, email	-	-
Wailwan Aboriginal Digging Group	28 February 2019, email	-	-
Wurrumay Consultancy	28 February 2019, email	-	-
Yulay Cultural Services	28 February 2019, email	-	-
Yurrandaali Cultural Services	28 February 2019, email	-	-

Appendix 2 Stage 1: Notification of project proposal and registration of interest

03 October 2018

Senior Team Leader - Planning
Office of Environment and Heritage
PO Box 644
Parramatta NSW 2124

Dear Sir or Madam,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

Altis Property Partners and Frasers Property are proposing to develop a logistics hub within 657-769 Mamre Road, Kemps Creek (the study area). The current proposal involves the construction of a Warehouse and Logistics Hub, located at 657-769 Mamre Road, Kemps Creek. The proposed development seeks approval for earthworks and infrastructure across the entire Site (carried out in two construction stages) and built-form of warehouse facilities. The proposed works will be assessed as a State Significant Development (SSD).

Biosis have been engaged by Altis Property Partners and Frasers Property to undertake an Aboriginal Cultural Heritage Assessment (ACHA) under the *Code of practice for archaeological investigation of Aboriginal objects in NSW* (DECCW 2010a) for the project.

In accordance with the Office of Environment and Heritage's *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010b) (consultation requirements), Part 6 *National Parks and Wildlife Act 1974*, individuals or groups are invited to register their interest in writing to participate in the ACHA and consultation process for the proposal.

Biosis Pty Ltd is assisting with consultation with the Aboriginal community in accordance with the consultation requirements. The purpose of the Aboriginal community consultation will be to assist with the preparation of an Environmental Impact Statement (EIS) and to provide sufficient information for the consideration of Aboriginal cultural heritage values as part of the SSD application.

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you could please provide contact details for any such Aboriginal people or organisations of which you are aware it would be greatly appreciated. Please provide these details by **4pm on Wednesday 17 October 2018**.

Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

biosis.com.au

In accordance with the consultation requirements, please note that the relevant client contact for this project is:

Stephen O'Connor
Project Director – Altis Property Partners
GPO Box 4456 Sydney NSW 2001
stephen.oconnor@altisproperty.com.au

All correspondence regarding provision of names and contact details of Aboriginal people who may hold cultural knowledge relevant to the study area should be provided in writing to:

James Cole
Biosis Pty Ltd
14, 17-17 Power Avenue
Alexandria NSW 2015
jcole@biosis.com.au

If you have any queries regarding the Project please don't hesitate to contact me on the details below.

Yours sincerely,

James Cole
Consultant Archaeologist

References

DECCW 2010a, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

DECCW 2010b, 'Aboriginal cultural heritage consultation requirements for proponents'.

03 October 2018

Office of the Registrar, Aboriginal Land Rights Act 1983
PO Box 5068
Parramatta NSW 2124

Dear Sir or Madam,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

Altis Property Partners and Frasers Property are proposing to develop a logistics hub within 657-769 Mamre Road, Kemps Creek (the study area). The current proposal involves the construction of a Warehouse and Logistics Hub, located at 657-769 Mamre Road, Kemps Creek. The proposed development seeks approval for earthworks and infrastructure across the entire Site (carried out in two construction stages) and built-form of warehouse facilities. The proposed works will be assessed as a State Significant Development (SSD).

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Yours sincerely,

James Cole
Consultant Archaeologist

References

DECCW 2010a, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

DECCW 2010b, 'Aboriginal cultural heritage consultation requirements for proponents'.

03 October 2018

Native Title Services Corporation
PO Box 2105
Strawberry Hills NSW 2012

Dear Sir or Madam,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033
Altis Property Partners and Frasers Property are proposing to develop a logistics hub within 657-769 Mamre Road, Kemps Creek (the study area). The current proposal involves the construction of a Warehouse and Logistics Hub, located at 657-769 Mamre Road, Kemps Creek. The proposed development seeks approval for earthworks and infrastructure across the entire Site (carried out in two construction stages) and built-form of warehouse facilities. The proposed works will be assessed as a State Significant Development (SSD).

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Consultant Archaeologist

References

DECCW 2010a, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

DECCW 2010b, 'Aboriginal cultural heritage consultation requirements for proponents'.

03 October 2018

National Native Title Tribunal
GPO Box 9973
Sydney NSW 2001

Dear Sir or Madam,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033
Altis Property Partners and Frasers Property are proposing to develop a logistics hub within 657-769 Mamre Road, Kemps Creek (the study area). The current proposal involves the construction of a Warehouse and Logistics Hub, located at 657-769 Mamre Road, Kemps Creek. The proposed development seeks approval for earthworks and infrastructure across the entire Site (carried out in two construction stages) and built-form of warehouse facilities. The proposed works will be assessed as a State Significant Development (SSD).

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James Cole
Consultant Archaeologist

References

DECCW 2010a, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

DECCW 2010b, 'Aboriginal cultural heritage consultation requirements for proponents'.

03 October 2018

Greater Sydney Local Land Services
PO Box 4515
Westfield Penrith NSW 2750

Dear Sir or Madam,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033
Altis Property Partners and Frasers Property are proposing to develop a logistics hub within 657-769 Mamre Road, Kemps Creek (the study area). The current proposal involves the construction of a Warehouse and Logistics Hub, located at 657-769 Mamre Road, Kemps Creek. The proposed development seeks approval for earthworks and infrastructure across the entire Site (carried out in two construction stages) and built-form of warehouse facilities. The proposed works will be assessed as a State Significant Development (SSD).

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James Cole
Consultant Archaeologist

References

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DECCW 2010b, 'Aboriginal cultural heritage consultation requirements for proponents'.

03 October 2018

General Manager
Penrith City Council
601 High Street
Penrith NSW 2750

Dear Sir or Madam,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

Altis Property Partners and Frasers Property are proposing to develop a logistics hub within 657-769 Mamre Road, Kemps Creek (the study area). The current proposal involves the construction of a Warehouse and Logistics Hub, located at 657-769 Mamre Road, Kemps Creek. The proposed development seeks approval for earthworks and infrastructure across the entire Site (carried out in two construction stages) and built-form of warehouse facilities. The proposed works will be assessed as a State Significant Development (SSD).

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Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

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03 October 2018

Deerubbin Local Aboriginal Land Council
2/9 Tindale Street
Penrith NSW 2750

Dear Sir or Madam,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033
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Yours sincerely,

James Cole
Consultant Archaeologist

References

DECCW 2010a, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

DECCW 2010b, 'Aboriginal cultural heritage consultation requirements for proponents'.

Anthea Vella

From: Geospatial Search Requests <GeospatialSearch@NNTT.gov.au>
Sent: Friday, 5 October 2018 4:22 PM
To: James Cole
Subject: RE: SR4944 - 27033 - Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment - notification to agencies - SR4944
Attachments: 20181005_SR4944_NSW_Penrith_City_Council_LGA_Overlap_Report.xlsx

UNCLASSIFIED

Native title search – *NSW Parcels within Penrith City Council LGA*
Your ref: *27033* - **Our ref:** *SR4944*

Change of e-mail address for Geospatial Searches
Please ensure that from 14th August 2018 your search requests are forwarded to GeospatialSearch@NNTT.gov.au with a ***completed search request form***. The form is available from the Tribunal's website at this address: http://www.nntt.gov.au/News-and-Publications/Pages/Forms.aspx

Dear James Cole,

Thank you for your search request received on 03 October 2018 in relation to the above area, please find your results attached.

Please note: Where the area identified to be searched is indistinct, generalised, or is for a freehold parcel, the results provided may relate to the Local Government Area (LGA) or Local Aboriginal Land Council (ALC).

Search Results
The results provided are based on the information you supplied and are derived from a search of the following Tribunal databases:

- Schedule of Native Title Determination Applications
- Register of Native Title Claims
- Native Title Determinations
- Register of Indigenous Land Use Agreements
- Notified Indigenous Land Use Agreements

For more information about the Tribunal's registers or to search the registers yourself and obtain copies of relevant register extracts, please visit our website.

Please note: There may be a delay between a native title determination application being lodged in the Federal Court and its transfer to the Tribunal. As a result, some native title determination applications recently filed with the Federal Court may not appear on the Tribunal's databases.

The search results are based on analysis against external boundaries of applications only. Native title applications commonly contain exclusions clauses which remove areas from within the external boundary. To determine whether the areas described are in fact subject to claim, you need to refer to the "Area covered by claim" section of the relevant Register Extract or Schedule Extract and any maps attached.

Search results and the existence of native title
Please note that the enclosed information from the Register of Native Title Claims and/or the Schedule of Applications is **not** confirmation of the existence of native title in this area. This cannot be confirmed until the Federal Court makes a determination that native title does or does not exist in relation to the area. Such determinations are registered on the National Native Title Register.

The Tribunal accepts no liability for reliance placed on enclosed information
The enclosed information has been provided in good faith. Use of this information is at your sole risk. The National Native Title Tribunal makes no representation, either express or implied, as to the accuracy or suitability of the information enclosed for any particular purpose and accepts no liability for use of the information or reliance placed on it.

If you have any further queries, please do not hesitate to contact us on the free call number 1800 640 501.

Regards,

Geospatial Searches
National Native Title Tribunal | Perth
Email: GeospatialSearch@nntt.gov.au | **www.nntt.gov.au**
Shared country, shared future

From: James Cole
Sent: Wednesday, 3 October 2018 2:08 PM
To: Geospatial Search Requests
Subject: SR4944 - 27033 - Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment - notification to agencies

Good afternoon,

In accordance with Section 4.1.2 of the Aboriginal cultural heritage consultation requirements for proponents (DECCW 2010) please find attached to this email a notification than an Aboriginal cultural heritage assessment is being undertaken at 657-769 Mamre Road, Kemps Creek NSW.

Biosis Pty Ltd is assisting with consultation with the Aboriginal community in accordance with the consultation requirements. The purpose of the Aboriginal community consultation will be to assist with the preparation of an Environmental Impact Statement (EIS) and to provide sufficient information for the consideration of Aboriginal cultural heritage values as part of the SSD application.

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you could please provide contact details for any such Aboriginal people or organisations of which you are aware it would be greatly appreciated. Please provide these details by 4pm on Wednesday 17 October 2018.

If you have any queries regarding the above or the attached information, please do not hesitate to contact me.

Kind regards,

James

James Cole
Consultant Archaeologist
M: 0437 856 233
D: (02) 9101 8708

E: jcole@biosis.com.au

Leaders in Ecology and Heritage Consulting

The information transmitted including attachments is intended only for the person or entity to which it is addressed and may contain copyright material, or information that is confidential or is exempt from disclosure by law. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient is strictly prohibited. If you received this in error, please contact the sender and delete the material from your computer. The views expressed in this email are those of the sender except where the sender expressly and with authority states them to be the views of Biosis Pty Ltd. Biosis Pty Ltd does not represent that this email is free of errors, viruses or interference. When using email to communicate with Biosis Pty Ltd, access to that information by Biosis Pty Ltd personnel is strictly limited and controlled.

Anthea Vella

From: Heather Lee-Kiorgaard
Sent: Monday, 8 October 2018 10:18 AM
To: James Cole
Cc: Sydney Resource Group
Subject: FW: Aboriginal Consultation List -657-769 Mamre Road, Kemps Creek
Attachments: 20181008081103058.pdf

Heather Lee-Kiorgaard
Project Management Administrator
D: (02) 9101 8720
E: hlee-kiorgaard@biosis.com.au

Leaders in Ecology and Heritage Consulting

The information transmitted including attachments is intended only for the person or entity to which it is addressed and may contain copyright material, or information that is confidential or is exempt from disclosure by law. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient is strictly prohibited. If you received this in error, please contact the sender and delete the material from your computer. The views expressed in this email are those of the sender except where the sender expressly and with authority states them to be the views of Biosis Pty Ltd. Biosis Pty Ltd does not represent that this email is free of errors, viruses or interference. When using email to communicate with Biosis Pty Ltd, access to that information by Biosis Pty Ltd personnel is strictly limited and controlled.

-----Original Message-----
From: Barry Gunther
Sent: Monday, 8 October 2018 9:44 AM
To: Sydney
Subject: Aboriginal Consultation List -657-769 Mamre Road, Kemps Creek

Dear James,

Thank you for your letter dated 3rd October 2018 regarding the request for the Aboriginal Consultation List for Aboriginal stakeholders for the proposed development of 657-769 Mamre Road, Kemps Creek NSW.

Please find attached the list as per your request

Regards
Barry Gunther
Aboriginal Heritage Planning Officer
www.environment.nsw.gov.au

Greater Sydney Branch
Communities and Greater Sydney Division

10 Valentine Avenue, Parramatta 2150
PO Box 644, Parramatta 2124
T 02 88376394

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If you are not the intended recipient, please notify the sender and then delete it immediately.
Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the NSW Office of Environment and Heritage.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

Anthea Vella

From: Jodie Rikiti <jodie.rikiti2@det.nsw.edu.au>
Sent: Tuesday, 9 October 2018 4:27 PM
To: James Cole
Subject: Biosis - 657-769 Mamre Road Kemps Creek
Attachments: Biosis - 657-769 Mamre Road Kemps Creek.docx

Dear James

Please see attached search as requested.

Regards
Jodie Rikiti
Administrative Support Officer,
Governance
Office of The Registrar ALRA 1983
Phone: 02 8633 1266
Email: jodie.rikiti2@oralra.nsw.gov.au
P.O Box 5068
PARRAMATTA NSW 2124
Website: www.oralra.nsw.gov.au

****
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privileged information or confidential information or both. If you
are not the intended recipient please delete it and notify the sender.
****

Anthea Vella

From: Carolyn Gartside <Carolyn.Gartside@penrith.city>
Sent: Tuesday, 9 October 2018 12:13 PM
To: stephen.oconnor@altisproperty.com.au ; jcole@biosis.com
Cc: Tracy Leahy
Subject: Re: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment - Notification to agencies

Dear Mr O'Conner and Mr Cole,

Council advises that the Deerubbin Local Aboriginal Land Council is the contact for Aboriginal Cultural Heritage matters in our Local Government Area. The contact person is Mr Steve Randall who you can reach on these numbers (02)4724-5600 or (m) 041-7219174.

Thank you

Carolyn Gartside
Aboriginal Liaison Officer

E Carolyn.Gartside@penrith.city
T +612 4732 7853 | F +612 4732 7958 | M +61407 48 9296
PO Box 60, PENRITH NSW 2751
www.visitpenrith.com.au
www.penrithcity.nsw.gov.au

PENRITH
CITY COUNCIL

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Anthea Vella

From: Margaret Bottrell <margaret.bottrell@lls.nsw.gov.au>
Sent: Thursday, 4 October 2018 1:00 PM
To: James Cole
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment - notification to agencies

To James Cole,
RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment - notification to agencies

Thank you for your letter dated 3 October 2018, requesting assistance with identifying Aboriginal stakeholder groups or persons who may have an interest in your project area.
Greater Sydney Local Land Services (GS LLS) acknowledges that Local Land Services have been listed in *Section 4.1.2 (g)* of the*Aboriginal cultural heritage consultation requirements for proponents 2010,* under *Part 6, National Parks and Wildlife Act 1974* as a source of information to obtain the "names of Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal *objects* and/or *places*".
GS LLS is a partner with many Aboriginal communities in the region on many natural resource management (NRM) projects. However, GS LLS is not the primary source for contacting or managing contact lists for Aboriginal communities or persons that may inform or provide comment on planning issues. GS LLS considers cultural heritage issues that relate to land-use planning in general and only considers culture and heritage issues in the context of NRM.
We strongly recommend that you make contact with the Office of Environment and Heritage (OEH), Cultural Heritage Division, for all-inclusive contact lists of persons and organisations that may assist with your investigation.
Note: Hawkesbury Nepean Catchment Management Authority (HNCMA) no longer exists. All work previously carried out by HNCMA in now delivered by Greater Sydney Local Land Services (GS LLS).
Regards,

--
Margaret Bottrell Senior Strategic Land Services Officer
(Aboriginal Communities)
Greater Sydney Local Land Service
Level 4, 2-6 Station Street Penrith
PO Box 4515 Penrith Westfields NSW 2750
T: 02 47242111
E:margaret.bottrell@lls.nsw.gov.au
W: http://www.lls.nsw.gov.au

NSW GOVERNMENT | Local Land Services • Grow • Protect • Connect
We help secure the future of agriculture and the environment for NSW communities

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Overlap Analysis Report

Disclaimer
This information product has been created to assist in understanding the spatial characteristics and relationships of this native title matter and is intended as a guide only. Spatial data used has been sourced from the relevant custodians in
Tribunal, and is referenced to the GDA94 datum.

While the National Native Title Tribunal (NNTT) and the Native Title Registrar (Registrar) have exercised due care in ensuring the accuracy of the information provided, it is provided for general information only and on the understanding tha
Registrar nor the Commonwealth of Australia is providing professional advice. Appropriate professional advice relevant to your circumstances should be sought rather than relying on the information provided. In addition, you must exercise
carefully evaluate the information provided for accuracy, currency, completeness and relevance for the purpose for which it is to be used.
The information provided is often supplied by, or based on, data and information from external sources, therefore the NNTT and Registrar cannot guarantee that the information is accurate or up-to-date.
The NNTT and Registrar expressly disclaim any liability arising from the use of this information.
This information should not be relied upon in relation to any matters associated with cultural heritage.

Please note:

- Calculated areas may not be the same as the legal area of a parcel.
- Where shown, NNTT Tenure Class for a non freehold parcel refers to a tenure grouping derived for the purposes of the Tribunal, and does not necessarily represent the jurisdictional tenure type.
- Overlap results are returned only for the currently active jurisdiction.

Selected feature

Name	Penrith
Full name	Penrith City Council
As at	6/08/2018
Calculated area SqKm	403.8705

Overlap details

Schedule of Native Title Determination Applications

No overlap found

Register of Native Title Claims

No overlap found

Native Title Determinations

No overlap found

Native Title Determination Outcomes

No overlap found

Indigenous Land Use Agreements

Overlap Tribunal ID	Name	AgreementStatus	Area sq km(calculated)
NI2014/001	Gundungurra Area Agreement	ILUA registered	6,941.0702

RATSIB areas

Name	Organisation	RATSIB Status	Area sq km(calculated)
New South Wales	NTSCORP Limited	NTSP	1,723,577.6107

each jurisdiction, and/or the

.t neither the NNTT, the
/our own judgment and

Overlap Area sq km (calculated)
2.2411

Overlap Area sq km (calculated)
403.8705

Office of Environment & Heritage

Our reference: SF18/7188

James Cole
Biosis Pty Ltd
Consultant Archaeologist
14, 17-17 power Avenue
Alexandria NSW 2015

Dear James,

Thank you for your letter dated 3/10/2018 to the Office of Environment and Heritage (OEH) regarding obtaining a list of the Aboriginal stakeholders that may have an interest in the proposed development for 657-769 Mamre Road, Kemps Creek, NSW.

Please find attached the list of Aboriginal stakeholders known to OEH that may have an interest in the project.

As the Department of Planning and Environment is the approval authority for this project, the consultation process should be in accordance with the relevant guidelines as stipulated by the Department of Planning and Environment.

If you wish to discuss any of the above matter further please email gs.ach@environment.nsw.gov.au.

Yours sincerely

S. Harrison 05/10/18

Susan Harrison
Senior Team Leader Planning
Greater Sydney Branch
Communities and Greater Sydney Division

PO Box 644 Parramatta NSW 2124
Level 2, 10 Valentine Avenue Parramatta NSW 2150
Tel: (02) 9995 5477
ABN 30 841 387 271
www.environment.nsw.gov.au

03 October 2018

Senior Team Leader - Planning
Office of Environment and Heritage
PO Box 644
Parramatta NSW 2124

Dear Sir or Madam,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

Altis Property Partners and Frasers Property are proposing to develop a logistics hub within 657-769 Mamre Road, Kemps Creek (the study area). The current proposal involves the construction of a Warehouse and Logistics Hub, located at 657-769 Mamre Road, Kemps Creek. The proposed development seeks approval for earthworks and infrastructure across the entire Site (carried out in two construction stages) and built-form of warehouse facilities. The proposed works will be assessed as a State Significant Development (SSD).

Biosis have been engaged by Altis Property Partners and Frasers Property to undertake an Aboriginal Cultural Heritage Assessment (ACHA) under the *Code of practice for archaeological investigation of Aboriginal objects in NSW* (DECCW 2010a) for the project.

In accordance with the Office of Environment and Heritage's *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010b) (consultation requirements), Part 6 *National Parks and Wildlife Act 1974*, individuals or groups are invited to register their interest in writing to participate in the ACHA and consultation process for the proposal.

Biosis Pty Ltd is assisting with consultation with the Aboriginal community in accordance with the consultation requirements. The purpose of the Aboriginal community consultation will be to assist with the preparation of an Environmental Impact Statement (EIS) and to provide sufficient information for the consideration of Aboriginal cultural heritage values as part of the SSD application.

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you could please provide contact details for any such Aboriginal people or organisations of which you are aware it would be greatly appreciated. Please provide these details by **4pm on Wednesday 17 October 2018**.

Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

biosis.com.au

In accordance with the consultation requirements, please note that the relevant client contact for this project is:

Stephen O'Connor
Project Director – Altis Property Partners
GPO Box 4456 Sydney NSW 2001
stephen.oconnor@altisproperty.com.au

All correspondence regarding provision of names and contact details of Aboriginal people who may hold cultural knowledge relevant to the study area should be provided in writing to:

James Cole
Biosis Pty Ltd
14, 17-17 Power Avenue
Alexandria NSW 2015
jcole@biosis.com.au

If you have any queries regarding the Project please don't hesitate to contact me on the details below.

Yours sincerely,

James Cole
Consultant Archaeologist

References

DECCW 2010a, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

DECCW 2010b, 'Aboriginal cultural heritage consultation requirements for proponents'.

LIST OF ABORIGINAL STAKEHOLDERS FOR THE GREATER SYDNEY BRANCH HELD BY OEH FOR THE PURPOSES OF THE *ABORIGINAL CULTURAL HERITAGE CONSULTATION REQUIREMENTS FOR PROPONENTS 2010*

These lists are provided to proponents in accordance with section 4.1.2 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (the "Consultation Requirements") which commenced on 12 April 2010.

The consultation process involves getting the views of, and information from, Aboriginal people and reporting on these. It is not to be confused with other field assessment processes involved in preparing a proposal and an application. Consultation does not include the employment of Aboriginal people to assist in field assessment and/or site monitoring. Aboriginal people may provide services to proponents through a contractual arrangement however, this is separate from consultation. The proponent is not obliged to employ those Aboriginal people registered for consultation. Consultation as per these requirements will continue irrespective of potential or actual employment opportunities for Aboriginal people.

A copy of the Consultation Requirements can be found on the OEH website at: http://www.environment.nsw.gov.au/resources/cultureheritage/commconsultation/09781ACHconsultreq.pdf.

Under the Consultation Requirements; a proponent is required to provide Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places as relevant to the proposed project area, with an opportunity to be involved in consultation. Section 3.3.1 of the Consultation Requirements states that Aboriginal people who can provide this information are, based on Aboriginal lore and custom, the traditional owners or custodians of the land that is the subject of the proposed project.

The Consultation Requirements also state that:

Traditional owners or custodians with appropriate cultural heritage knowledge to inform decision making who seek to register their interest as an Aboriginal party are those people who:

- *continue to maintain a deep respect for their ancestral belief system, traditional lore and custom*
- *recognise their responsibilities and obligations to protect and conserve their culture and heritage and care for their traditional lands or Country*
- *have the trust of their community, knowledge and understanding of their culture, and permission to speak about it.*

Please note: the placement of an organisation's name on any OEH Aboriginal stakeholder list for the Consultation Requirements does not override a proponent's requirement to also advertise in the local newspaper and to seek from other sources the names of any other Aboriginal people who may hold cultural knowledge as required under clause 80C of the National Parks and Wildlife Regulation 2009.

How to use this list

1. **Determine which Local Government Area/s (LGA/s) your project area falls into**
2. **Identify which organisations and individuals on the list have an interest in the LGA/s relevant to your project – identified in column 6 of the list**
3. **Contact the organisations/individuals who have indicated an interest in the relevant LGA/s and invite them to register an interest in your project**

Do not reproduce the attached list in publicly available reports and other documents. Your report should only contain the names of the organisations and individuals who you have invited to register an interest in your project and those who have registered as stakeholders for your project.

PLEASE NOTE: THE STAKEHOLDER LIST HAS NOT BEEN UPDATED TO INCLUDE THE RECENT COUNCIL MERGERS AND NAME CHANGES. PLEASE CONSIDER THE PRE-MERGER COUNCIL BOUNDARIES WHEN DETERMINING WHO SHOULD BE INVITED TO REGISTER FOR YOUR PROJECT.

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's		Additional information
Deerubbin Local Aboriginal Land Council	Kevin Cavanagh	(02) 4724 5600	Not provided	2/9 Tindale St, Penrith NSW 2750	Hawkesbury Blacktown Penrith Fairfield	Holroyd Blue Mountains The Hills Shire Parramatta	
Tharawal Local Aboriginal Land Council	Rebecca Ede (CEO)	(02) 46810059	ceo@tharawal.com.au reception@tharawal.com.au	PO Box 245 Thirlmere NSW 2572	Camden Campbelltown Wollondilly	Sutherland Liverpool	
Metropolitan Local Aboriginal Land Council	Nathan Moran	(02) 83949666	Not provided	PO Box 1103 Strawberry Hills NSW 2016	The Hills Shire Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay	Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	
Gandangara Local Aboriginal Land Council	Not provided	(02) 96025280	Not provided	PO Box 1038 Liverpool NSW 2170	Liverpool Fairfield Holroyd Parramatta	Auburn Bankstown Sutherland	
La Perouse Local Aboriginal Land Council	Chris Ingrey	(02) 9311 4282	Not provided	PO Box 365 Matraville NSW 2036	Sutherland Randwick Botany Bay Waverly	Woollahra Sydney Rockdale	
Parramatta City Council Aboriginal Advisory Committee	Parramatta City Council	(02)9806 5050	Not provided	PO Box 32, Parramatta, NSW, 2124	Parramatta		
Holroyd City Council Advisory Committee	Holroyd City Council	(02) 9840 9840	Not provided	P.O. Box 42, Merrylands, NSW 2160	Holroyd		
Darug Custodian Aboriginal Corporation	Justine Coplin	0414 962 766	justinecoplin@optusnet.com.au	PO Box 81, Windsor NSW 2756	Hawkesbury Blacktown Penrith Fairfield Holroyd Blue Mountains	Camden Campbelltown The Hills Shire Liverpool Parramatta	
Darug Tribal Aboriginal Corporation	Not provided	02 9622 4081	Not provided	PO Box 441, Blacktown NSW 2148	Hawkesbury Blacktown Penrith Fairfield Holroyd Blue Mountains	Camden Campbelltown The Hills Shire Liverpool Parramatta	
Darug Aboriginal Cultural Heritage Assessments	Gordon Morton	02 9410 3665 or 0422 865 831	Not provided	Unit 9, 6 Chapman Avenue, Chatswood, NSW 2067	Hawkesbury Blacktown Penrith Fairfield Holroyd Blue Mountains Camden Campbelltown The Hills Shire	Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney	

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Liverpool Parramatta Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	
Darug Land Observations	Jamie Workman and Anna Workman	0418 494 951 0413 687 279	daruglandobservations@gmail.com	PO Box 173, Ulladulla, NSW 2539	Ashfield Auburn Bankstown Blacktown Blue Mountains Botany Bay Burwood Camden Campbelltown Canada Bay Canterbury Fairfield Hawkesbury The Hills Holroyd Hornsby Hunter's Hill Hurstville Kogarah Ku-ring-gai Lane Cove Leichhardt Liverpool Manly Marrickville Mosman North Sydney Parramatta Penrith Pittwater Randwick Rockdale Ryde Strathfield Sutherland Sydney Warringah Waverley Willoughby Woollahra Wollondilly	
Des Dyer		0408 360 814	Not provided	18a Perigee Close, Doonside 2767	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown The Hills Shire Liverpool Parramatta	
Ken Foster		0411 818 091	Not provided	68 Australia St Matraville	Sutherland	
La Perouse Botany Bay Corporation	Yvonne Simms	04660 94491	Fax (02) 9311 3440	10 Murrong Place, La Perouse NSW 2036	Sutherland	
Norma Simms		04660 94491	Not provided	10 Murrong Place, La Perouse NSW 2036	Sutherland	
Matthew and Andrew Coe		(08)83442196	Not provided	37 Derlanger Avenue, Collingswood, South Australia 5081	Sutherland	
Gundungurra Aboriginal Heritage Association Inc	Merl Williams	02 4757 3223	Not provided	PO Box 31, Lawson NSW 2783	Blue Mountains	
Gundungurra Tribal Council Aboriginal Corporation	Sharon Brown	02 4729 3713	Not provided	PO Box 7244, Leura NSW 2780	Blue Mountains	
Trevor Robinson		Not provided	Not provided	PO Box 73, Peak Hill, NSW 2869	Blue Mountains	
Tania Matthews		0409 193 612/ (02) 67924038	aboriginalhistoryhunter@gmail.com	U2 11 Walowa Street, Narrabri, NSW 2390	Blue Mountains	
A1 Indigenous Services	Carolyn Hickey	0411 650 057	cazadirect@live.com	73 Russell Street, Emu Plains, NSW 2750.	Blue Mountains	Carolyn is Wonnarua

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's		Additional information
Cubbitch Barta	Glenda Chalker	0427 218 425	Not provided	55 Nightingale Rd, Pheasants Nest NSW 2574	Camden Campbelltown	Liverpool Wollondilly	
	Rebecca Chalker	Not Provided	Not provided	99 Menangle street, Picton 2571			
Eric Keidge		04311 66423	Not provided	11 Olsson Close Hornsby Heights NSW 2077	The Hills Shire Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay	Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	
Gunjeewong Cultural Heritage Aboriginal Corporation	Cherie Carroll Turrise	(02) 6355 4110 0456 116 408	cheriecarroll68@yahoo.com	1 Bellvue Place, Portland NSW, 2847	Hawkesbury Blacktown Penrith Fairfield	Holroyd Camden Campbelltown Parramatta	Cherie is a Ngunnawal Elder however lived in the Western Sydney area during her childhood. She recognises she is not from the area but has associations
	Contact details have changed as the above contact details have been hacked as of January 2018	0438 428 805 or 0409 558 846	Gunjeewong53@hotmail.com				
Merrigarn Indigenous Corporation	Shaun Carroll	0435 040 842	Not provided	GPO Box 158, Canberra City, ACT, 2601	Hawkesbury Blacktown Penrith Fairfield	Holroyd Camden Campbelltown Parramatta	Shaun is Ngunnawal and is Cherie's brother. **NOTE:** It has been reported to OEH that the contact details for this group are incorrect; however, OEH has not been provided with revised contact details.
Corroboree Aboriginal Corporation	Steve Johnson	0406 991 221	Not provided	PO Box 3340, Rouse Hill, NSW 2155	Western Sydney Camden	Campbelltown Parramatta	Ngunnawal and lives in Western Sydney
Murra Bidgee Mullangari Aboriginal Corporation	Darleen Johnson	0490 051 102	Not provided	PO Box 246, Seven Hills, NSW, 2147	Hawkesbury Blacktown Penrith Fairfield	Holroyd Camden Campbelltown Parramatta	Ngunnawal and lives in Western Sydney
Muragadi Heritage Indigenous Corporation	Jesse Johnson	0447 970 049	Not provided	5 Hession Road, Nelson, NSW 2765	Western Sydney Camden	Campbelltown Parramatta	Ngunnawal and lives in Western Sydney
Bidjawong Aboriginal Corporation	James Carroll	0433 224 324	Not provided	PO Box 124, Round Corner, NSW 2158	Hawkesbury Blacktown Penrith Fairfield	Holroyd Camden Campbelltown Parramatta	
Phil Kahn		0434 545 982	Not provided	78 Forbes Street, Emu Plains, NSW 2750	Hawkesbury Blacktown Penrith	Camden Campbelltown Liverpool	

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's		Additional information
					Fairfield Holroyd	Parramatta	
Wurrumay Consultancy	Kerrie Slater	0423 935 556	wurrumay@hotmail.com; Vicki.slater@hotmail.com	89 Pyramid street, Emu Plains NSW	Hawkesbury Blacktown Penrith Fairfield Holroyd	Camden Campbelltown Liverpool Parramatta Wollondilly	
Warragil Cultural Services	Aaron Slater (Manager)	0481 280 067	Warragil_c.s@hotmail.com		Hawkesbury Blacktown Penrith Fairfield	Holroyd Camden Campbelltown Liverpool Parramatta	
Kawul Cultural Services	Vicky Slater (Manager)	0431 720 887	Vicki.slater@hotmail.com	89 Pyramid Street, Emu Plains NSW 2750	Hawkesbury Blacktown Penrith Fairfield Holroyd Blue Mountains Sutherland Liverpool	Camden Campbelltown Parramatta Wollondilly The Hills Shire Auburn Bankstown	
Tocomwall	Scott Franks	0404 171 544	Not provided	PO Box 76, Caringbah NSW 1495	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown The Hills Shire Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown	Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	
D'harawal Mens Aboriginal Corporation	Elwyn Brown	0401920982	Not provided	187 Riverside Drive, Airds NSW 2560	Camden Campbelltown	Wollondilly	
Amanda Hickey Cultural Services	Amanda Hickey	0434 480 588	Not provided	41 Dempsey Street, Emu Heights, NSW 2750	Hawkesbury Blacktown Penrith Blue Mountains	Fairfield Holroyd Parramatta	Amanda is Wonnarua
Widescope Indigenous Group	Steven Hickey and Donna Hickey	0425 230 693 (Steven) 0425 232 056 (Donna)	Not provided	73 Russell Street, Emu Plains, NSW 2750	Hawkesbury Blacktown Penrith	Fairfield Holroyd Parramatta Blue Mountains	
HSB Consultants	Patricia Hampton	0424 142 216	Not provided	62 Ropes Crossing Boulevard, Ropes Crossing 2760	Hawkesbury Blacktown Penrith	Fairfield Holroyd Parramatta	

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's		Additional information
Rane Consulting	Tony Williams	02 88246991	ajw1901@bigpond.com	1 Pyrenees Way Beaumont Hills NSW 2155	Hawkesbury Blacktown Penrith	Fairfield Holroyd Parramatta	
Anthony Williams		0456 399 687	Not provided	Unit 2 / 24 Goodwin Street Narrabeen NSW 2101	Hawkesbury Blacktown Penrith	Fairfield Holroyd Parramatta	
Dhinawan-Dhigaraa Culture & Heritage Pty Ltd	Ricky Fields	0402 942 572	dhinawan.fields@gmail.com	Not provided	Hawkesbury Blacktown Penrith	Fairfield Holroyd Parramatta	
	Athol Smith	0449 665 715	Not provided	16 Yantara Place, Woodcroft, NSW, 2767			
Gunyuu	Kylie Ann Bell	Not provided	gunyuuchts@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield	Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River.
Walbunja	Hika Te Kowhai	0402 730 612	walbunja@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield	Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River
Badu	Karia Lea Bond	0476 381 207	Not provided	11 Jeffery Place, Moruya, NSW 2537	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown	Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	
Goobah Developments	Basil Smith	0405 995 725	Not provided	66 Grantham Road, Batehaven NSW, 2536	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River
Wullung	Lee-Roy James Boota	0403 703 942	Not provided	54 Blackwood Street, Gerringong, NSW, 2534	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River
Yerramurra	Robert Parson	Not provided	yerramurra@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	
Nundagurri	Newton Carriage	Not Provided	nundagurri@gmail.com	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River
Murrumbul	Mark Henry	Not provided	murrumbul@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River.
Jerringong	Joanne Anne Stewart	0422 800 184	jerringong@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	
Pemulwuy CHTS	Pemulwuy Johnson	0425 066 100	pemulwuyd@gmail.com	14 Top Place, Mt Annan	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown The Hills Shire Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River
Bilinga	Simalene Carriage	Not provided	bilingachts@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River.
Munyunga	Kaya Dawn Bell	Not provided	munyungachts@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River.

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	
Wingikara	Hayley Bell	Not provided	wingikarachts@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River.
Minnamunnung	Aaron Broad	0402 526 888	Not provided	1 Waratah Avenue, Albion Park Rail NSW 2527	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Burwood Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby	
Walgalu	Ronald Stewart	Not provided	walgaluchts@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	
Thauaira	Shane Carriage	Not provided	thauairachts@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River
Dharug	Andrew Bond	Not provided	dharugchts@gmail.com	Not provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's		Additional information
					Woollahra	Waverly Wollondilly	
Bilinga Cultural Heritage Technical Services	Robert Brown	Not Provided	bilinga@mirramajah.com	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra	Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	This group is a member of the Mirramajah Group of RAPs
Gunyuu Cultural Heritage Technical Services	Darlene Hoskins-McKenzie	Not Provided	gunyuu@mirramajah.com management@mirramajah.com (management & administrative email address for the Mirramajah Group of RAPs).	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra	Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	This group is a member of the Mirramajah Group of RAPs
Munyunga Cultural Heritage Technical Services	Suzannah McKenzie	Not Provided	munyunga@mirrmajah.com	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland	Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby	This group is a member of the Mirramajah Group of RAPs

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	
Murrumbul Cultural Heritage Technical Services	Levi McKenzie-Kirkbright	Not Provided	murrumbul@mirramajah.com	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	This group is a member of the Mirramajah Group of RAPs
Wingikara Cultural Heritage Technical Services	Wandai Kirkbright	Not Provided	wingikara@mirramajah.com	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	This group is a member of the Mirramajah Group of RAPs

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
Gulaga	Wendy Smith	Not Provided	gulagachts@gmail.com	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River
Biamanga	Seli Storer	Not Provided	biamangachts@gmail.com	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River
Callendulla	Corey Smith	Not Provided	cullendullachts@gmail.com	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's		Additional information
					Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra	Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	
Murramarang	Roxanne Smith	Not Provided	murramarangchts@gmail.com	Not Provided	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra	Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	This group states that their boundaries (Murrin Peoples) extend from the Hawkesbury River to the Snowy River
DJMD Consultancy	Darren Duncan	0410 510 397	darrenjohnduncan@gmail.com	Not Provided	Hawkesbury Blacktown Penrith Parramatta Sydney Marrickville Strathfield Warringah Willoughby Blue Mountains Burwood The Hills Ryde	Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater	Darren is associated with Metro and Deerubbin LALCs
Butucarbin Aboriginal Corporation	Jennifer Beale	(02)9832 7167	koori@ozemail.com.au	PO Box E18, Emerton, NSW 2770	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta	Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill	Preferred contact via email

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	
Didge Ngunawal Clan	Lillie Carroll Paul Boyd	0426 823 944	didgengunawalclan@yahoo.com.au	7 Siskin St, Quakers Hill NSW 2763	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	
Ginninderra Aboriginal Corporation	Steven Johnson and Krystle Carroll	0406991221	Ginninderra.corp@gmail.com	PO BOX 3143 Grose Vale NSW 2754	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
Garrara Aboriginal Corporation	Raymond Ingrey		raymond@bariyu.org.au		Sutherland Liverpool Camden Campbelltown Wollondilly	
Nerrigundah	Newton Carriage	0421 253 677	nerrigundachts@gmail.com		Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly	
Duncan Falk Consultancy	Duncan Falk	0406 610 644	duncanfalk@hotmail.com	34 Robinia Drive, Bowral NSW 2576	Camden Campbelltown	
Sharon Hodgetts		0405288814	sharonhodgetts@hotmail.com	21/29 Central Coast Hwy West Gosford 2250	Hawkesbury	
Wailwan Aboriginal Group	Philip Boney	0436 483 210	waarlan12@outlook.com		Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly	
Guntawang Aboriginal Resources Incorporated	Wendy Morgan	0414 964 657 9601 7183	Wenlissa01@hotmail.com	113 Reservoir Road Mt Pritchard NSW 2170	Camden Campbelltown Liverpool Fairfield	

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Holroyd Wollondilly Blue Mountains	
Barking Owl Aboriginal Corporation	Mrs Jody Kulakowski (Director)	0426 242 015	barkingowlcorp@gmail.com	2-65/69 Wehlow St. Mt Druitt	Hawkesbury Blacktown Penrith Fairfield Holroyd Camden Campbelltown Liverpool Parramatta Sutherland Sydney Kogarah Hurstville Rockdale Canterbury Marrickville Bankstown Strathfield Randwick Woollahra Ashfield Auburn Canada Bay Leichhardt Manly Mosman North Sydney Lane Cove Hunters Hill Hornsby Ku-Ring-Gai Pittwater Botany Bay Ryde Warringah Willoughby Blue Mountains Burwood The Hills Waverly Wollondilly	
Yulay Cultural Services	Arika Jalomaki (Manager)	0411 048 794	yulayculturalservices@gmail.com	15 Rowley Place, Airds NSW 2560	Deerubbin LALC Tharawal LALC Gandangarra LALC	LGAs of interest not specified, rather, LALC boundaries within which the organisation wish to be consulted
Thoorga Nura	John Carriage (Chief Executive Officer)	0401 641 299	thoorganura@gmail.com	50B Hilltop Crescent, Surf Beach, 2536, NSW	Ashfield Auburn Bankstown Blacktown Blue Mountains Botany Bay Burwood Camden Campbelltown Canada Bay Canterbury Fairfield Hawkesbury The Hills Holroyd Hornsby Hunter's Hill Hurstville Kogarah Ku-ring-gai Lane Cove Leichhardt Liverpool Manly Marrickville Mosman North Sydney Parramatta Penrith Pittwater Randwick Rockdale Ryde Strathfield Sutherland Sydney Warringah Waverley Willoughby Woollahra Wollondilly	
Barraby Cultural Services	Lee Field (Manager)	0423 906 606	barrabyculturalservices@gmail.com	6 Macgibbon Parade, Old Erowal Bay, NSW 2540	Tharawal LALC	LGAs of interest not specified, rather, LALC

Organisation/ Individual	Contact Name	Phone Number	Email Address/ Fax	Postal Address	LGA's	Additional information
					Gandagarra LALC	boundaries within which the organisation wish to be consulted
Yurrandaali Cultural Services	Bo Field (Manager)	0457 546 643	yurrandaali_cs@hotmail.com	3 Sheeran Street, Old Erowal Bay NSW 2540	Tharawal LALC Gandagarra LALC	LGAs of interest not specified, rather, LALC boundaries within which the organisation wish to be consulted
Darug Boorooberongal Elders Aboriginal Corporation	Gordon Workman	0415 663 763	fax 02 9831 8868 boorooberongal@outlook.com	73 Judith Anderson Drive, Doonside NSW 2767	Ashfield Auburn Bankstown Blacktown Blue Mountains Botany Bay Burwood Camden Campbelltown Canada Bay Canterbury Fairfield Hawkesbury The Hills Holroyd Hornsby Hunter's Hill Hurstville Kogarah Ku-ring-gai Lane Cove Leichhardt Liverpool Manly Marrickville Mosman North Sydney Parramatta Penrith Pittwater Randwick Rockdale Ryde Strathfield Sutherland Sydney Warringah Waverley Willoughby Woollahra Wollondilly	

OFFICE OF THE REGISTRAR
ABORIGINAL LAND RIGHTS ACT 1983 (NSW)

9 October 2018

James Cole
Biosis Pty Ltd
14, 17 – 17 Power Avenue
ALEXANDRIA NSW 2015

Dear James

Re: Request - Search for Registered Aboriginal Owners

I refer to your email dated 2 October 2018 regarding an Aboriginal Cultural Heritage Assessment for the Mamre South Precinct Rezoning located at 657 – 769 Mamre Road, Kemps Creek NSW.

I have searched the Register of Aboriginal Owners and the project area described does not have Registered Aboriginal Owners pursuant to Division 3 of the *Aboriginal Land Rights Act 1983*.

I suggest that you contact Deerubbin Local Aboriginal Land Council on 02 4724 5600 regarding the project. They may also be able to assist you in identifying other Aboriginal stakeholders that wish to participate.

Yours sincerely

Jodie Rikiti
Administration Officer
Office of the Registrar, ALRA

Address: Level 3, 2 – 10 Wentworth Street, PARRAMATTA NSW 2150
Post: P.O Box 5068, PARRAMATTA NSW 2124
Phone: 02 8633 1266

Altis Property Partners and Frasers Property
NOTIFICATION AND REGISTRATION OF ABORIGINAL INTERESTS

Altis Property Partners and Frasers Property are proposing to rezone and develop land contained within 657-769 Mamre Road, Kemps Creek, within the Penrith City Council Local Government Area.

An Aboriginal Cultural Heritage Assessment will be undertaken which will support a State Significant Development (SSD) application and possible sub-surface investigations.

Biosis Pty Ltd invites Aboriginal people who hold cultural knowledge in determining the significance of Aboriginal object(s) and/or places in the vicinity of the above area to register their interest in a process of community consultation.

The purpose of the Aboriginal community consultation will be to assist with the preparation of an Environmental Impact Statement and to provide sufficient information for the consideration of Aboriginal cultural heritage values as part of the SSD application.

For more information please contact:

Stephen O'Connor
Project Director – Altis Property Partners
GPO Box 4456 Sydney NSW 2001
stephen.oconnor@altisproperty.com.au

To register in writing please contact:

Charlotte Allen
Biosis Pty. Ltd.
Unit 14, 17-27 Power Avenue Alexandria NSW 2015
Tel: (02) 9101 8700
Email: callen@biosis.com.au

Please note that the name of each group that registers for consultation on this project will be provided to OEH and the LALC unless the group specifies that they do not want their details released.

REGISTRATIONS MUST BE RECEIVED
BEFORE 4.00pm, 2nd November 2018

Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'yulayculturalservices@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

Good morning,

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

Biosis have been engaged by Altis Property Partners and Frasers Property to undertake an Aboriginal Cultural Heritage Assessment (ACHA) under the Code of practice for archaeological investigation of Aboriginal objects in NSW (DECCW 2010a) for the project.

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you would like to register your interest to be consulted for this assessment, please respond by 4pm on Wednesday 7 November 2018.

If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

Leaders in Ecology and Heritage Consulting

The information transmitted including attachments is intended only for the person or entity to which it is addressed and may contain copyright material, or information that is confidential or is exempt from disclosure by law. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient is strictly prohibited. If you received this in error, please contact the sender and delete the material from your computer. The views expressed in this email are those of the sender except where the sender expressly and with authority states them to be the views of Biosis Pty Ltd. Biosis Pty Ltd does not represent that this email is free of errors, viruses or interference. When using email to communicate with Biosis Pty Ltd, access to that information by Biosis Pty Ltd personnel is strictly limited and controlled.

Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'yerramurra@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

Good morning,

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If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'wurrumay@hotmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

Good morning,

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

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If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'wingikara@mirramajah.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

Good morning,

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

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If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'wingikarachts@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

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If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

Leaders in Ecology and Heritage Consulting

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'widescope.group@live.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'warragil_c.s@hotmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'walgaluchts@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'walbunja@gmail.com'
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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'waarlan12@outlook.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
To: 'thoorganura@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
To: 'ajw1901@bigpond.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
To: 'pemulwuyd@gmail.com'
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
To: 'nundagurri@gmail.com'
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
To: 'murrumbul@mirramajah.com'
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E: avella@biosis.com.au

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
To: 'murramarangchts@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

Good morning,

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Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

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Sent: Wednesday, 24 October 2018 10:48 AM
To: 'munyungachts@gmail.com'
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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
To: 'vicki.slater@hotmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:34 AM
To: 'gunyuu@mirramajah.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:34 AM
To: 'gunyuuchts@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:34 AM
To: 'gunjeewong53@hotmail.com'
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From: Anthea Vella
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To: 'Ginninderra.corp@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:34 AM
To: 'darrenjohnduncan@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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To: 'didgengunawalclan@yahoo.com.au'
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:34 AM
To: 'dhinawan.fields@gmail.com'
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:34 AM
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:34 AM
To: 'srandall@deerubbin.org.au'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

Leaders in Ecology and Heritage Consulting

The information transmitted including attachments is intended only for the person or entity to which it is addressed and may contain copyright material, or information that is confidential or is exempt from disclosure by law. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient is strictly prohibited. If you received this in error, please contact the sender and delete the material from your computer. The views expressed in this email are those of the sender except where the sender expressly and with authority states them to be the views of Biosis Pty Ltd. Biosis Pty Ltd does not represent that this email is free of errors, viruses or interference. When using email to communicate with Biosis Pty Ltd, access to that information by Biosis Pty Ltd personnel is strictly limited and controlled.

Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:34 AM
To: 'daruglandobservations@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

Good morning,

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:34 AM
To: 'justinecoplin@optusnet.com.au'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:16 AM
To: 'boorooberongal@outlook.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.pdf

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:16 AM
To: 'cullendullachts@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.pdf

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:16 AM
To: 'koori@ozemail.com.au'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.pdf

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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:16 AM
To: 'bilingachts@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.pdf

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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:16 AM
To: 'bilinga@mirramajah.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
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From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:16 AM
To: 'biamangachts@gmail.com'
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Attachments: 27033.Stage1.pdf

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:16 AM
To: 'barkingowlcorp@gmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.pdf

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:16 AM
To: 'amandahickey@live.com.au'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.pdf

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:48 AM
To: 'munyunga@mirrmajah.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

Good morning,

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Anthea Vella

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'desmond4552@hotmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: 27033.Stage1.MamreSth.pdf

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24 October 2018

Karia Lea Bond
Badu
11 Jeffrey Place
Moruya NSW 2537

Dear Karia Lea Bond,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

Biosis have been engaged by Altis Property Partners and Frasers Property to undertake an Aboriginal Cultural Heritage Assessment (ACHA) under the *Code of practice for archaeological investigation of Aboriginal objects in NSW* (DECCW 2010a) for the project.

In accordance with the Office of Environment and Heritage's *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010b) (consultation requirements), Part 6 *National Parks and Wildlife Act 1974*, individuals or groups are invited to register their interest in writing to participate in the ACHA and consultation process for the proposal.

Biosis Pty Ltd is assisting with consultation with the Aboriginal community in accordance with the consultation requirements. The purpose of the Aboriginal community consultation will be to assist with the preparation of an Environmental Impact Statement (EIS) and to provide sufficient information for the consideration of Aboriginal cultural heritage values as part of the State Significant Development (SSD) application.

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you would like to register your interest to be consulted for this assessment, please respond by **4pm on Wednesday 7 November 2018**.

Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

biosis.com.au

In accordance with the consultation requirements, please note that the relevant client contact for this project is:

Stephen O'Connor
Project Director – Altis Property Partners
GPO Box 4456 Sydney NSW 2001
stephen.oconnor@altisproperty.com.au

All correspondence regarding provision of names and contact details of Aboriginal people who may hold cultural knowledge relevant to the study area should be provided in writing to:

Charlotte Allen
Biosis Pty Ltd
14, 17-17 Power Avenue
Alexandria NSW 2015
callen@biosis.com.au

If you have any queries regarding the Project please don't hesitate to contact me on the details below.

Yours sincerely,

Charlotte Allen
Field Archaeologist
02 9101 8712
0437 641 267
callen@biosis.com.au

References

DECCW 2010a, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

DECCW 2010b, 'Aboriginal cultural heritage consultation requirements for proponents'.

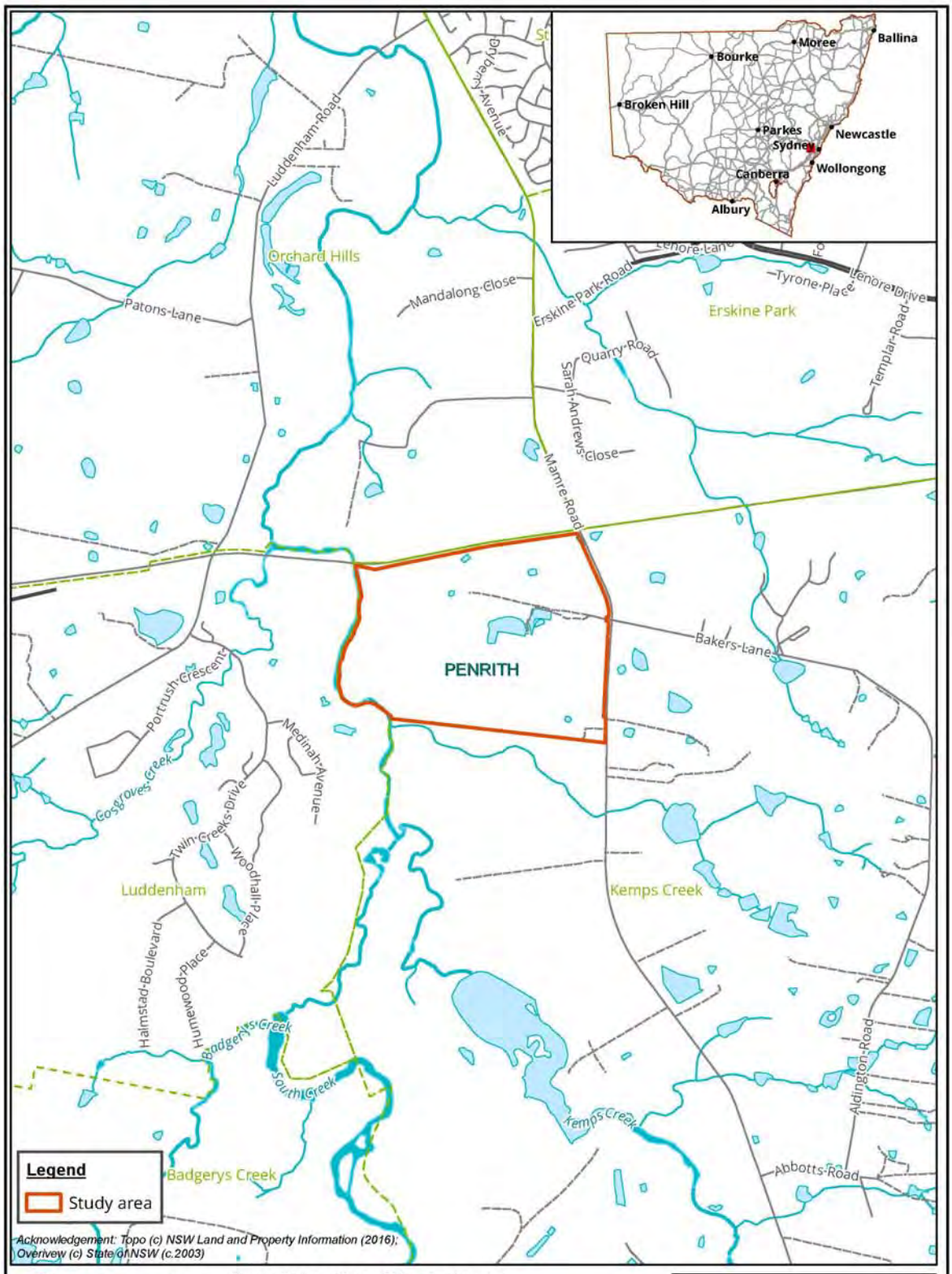

Figure 1: Location of the study area

Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
Date: 20 April 2018,
Checked by: SJK, Drawn by: LH, Last edited by: lwilson
Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

24 October 2018

James Carroll
Bidjawong Aboriginal Corporation
PO Box 124
Round Corner NSW 2158

Dear James Carroll,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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Yours sincerely,

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Field Archaeologist
02 9101 8712
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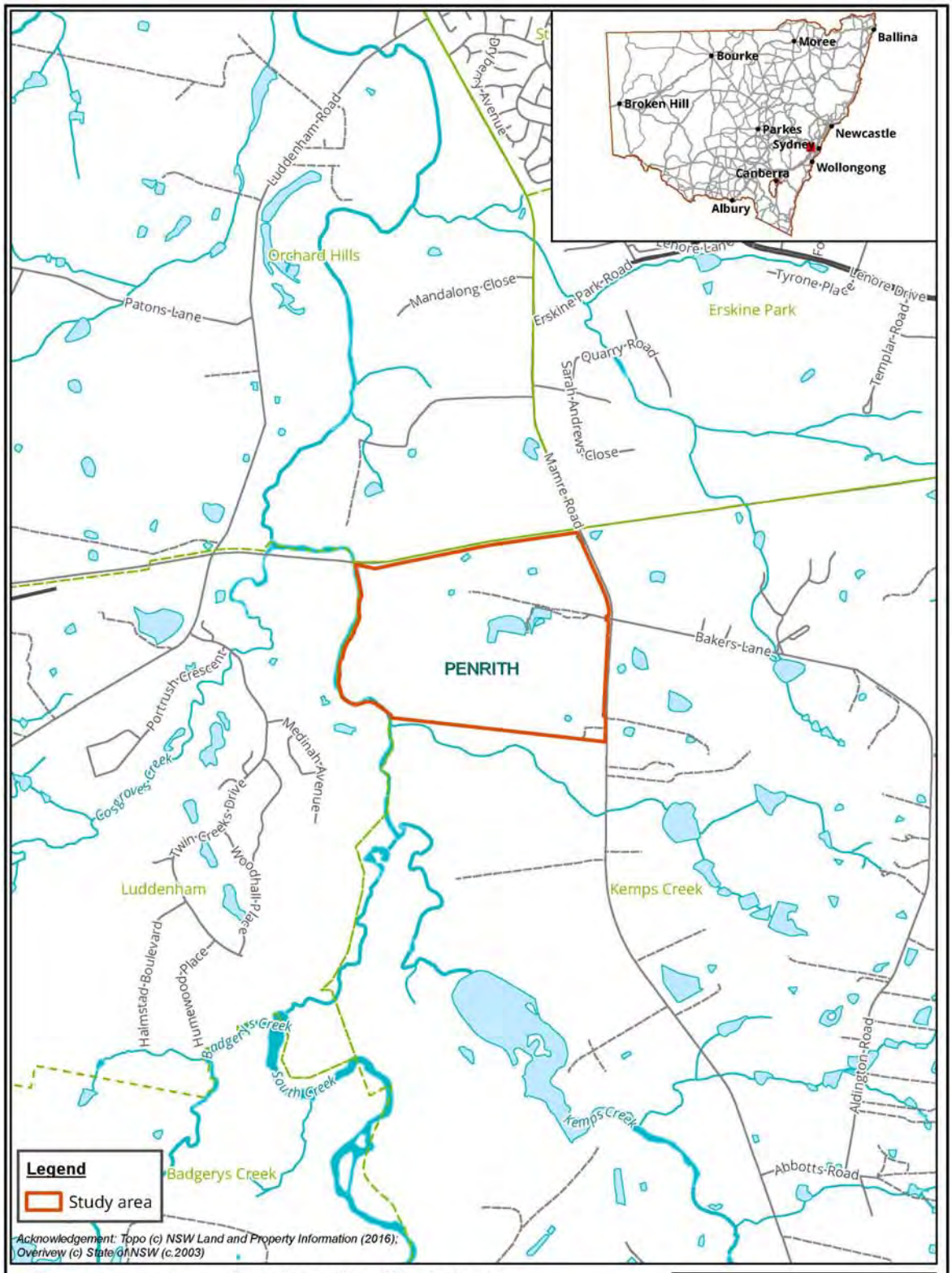

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Figure 2: Study area detail

24 October 2018

Gordon Morton
Darug Aboriginal Cultural Heritage Assessments
Unit 9, 6 Chapman Avenue
Chatswood NSW 2067

Dear Gordon Morton,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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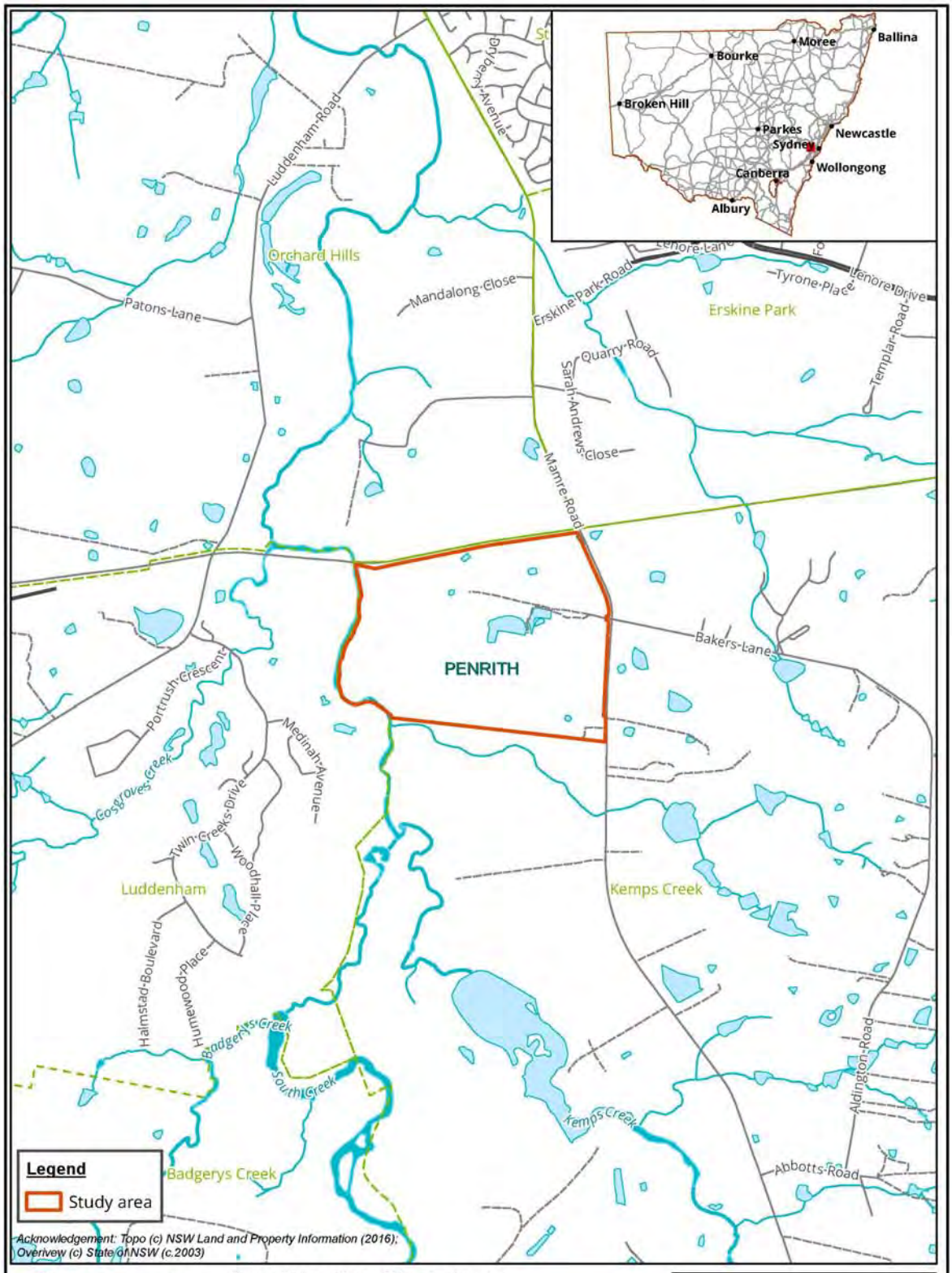

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Figure 2: Study area detail

24 October 2018

Darug Tribal Aboriginal Corporation
PO box 441
Blacktown NSW 2148

Dear Sir or Madam,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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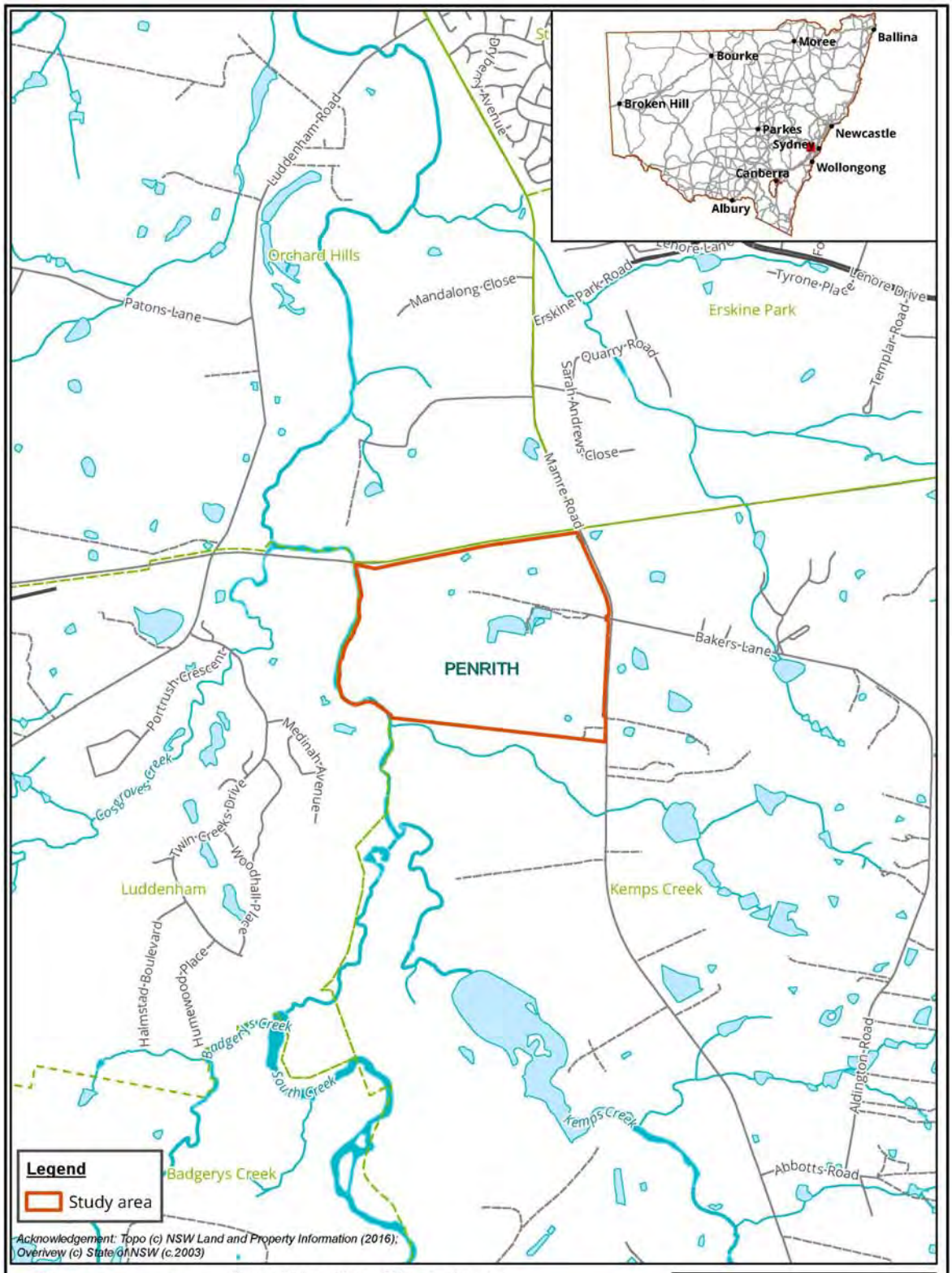

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Figure 2: Study area detail

24 October 2018

Athol Smith
Dhinawan-Dhigaraa Culture & Heritage Pty Ltd
16 Yantara Place
Woodcroft NSW 2767

Dear Athol Smith,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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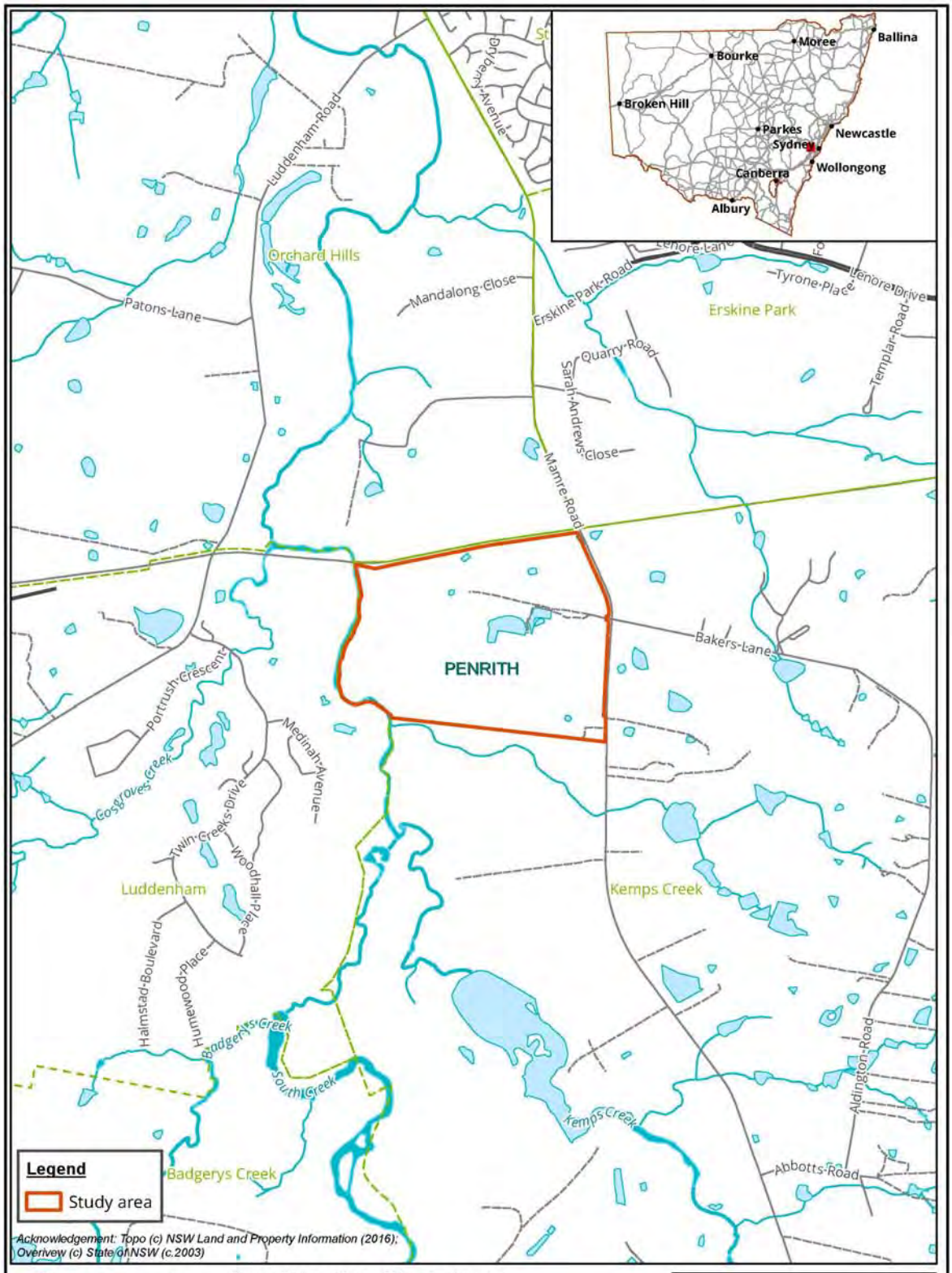

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Figure 2: Study area detail

24 October 2018

Basil Smith
Goobah Developments
66 Grantham Road
Batehaven NSW 2536

Dear Basil Smith,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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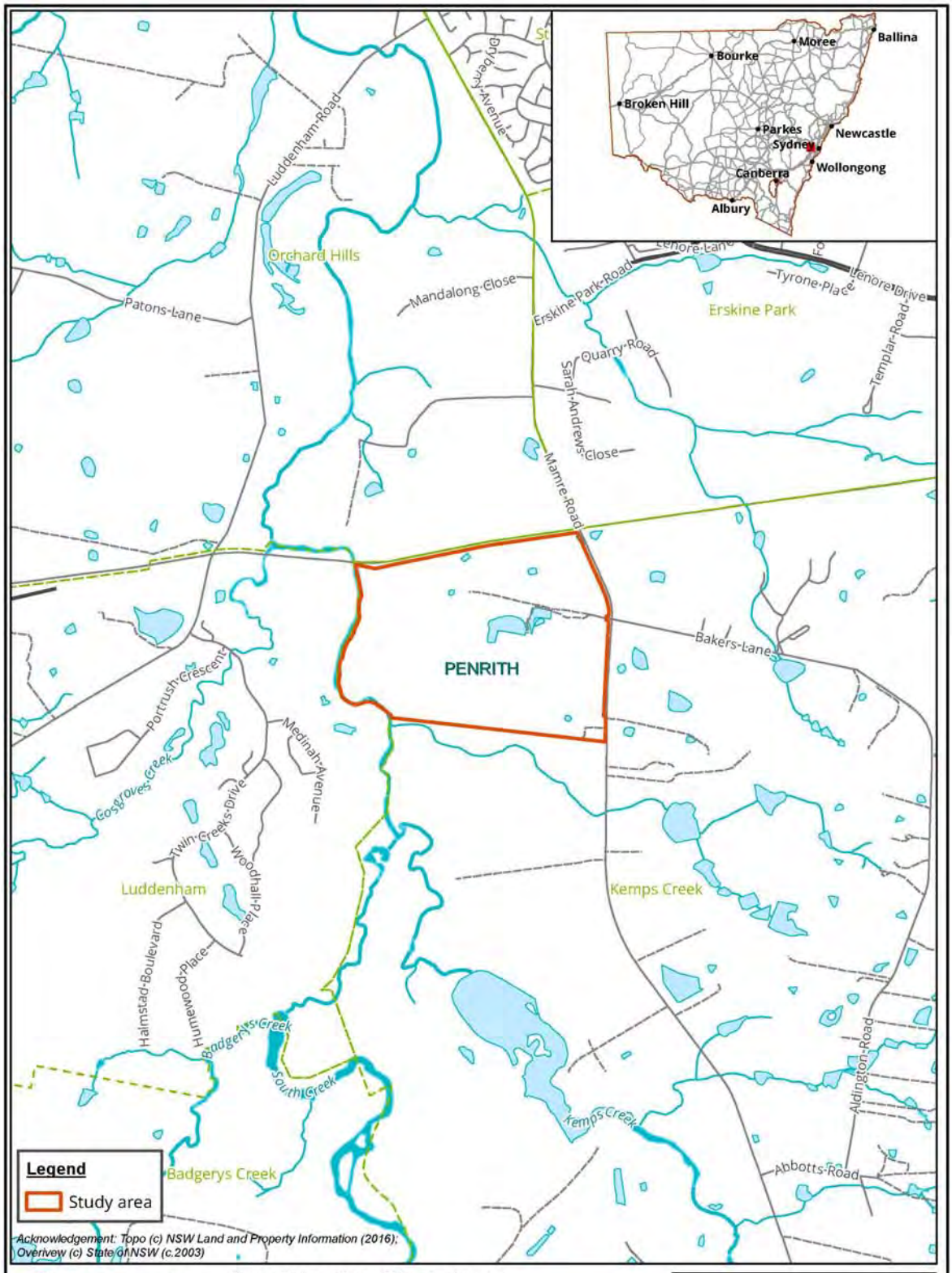

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Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

24 October 2018

Patricia Hampton
HSB Consultants
62 Ropes Crossing Boulevard
Ropes Crossing NSW 2760

Dear Patricia Hampton,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

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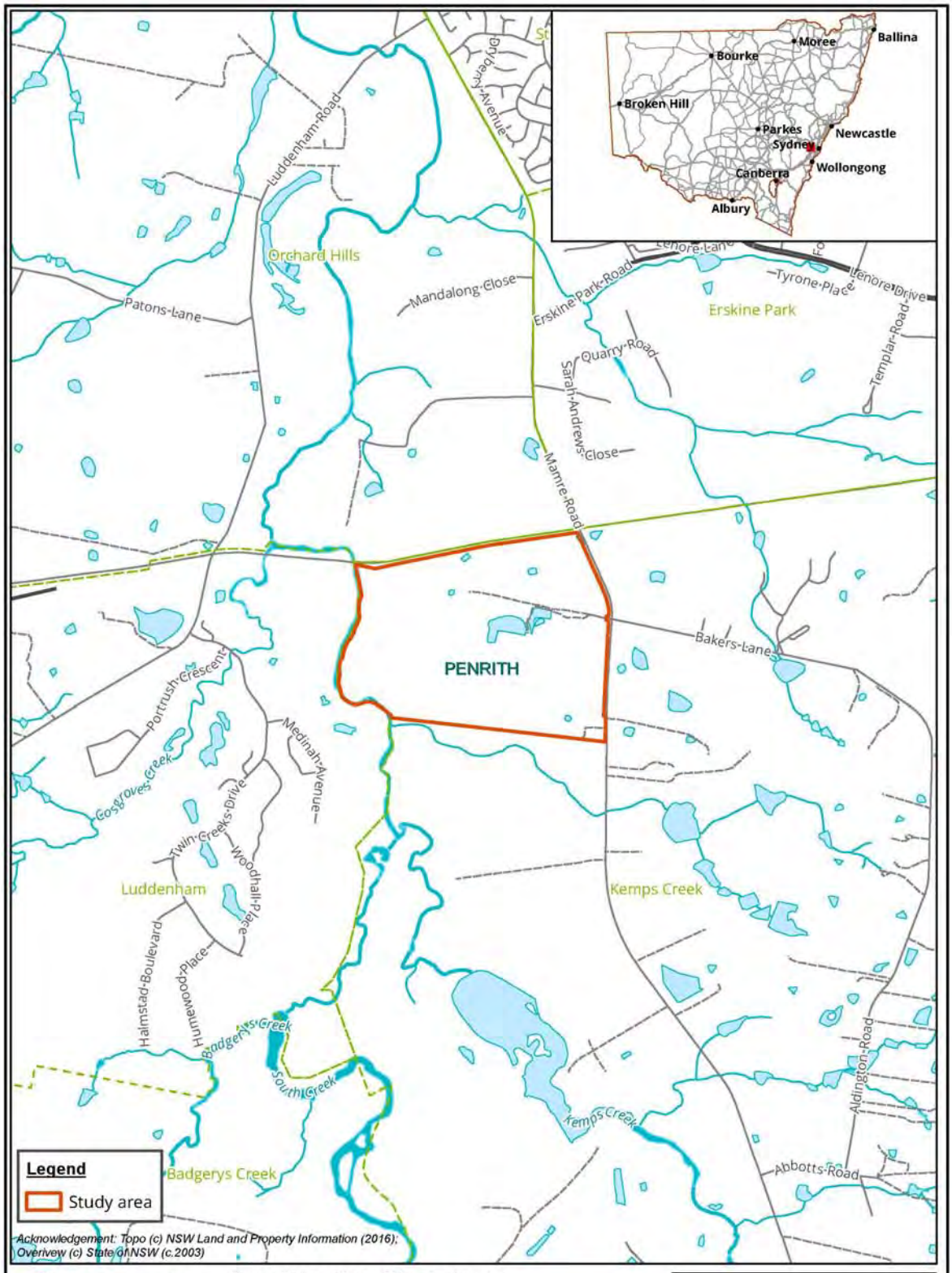

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24 October 2018

Shaun Carroll
Merrigarn Indigenous Corporation
GPO Box 158
Canberra City ACT 2601

Dear Shaun Carroll,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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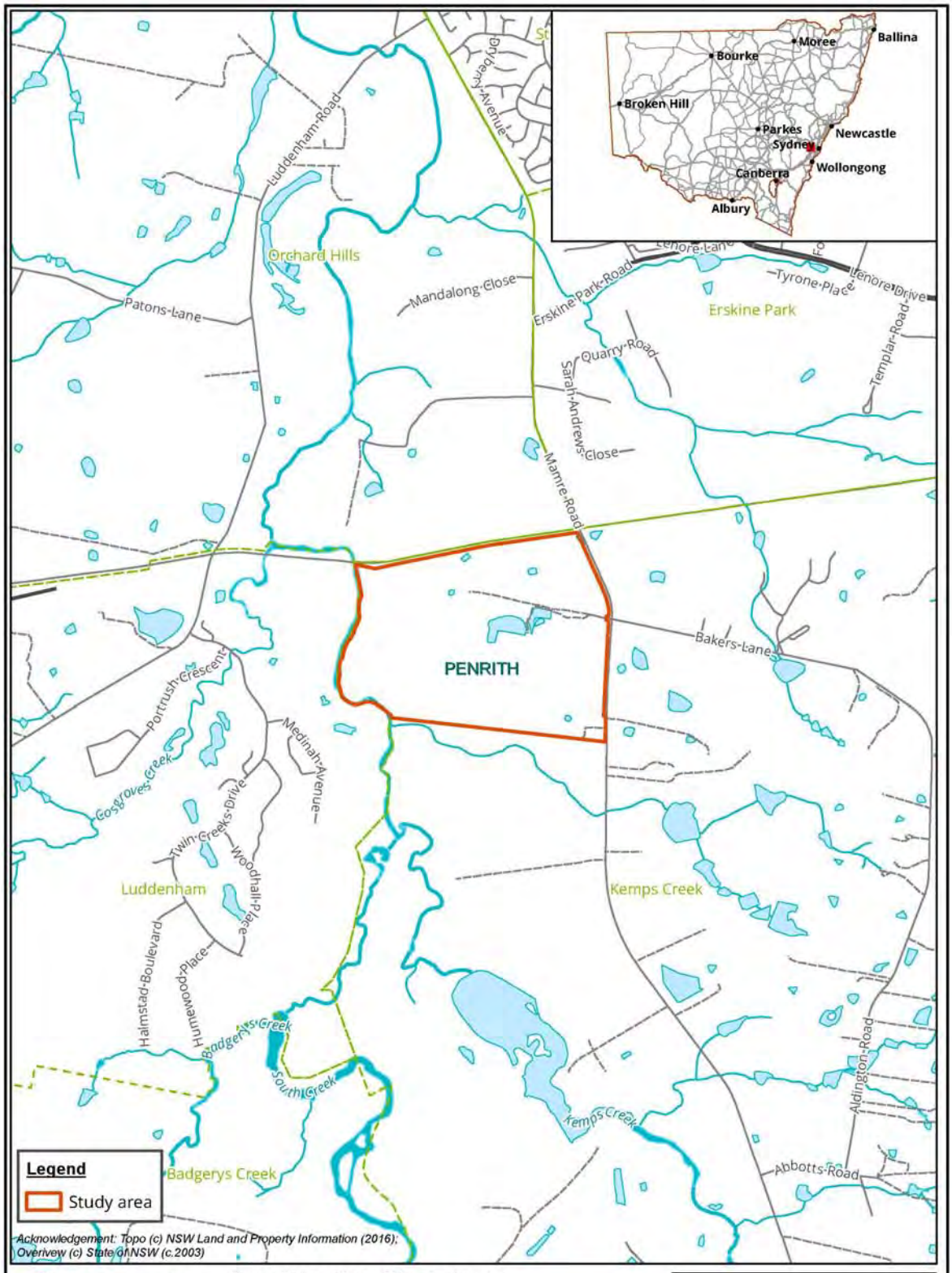

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24 October 2018

Aaron Broad
Minnamunnung
1 Waratah Avenue
Albion Park Rail NSW 2527

Dear Aaron Broad,

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Our Ref: Matter 27033

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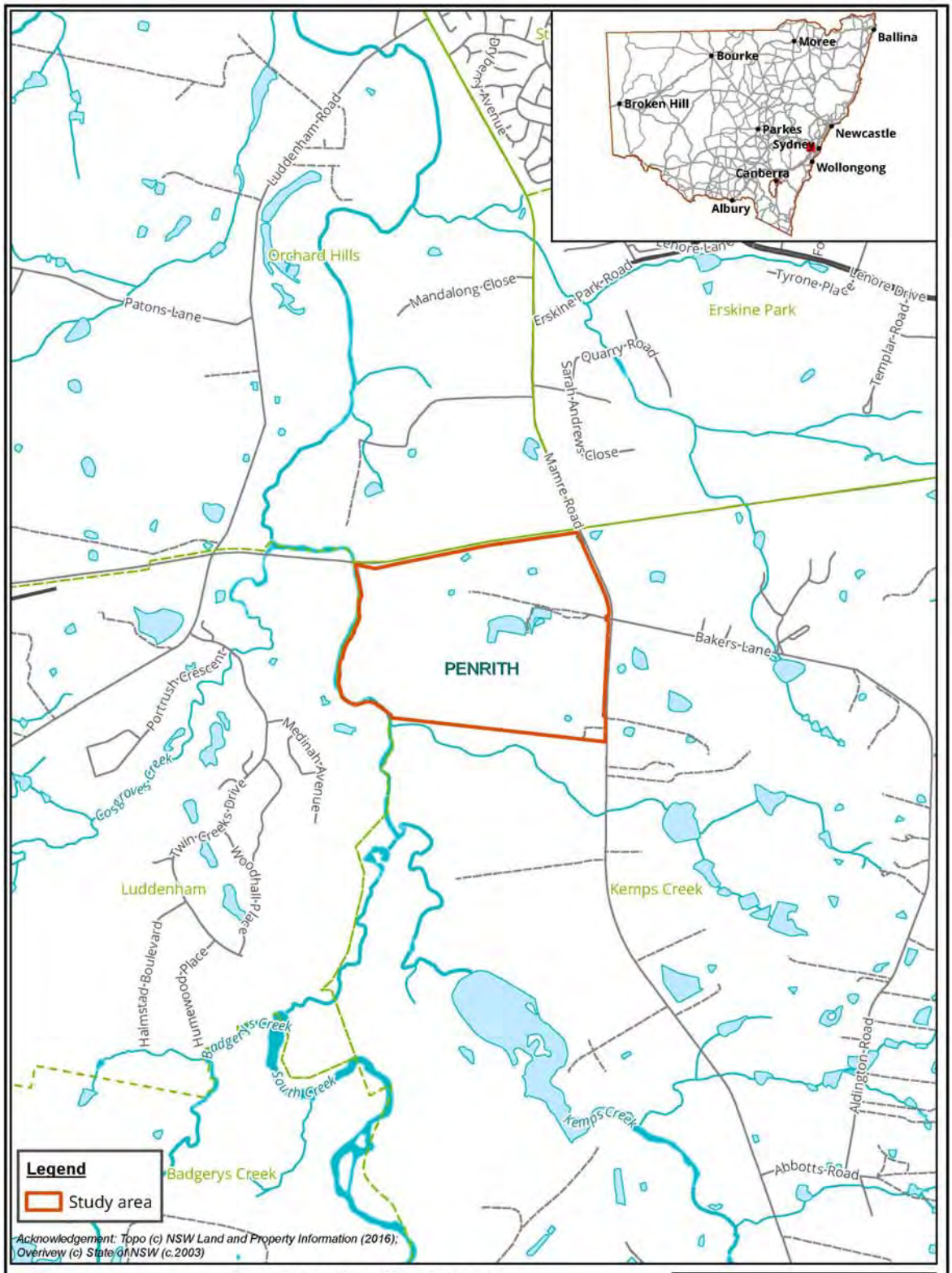

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24 October 2018

Jesse Johnson
Muragadi Heritage Indigenous Corporation
5 Hession road
Nelson NSW 2765

Dear Jesse Johnson,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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Alexandria NSW 2015

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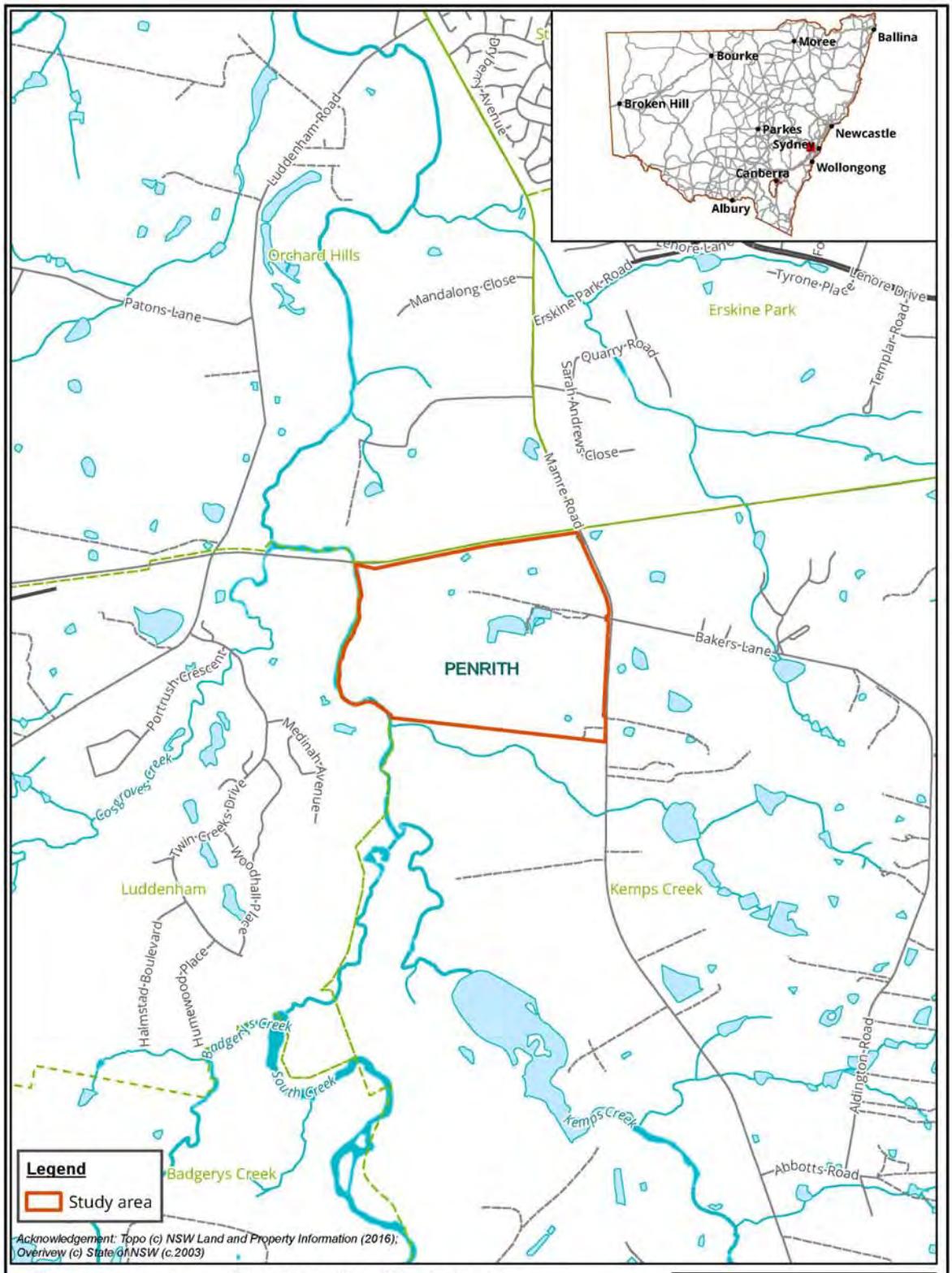

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Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
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Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

24 October 2018

Darleen Johnson
Murra Bidgee Mullangari Aboriginal Corporation
PO Box 246
Seven Hills NSW 2147

Dear Darleen Johnson,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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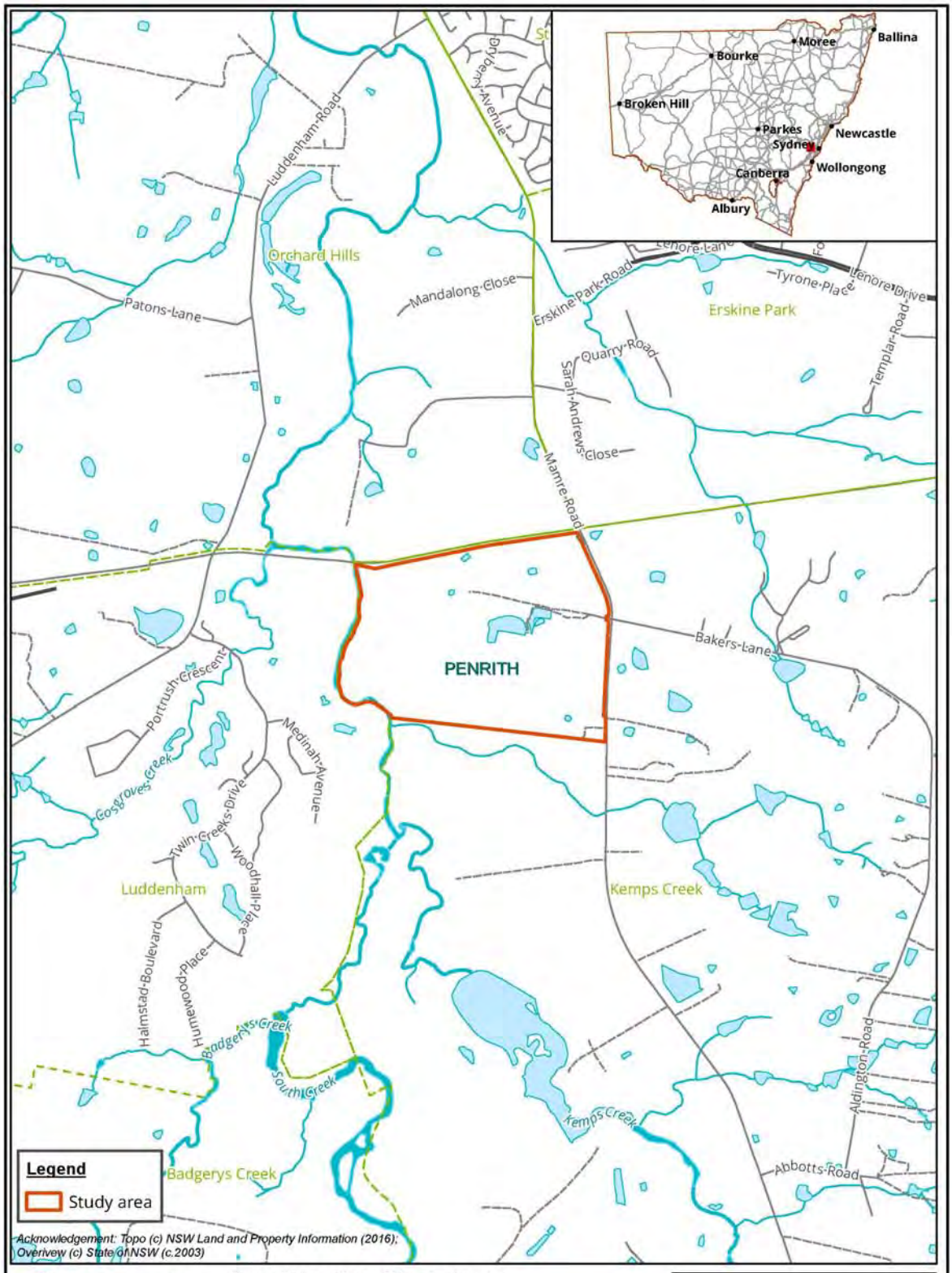

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Figure 2: Study area detail

24 October 2018

Scott Franks
Tocomwall
PO Box 76
Caringbah NSW 1495

Dear Scott Franks,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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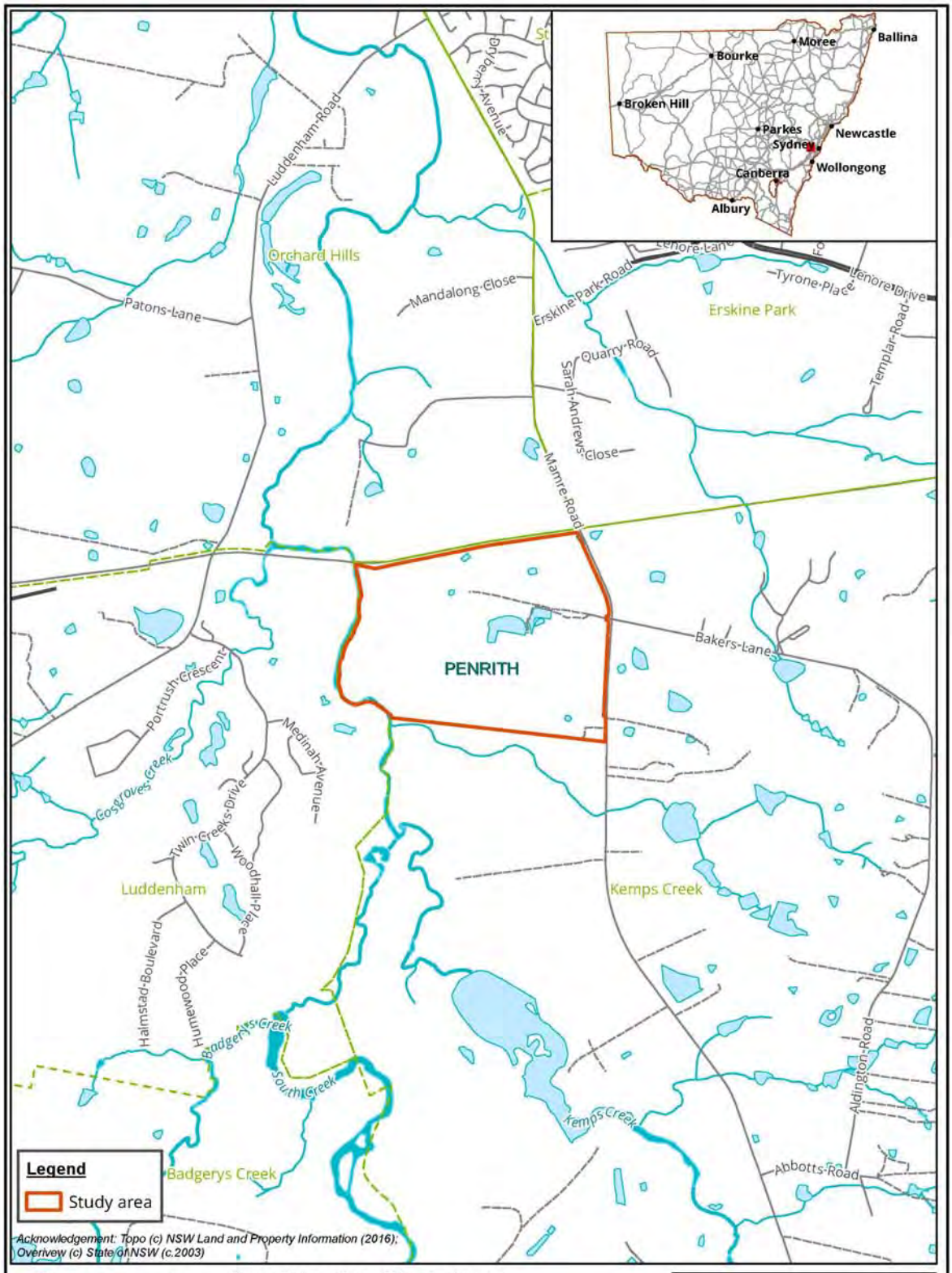

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Figure 2: Study area detail

24 October 2018

Lee-Roy James Boota
Wullung
54 Blackwood Street
Gerringong NSW 2534

Dear Lee-Roy James Boota,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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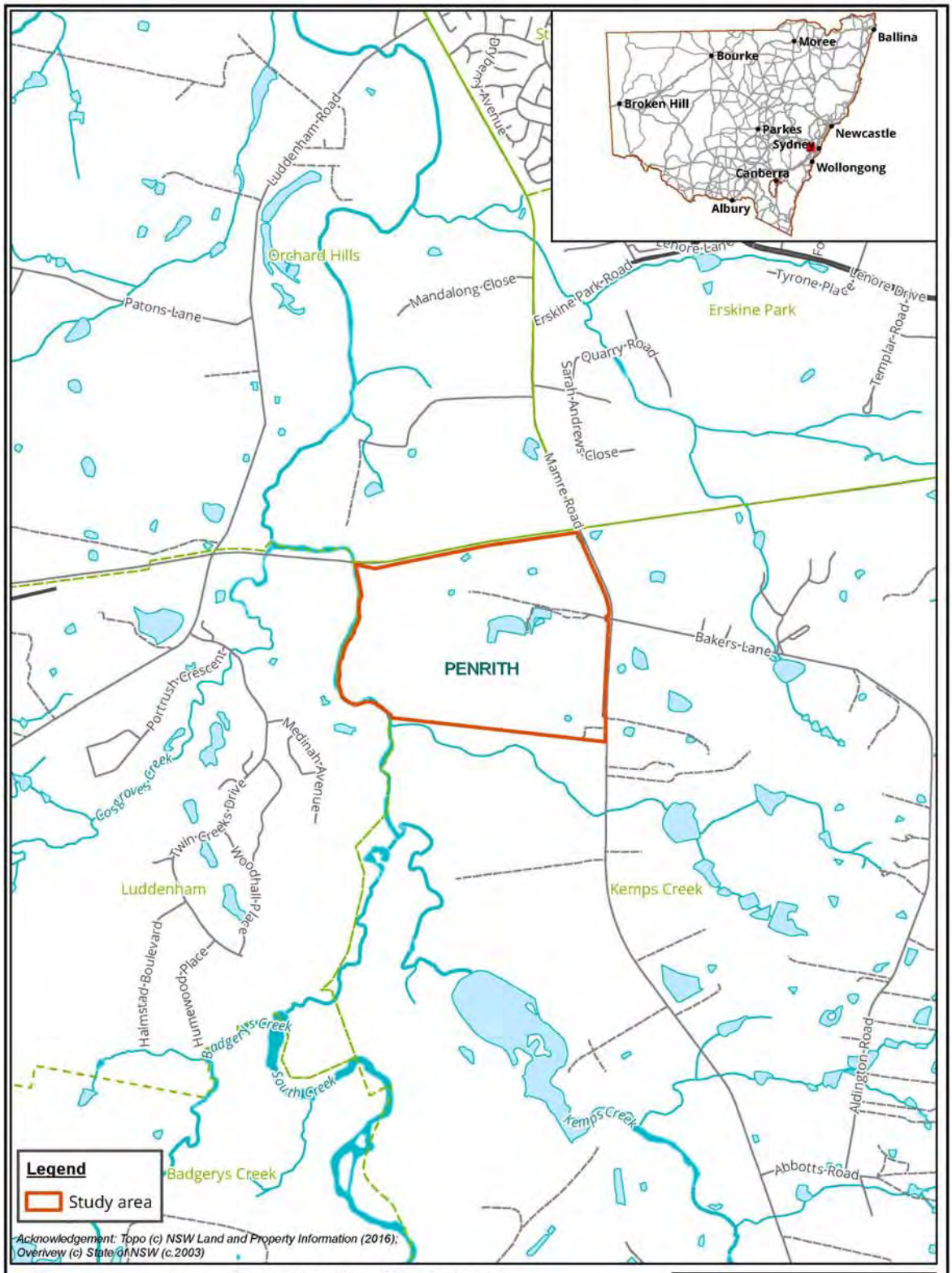

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Figure 2: Study area detail

24 October 2018

Phil Khan
78 Forbes Street
Emu Plains NSW 2750

Dear Phil Khan,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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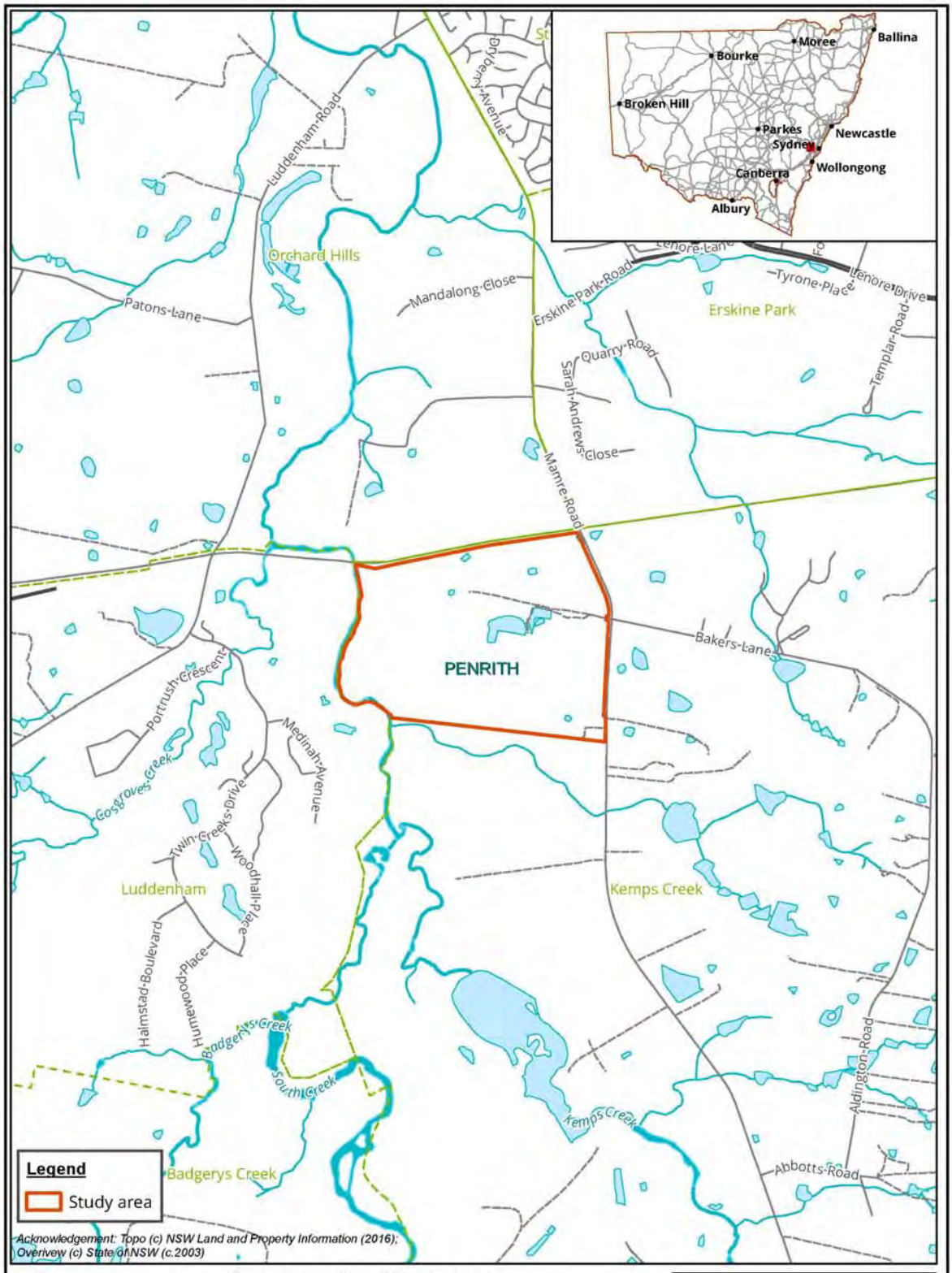

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24 October 2018

Anthony Williams
Unit 2, 24 goodwin Street
Narrabeen NSW 2101

Dear Anthony Williams,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

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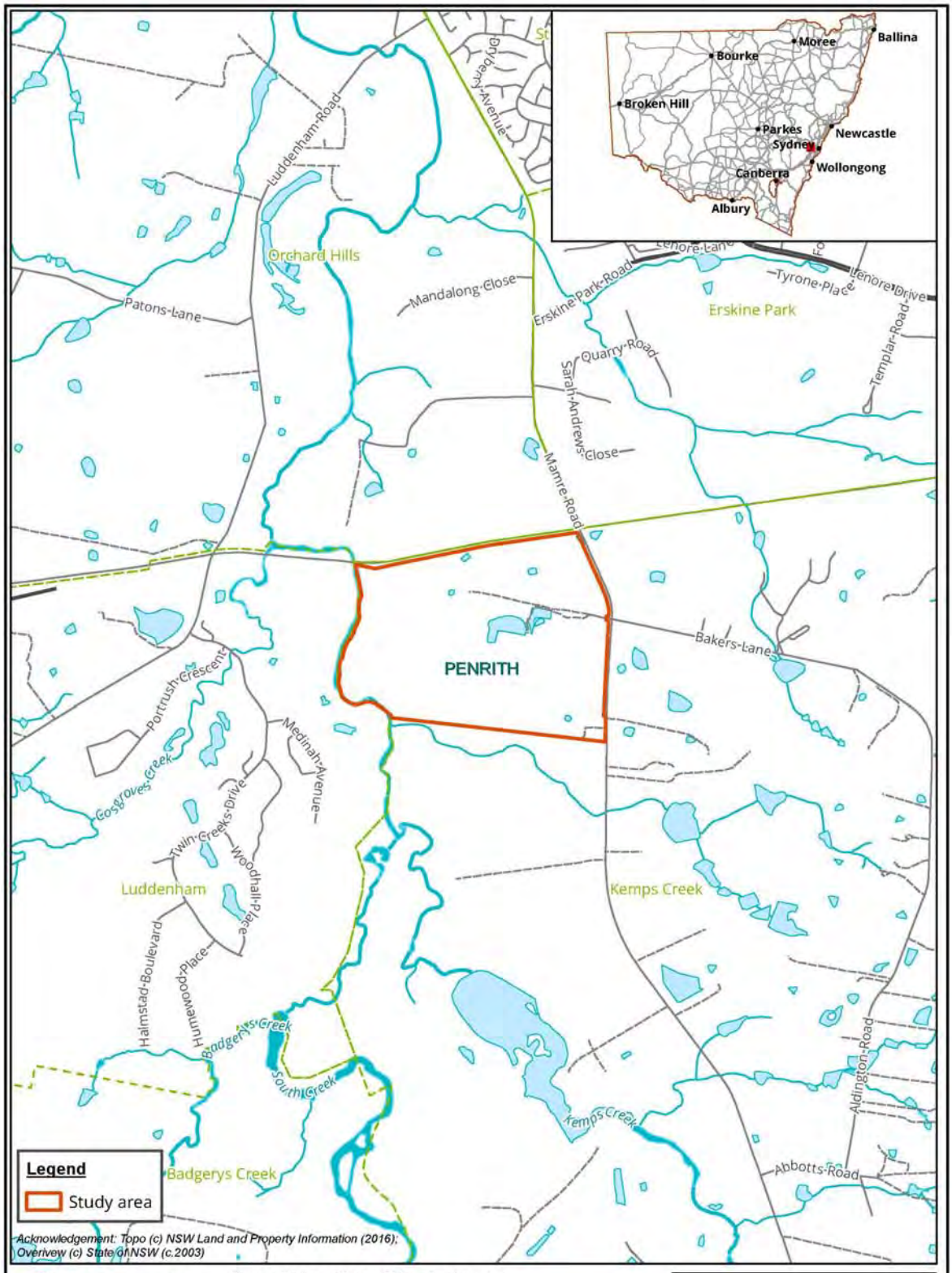

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24 October 2018

Philip Boney
Wailwan Aboriginal Digging Group

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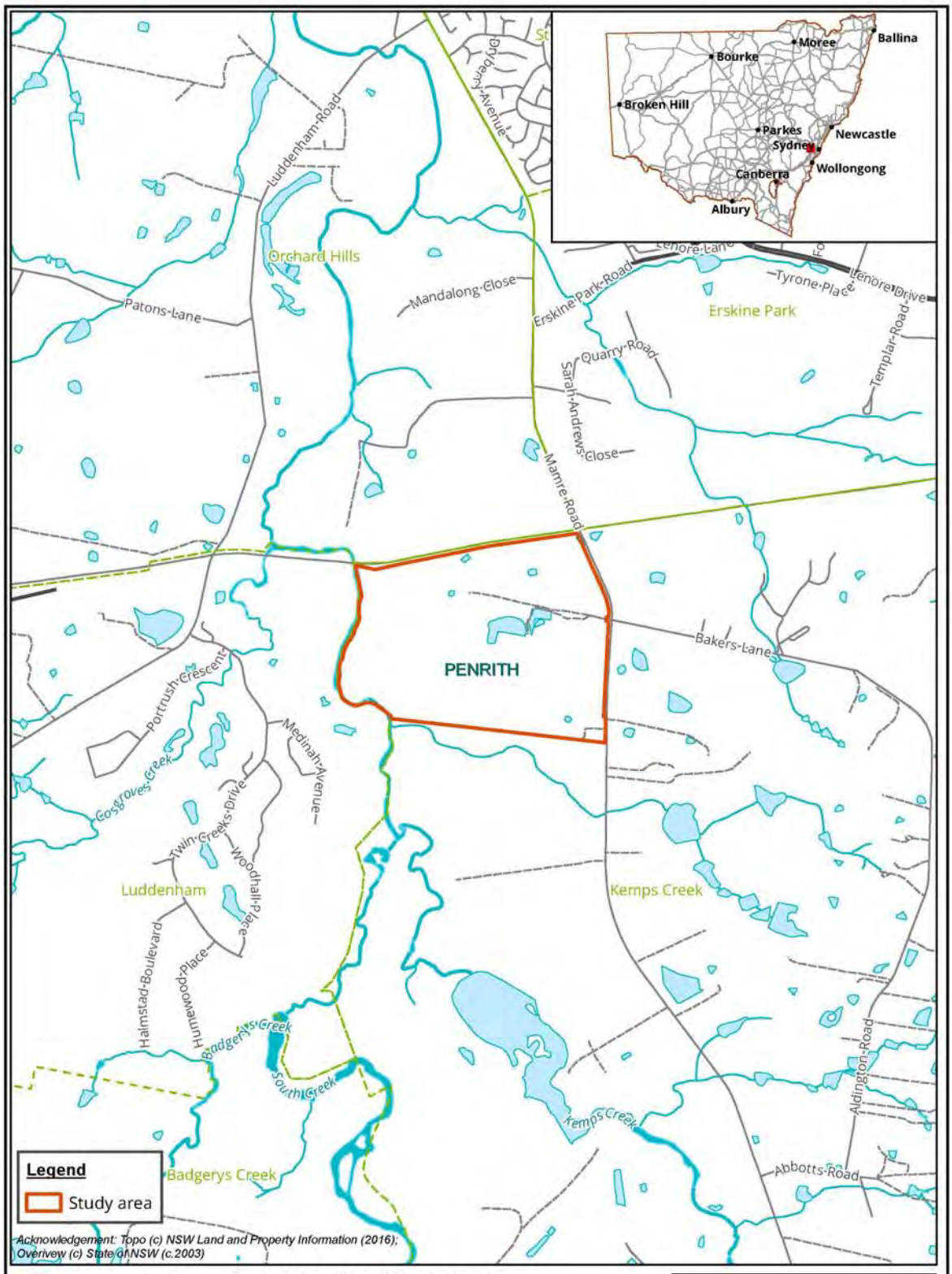

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24 October 2018

Hika Te Kowhai
Walbunja

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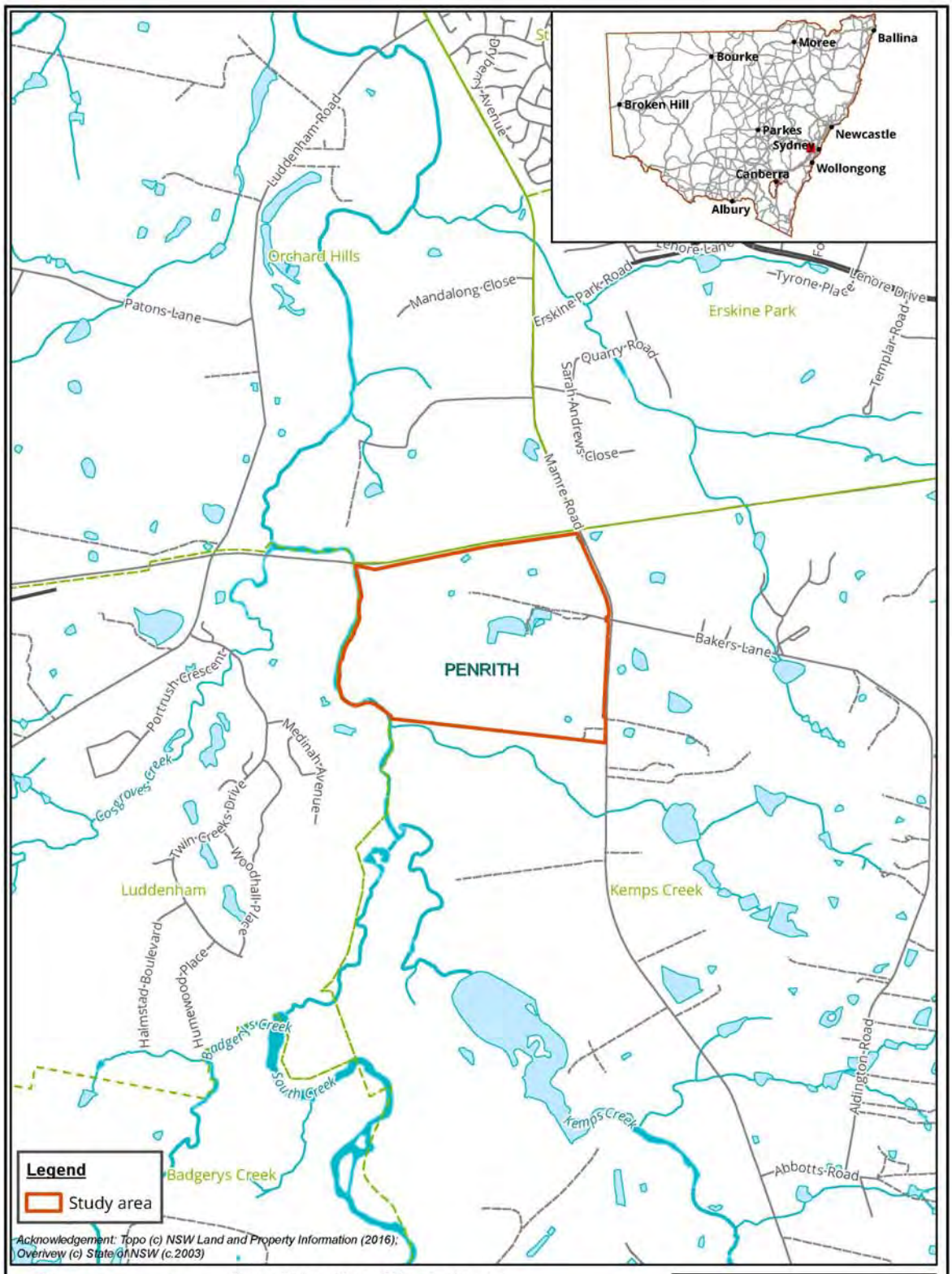

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Ronald Stewart
Walgalu

Dear Ronald Stewart,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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Alexandria NSW 2015

Phone: 02 9101 8700

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ABN 65 006 175 097

Email: sydney@biosis.com.au

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Yours sincerely,

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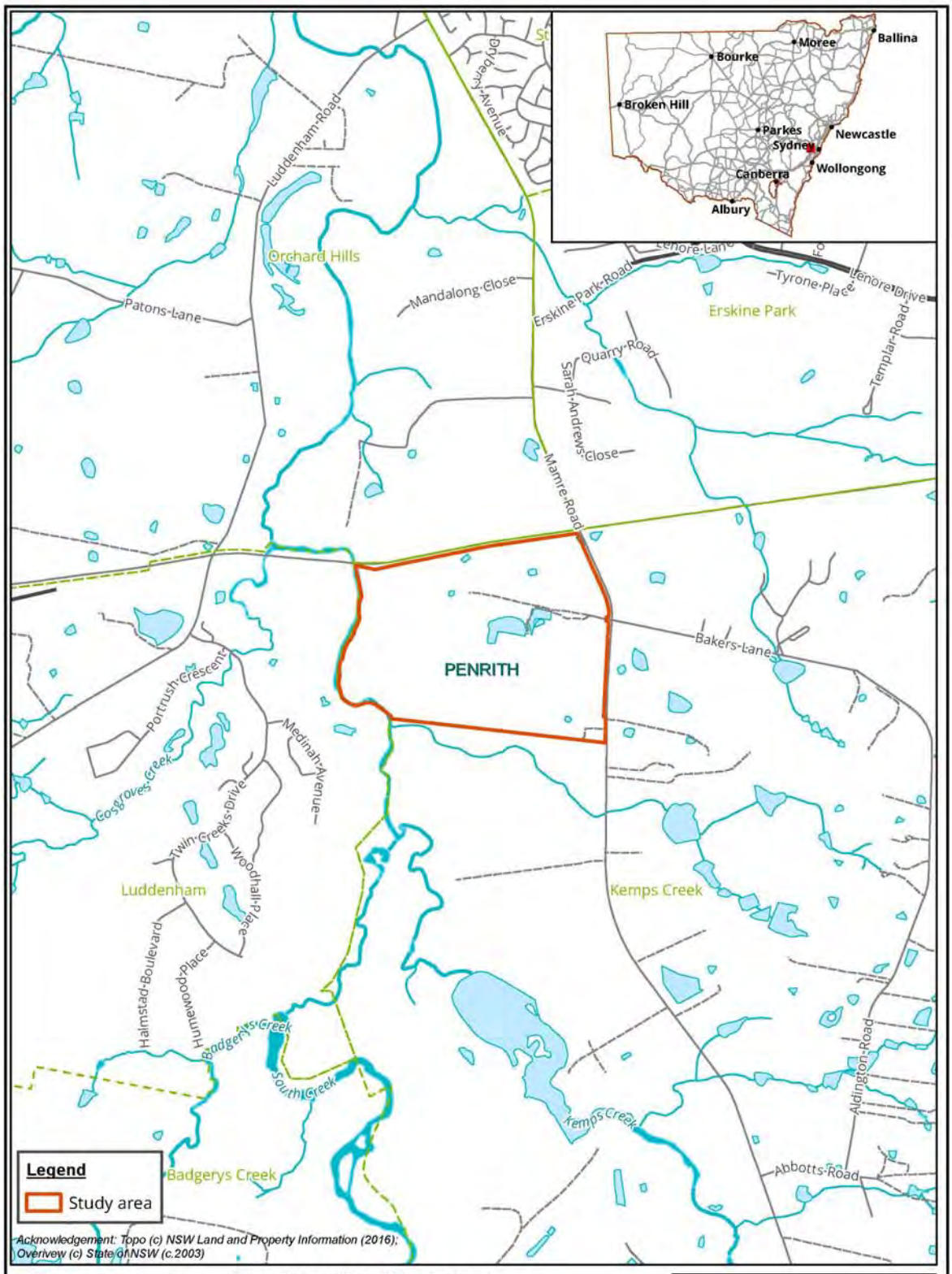

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Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
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Figure 2: Study area detail

24 October 2018

Aaron Slater
Warragil Cultural Services

Dear Aaron Slater,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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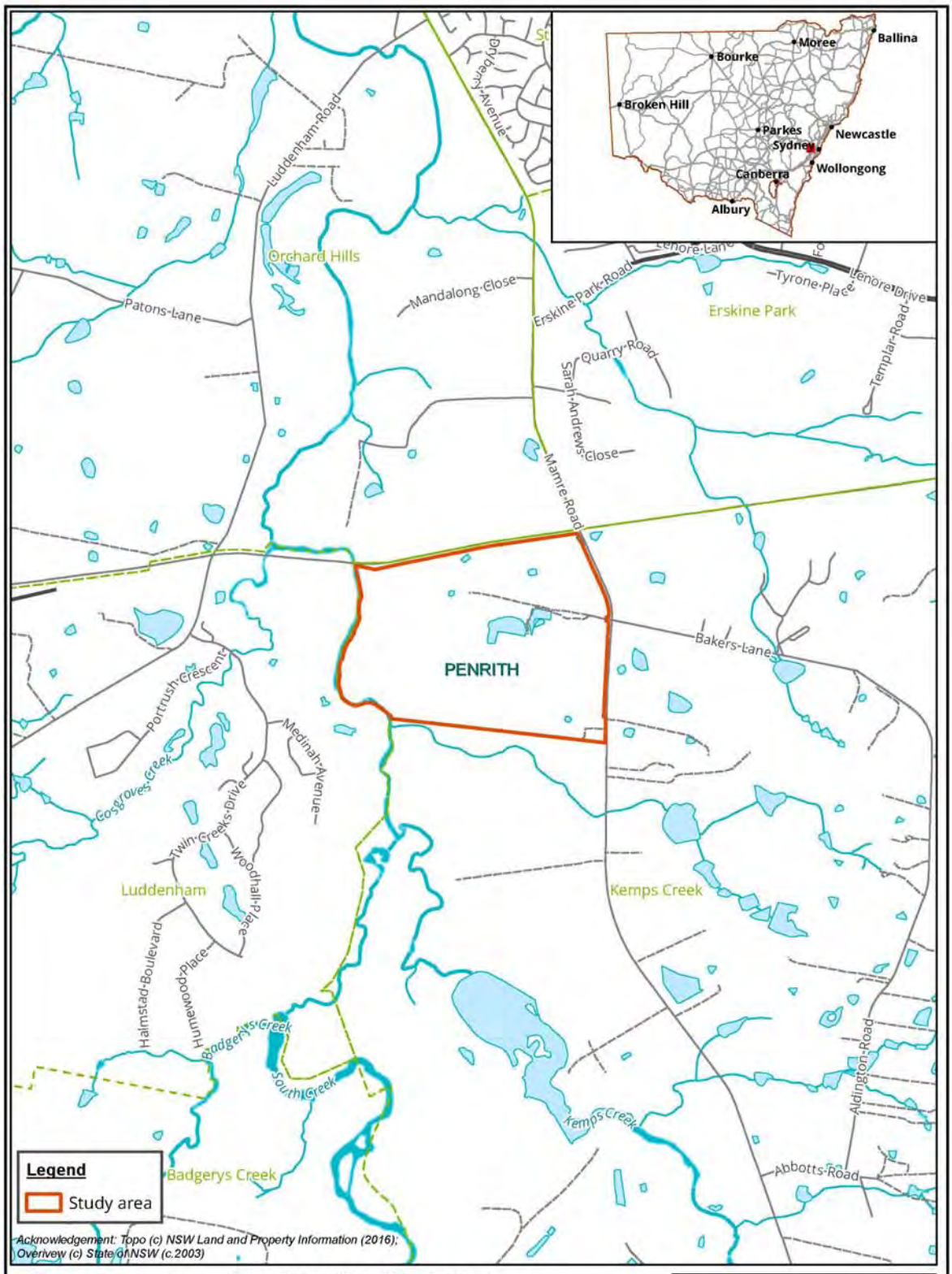

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Figure 2: Study area detail

24 October 2018

Steven Hickey and Donna Hickey
Widescope Indigenous Group
73 Russell Street
Emu Plains NSW 2750

Dear Steven Hickey and Donna Hickey,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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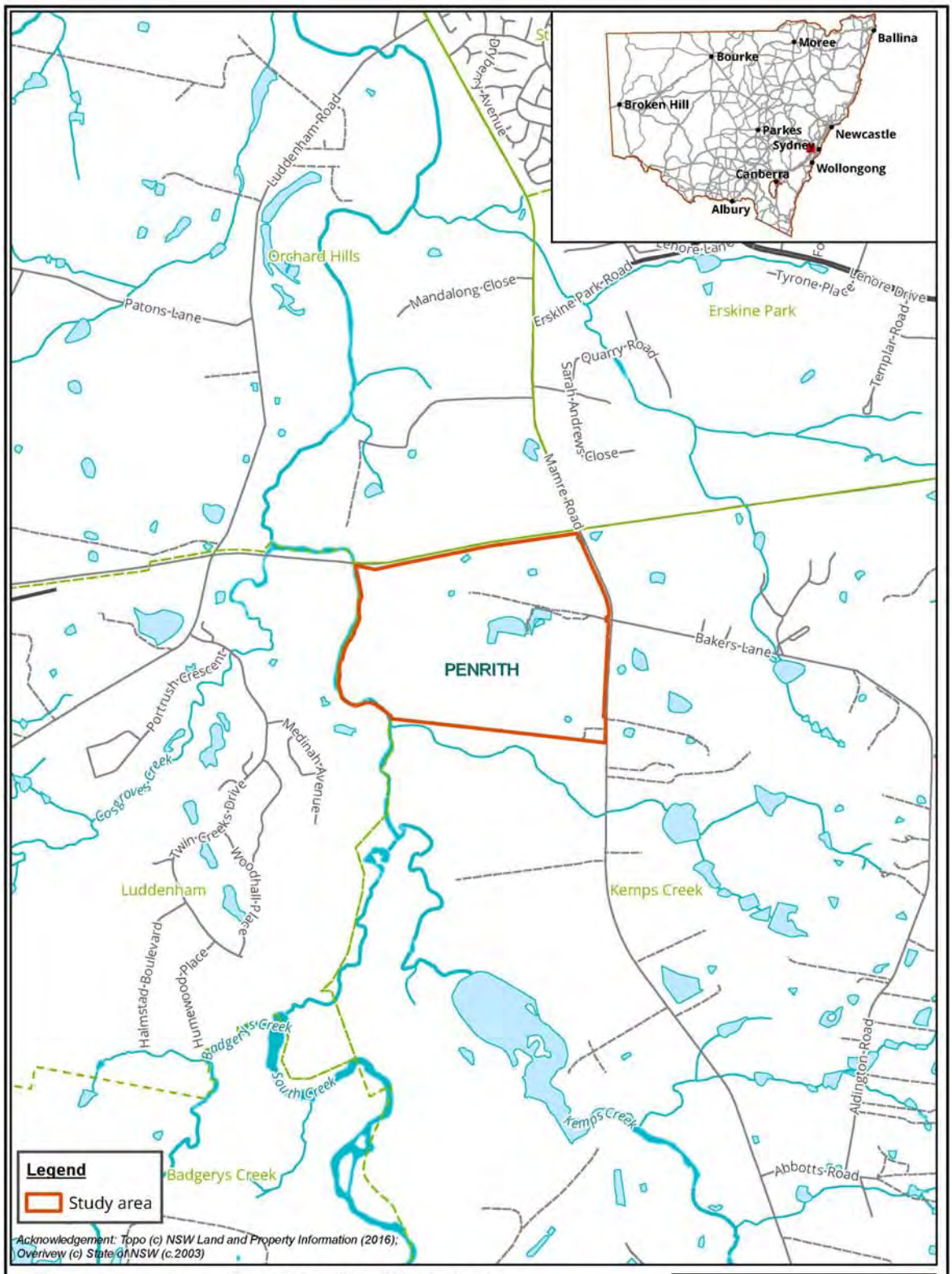

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Figure 2: Study area detail

24 October 2018

Hayley Bell
Wingikara

Dear Hayley Bell,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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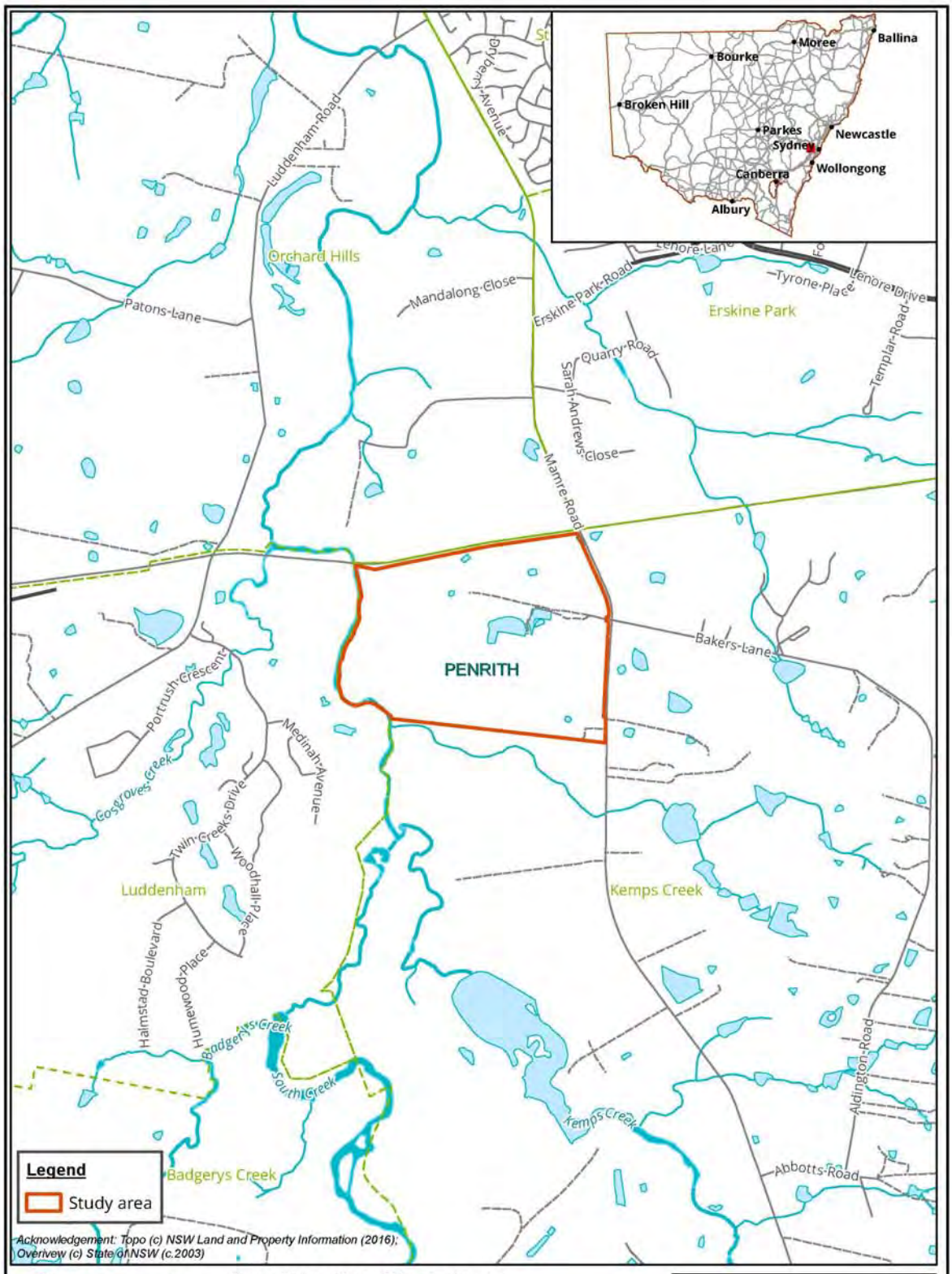

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Figure 2: Study area detail

24 October 2018

Wandai Kirkbright
Wingikara Cultural Heritage Technical Services

Dear Wandai Kirkbright,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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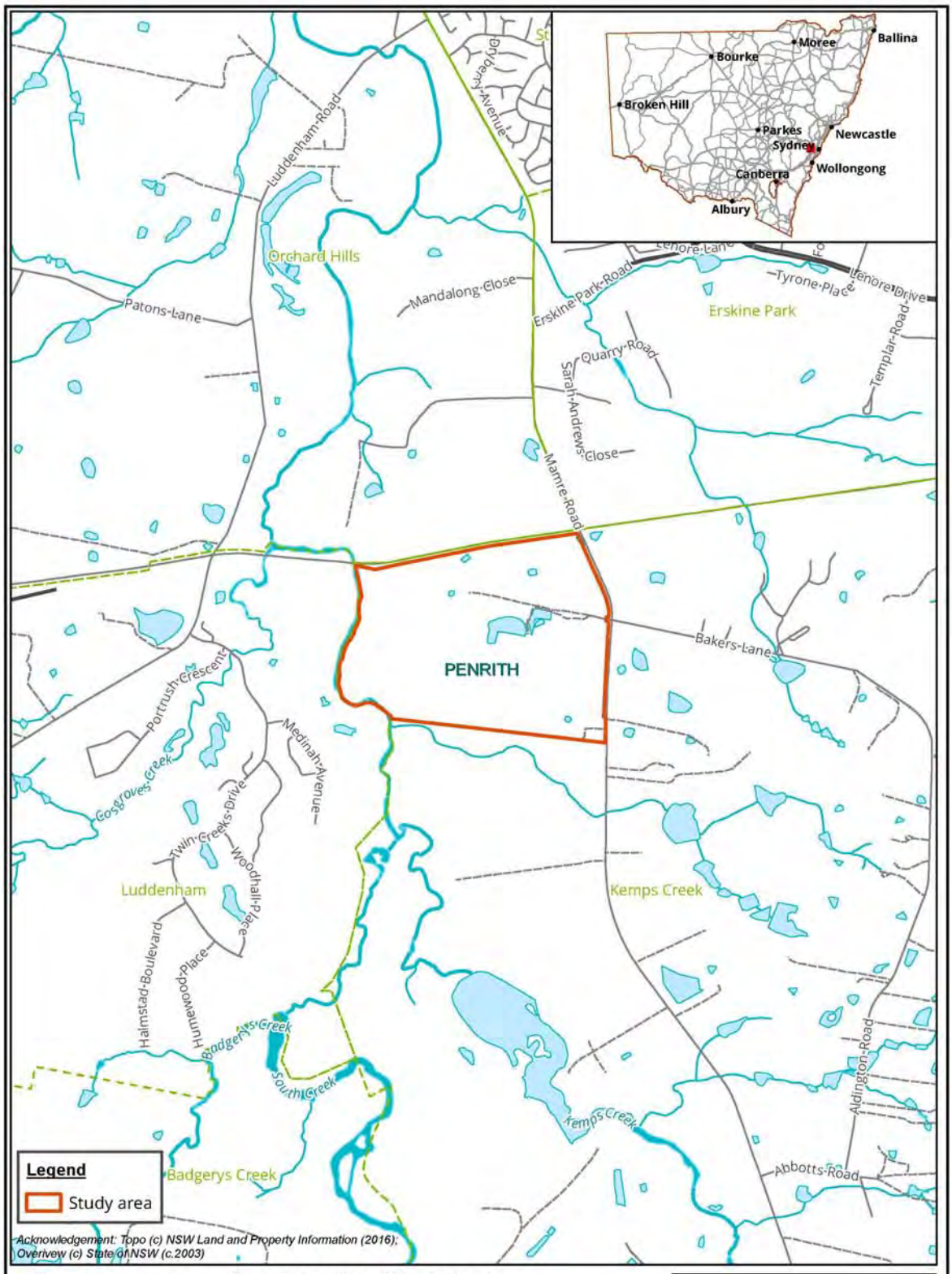

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24 October 2018

Kerrie Slater
Wurrumay Consultancy
89 Pyramid Street
Emu Plains NSW 2750

Dear Kerrie Slater,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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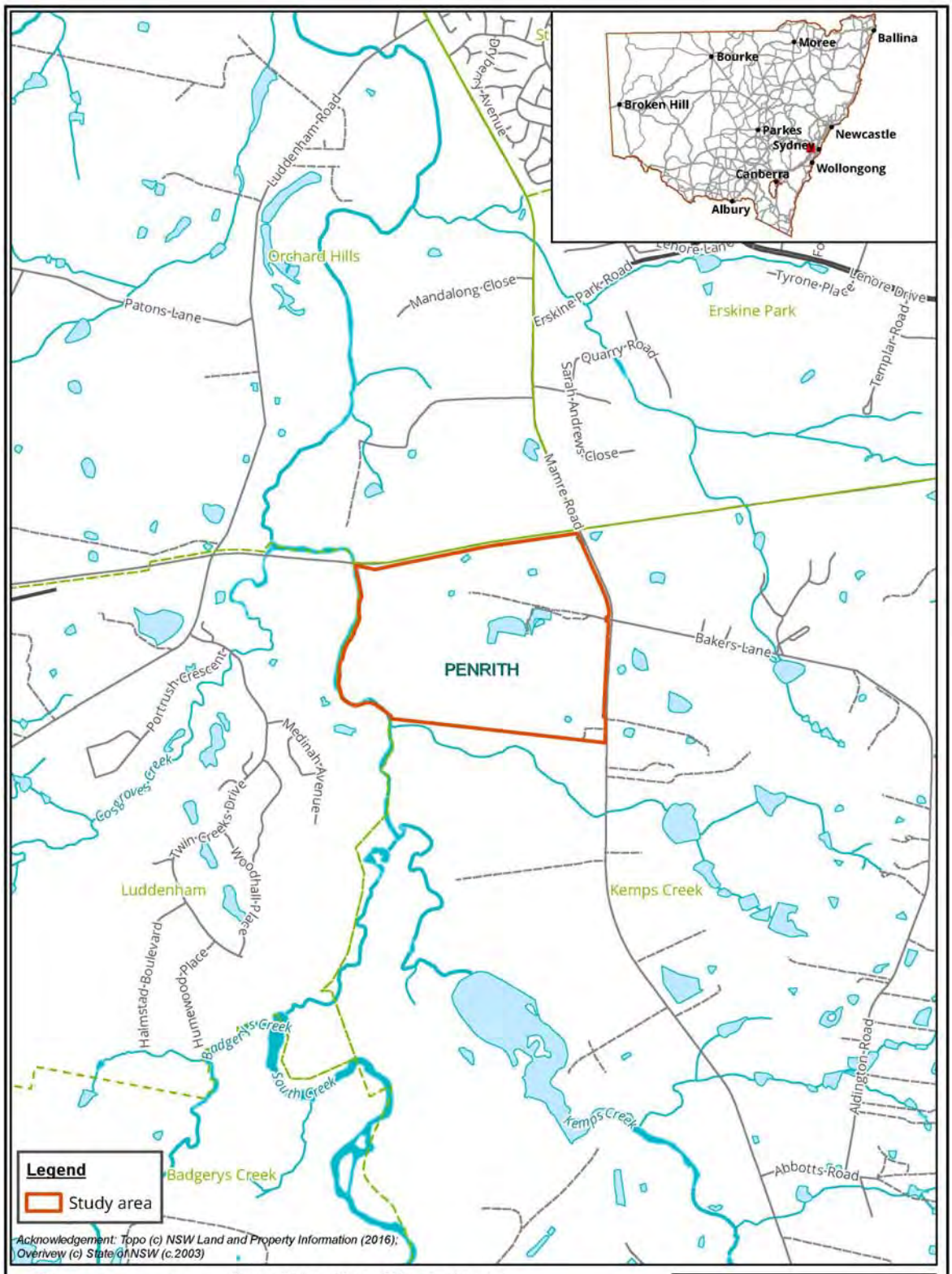

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24 October 2018

Robert Parson
Yerramurra

Dear Robert Parson,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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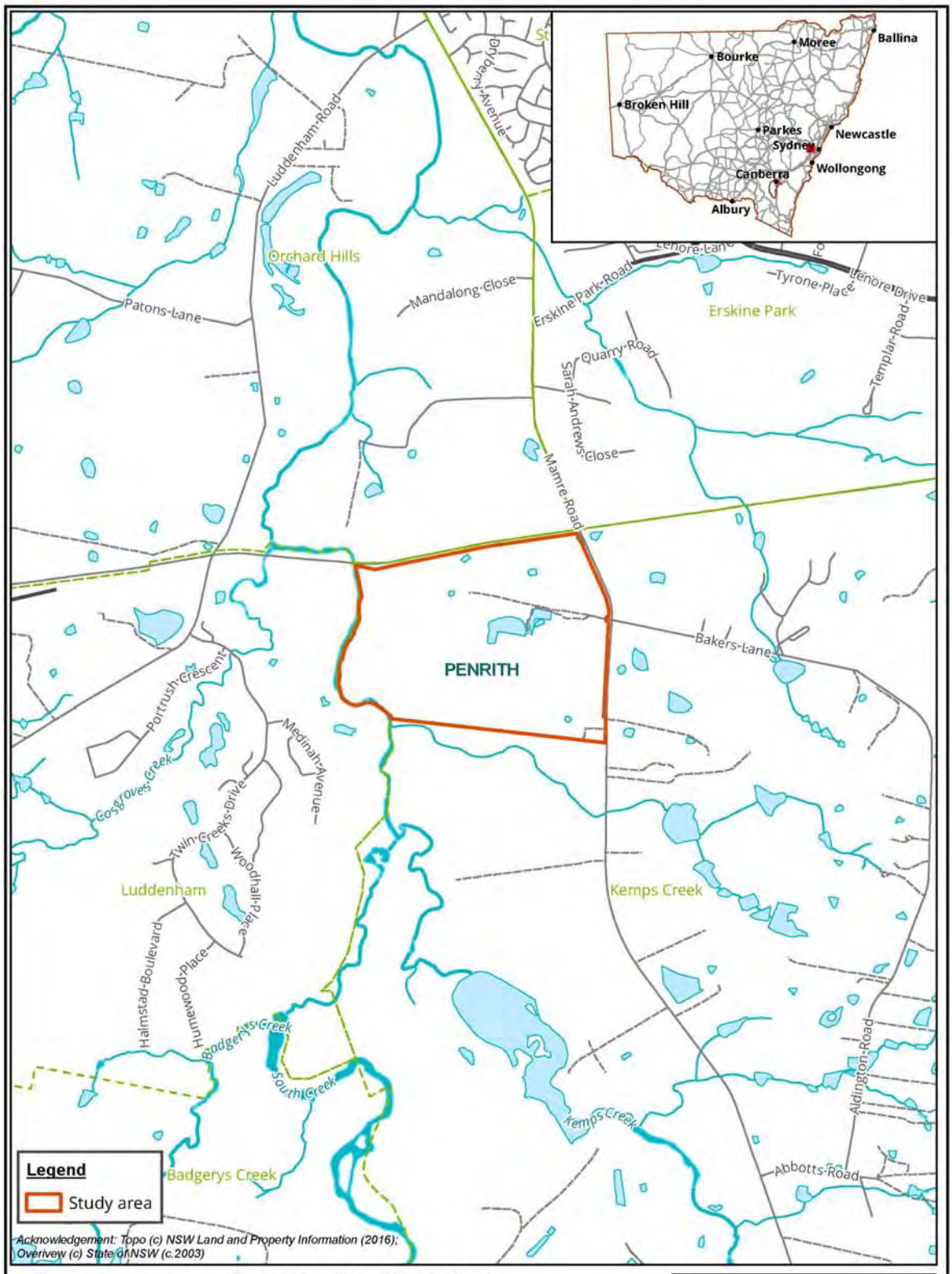

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24 October 2018

Justine Coplin
Darug Custodian Aboriginal Corporation
PO Box 81
Windsor NSW 2756

Dear Justine Coplin,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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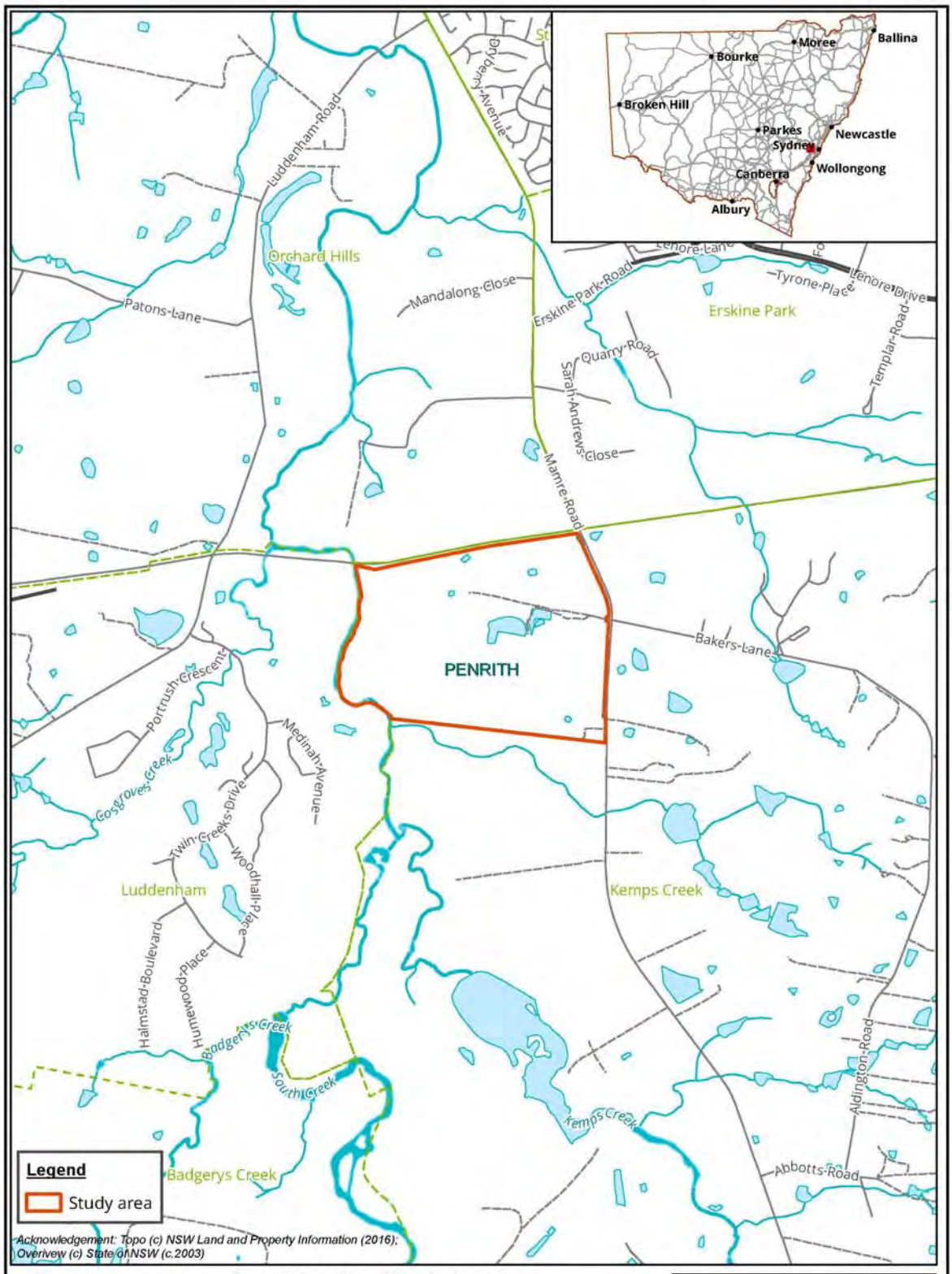

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24 October 2018

Jamie Workman and Anna Workman
Darug Land Observations
PO Box 173
Ulladulla NSW 2539

Dear Jamie Workman and Anna Workman,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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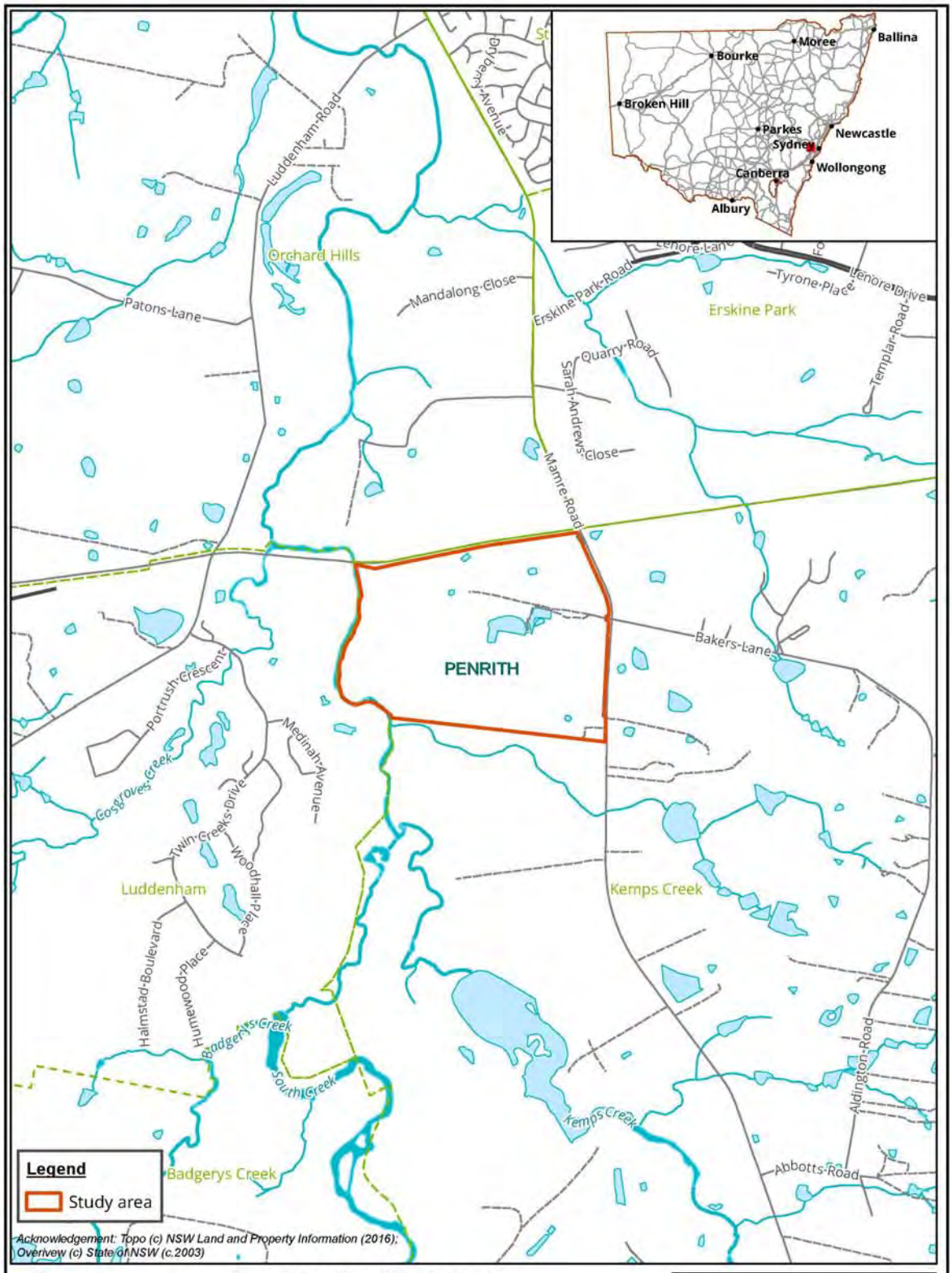

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Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
Date: 20 April 2018,
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Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

24 October 2018

Steven Randall
Deerubbin Local Aboriginal Land Council
PO Box 40
Penrith NSW 2751

Dear Steven Randall,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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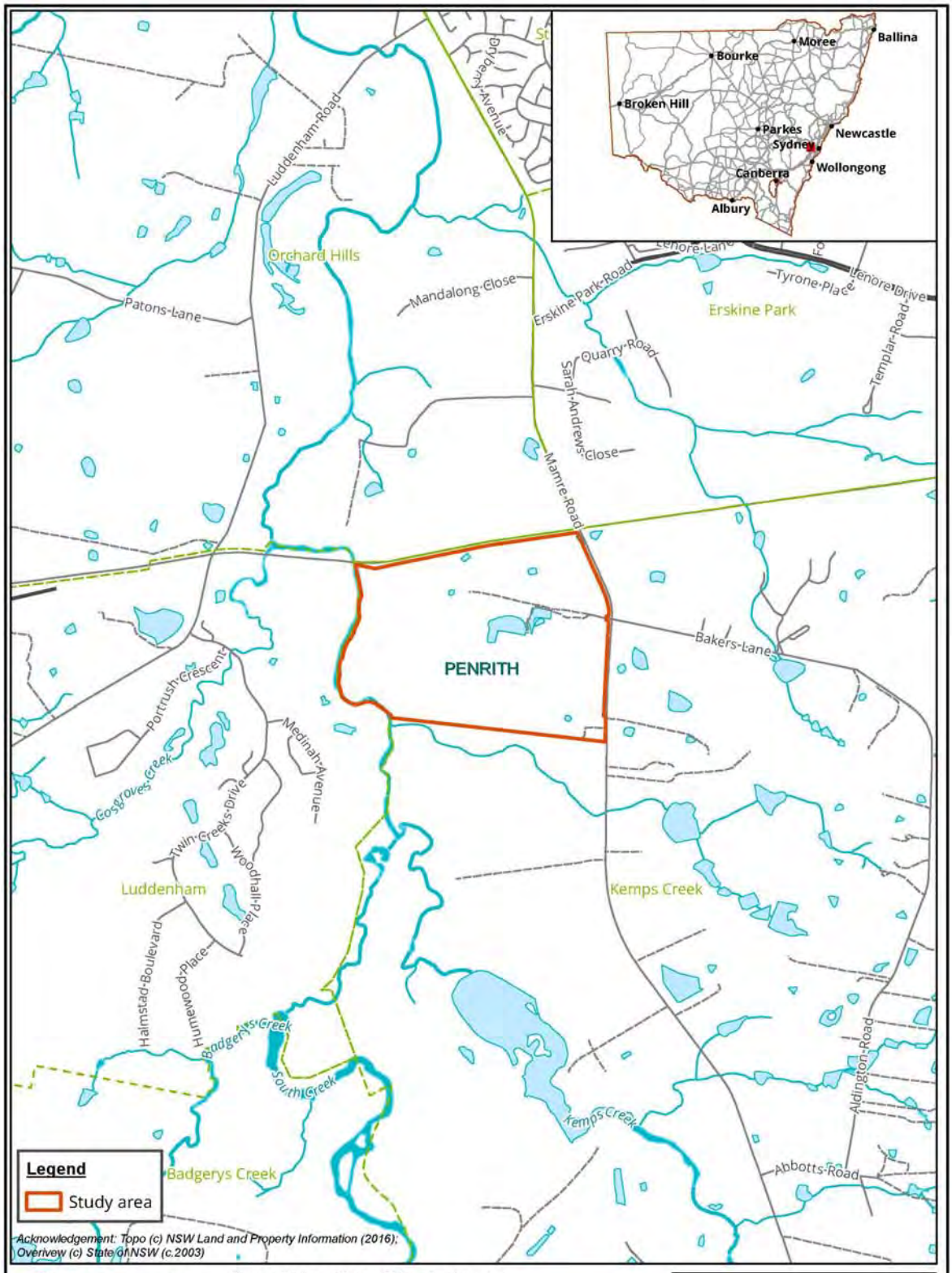

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Figure 2: Study area detail

24 October 2018

Andrew Bond
Dharug

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RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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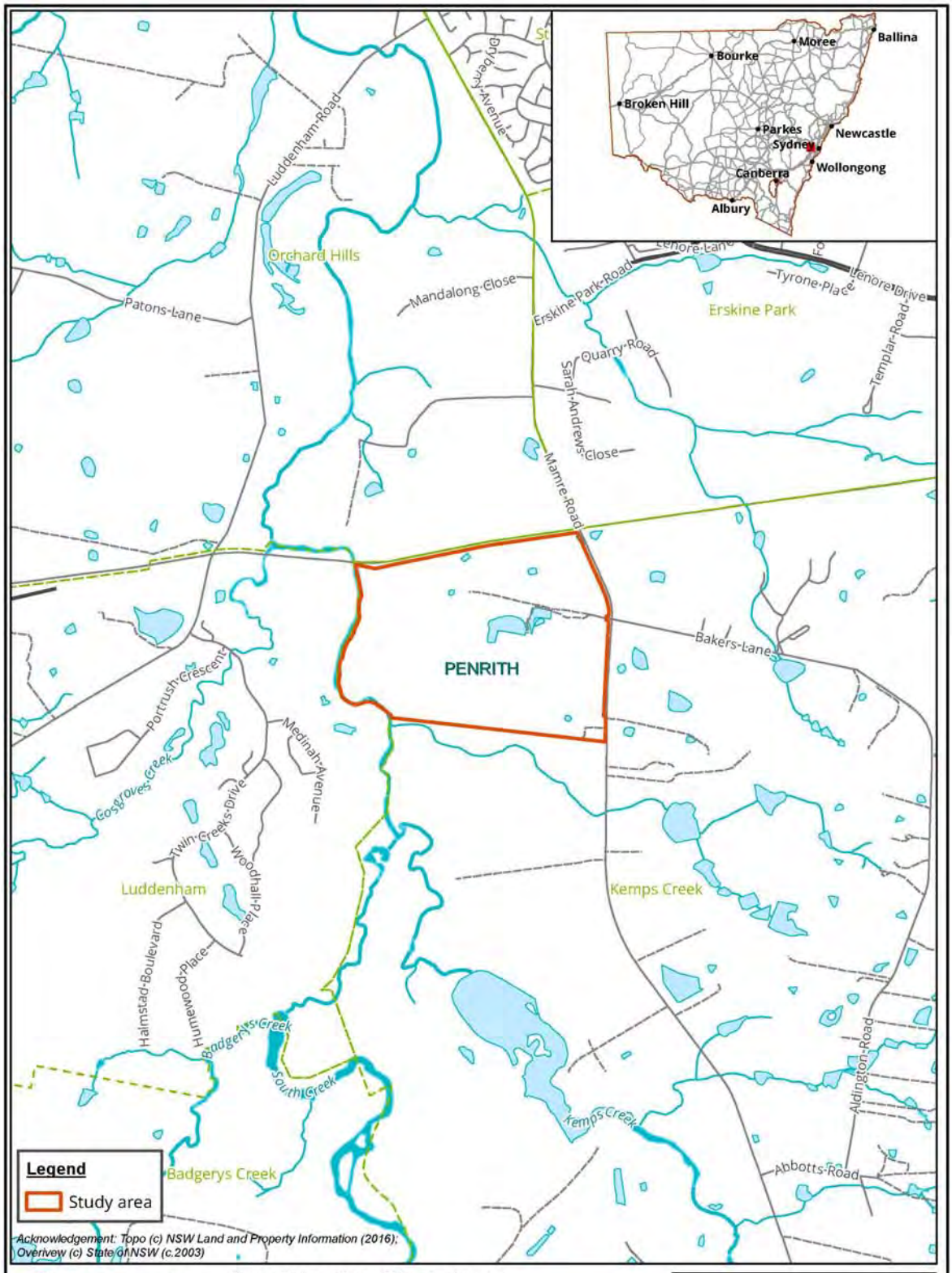

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Figure 2: Study area detail

24 October 2018

Ricky Fields
Dhinawan-Dhigaraa Culture & Heritage Pty Ltd

Dear Ricky Fields,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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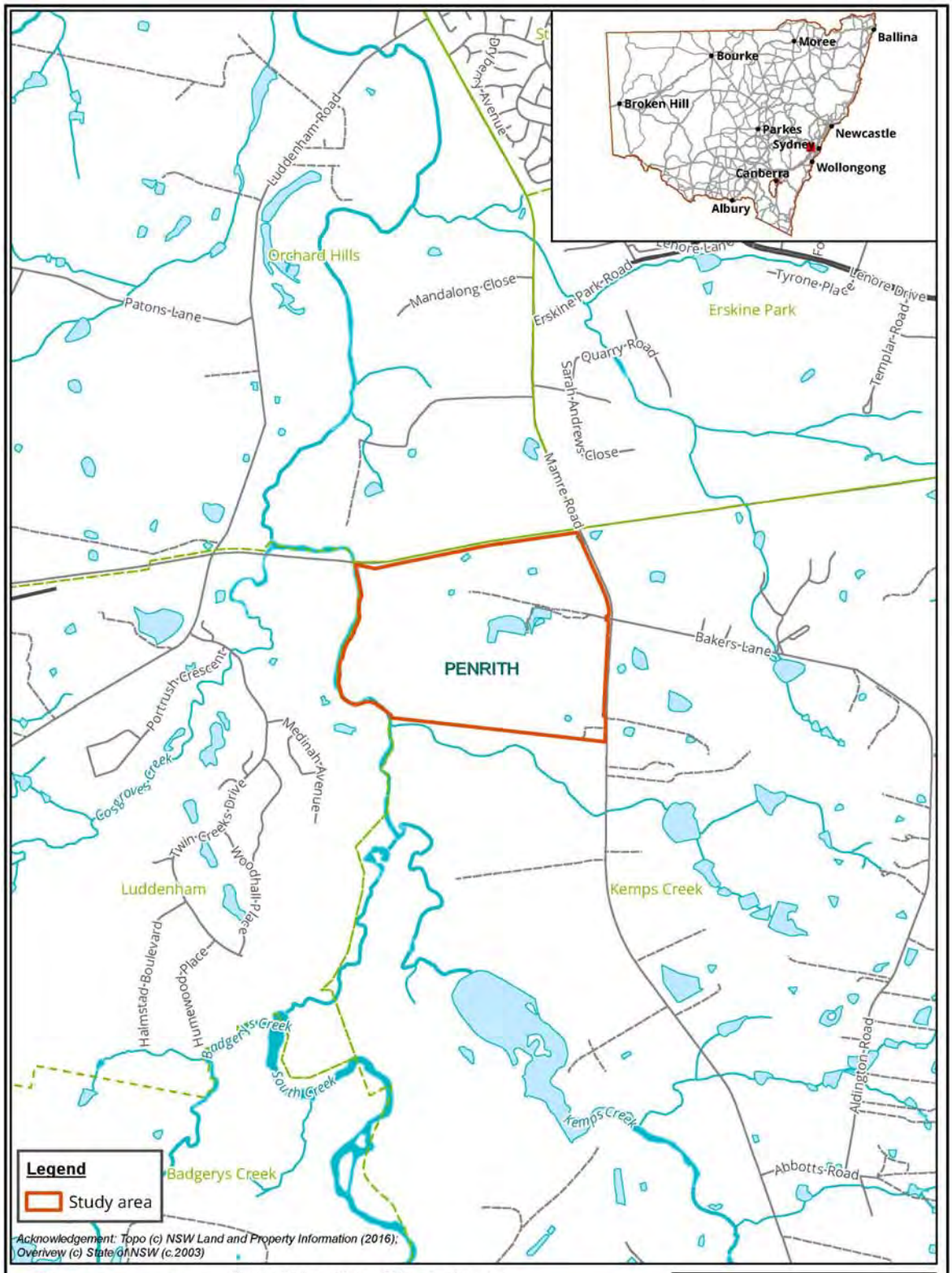

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Figure 2: Study area detail

24 October 2018

Lillie Carrol and Paul Boyd
Didge Ngunawal Clan
7 Siskin Street
Quakers Hill NSW 2763

Dear Lillie Carrol and Paul Boyd,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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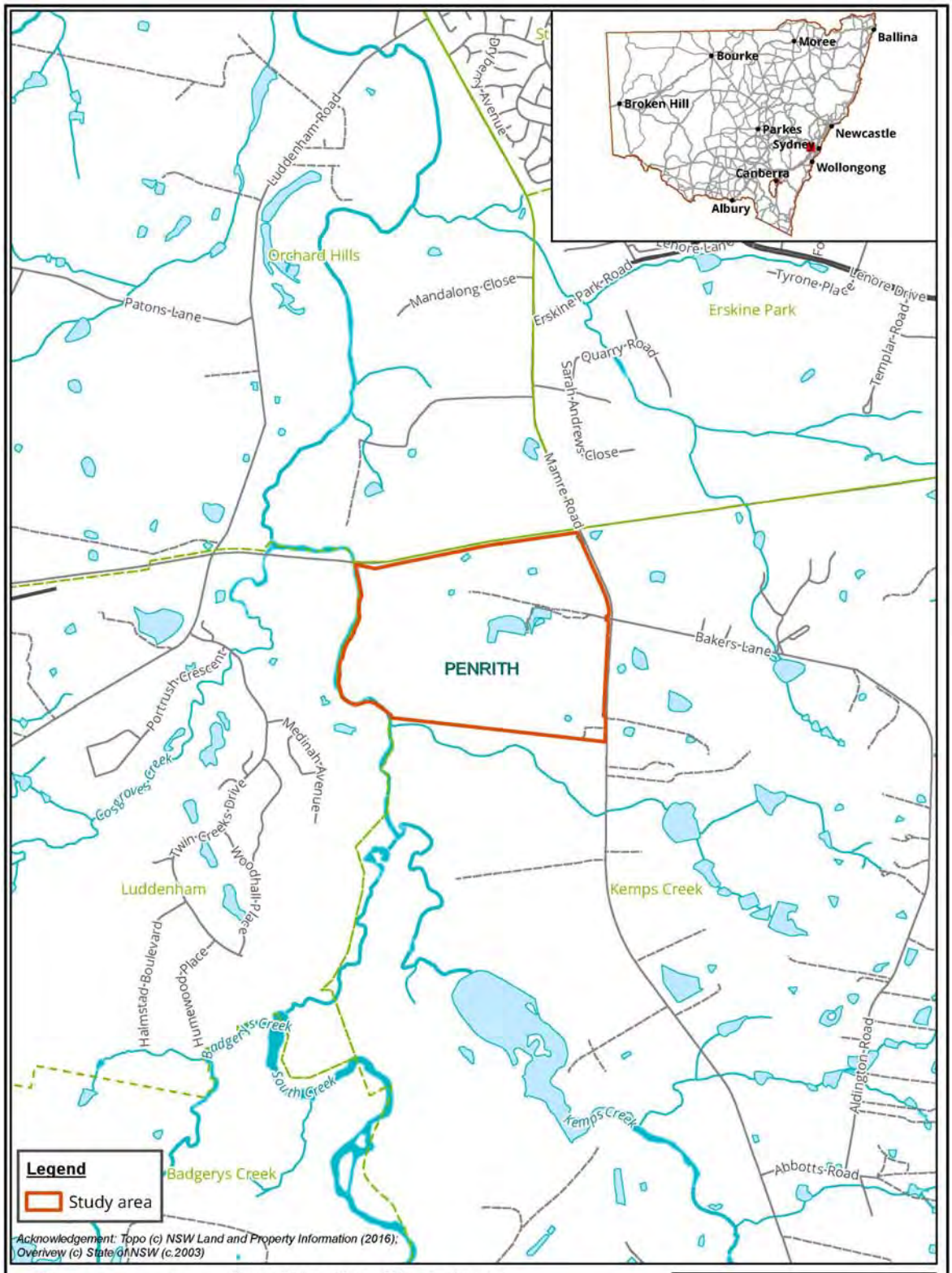

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24 October 2018

Darren Duncan
DJMD Consultancy

Dear Darren Duncan,

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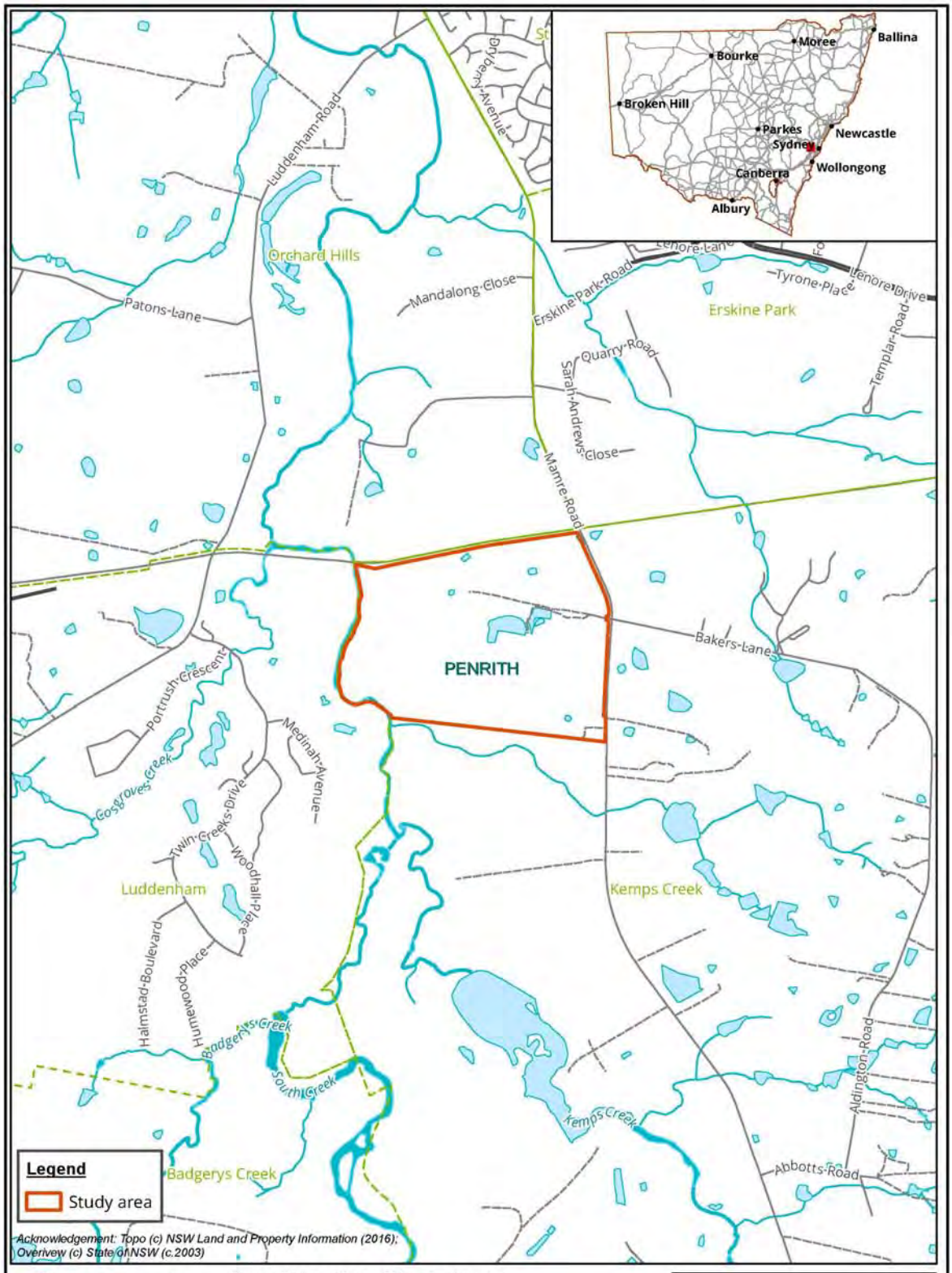

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24 October 2018

Steven Johnson and Krystle Carroll
Ginninderra Aboriginal Corporation
PO BOX 3143
Grose Vale NSW 2754

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Our Ref: Matter 27033

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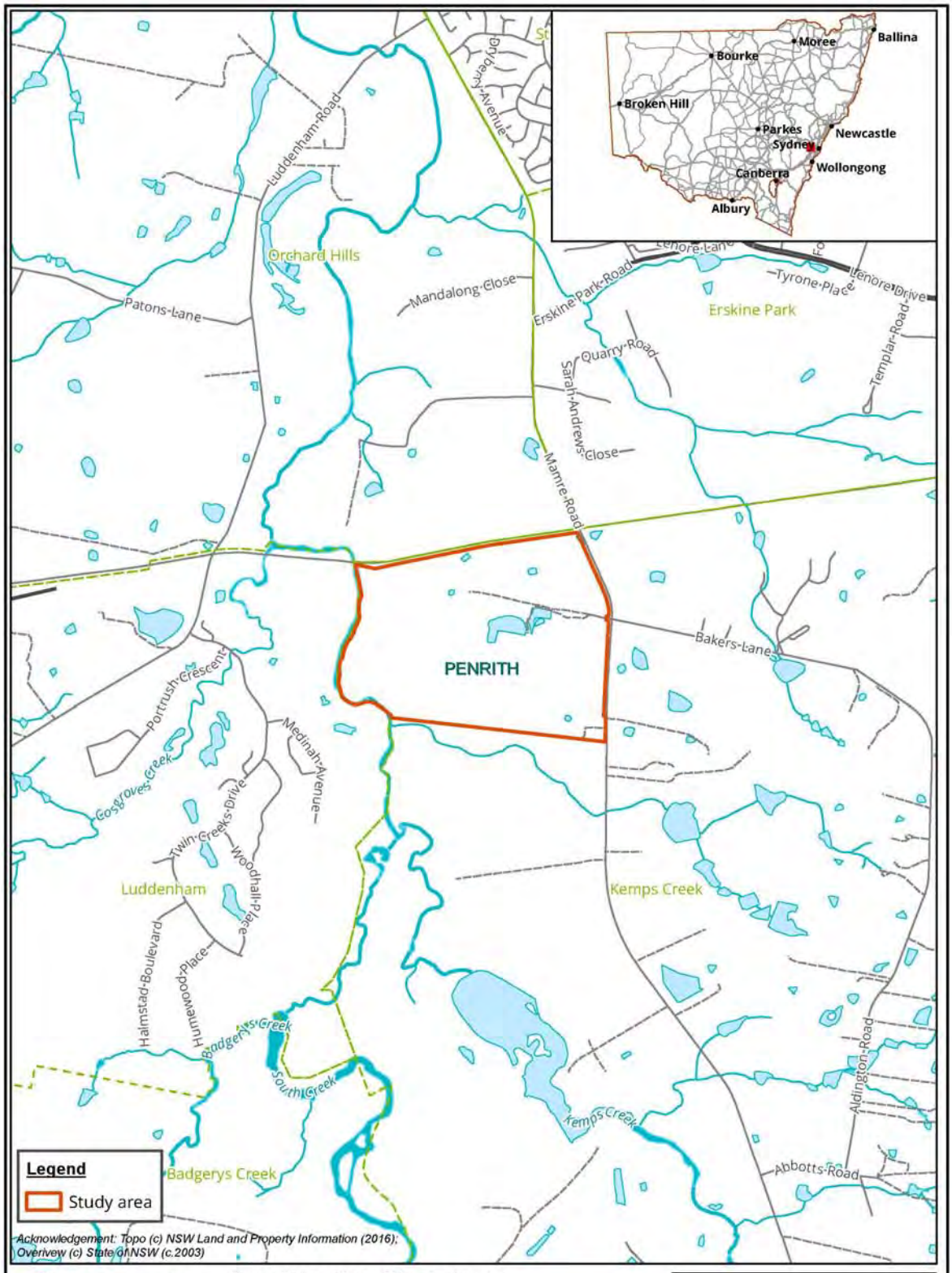

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Wendy Smith
Gulaga

Dear Wendy Smith,

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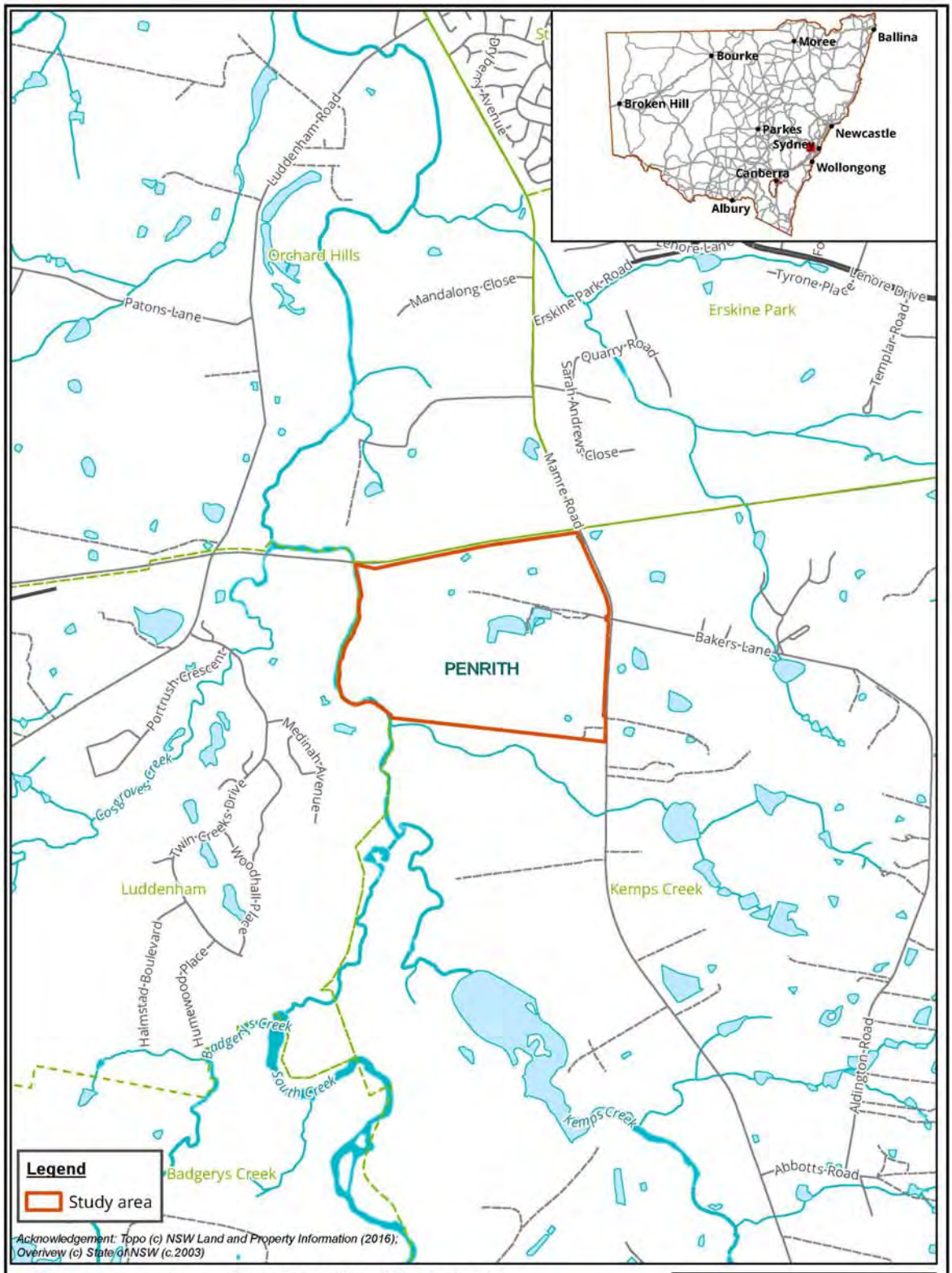

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Joanne Anne Stewart
Jerringong

Dear Joanne Anne Stewart,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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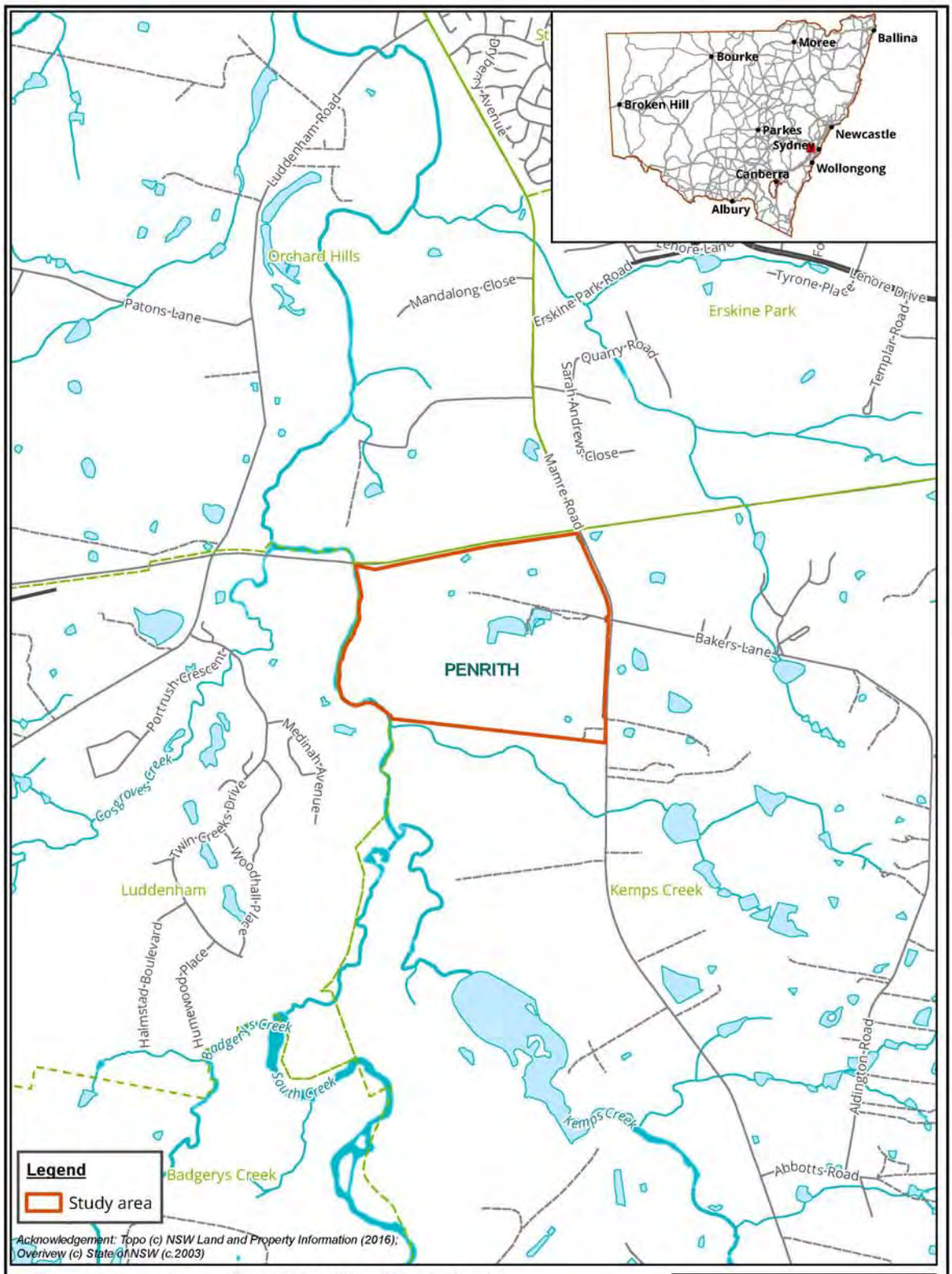

Figure 1: Location of the study area

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Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
Date: 20 April 2018,
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Figure 2: Study area detail

24 October 2018

Vicky Slater
Kawul Cultural Services
89 Pyramid Street
Emu Plains NSW 2750

Dear Vicky Slater,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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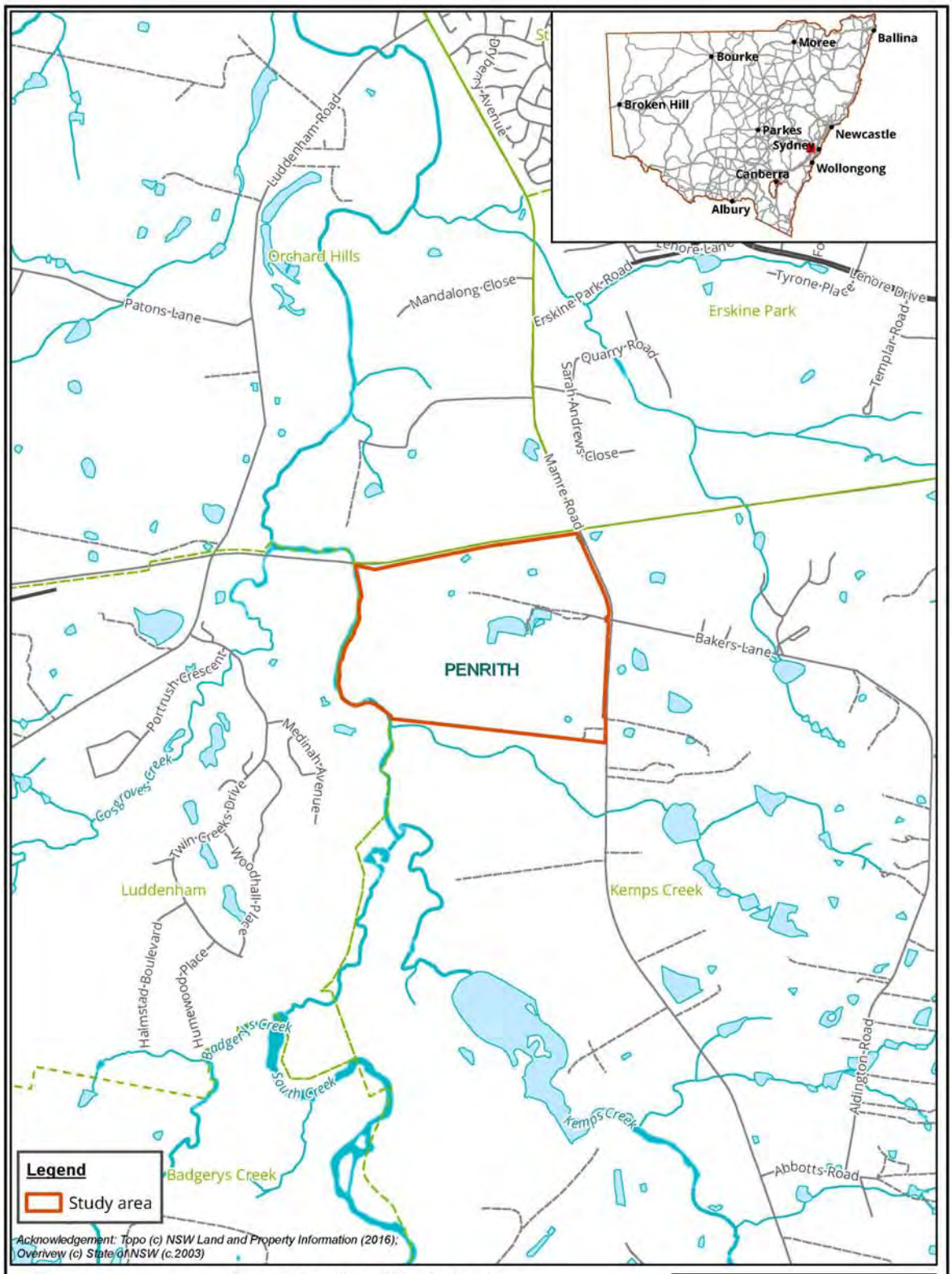

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Figure 2: Study area detail

24 October 2018

Kaya Dawn Bell
Mununga

Dear Kaya Dawn Bell,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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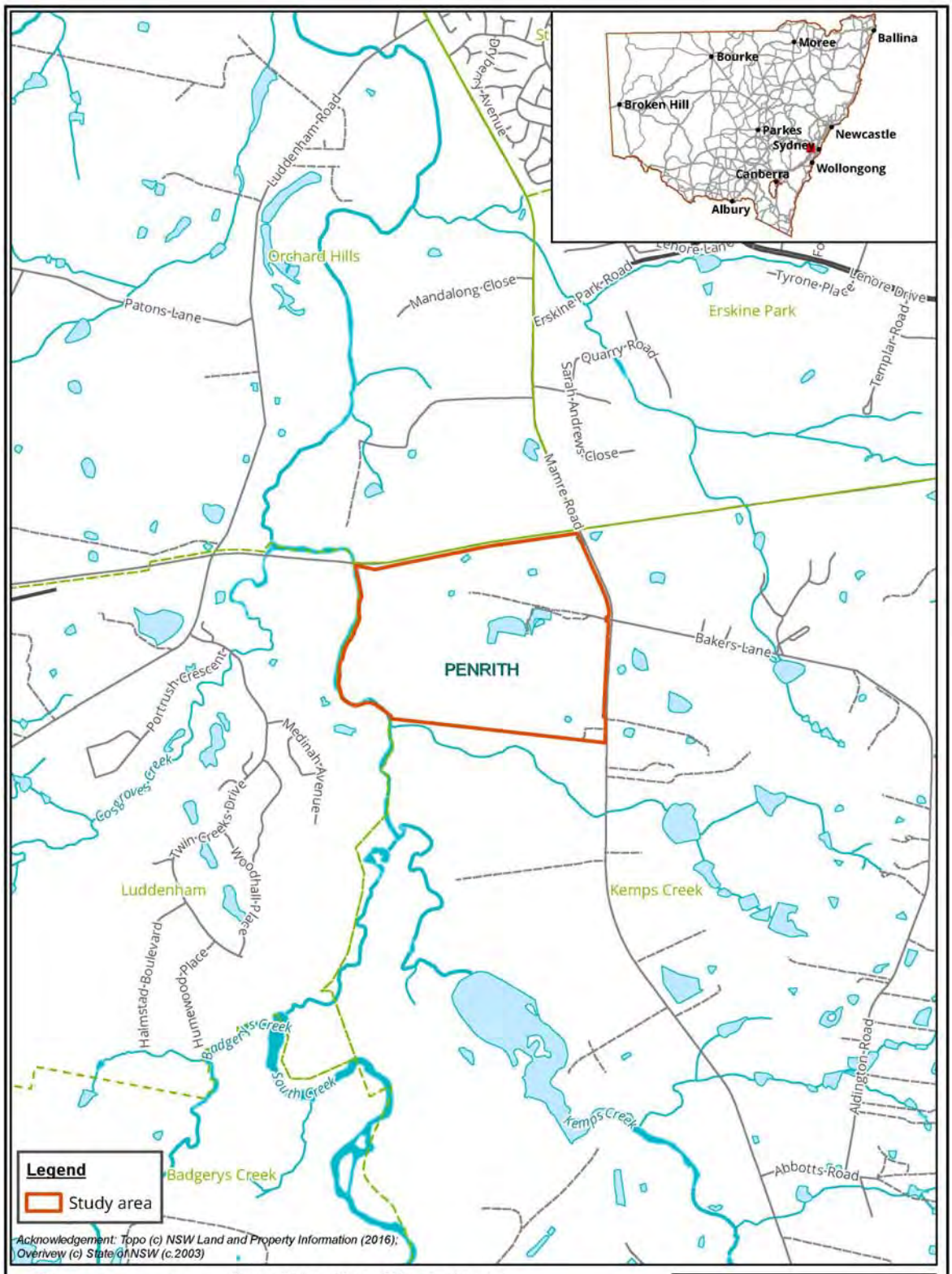

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Figure 2: Study area detail

24 October 2018

Suzannah McKenzie
Munyunga Cultural Heritage Technical Services

Dear Suzannah McKenzie,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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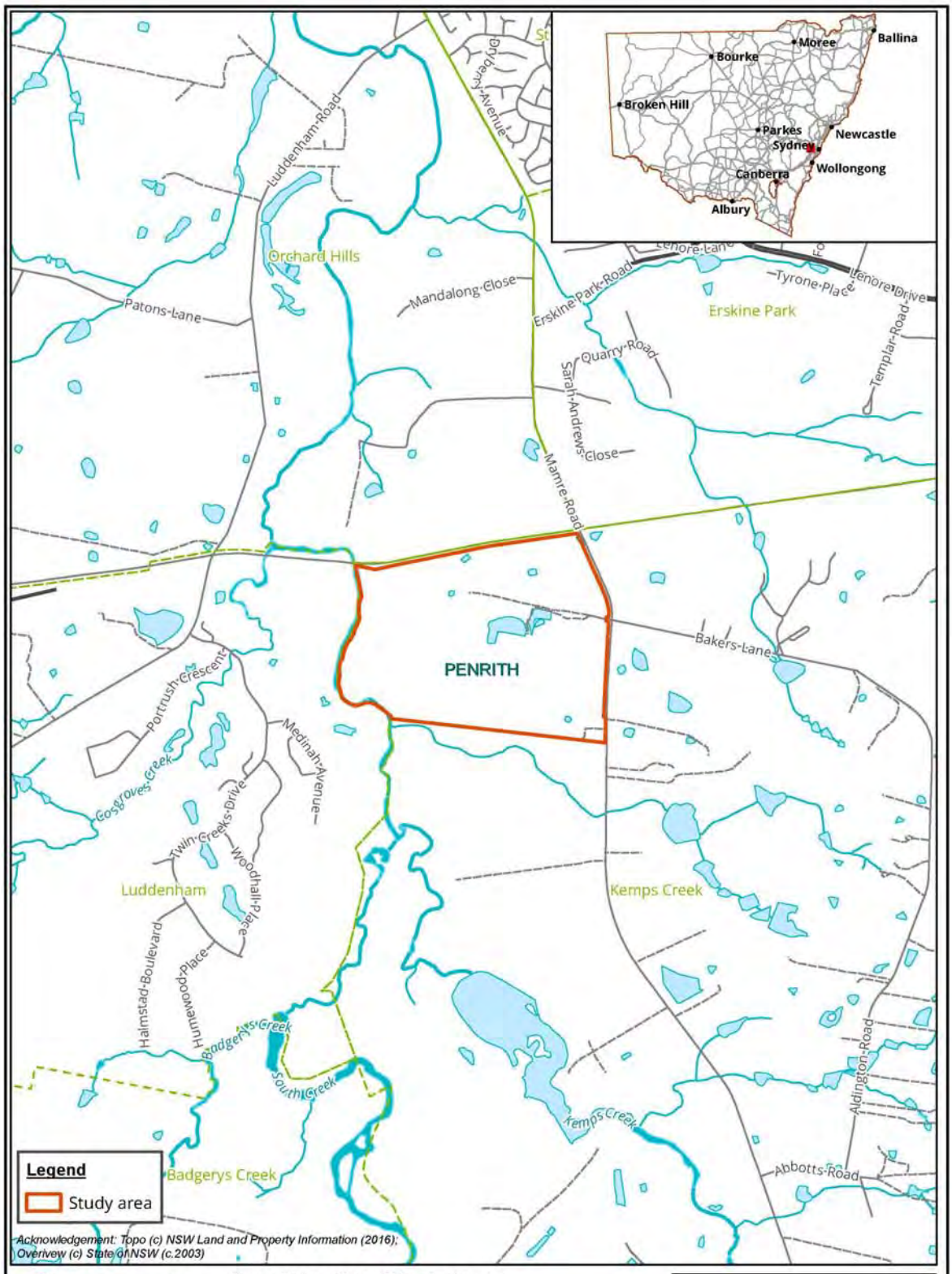

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Figure 2: Study area detail

24 October 2018

Roxanne Smith
Murramarang

Dear Roxanne Smith,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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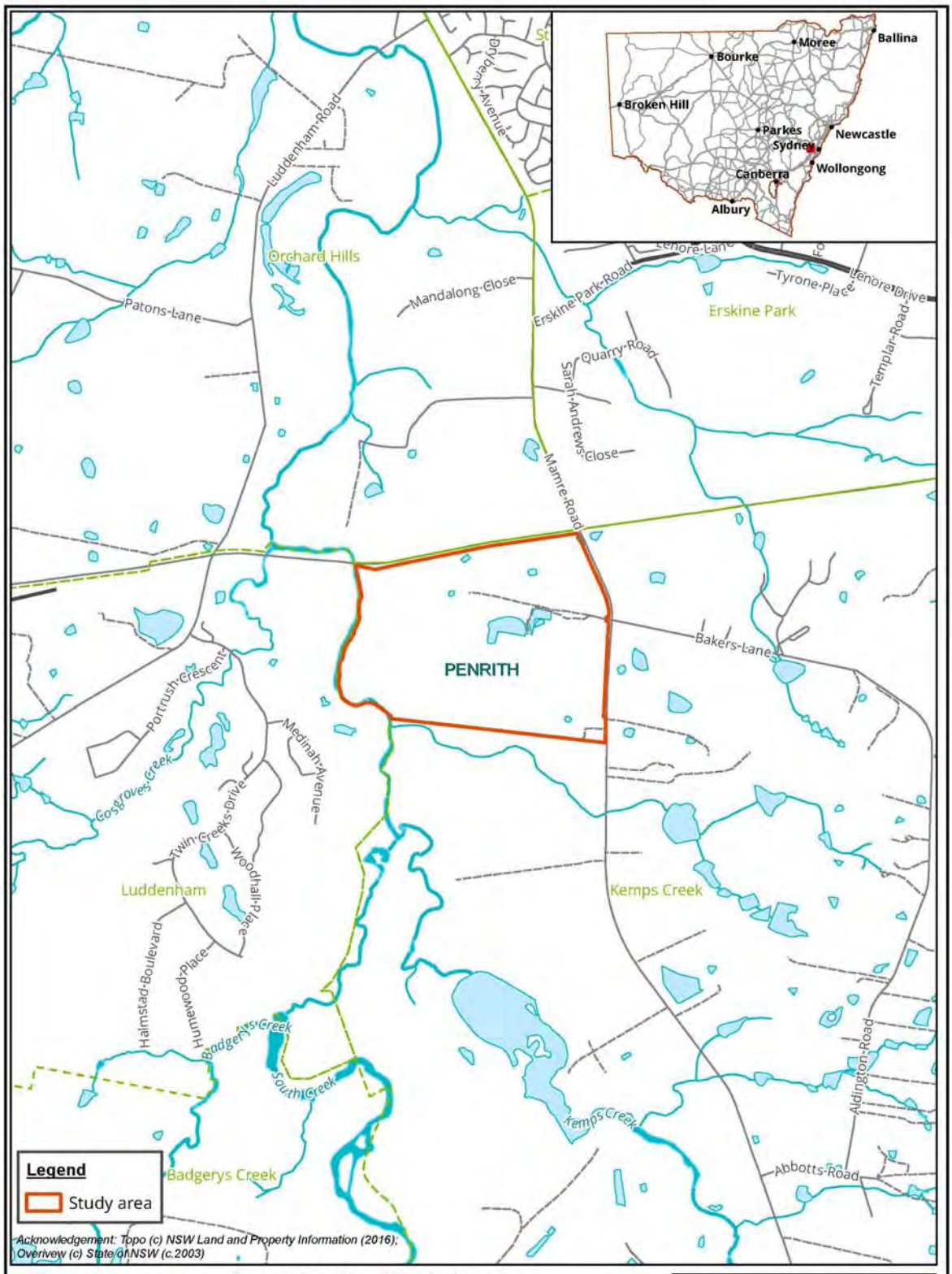

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24 October 2018

Mark Henry
Murrumbul

Dear Mark Henry,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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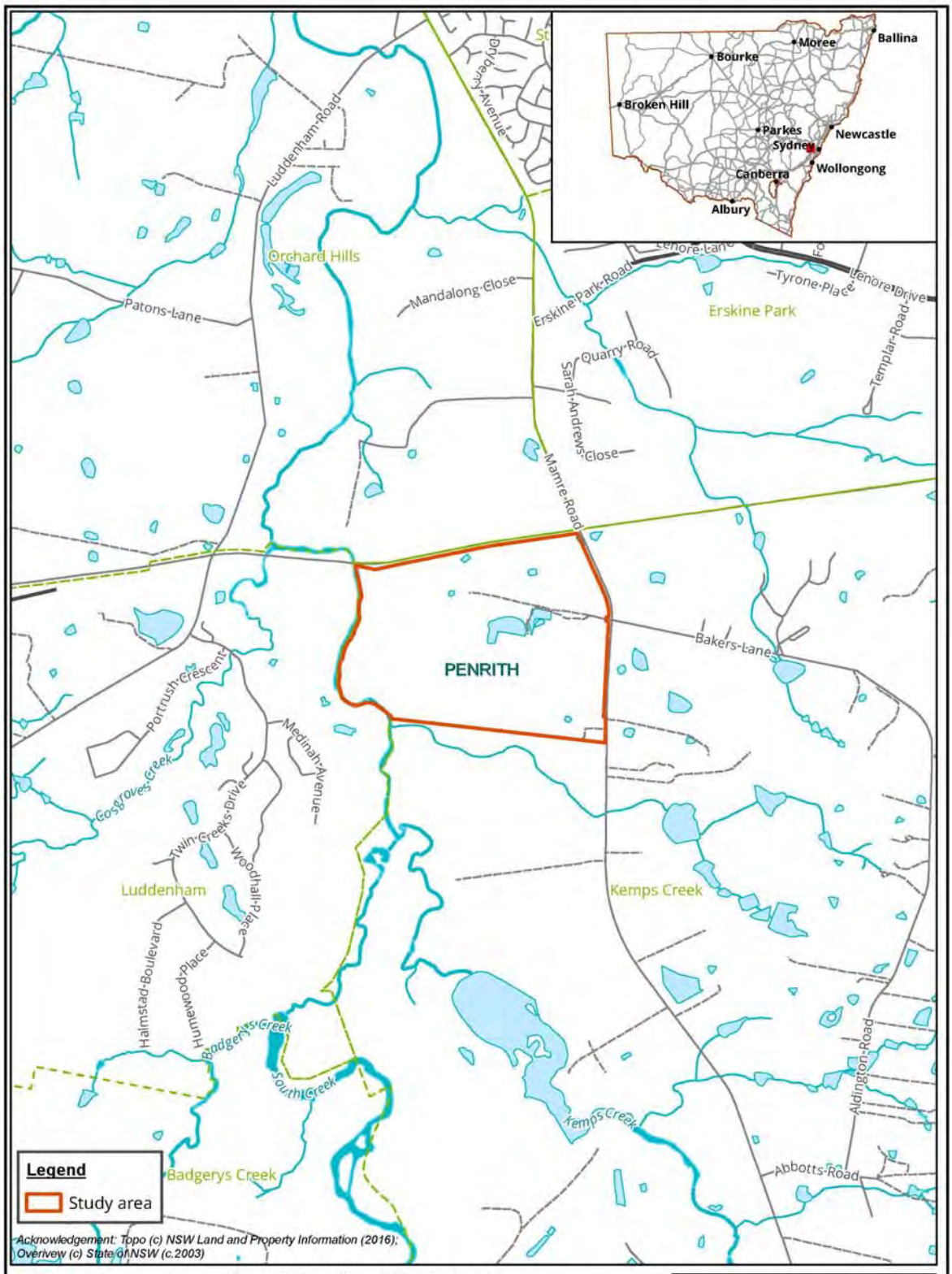

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24 October 2018

Levi McKenzie-Kirkbright
Murrumbul Cultural Heritage Technical Services

Dear Levi McKenzie-Kirkbright,

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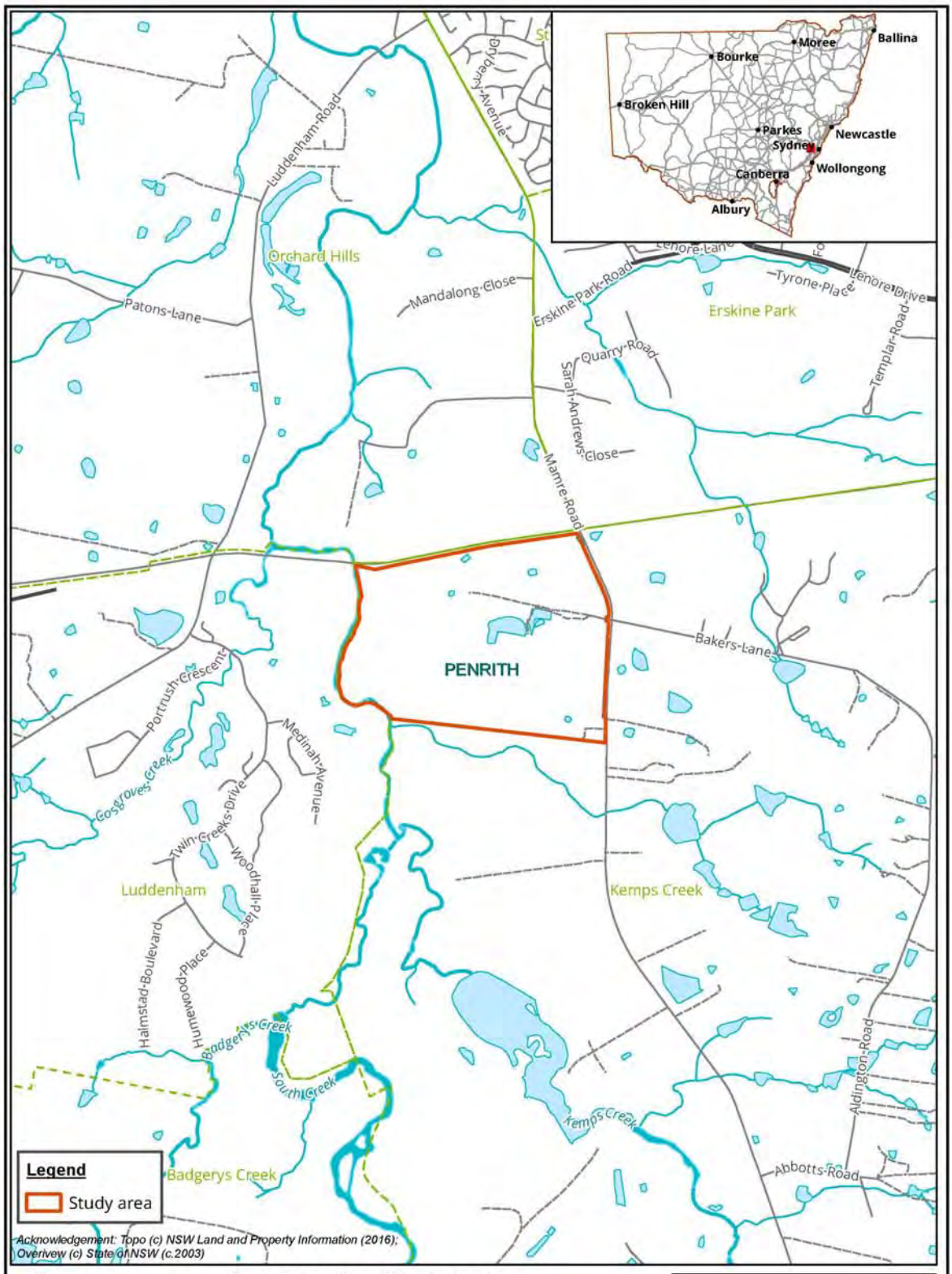

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Newton Carriage
Nerrigundah

Dear Newton Carriage,

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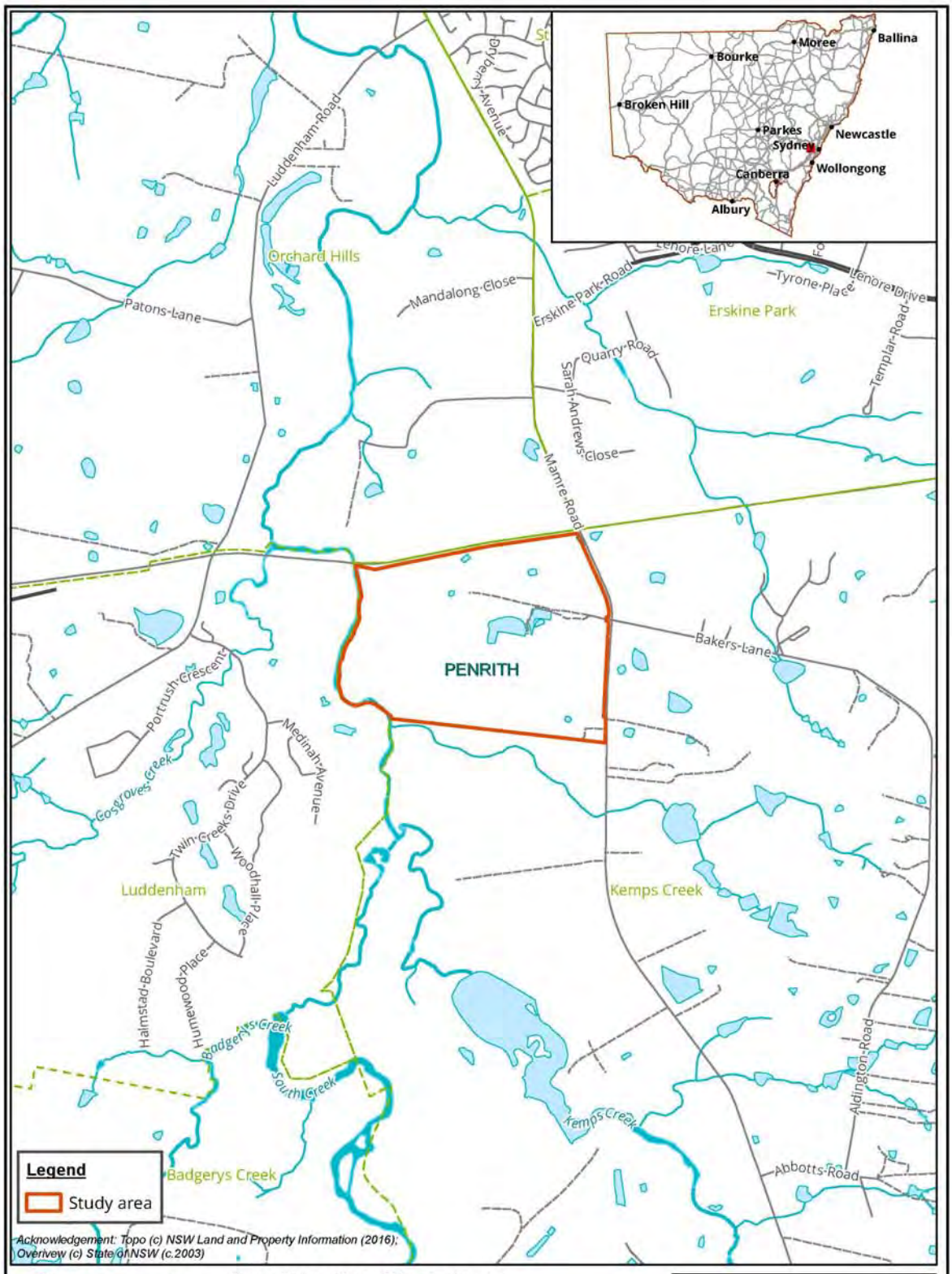

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Newton Carriage
Nundagurri

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Our Ref: Matter 27033

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Alexandria NSW 2015

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ABN 65 006 175 097

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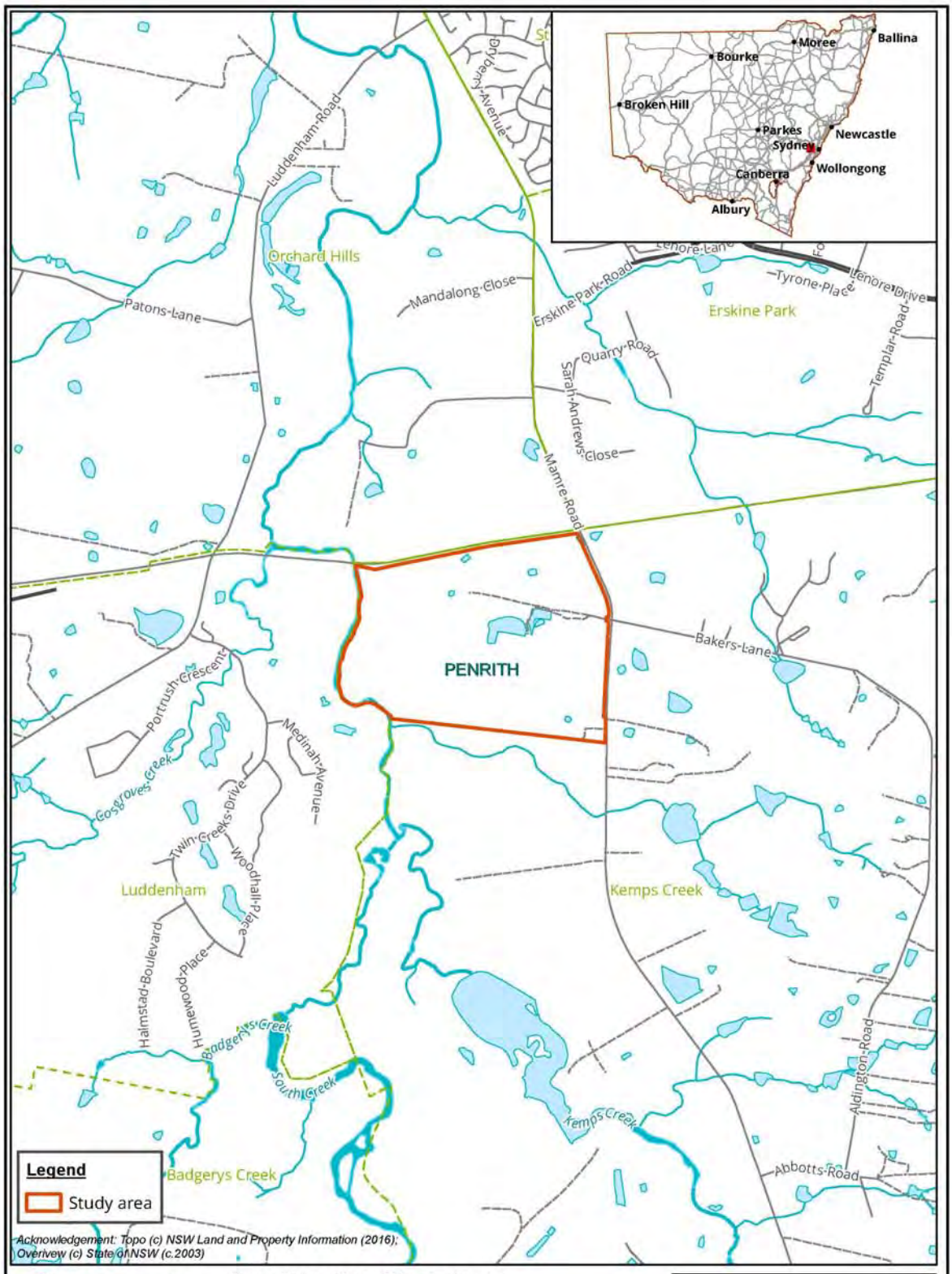

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Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
Date: 20 April 2018,
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Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

24 October 2018

Arika Jalomaki
Yulay Cultural Services
15 Rowley Place
Airds NSW 2560

Dear Arika Jalomaki,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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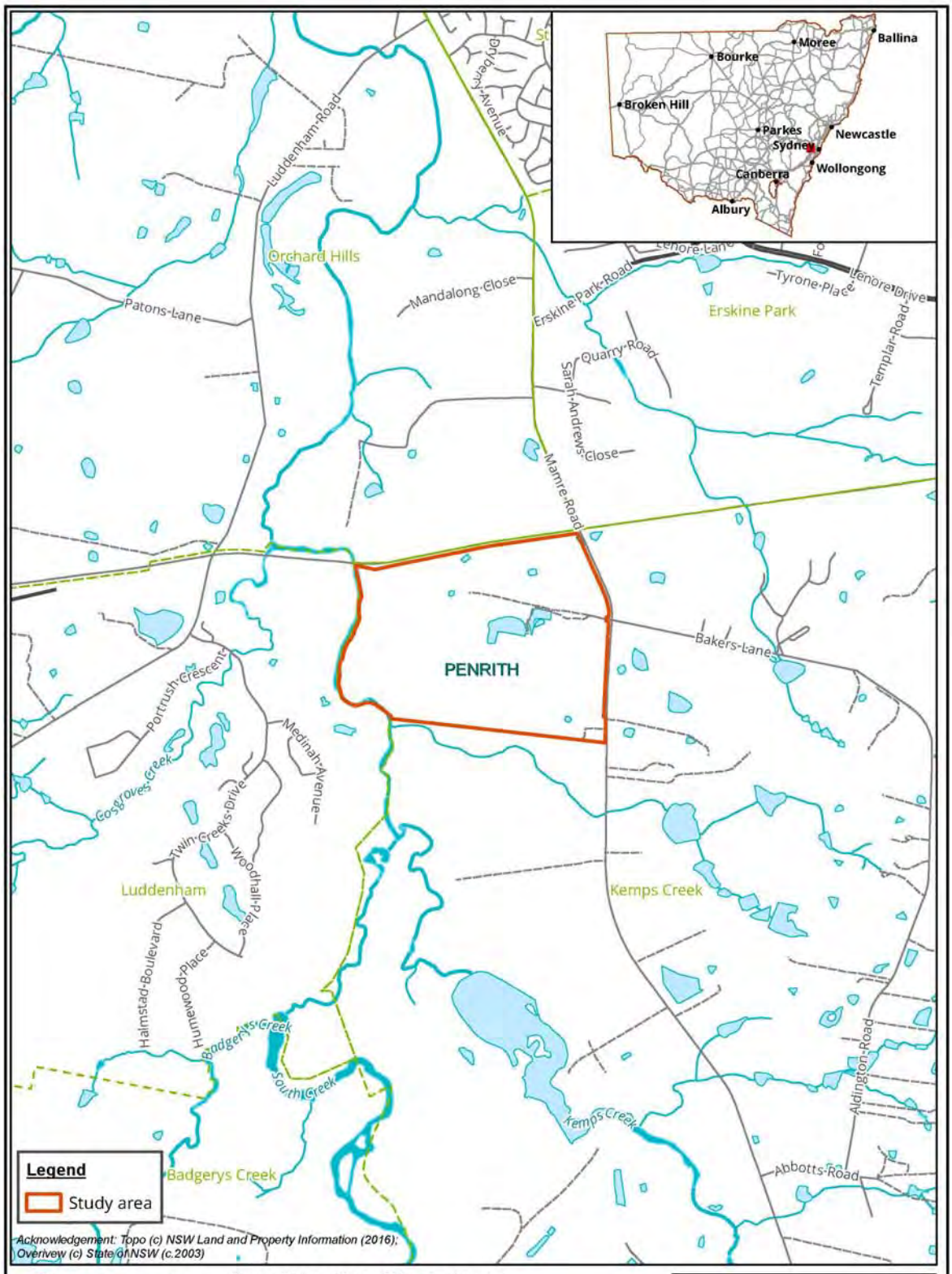

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Figure 2: Study area detail

24 October 2018

Des Dyer
18A Perigree Close
Doonside NSW 2767

Dear Des Dyer,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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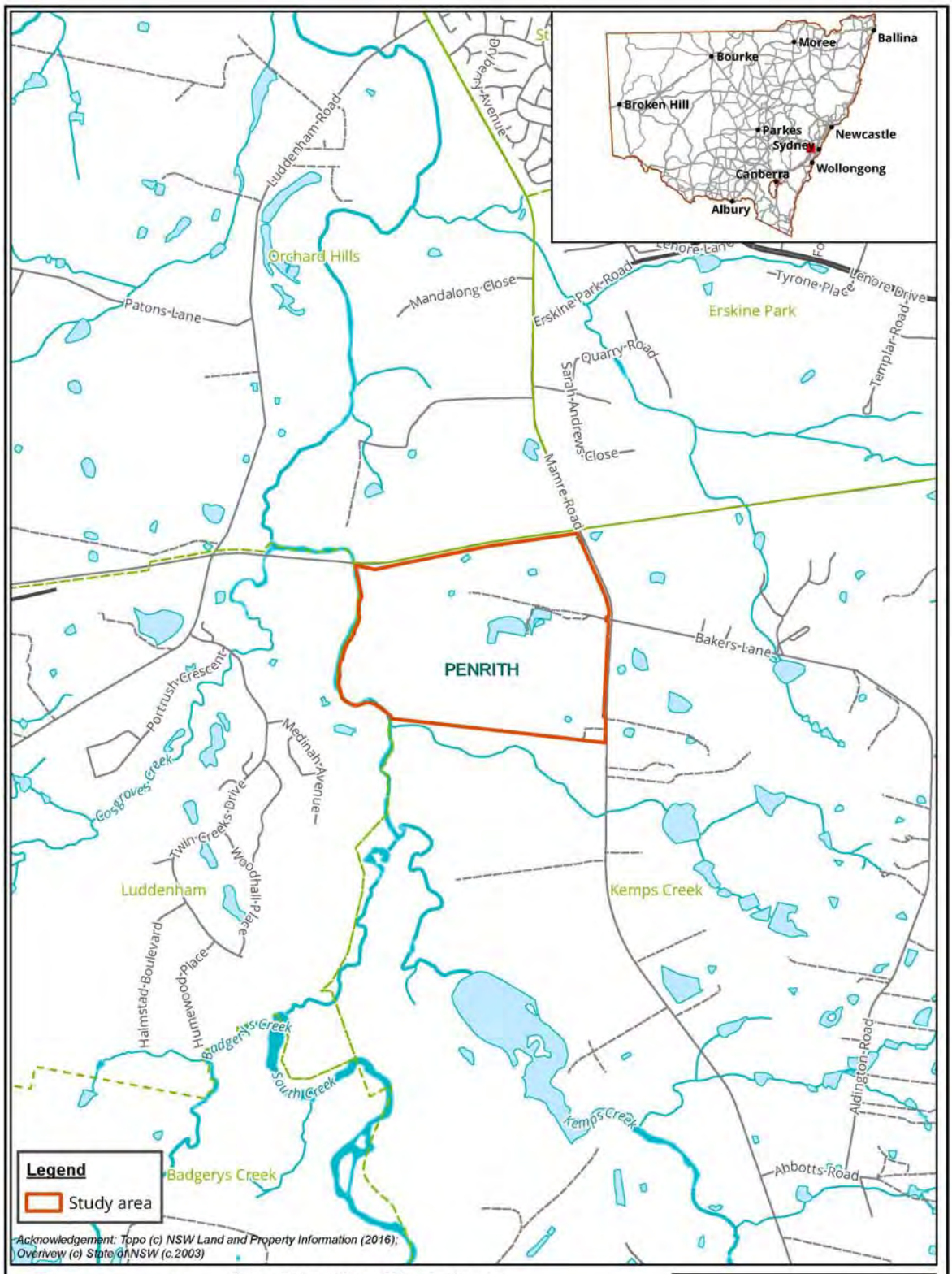

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24 October 2018

Cherie Carroll Turrise
Gunjeewong Cultural Heritage Aboriginal Corporation
1 Bellvue Place
Portland NSW 2847

Dear Cherie Carroll Turrise,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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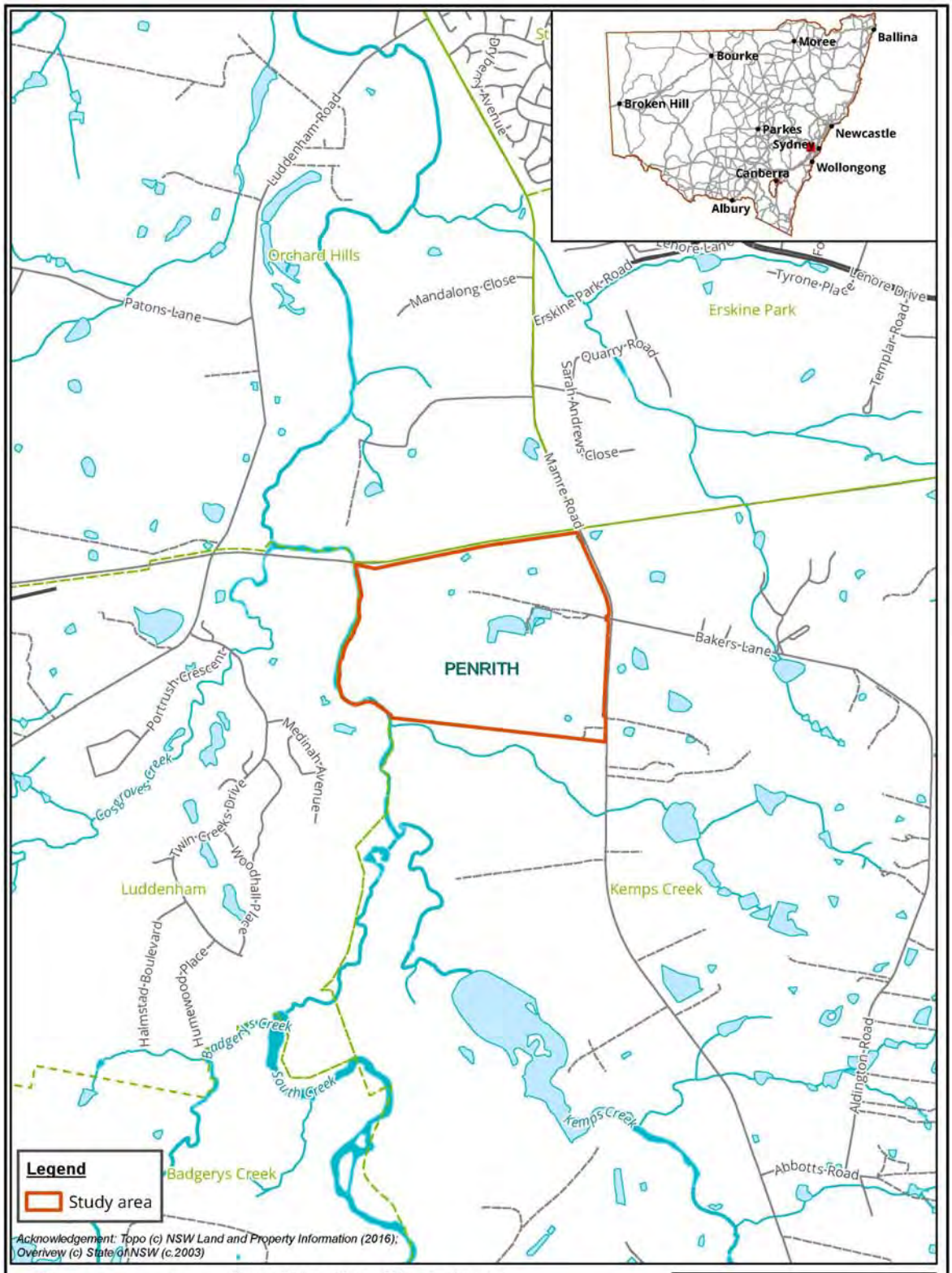

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24 October 2018

Kylie Ann Bell
Gunyuu

Dear Kylie Ann Bell,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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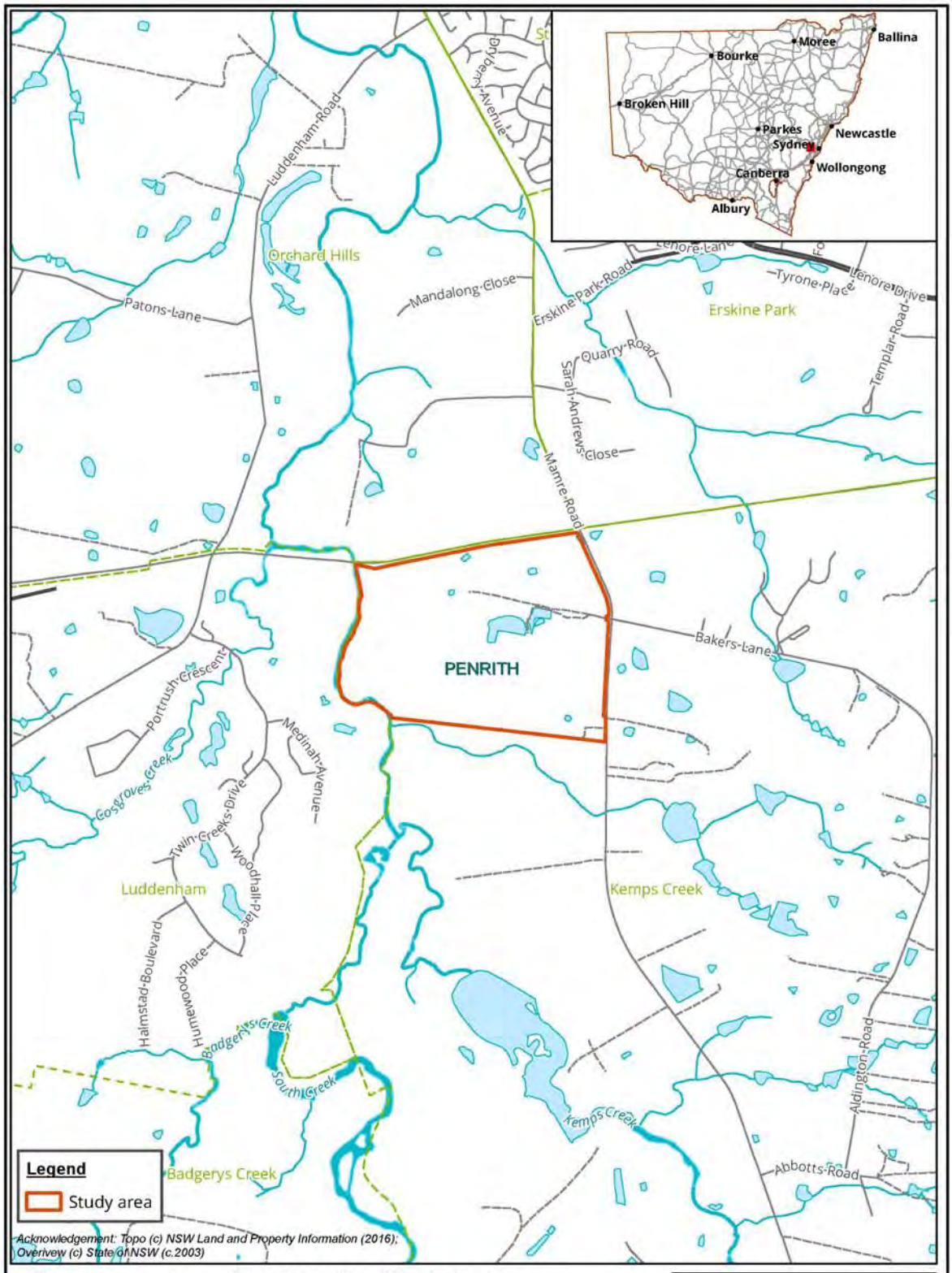

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24 October 2018

Darlene Hoskins-McKenzie
Gunyuu Cultural Heritage Technical Services

Dear Darlene Hoskins-McKenzie,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

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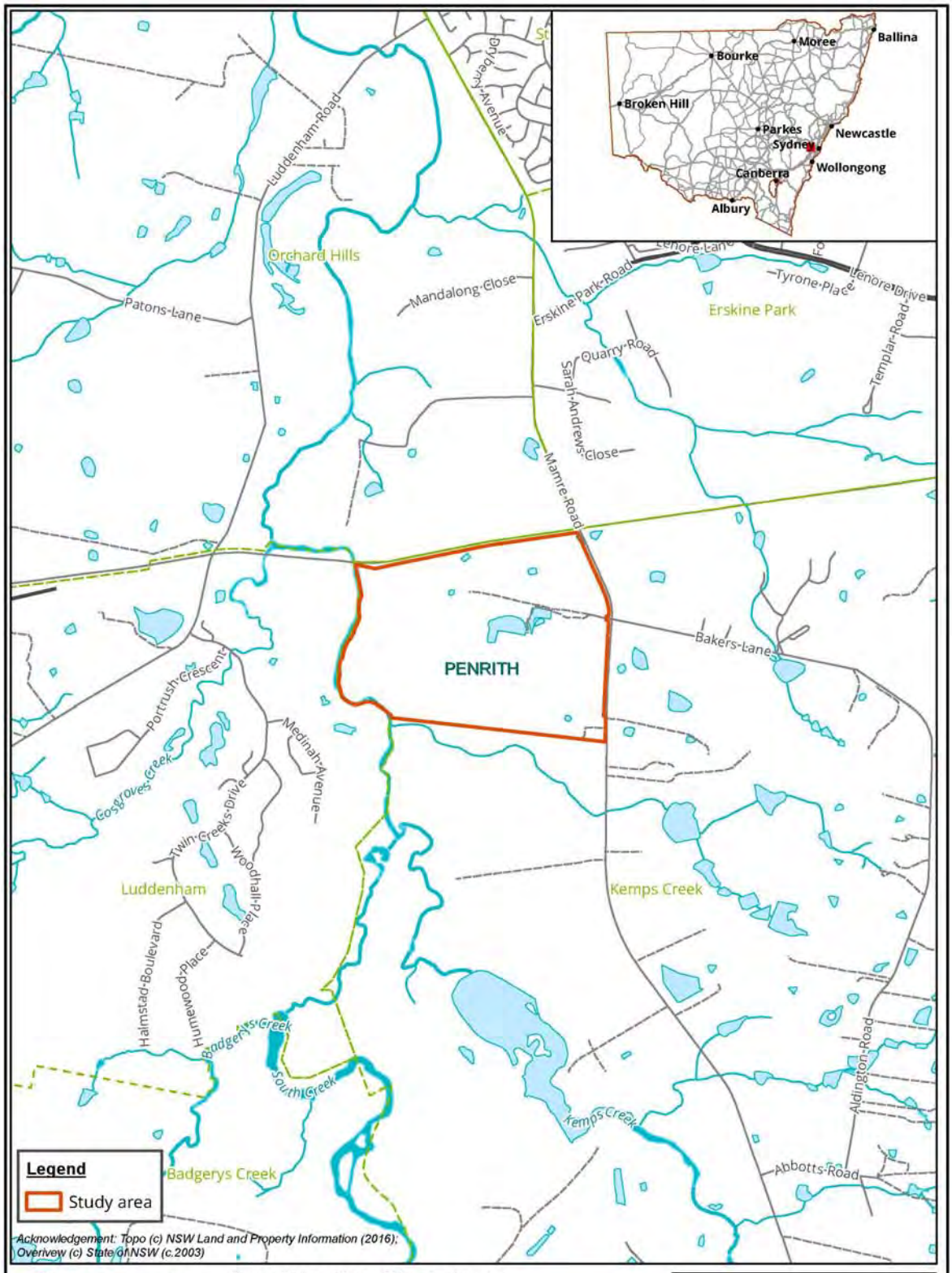

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24 October 2018

Pemulwuy Johnson
Pemulwuy CHTS
14 Top Place
Mt Annan NSW 2567

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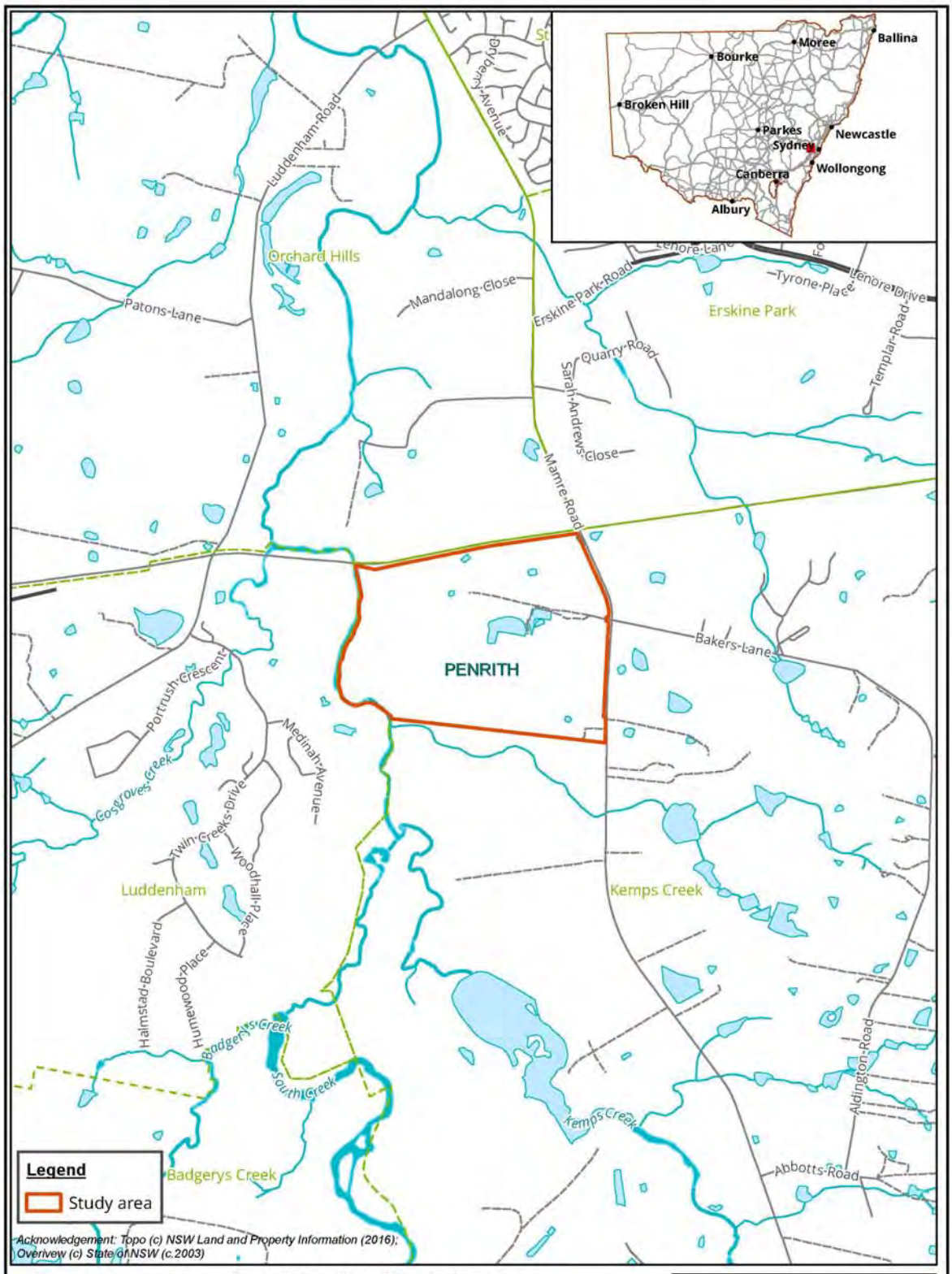

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24 October 2018

Tony Williams
Rane Consulting
1 Pyrenees Way
Beaumont Hills NSW 2155

Dear Tony Williams,

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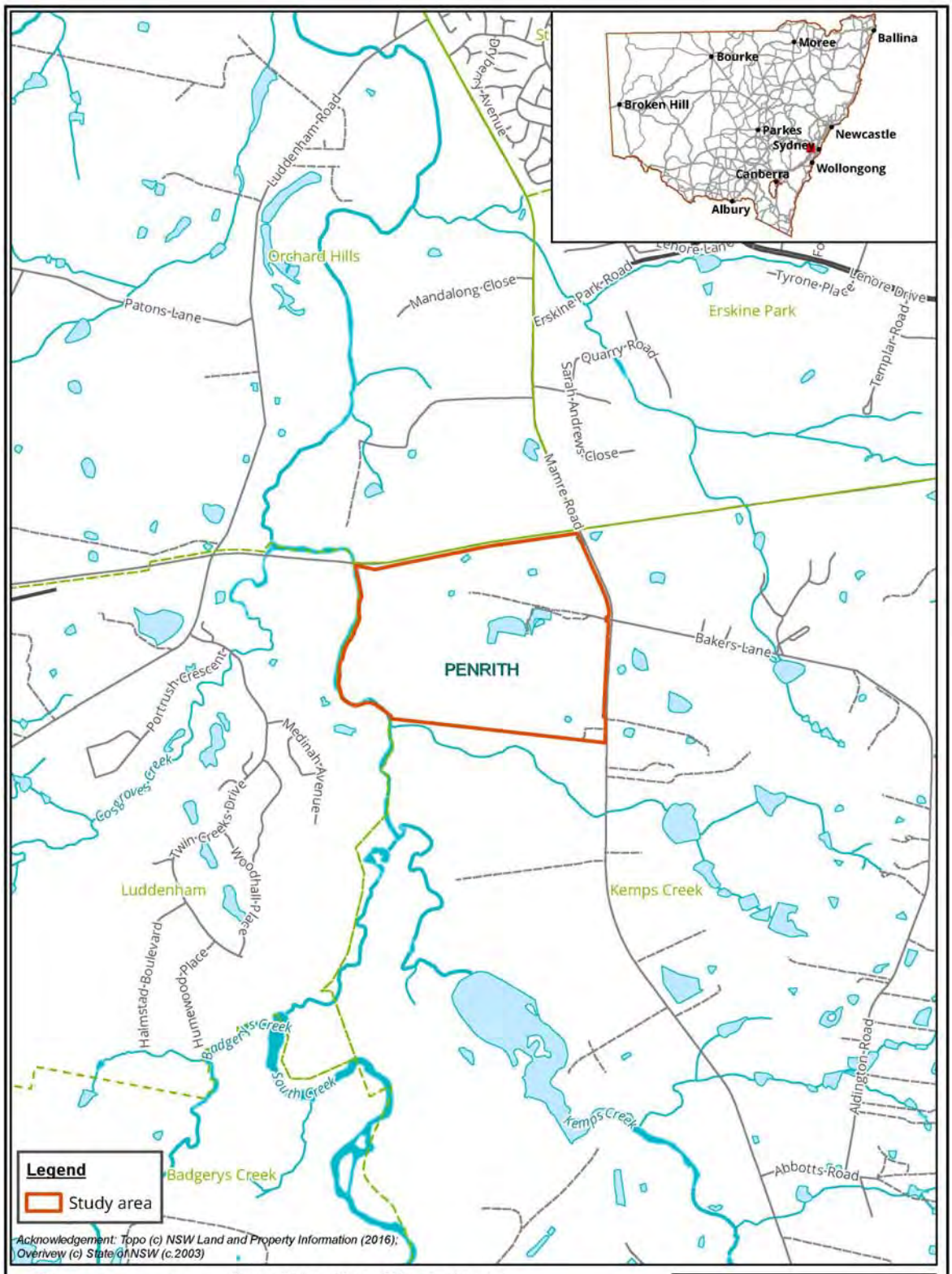

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Figure 2: Study area detail

24 October 2018

Shane Carriage
Thauaira

Dear Shane Carriage,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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Yours sincerely,

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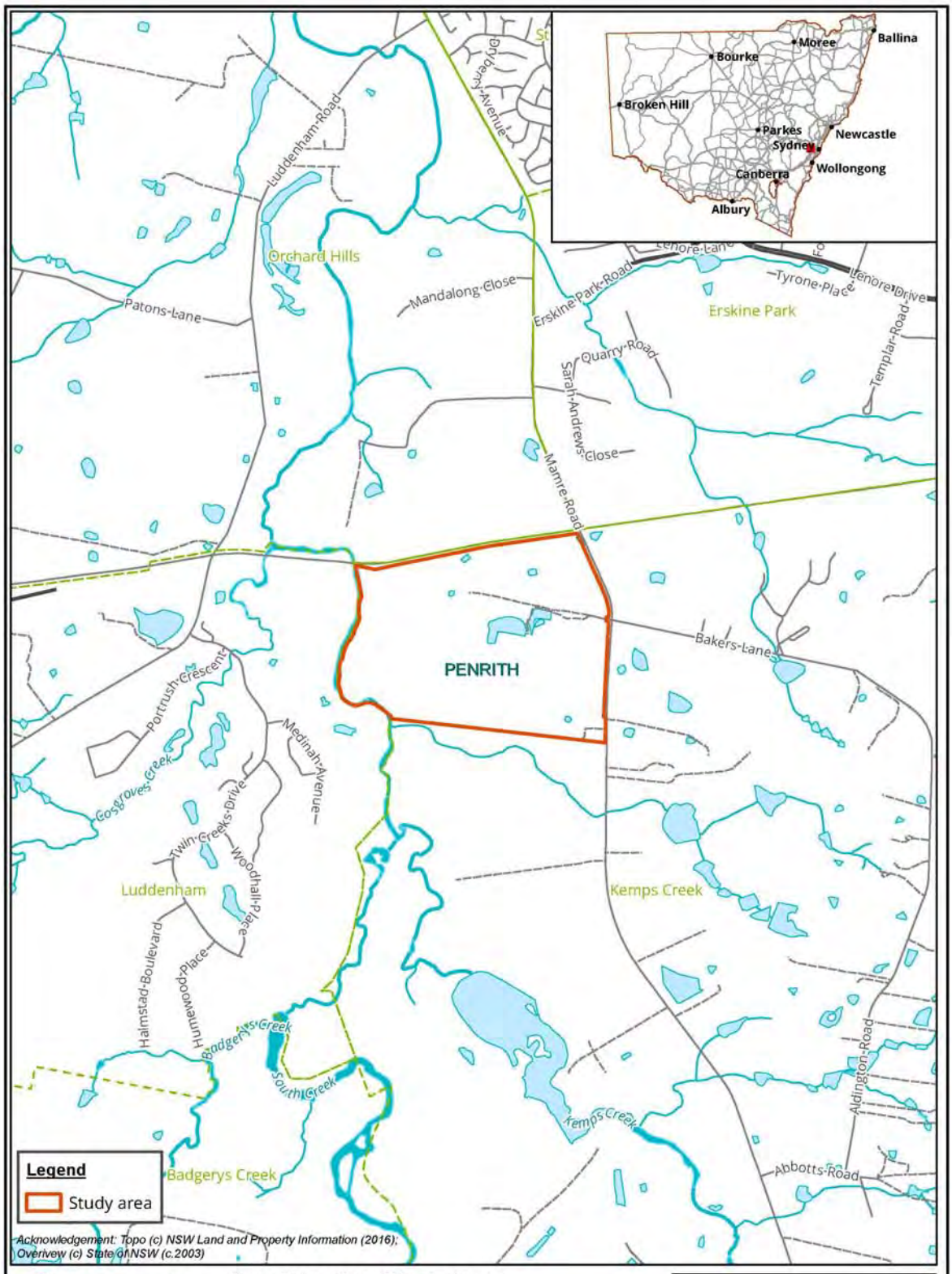

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24 October 2018

John Carriage
Thoorga Nura
50B Hilltop Crescent
Surf Beach 2536 NSW

Dear John Carriage,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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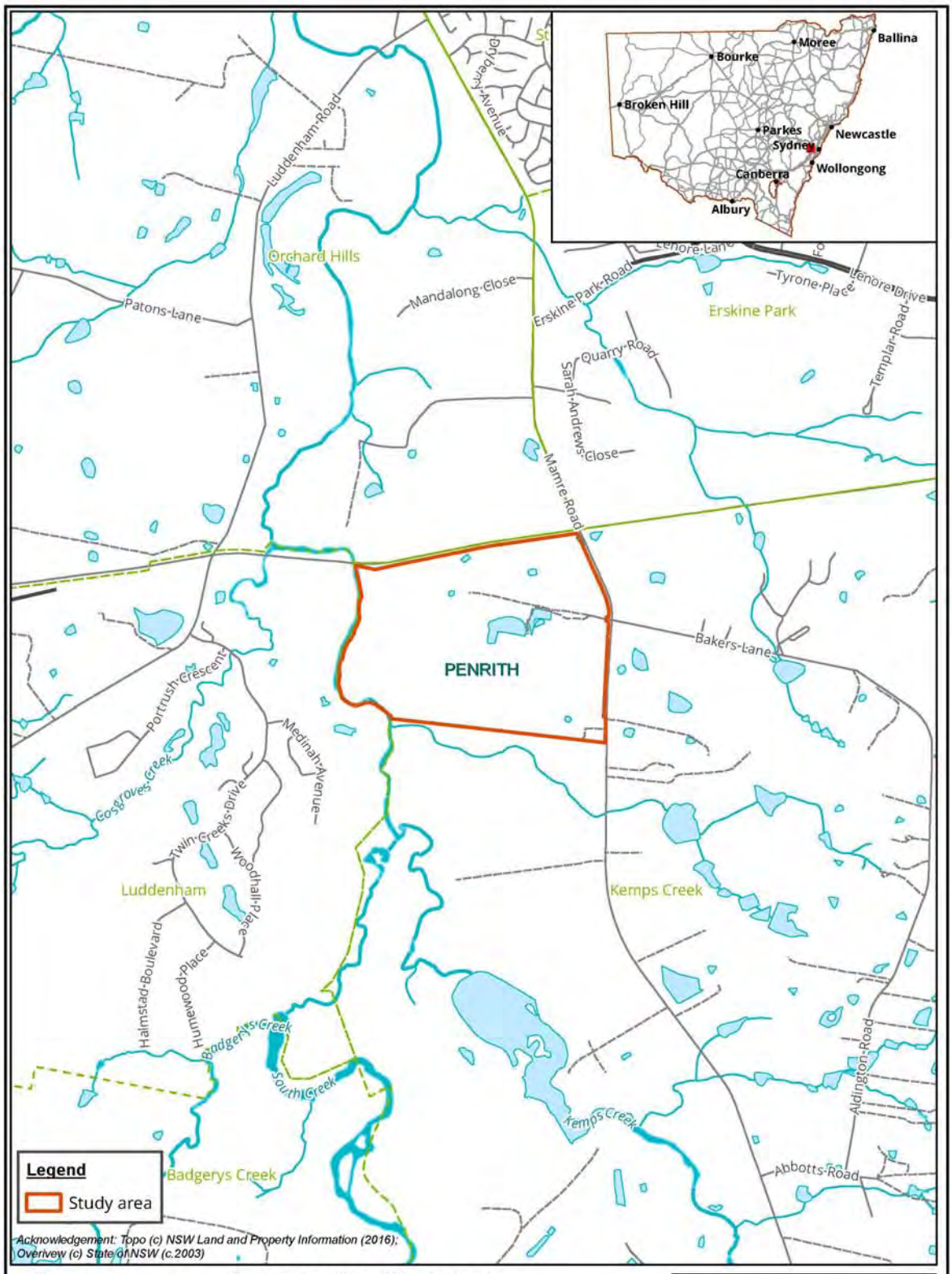

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24 October 2018

Amanda Hickey
Amanda Hickey Cultural Services
41 Dempsey Street
Emu Heights NSW 2750

Dear Amanda Hickey,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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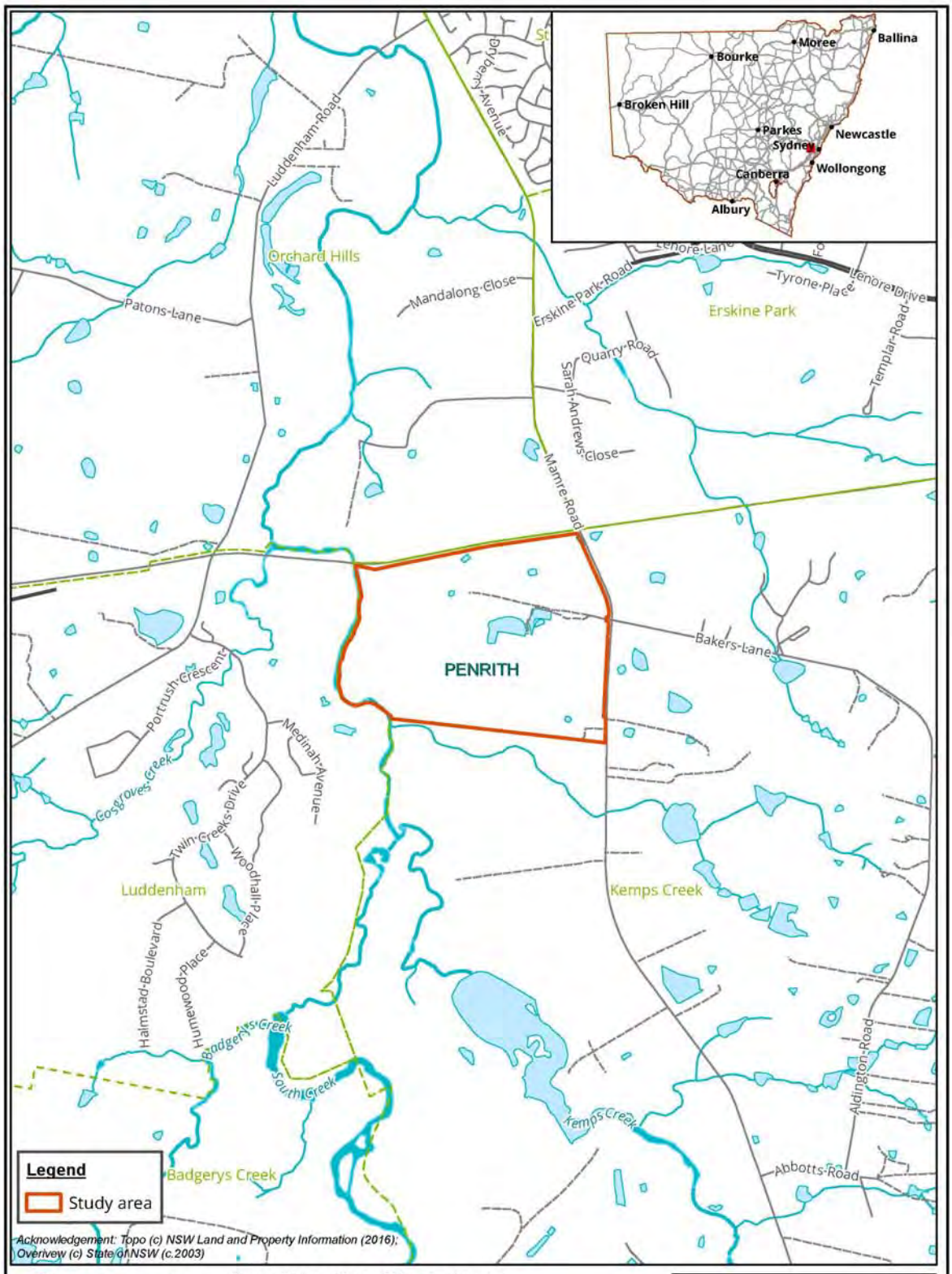

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24 October 2018

Jody Kulakowski
Barking Owl Aboriginal Corporation
2-65/69 Wehlow Street
Mt Druitt NSW 2770

Dear Jody Kulakowski,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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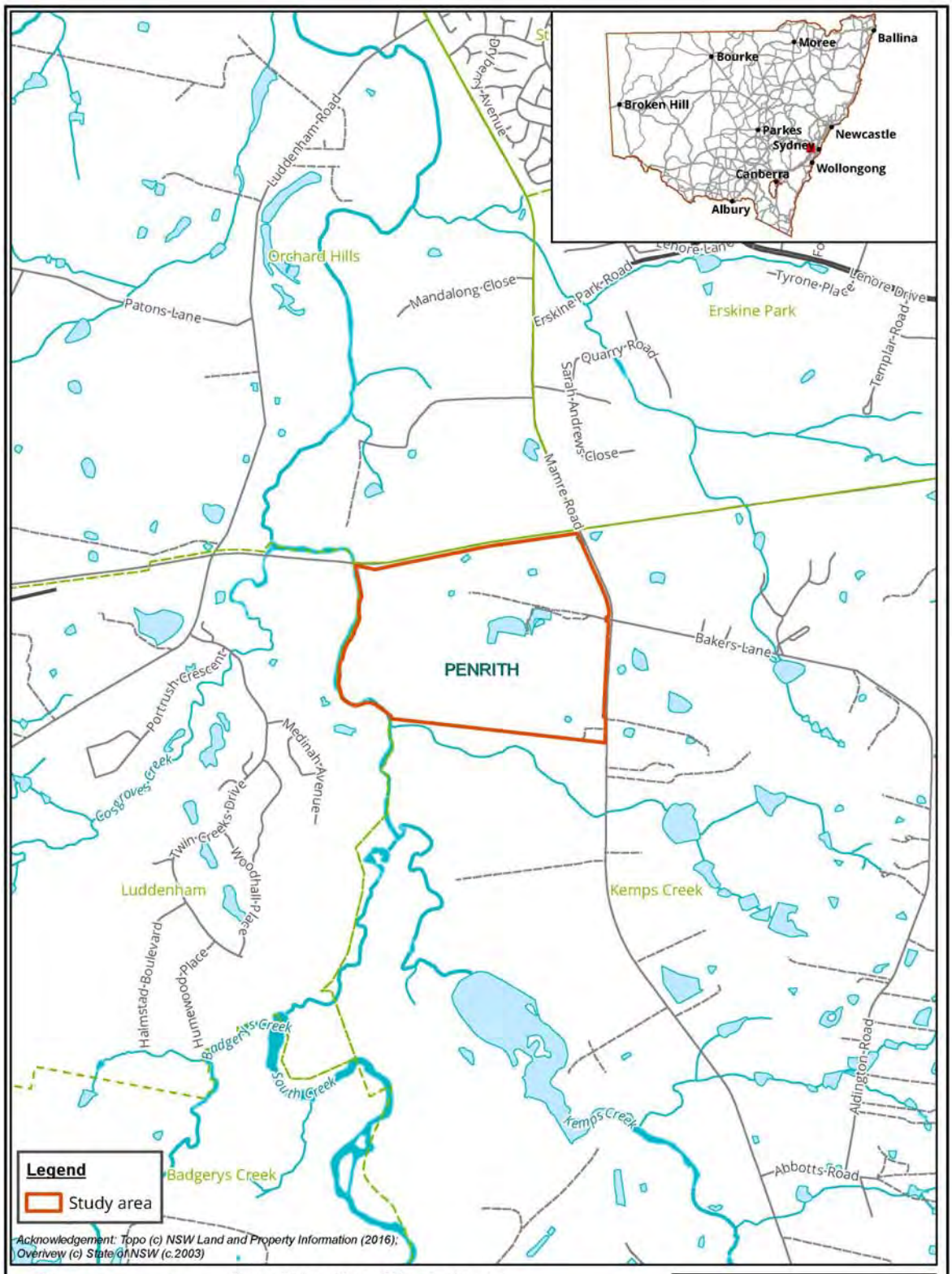

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Figure 2: Study area detail

24 October 2018

Seli Storer
Biamanga

Dear Seli Storer,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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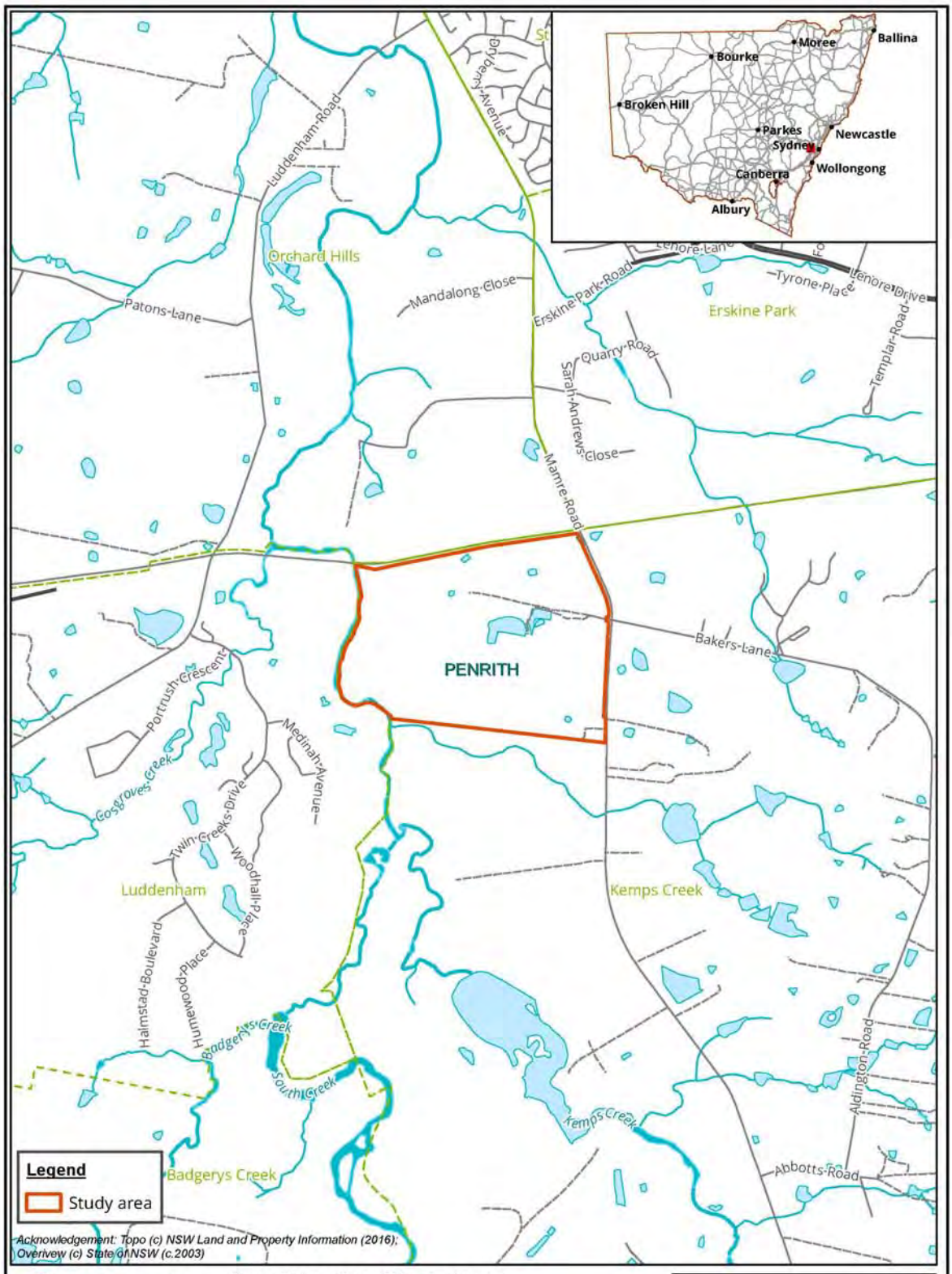

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24 October 2018

Robert Brown
Bilinga Cultural Heritage Technical Services

Dear Robert Brown,

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Our Ref: Matter 27033

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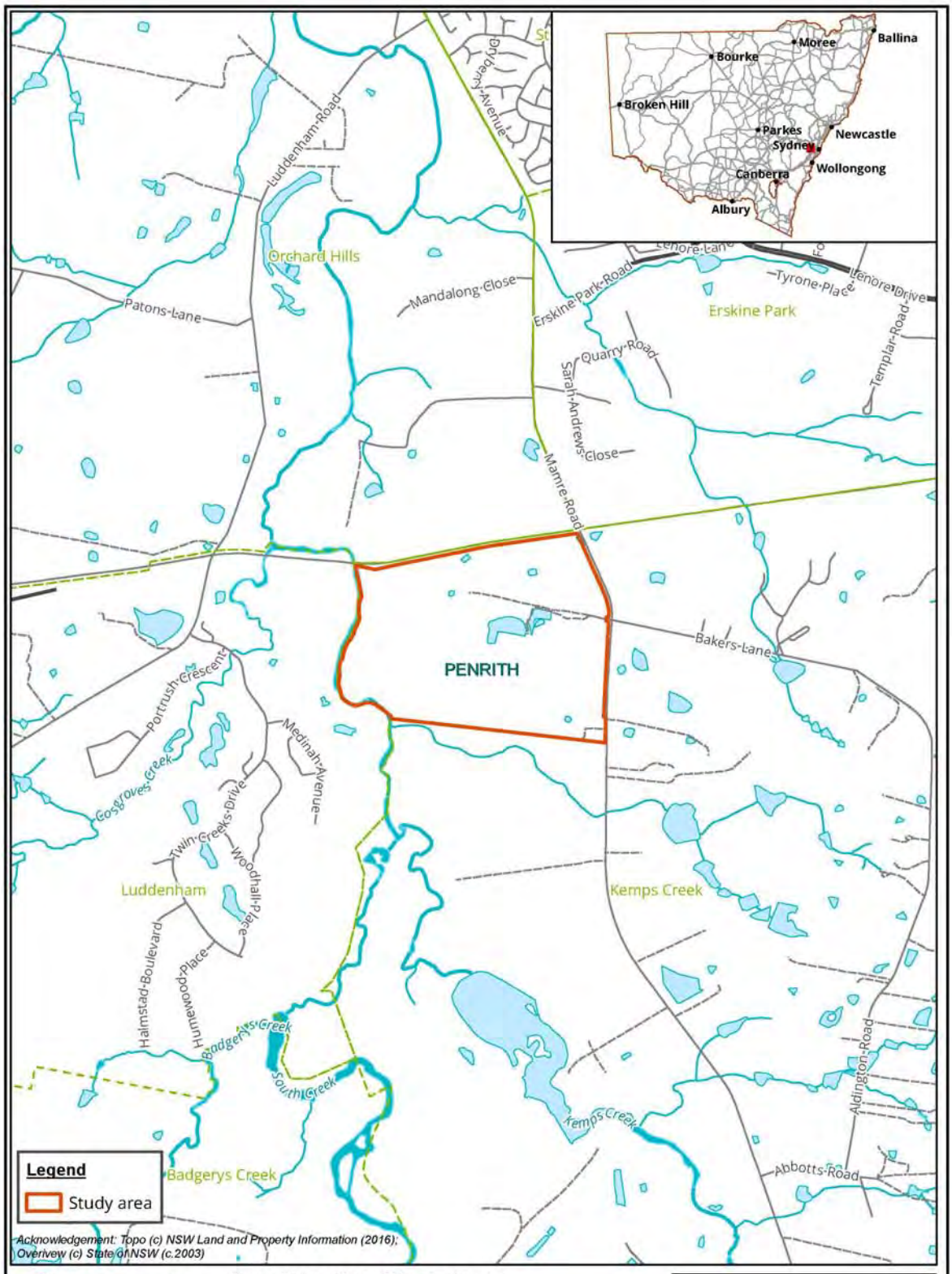

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24 October 2018

Simalene Carriage
Billinga

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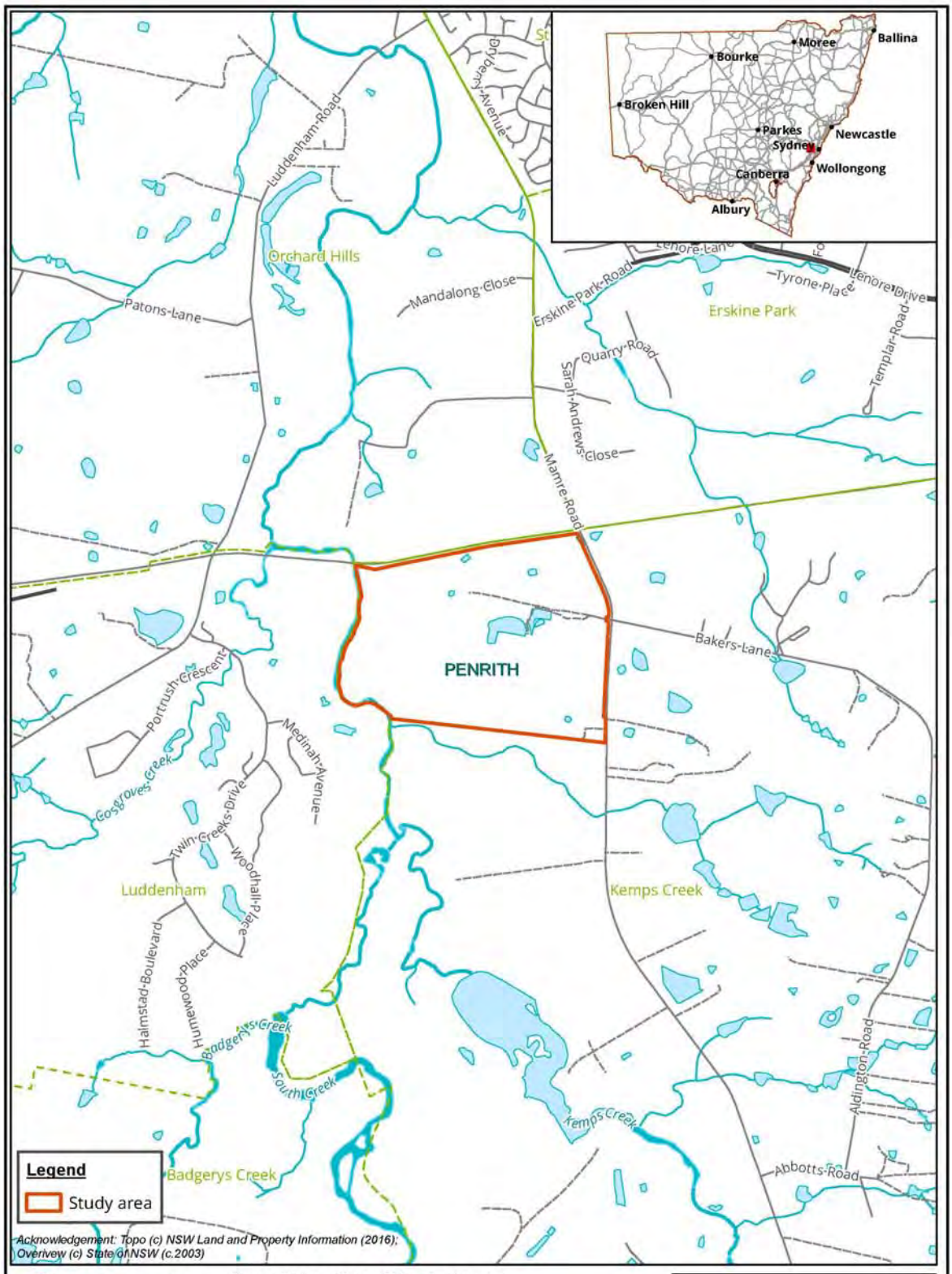

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24 October 2018

Jennifer Beale
Butucarbin Aboriginal Corporation
PO Box E18
Emerton NSW 2770

Dear Jennifer Beale,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

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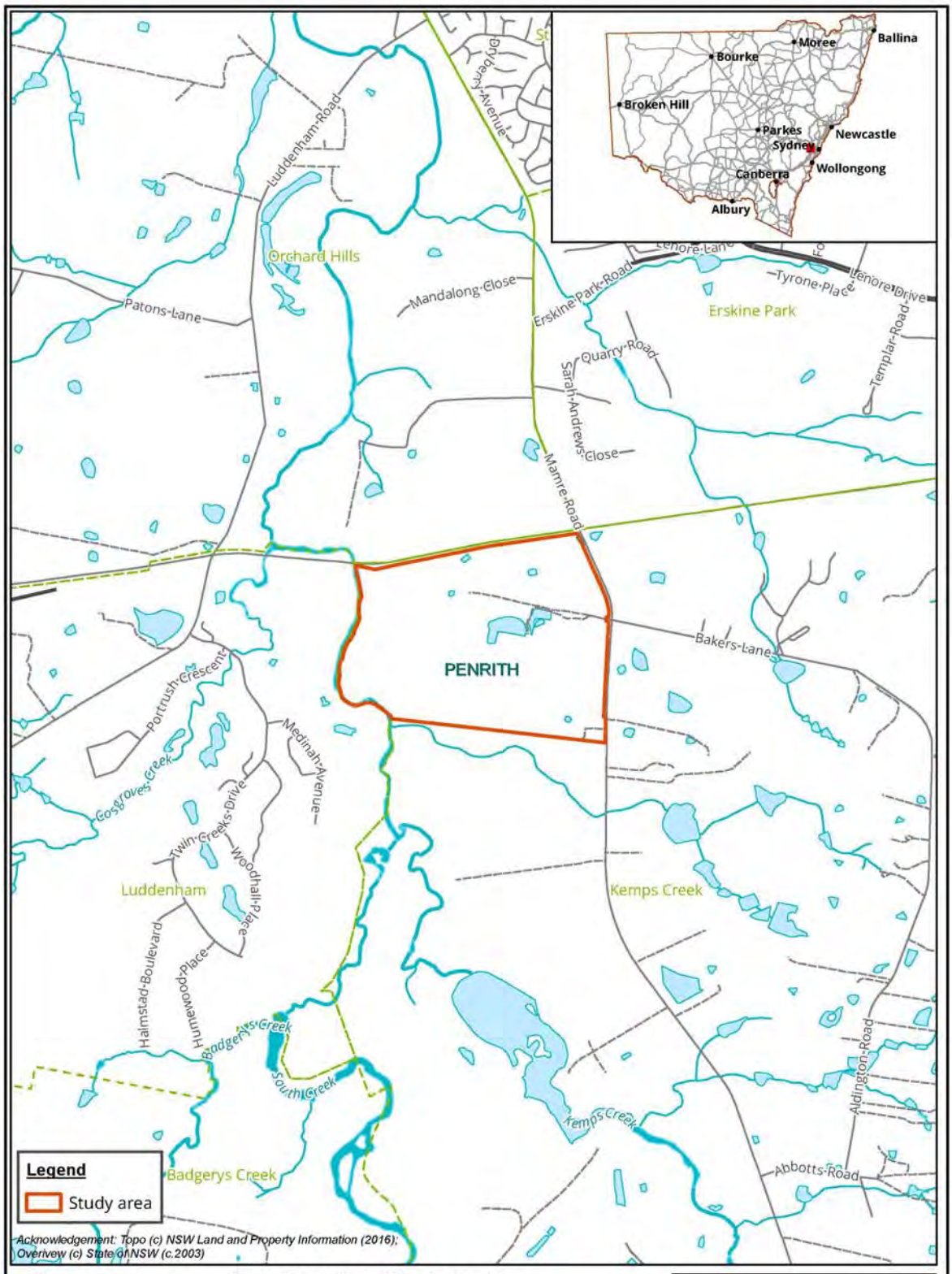
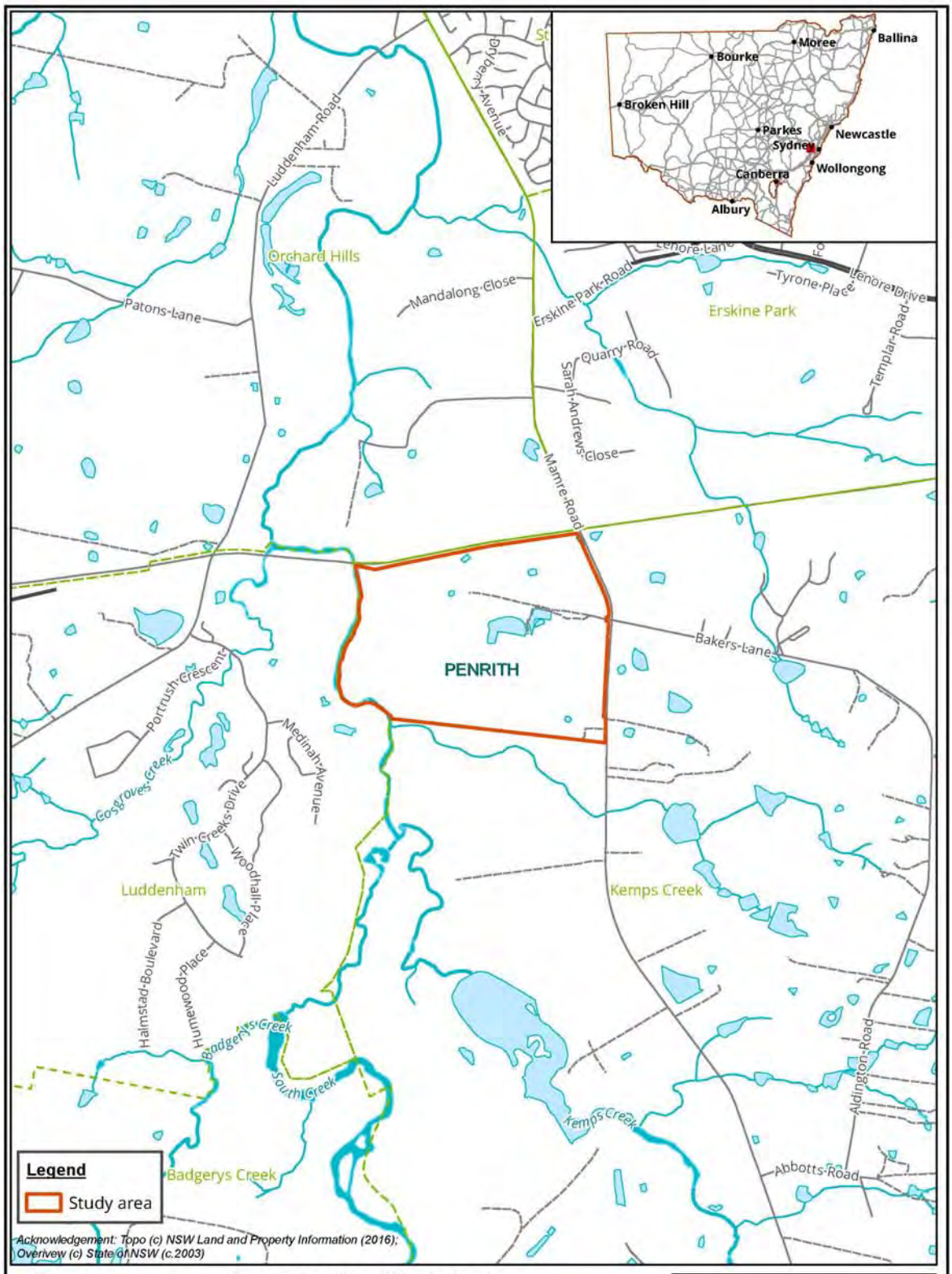


Figure 1: Location of the study area

Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
Date: 20 April 2018,
Checked by: SJK, Drawn by: LH, Last edited by: lwilson
Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail



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Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

24 October 2018

Corey Smith
Cullendulla

Dear Corey Smith,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

Biosis have been engaged by Altis Property Partners and Frasers Property to undertake an Aboriginal Cultural Heritage Assessment (ACHA) under the *Code of practice for archaeological investigation of Aboriginal objects in NSW* (DECCW 2010a) for the project.

In accordance with the Office of Environment and Heritage's *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010b) (consultation requirements), Part 6 *National Parks and Wildlife Act 1974*, individuals or groups are invited to register their interest in writing to participate in the ACHA and consultation process for the proposal.

Biosis Pty Ltd is assisting with consultation with the Aboriginal community in accordance with the consultation requirements. The purpose of the Aboriginal community consultation will be to assist with the preparation of an Environmental Impact Statement (EIS) and to provide sufficient information for the consideration of Aboriginal cultural heritage values as part of the State Significant Development (SSD) application.

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you would like to register your interest to be consulted for this assessment, please respond by **4pm on Wednesday 7 November 2018**.

Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

biosis.com.au

In accordance with the consultation requirements, please note that the relevant client contact for this project is:

Stephen O'Connor
Project Director – Altis Property Partners
GPO Box 4456 Sydney NSW 2001
stephen.oconnor@altisproperty.com.au

All correspondence regarding provision of names and contact details of Aboriginal people who may hold cultural knowledge relevant to the study area should be provided in writing to:

Charlotte Allen
Biosis Pty Ltd
14, 17-17 Power Avenue
Alexandria NSW 2015
callen@biosis.com.au

If you have any queries regarding the Project please don't hesitate to contact me on the details below.

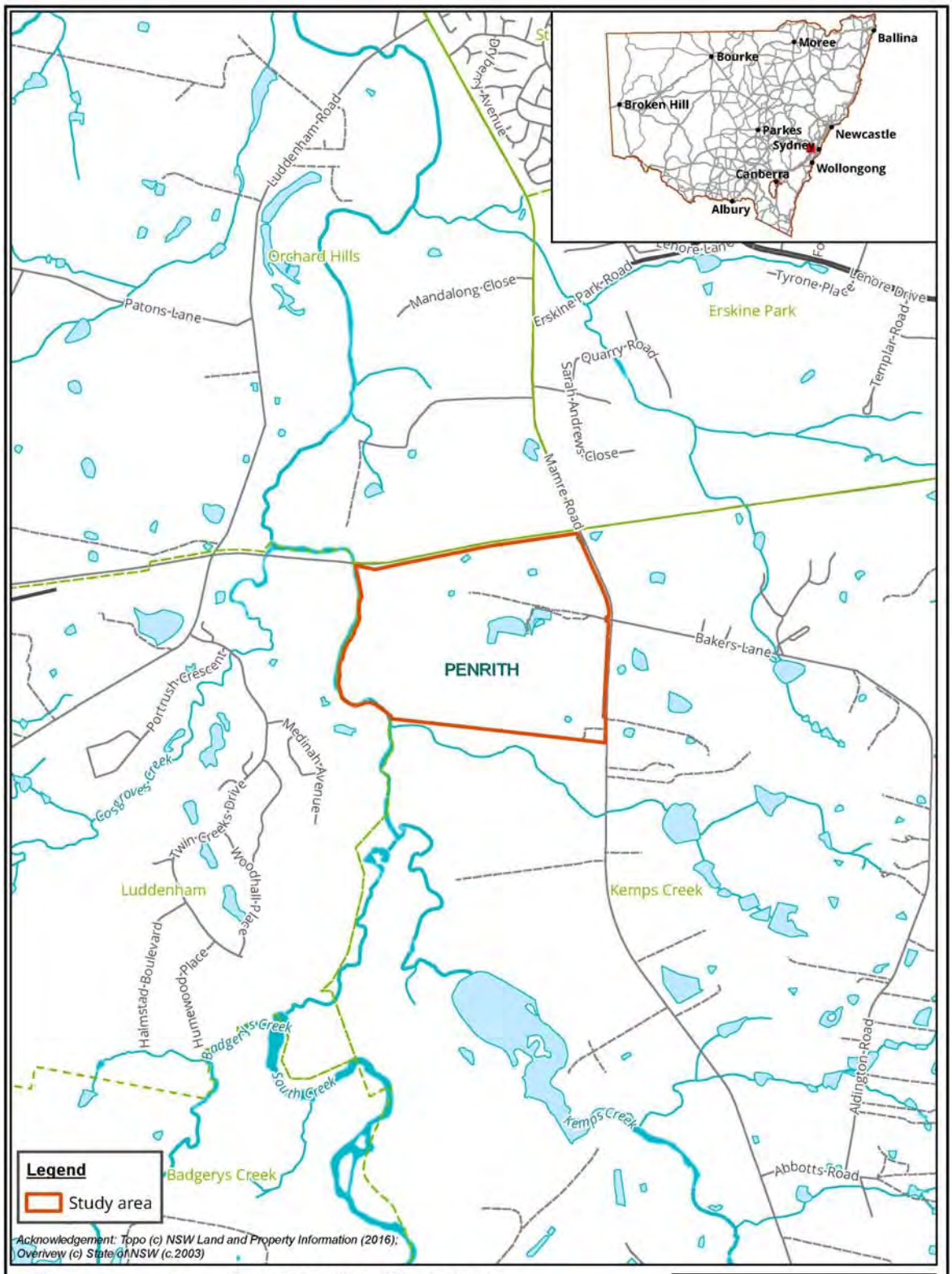
Yours sincerely,

Charlotte Allen
Field Archaeologist
02 9101 8712
0437 641 267
callen@biosis.com.au

References

DECCW 2010a, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

DECCW 2010b, 'Aboriginal cultural heritage consultation requirements for proponents'.



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Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

24 October 2018

Gordon Workman
Darug Boorooberongal Elders Aboriginal Corporation
73 Judith Anderson Drive
Doonside NSW 2767

Dear Gordon Workman,

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Our Ref: Matter 27033

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

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Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

biosis.com.au

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Stephen O'Connor
Project Director – Altis Property Partners
GPO Box 4456 Sydney NSW 2001
stephen.oconnor@altisproperty.com.au

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Charlotte Allen
Biosis Pty Ltd
14, 17-17 Power Avenue
Alexandria NSW 2015
callen@biosis.com.au

If you have any queries regarding the Project please don't hesitate to contact me on the details below.

Yours sincerely,

Charlotte Allen
Field Archaeologist
02 9101 8712
0437 641 267
callen@biosis.com.au

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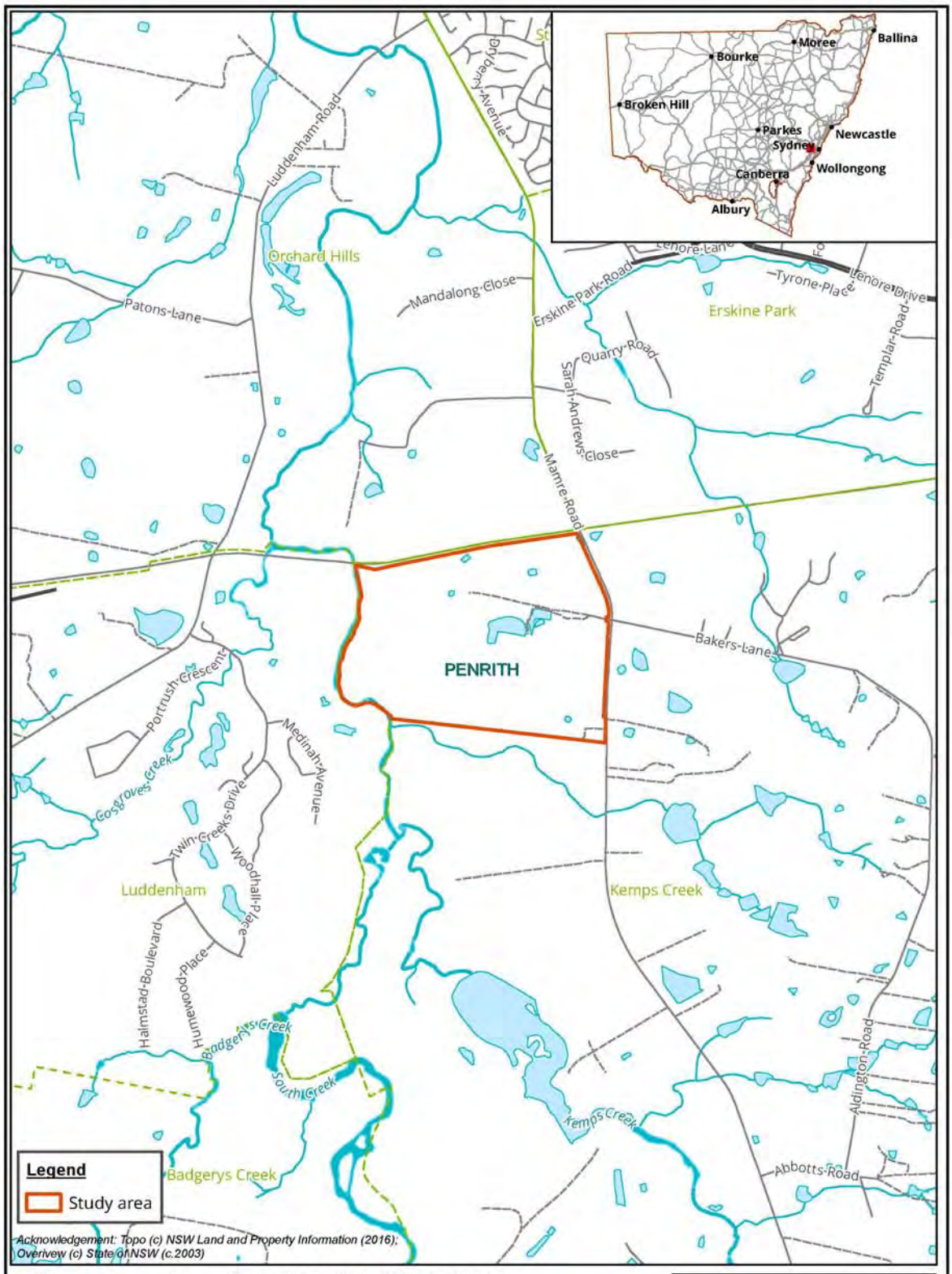

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Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

biosis.com.au

Anthea Vella

From: Darug Tribal Aboriginal Corporation ICN 2734 <darug_tribal@live.com.au>
Sent: Wednesday, 31 October 2018 3:48 PM
To: Charlotte Allen
Subject: Darug Tribal Aboriginal Corporation - EOI - Mamre South Precinct Rezoning
Attachments: 181031_DTAC_EOI_Biosis_657-769_Mamre_Road_Kemps_Creek.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Heilsan Charlotte,

Please find attached Expression of Interest attached.

Cheers

Dirk Schmitt
Accountant to
Darug Tribal Aboriginal Corporation

Anthea Vella

From: Darug Tribal Aboriginal Corporation ICN 2734 <darug_tribal@live.com.au>
Sent: Wednesday, 31 October 2018 3:48 PM
To: Charlotte Allen
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Attachments: 181031_DTAC_EOI_Biosis_657-769_Mamre_Road_Kemps_Creek.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Heilsan Charlotte,

Please find attached Expression of Interest attached.

Cheers

Dirk Schmitt
Accountant to
Darug Tribal Aboriginal Corporation

Anthea Vella

From: Scott Franks <scott@tocomwall.com.au>
Sent: Wednesday, 31 October 2018 4:36 PM
To: Charlotte Allen
Subject: EOI

Follow Up Flag: Follow Up
Due By: Thursday, 1 November 2018 8:23 AM
Flag Status: Flagged

Dear Callen,

Could you please register our interest in the EOI for Mamre south precint rezoning ACHA project please.

Regards
Scott Franks

Native Title & Environmental Services Consultant

Tocomwall Pty Ltd
PO Box 76
CARINGBAH NSW 1495
m: 0404 171544
p: 02 9542 7714
f: 02 9524 4146
e: scott@tocomwall.com.au
www.tocomwall.com.au

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DARUG LAND
OBSERVATIONS PTY LTD
ABN 27 602 765 453

EMAIL: DARUGLANDOBSERVATIONS@GMAIL.COM
PO BOX 173 ULLADULLA NSW 2539
MOBILE: 0413 687 279

30th October, 2018

Anthea Vella
BIOSIS Pty Ltd
Unit 14, 17-27 Power Avenue
ALEXANDRIA NSW 2015

Notification and Registration of ALL Aboriginal Interests

RE: PROPOSED REZONING OF LAND AT 657-769 MAMRE ROAD, KEMPS CREEK
Aboriginal Archaeological & Cultural Heritage Assessment

Dear Anthea,

Please be advised that Darug Land Observations Pty Ltd is seeking to be involved in any and all consultation meetings and fieldwork.

This office specialises in Aboriginal and community consultations, and has a membership that comprises of Traditional owners from the area in question. Those retain strong story, song lines, oral history and continued contact.

We would also like to state that we do not accept or support any person or organisation that are NOT from the DARUG Nation that comments regarding the said area.

Please also be advised that this Aboriginal organisation does not do volunteer work or attend unpaid meetings. I hope that you advise your client of this so that, 'This Group', will not be discriminated against and refused paid fieldwork. DLO's rate is $440 half day (less than 4 hours) and $880 per day (flat rate), including GST.

All correspondence should be emailed to: daruglandobservations@gmail.com and any further consultation during this project can be directed to Anna on 0413 687 279.

Yours sincerely,

Jamie Workman
Darug Land Observations Pty Ltd

Uncle Gordon Workman
Darug Elder

DARUG BOOROOBEROGAL ELDERS ABORIGINAL CORPORATION

ICN: 8890 ABN: 76 170 262 247
E-mail: boorooberongal@outlook.com
Address: PO Box 14 Doonside NSW 2767
Phone: 0415 663 763

24/10/2018

TO: **Anthea Vella**
Biosis **Research Assistant Heritage**

RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Notification and Registration of ALL Darug Aboriginal Interests

Please be advice that Darug Boorooberongal Elders Aboriginal Corporation (DBEAC) is seeking to be involved in any and all consultation meetings and field work.

This office specialises in Darug Aboriginal and community consultation. The membership comprises of traditional owners from the area in question who retain strong story, song lines, oral history and continued contact. We have a continued spiritual connection to Darug nation territories. We would also like to state, that we do not except or support any person or organisation that are NOT from the DARUG Nation to have input on the project area.

Please also be advised that this Aboriginal organisation does not do volunteer work or attend unpaid meetings. I hope that you advise your client of this, so that, this group will not be discriminated against and refused paid field work.

We will be delighted to discuss this project with you in the near future.
Please do not hesitate to send all correspondence should be emailed to our email boorooberongal@outlook.com.

Yours faithfully

Uncle
Gordon Workman
Darug Elder

Sites Officer

Environment & Heritage

Darug Aboriginal Land Care

(Uncle Des Dyer)

18a Perigee Close
Doonside 2767NSW
ABN 71 301 006 047

Charlotte Allen
Archaeologist
Biosis Pty Ltd
14, 17-17 Power Avenue
Alexandria 2015
NSW

Re: Mamre South Precinct .

Dear Charlotte,

Darug Aboriginal Land care / Uncle Des Dyer. Have no objections to the planned development.

The Darug Aboriginal Land care would like to **register** for this project and be consulted and take part in survey and test excavations. This project falls within the Darug land.
We are Traditional Owner, our members have lived on Darug land for most of their lives and worked in the area. We have responsibility to look after the plants, creeks and rivers on Darug land. We have been doing Cultural Heritage Assessments for over 20 year and still do today.

Our members are family and have lived in the area, we consult with them by Email and phone.
We would like to take part in any field survey and test excavations. Attend any meetings.

We have over 20years experience and all our works have White cards
Our preferred method of communication is by Email.

Our Site Officer Ricky Fields
Mobile 0402942572.

Email fields.r@outlook.com

For all Survey test excavation and salvage works please contact him for all work matters.
please contact him

We agree and understand you can give our contacted details to others.

The area is an important part of our culture and valued by the community as most of the people that lived there were Darug. We can provide cultural knowledge during the survey.
Our preferred option to receive the project information is by E-mail.

Thank you
Kind regards
Des Dyer. Manager.
Darug Elder
Email desmond4552@hotmail.com
Mobile 0408360814

Anthea Vella

From: lilly carroll <didgengunawalclan@yahoo.com.au>
Sent: Wednesday, 24 October 2018 10:55 AM
To: Anthea Vella
Subject: Re: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Hi Anthea,

DNC would like to register an interest into Mamre South present rezoning Project,

Warm regards
Paul Boyd & Lilly Carroll
Directors DNC

Sent from Yahoo Mail for iPhone

On Wednesday, October 24, 2018, 10:34 am, Anthea Vella wrote:

> Good morning,
>
> Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.
>
> Biosis have been engaged by Altis Property Partners and Frasers Property to undertake an Aboriginal Cultural Heritage Assessment (ACHA) under the Code of practice for archaeological investigation of Aboriginal objects in NSW (DECCW 2010a) for the project.
>
> Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you would like to register your interest to be consulted for this assessment, please respond by 4pm on Wednesday 7 November 2018.
>
> If you have any questions please contact us.
>
> Kind regards,
>
> Anthea Vella
> Research Assistant Heritage
> M: 0427 463 834
> D: (02) 4911 4047
> E: avella@biosis.com.au
>
> biosis
> Leaders in Ecology and Heritage Consulting

The information transmitted including attachments is intended only for the person or entity to which it is addressed and may contain copyright material, or information that is confidential or is exempt from disclosure by law. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient is strictly prohibited. If you received this in error, please contact the sender and delete the material from your computer. The views expressed in this email are those of the sender except where the sender expressly and with authority states them to be the views of Biosis Pty Ltd. Biosis Pty Ltd does not represent that this email is free of errors, viruses or interference. When using email to communicate with Biosis Pty Ltd, access to that information by Biosis Pty Ltd personnel is strictly limited and controlled.

Anthea Vella

From: Uncle Gordon Workman <Boorooberongal@outlook.com>
Sent: Wednesday, 24 October 2018 10:26 PM
To: Anthea Vella
Subject: Re: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: ICN.doc

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area.

the groups you ask is only the DARUG people

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:16 AM
To: 'boorooberongal@outlook.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Good morning,

Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.
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If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

Leaders in Ecology and Heritage Consulting

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Anthea Vella

From: Phillip Boney <waarlan12@outlook.com>
Sent: Thursday, 25 October 2018 9:26 PM
To: Anthea Vella
Subject: Re: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Hi Anthea,

My name is Phil Boney/ Wailwan Aboriginal Group, I would like to register for the kemps creek project. If successful I look forward to working with you. Thank you.

With regards, Phil Boney
Wailwan Aboriginal Group

Get Outlook for iOS

From: Anthea Vella
Sent: Wednesday, October 24, 2018 10:58:56 AM
To: 'waarlan12@outlook.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Good morning,

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

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Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

biosis
Leaders in Ecology and Heritage Consulting

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Anthea Vella

From: desmond dyer <desmond4552@hotmail.com>
Sent: Friday, 26 October 2018 9:57 PM
To: Anthea Vella
Subject: Re: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: LETTER OF REGISTER 2.odt

Hi Anthea,
This is the Darug Aboriginal Land care letter to register for this project

Kind regards
Des

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'desmond4552@hotmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Good morning,

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

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Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

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Anthea Vella

From: Gulaga <gulagachts@gmail.com>
Sent: Saturday, 27 October 2018 4:29 PM
To: Anthea Vella
Subject: Re: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: image11f37f.PNG

I am interested.

Kind Regards
Wendy Smith
Cultural Heritage Officer
Gulaga
0401 808 988

This email may contain privileged information. Privilege is not waived if it has been sent to you in error, or if you are not the intended recipient. Please immediately notify me and delete the email if you have received this in error.

On Wed, Oct 24, 2018 at 10:34 AM Anthea Vella <AVella@biosis.com.au> wrote:

Good morning,

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

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If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

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Anthea Vella

From: Darug Land Observations <daruglandobservations@gmail.com>
Sent: Tuesday, 30 October 2018 10:31 AM
To: Anthea Vella
Subject: Re: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies
Attachments: image882625.PNG; Expressions of Interest letter BIOSIS (KempsCreek).docx

Hi Anthea,

Please find attached Expressions of Interest letter for the proposed rezoning of land at 657-769 Mamre Road, in Kemps Creek.

Look forward to working with you on this project.

Kind Regards,

Anna

On Wed, Oct 24, 2018 at 10:34 AM Anthea Vella <AVella@biosis.com.au> wrote:

Good morning,

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

Biosis have been engaged by Altis Property Partners and Frasers Property to undertake an Aboriginal Cultural Heritage Assessment (ACHA) under the Code of practice for archaeological investigation of Aboriginal objects in NSW (DECCW 2010a) for the project.

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you would like to register your interest to be consulted for this assessment, please respond by 4pm on Wednesday 7 November 2018.

If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

Leaders in Ecology and Heritage Consulting

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Anthea Vella

From: Vicki Slater <vicki.slater@hotmail.com>
Sent: Tuesday, 13 November 2018 4:39 PM
To: Anthea Vella
Subject: Re: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Good Evening Anthea.

Kawul Cultural Services would like to register an interest in the above project.
Ancestral Connection to Country fromc1800 Black Kitty n Colebee.
Site officer has 20yrs experience in Aboriginal Archaeology in Culture n Heritage in all Aspects of Archaeology.
We have current Insurances.
Kind Regards
Vicky Slater
Manager

On 24 Oct. 2018 10:47 am, Anthea Vella wrote:

Good morning,

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

Biosis have been engaged by Altis Property Partners and Frasers Property to undertake an Aboriginal Cultural Heritage Assessment (ACHA) under the Code of practice for archaeological investigation of Aboriginal objects in NSW (DECCW 2010a) for the project.

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you would like to register your interest to be consulted for this assessment, please respond by 4pm on Wednesday 7 November 2018.

If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

Leaders in Ecology and Heritage Consulting

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Anthea Vella

From: Anthea Vella
Sent: Monday, 12 November 2018 7:06 PM
To: 'kerrie slater'
Subject: RE: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Hi Kerry,

I just checked and we previously haven't received a notification of interest in the project from you. I can register you for the project and someone from the office will be able to send you stage 2 and 3 consultation.

Kind regards,

Anthea

From: kerrie slater
Sent: Monday, 12 November 2018 9:12 AM
To: Anthea Vella
Subject: Re: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Dear Anthea

Confirming if I have registered an interest in the project.

Cheers

Kerry

From: Anthea Vella
Sent: Wednesday, 24 October 2018 10:59 AM
To: 'wurrumay@hotmail.com'
Subject: Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Good morning,

Altis Property Partners and Frasers Property are proposing to rezone land contained within 657-769 Mamre Road, Kemps Creek (the study area) (Figure 1, Figure 2). The current proposal involves planning studies to facilitate precinct level approvals required to amend the State Environmental Planning Policy (Western Sydney Employment Area) and rezone the land to IN1 General Industrial and E2 Environmental Conservation. Following this an infrastructure Development Application (DA) will be lodged for associated Estate works consisting of Vegetation Clearing, Bulk Earthworks, Subdivision and Civil Engineering works (eg road, stormwater, sewer and water supply works) and several buildings.

Biosis have been engaged by Altis Property Partners and Frasers Property to undertake an Aboriginal Cultural Heritage Assessment (ACHA) under the Code of practice for archaeological investigation of Aboriginal objects in NSW (DECCW 2010a) for the project.

Biosis wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Kemps Creek area. If you would like to register your interest to be consulted for this assessment, please respond by 4pm on Wednesday 7 November 2018.

If you have any questions please contact us.

Kind regards,

Anthea Vella
Research Assistant Heritage

M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

Leaders in Ecology and Heritage Consulting

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Anthea Vella

From: lee field <barrabyculturalservices@gmail.com>
Sent: Wednesday, 24 October 2018 11:51 AM
To: Charlotte Allen
Subject: Re: Registration Of Interest ACHA - Mamre South Precinct Rezoning
Attachments: EOI-MAMRESOUTH.docx

Follow Up Flag: Follow Up
Due By: Wednesday, 24 October 2018 4:25 PM
Flag Status: Flagged

Dear Charlotte,

Barraby Cultural Services would like to register our interest in this project.

Please see our attached Letter Of Registration.

Kind Regards
Lee Field

Anthea Vella

From: Justine Coplin <justinecoplin@optusnet.com.au>
Sent: Friday, 26 October 2018 2:23 PM
To: Anthea Vella
Subject: reg of interest 657-769 Mamre Road, Kemps Creek
Attachments: reg of interest 657-769 Mamre Road, Kemps Creek.docx

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This email has been checked for viruses by AVG.
https://www.avg.com

DARUG CUSTODIAN
ABORIGINAL
CORPORATION

PO BOX 81 WINDSOR 2756
PHONE: 0245775181 FAX: 0245775098
MOBILE: 0415770163 Leanne Watson
0414962766 Justine Coplin
EMAIL: mulgokiwi@bigpond.com / justinecoplin@optusnet.com.au

Attention Biosis

Subject: 657-769 Mamre Road, Kemps Creek

Dear Anthea

Our group is a non- profit organisation that has been active for over forty years in Western Sydney, we are a Darug community group with over three hundred members. The main aim in our constitution is the care of Darug sites, places, wildlife and to promote our culture and provide education on the Darug history.

The Kemps Creek area is an area that our group has a vast knowledge of, we have worked and lived in for many years, this area is significant to the Darug people due to the connection of sites and the continued occupation. Our group has been involved in all previous assessments and works in this area as a traditional owner Darug group for the past 40 plus years.

Therefore we would like to register our interest for full consultation and involvement in the above project area.

Please contact us with all further enquiries on the above contacts.

Regards

Justine Coplin

Archaeological Project - Expression of Interest

Darug Research
& Information Centre
71 Seven Hills Rd South,
Seven Hills, NSW, 2147
Ph (02) 9622-4081

Darug Tribal Aboriginal Corporation
ICN: 2734
PO Box 441
Blacktown, NSW, 2148
Ph | 02 9622 4081
Email: darug_tribal@live.com.au

©

31/10/2018

Charlotte Allen
Biosis Pty Ltd
14, 17-27 Power Avenue
Alexandria NSW 2015
callen@biosis.com.au

RE – Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Dear Charlotte,

On behalf of the Board of Darug Tribal Aboriginal Corporation, I would like to thank you for the invitation to participate in the above-mentioned project.

The Darug Tribal Aboriginal Corporation, on behalf the Board and its Members, do hereby request to be included in all activities regarding this project, including any future correspondence there from arising.

Correspondence arising should be addressed to the Archaeological Coordinator, Mr. John Reilly and may be provided by post to the above PO Box address, or via e-mail to the above e-mail address. John may be contacted directly via Mobile at: (04) 0233-4123 or a message may be left on the answering machine in the DTAC Office via (02) 9622-4081.

On site consulting, and other services can be provided as required. The standard rate for such services is $100 excluding GST per hour ($110 per hour including GST).

The Corporation is a Not for Profit entity, and as such, all net income, following payment of wages to archaeological workers, derived from our participation in any project, goes toward supporting our Members, being the Traditional Owners of Darug land, the protection and preservation of Darug places and sites, the education of the wider community about the Darug people, their history, heritage and culture, and the functioning of the Corporation and its' services.

Sincerely,

Dirk Schmitt
Accountant to Darug Tribal Aboriginal Corporation

[redacted]
aas.info@bigpond.com

Aboriginal Archaeology Service INC.
Darug Traditional Owners

6th November 2018

Biosis Pty Ltd

Attention: Charlotte Allen

Ref: 27033

Registration for consultation for Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

Aboriginal Archaeology Service is seeking *involvement* in all consultation meetings and fieldwork for the above-mentioned project, as we are registered traditional owners of the area. AAS immediate family has lived in the area from 1897 and retains local and oral history on behalf of its first nation people. We have no objection to our information being provided to the Office of Environment and Heritage and the Local Aboriginal Land Council.

AAS can assist with input that can be incorporated into a written assessment of cultural values of the area. We are also able to provide fit staff to assist with work that may involve physical labour. We can provide our schedule of rates and copies of relevant certificates of currency for business insurances on request.

All correspondence should be emailed to AAS.info@bigpond.com and. The area is an important part of our culture and valued by our family.

Yours truly

Andrew Williams

[redacted]
aas.info@bigpond.com

Aboriginal Archaeology Service INC.
Darug Traditional Owners

6th November 2018

Biosis Pty Ltd

Attention: Charlotte Allen

Ref: 27033

Registration for consultation for Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment – notification to agencies

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AAS can assist with input that can be incorporated into a written assessment of cultural values of the area. We are also able to provide fit staff to assist with work that may involve physical labour. We can provide our schedule of rates and copies of relevant certificates of currency for business insurances on request.

All correspondence should be emailed to AAS.info@bigpond.com and. The area is an important part of our culture and valued by our family.

Yours truly

Andrew Williams

From:	Darug Tribal Aboriginal Corporation ICN 2734
To:	Charlotte Allen
Subject:	Darug Tribal Aboriginal Corporation - EOI - Mamre South Precinct Rezoning
Date:	Wednesday, 31 October 2018 3:48:20 PM
Attachments:	181031_DTAC_EOI_Biosis_657-769_Mamre_Road_Kemps_Creek.pdf

---

Heilsan Charlotte,

Please find attached Expression of Interest attached.

Cheers

Dirk Schmitt
Accountant to
Darug Tribal Aboriginal Corporation

From:	Scott Franks
To:	Charlotte Allen
Subject:	EOI
Date:	Wednesday, 31 October 2018 4:36:24 PM
Attachments:	image001.png

Dear Callen,

Could you please register our interest in the EOI for Mamre south precint rezoning ACHA project please.

Regards
Scott Franks

Native Title & Environmental Services Consultant

Tocomwall Pty Ltd
PO Box 76
CARINGBAH NSW 1495
m: 0404 171544
p: 02 9542 7714
f: 02 9524 4146
e: scott@tocomwall.com.au
www.tocomwall.com.au

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Barraby Cultural Services
ABN: 65 112 720 796
11 Waterhouse Place
Airds NSW 2540
M: 0423 906 606
E: barrabyculturalservices@gmail.com

24/10/2018

Charlotte Allen
Biosis Pty Ltd
14, 17-17 Power Avenue
Alexandria NSW 2015

Re: I am writing in regards to Express my Interest to register for consultation -Aboriginal Cultural Heritage Assessment of Mamre South Precinct Rezoning

Barraby Cultural Services would like to register interest for the Aboriginal Cultural Heritage Assessment for the project mentioned above.

Barraby Cultural Services wishes to be involved in all aspects of this project such as any upcoming Consultation Meetings, heritage identification, assessment and management and Fieldwork. Attached are our Certificates of Currency for your records. We would prefer to be contacted via email or telephone.

Barraby Cultural Services is an Aboriginal owned company and I have been working within Aboriginal Heritage Work for over 8 years throughout the Sydney Basin Regions and South Coast Regions. I would like to be given an opportunity to further my knowledge and skills where I have great experience identifying Aboriginal heritage values and I am aware of the impacts of any changes to the land uses on those values.

I have great pride in my culture and I acknowledge the lands that I live and work on and I pay my respects to the elders past and present and I am a active member within the Campbelltown, Liverpool and South Coast Aboriginal Communities.

I have completed all the tasks as directed and meet the physical labour and all the requirements listed below

- Transects
- Science excavation
- Artefacts analysis
- Wet and dry seiving
- Monitoring
- White Card –
- Experience in Aboriginal Cultural Heritage in Aboriginal Archaeology
- Western Sydney Airport Project
- Mt Gilead Project
- South Coast Regions NSW & Western Sydney / South Western Sydney Regions

Kind Regards
Lee Field
Barraby Cultural Services

Yurrandaali Cultural Services
ABN: 52 618 794 088
11 Waterhouse Place
Airds NSW 2560
T: 0457 546 643
E: yurrandaali_cs@hotmail.com

24/10/2018

Charlotte Allen
Biosis Pty Ltd
14, 17-17 Power Avenue
Alexandria NSW 2015

Re: I am writing in regards to Express my Interest to register for consultation - Aboriginal Cultural Heritage Assessment of Mamre South Precinct Rezoning

Yurrandaali Cultural Services would like to register interest for the Aboriginal Cultural Heritage Assessment for the project mentioned above.

Yurrandaali Cultural Services wishes to be involved in all aspects of this project such as any upcoming Consultation Meetings, heritage identification, assessment and management and Fieldwork. Attached are our Certificates of Currency for your records. We would prefer to be contacted via email or mobile.

Yurrandaali Cultural Services is an Aboriginal owned company and I have been working within Aboriginal Heritage Work for over 10 years throughout the South Coast and Sydney Basin Regions.

I would like to be given an opportunity to further my knowledge and skills where I have great experience identifying Aboriginal heritage values and I am aware of the impacts of any changes to the land uses on those values.

I have completed all the tasks as directed and meet the physical labour and all the requirements listed below

- Transects
- Science excavation
- Artefacts analysis
- Wet and dry seiving
- Monitoring
- White Card –
- Experience in Aboriginal Cultural Heritage in Aboriginal Archaeology
- RMS on the Hunter Expressway (15-18 months)
- South Coast Regions & Western Sydney / South Western Sydney
- Mt Gillard Project
- Western Sydney Airport

- RMS – M12

I have great pride in my culture and I acknowledge the lands that I live and work on and I pay my respects to the elders past and present and I am a active member within the Campbelltown and South Coast Aboriginal Communities.

Kind Regards
Bo Field
Yurrandaali Cultural Services

Pl lowan Phillip Khan
78 Forbes Street
Emu Plains NSW 2750
Email philipkhan.acn@live.com.au
mobile: 0434545982

Charlotte Allen
Biosis Pty Ltd
Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

7/11/18

Dear Charlotte

ref 27033

Thank you for your letter informing me that Biosis Pty Ltd has been engaged by Altis Property Partners and Frasers Property 657-769 Mamre Rd Kemps Ck., to undertake an Aboriginal Cultural Heritage Assessment including test excavations at Mamre Rd Kemps Kkay Cecil Hills Public School. And that you are inviting Aboriginal organisations to register, if they wish to be involved in the community consultation process and Field Work.

As Senior Aboriginal person who has for the past forty of so years (40) actively participated in the Protection Aboriginal Cultural Heritage throughout the Sydney Basin , and particularly throughout Western Sydney, I, on behalf of the Kamilaroi Yankuntjatjara Working Group, wish to provide to you my organisations' registration of interest.

Information in my registration of Interest:

1. I am a Senior Aboriginal and Principal of the Kamilaroi -Yankuntjatjara Working Group, and all Aboriginal entity (ABN33979702507).

2. I prefer communicating by, Mail, Telephone, and; and I am, the Principal, person to contact, and;
   My contact details are:
   Phillip Khan
   78 Forbes Street, Emu Plains NSW 2750
   Mobile 043 4545 982 email philipkhan.acn@live.com.au

3. I wish to be involved and participate in all levels of consultation/project involvement. I wish to attend all meetings, and, participate in available field work; and would receive a copy of the report.

4. I attach to this letter a copy of Kamilaroi- Yankuntjatjara Working Group's; GIO Public Liability Insurance; GIO Workers Compensation Certificate.

Should you wish me to provide further information, please do not hesitate to contact me on 0434545982.

Yours Sincerely,Pollowan Phillip Khan

Barking Owl Aboriginal Corporation
ICN 8822
barkingowlcorp@gmail.com

2nd November 2018

Dear Charlotte,

RE: 657-769 MAMRE RD KEMPS CREEK
ABORIGINAL CULTURAL HERITAGE ASSESSMENT

We would like to register interest for full consultation and involvement in the study area.

Registering Aboriginal Party:	**Barking Owl Aboriginal Corporation**
Contact Person:	**Jody Kulakowski**
Phone:	**0426 242 015**
Email:	**barkingowlcorp@gmail.com (preferred contact method)**

We are able to provide fit and hardworking site officers to assist with work that may involve physical labour with current white cards and all PPE equipment.
We can provide copies of relevant certificates of currency for business insurances on request.

Members put forward have experience in a variety of community consultation projects through other Registered Corporations.

Please feel free to contact by email barkingowlcorp@gmail.com if you require any further information.

kind regards

Jody Kulakowski
Director
Barking Owl Aboriginal Corporation
0426 242 015

Barking Owl Aboriginal Corporation
ICN 8822
barkingowlcorp@gmail.com

2nd November 2018

Dear Charlotte,

RE: 657-769 MAMRE RD KEMPS CREEK
ABORIGINAL CULTURAL HERITAGE ASSESSMENT

We would like to register interest for full consultation and involvement in the study area.

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Contact Person:	**Jody Kulakowski**
Phone:	**0426 242 015**
Email:	**barkingowlcorp@gmail.com (preferred contact method)**

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Members put forward have experience in a variety of community consultation projects through other Registered Corporations.

Please feel free to contact by email barkingowlcorp@gmail.com if you require any further information.

kind regards

Jody Kulakowski
Director
Barking Owl Aboriginal Corporation
0426 242 015

From: Muragadi
To: Charlotte Allen
Subject: Mamre South precinct registration
Date: Friday, 9 November 2018 2:10:48 AM

Hi Charlotte,
Could you please register our interest in the above project, my family and members have a strong connection to the project area. My mother lived on Mamre road St'Marys with my aunt and family for a number of years when she was younger.
Thanks
Jesse

From:	Ryan Johnson
To:	Charlotte Allen
Subject:	Mamre South precinct registration
Date:	Friday, 9 November 2018 2:13:49 AM

Dear Charlotte,
Our corporation would like to register an interest in the above project, please feel free to contact me if you require further details (0475565517)
Thanks

Ryan Johnson | **Murra Bidgee Mullangari**

Aboriginal Corporation Cultural Heritage

A: PO Box 246, Seven Hills, NSW, 2147
E: murrabidgeemullangari@yahoo.com.au
ICN: 8112

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From:	lee field
To:	Charlotte Allen
Subject:	Re: Registration Of Interest ACHA - Mamre South Precinct Rezoning
Date:	Wednesday, 24 October 2018 11:50:57 AM
Attachments:	EOI-MAMRESOUTH.docx

Dear Charlotte,

Barraby Cultural Services would like to register our interest in this project.

Please see our attached Letter Of Registration.

Kind Regards
Lee Field

From:	arika jalomaki
To:	Charlotte Allen
Subject:	Re: Registration Of Interest ACHA - Mamre South Precinct Rezoning
Date:	Wednesday, 24 October 2018 12:04:54 PM
Attachments:	EOI-MAMRESOUTH.docx

Dear Charlotte,

Yulay Cultural Services would like to register our interest in this project.

Please see our attached Letter Of Registration.

Kind Regards
Arika Jalomaki

From:	Bo Field
To:	Charlotte Allen
Subject:	Re: Registration Of Interest ACHA - Mamre South Precinct Rezoning
Date:	Wednesday, 24 October 2018 12:04:13 PM
Attachments:	EOI-MAMRESOUTH.docx

Dear Charlotte,

Yurrandaali Cultural Services would like to register our interest in this project.

Please see our attached Letter Of Registration.

Kind Regards
Bo Field

Sent from Outlook

From:	Andrew Williams
To:	Charlotte Allen
Cc:	stephen.oconnor@altisproperty.com.au; Dad Williams
Subject:	Registration for Mamre South Precinct Rezoning - ACHA
Date:	Tuesday, 6 November 2018 3:12:14 PM
Attachments:	biosis 27033 registration.pdf

Charlotte,

Please see attached AAS registration for Mamre South Precinct Rezoning.

Regards

Andrew Williams
aas.info@bigpond.com

From:	Barking Owl Aboriginal Corporation
To:	Charlotte Allen
Subject:	Registration of Interest Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment
Date:	Friday, 2 November 2018 3:34:25 PM
Attachments:	MAMRE RD KEMPS CREEK 01 expression of interest barking owl copy.docx

---

Dear Charlotte,

Please find attached Registration of Interest Mamre South Precinct Rezoning, Aboriginal Cultural Heritage Assessment.

kind regards

Jody Kulakowski

Barking Owl
Aboriginal Corporation

From: Steve Randall
To: Charlotte Allen
Subject: Your Ref: Matter 27033 - Mamre South Precinct, Kemps Creek
Date: Thursday, 25 October 2018 12:21:14 PM

Hi Charlotte,

Deerubbin LALC would like to formally register to participate in the abovementioned project

regards

Steven Randall
Aboriginal Cultural Heritage Officer

Deerubbin Local Aboriginal Land Council
Level 1, Suite 3
291-295 High Street, Penrith NSW 2750
PO Box 40, Penrith NSW 2751
T: (02) 4724 5600 F: (02) 4722 9713 M: 0417 219 174
E: srandall@deerubbin.org.au

Appendix 3 Stage 2: Presentation of information about the proposed project

12 November 2018

Didge Ngunawal Clan
Lilly Carrol and Paul Boyd

Dear Lilly Carrol and Paul Boyd,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

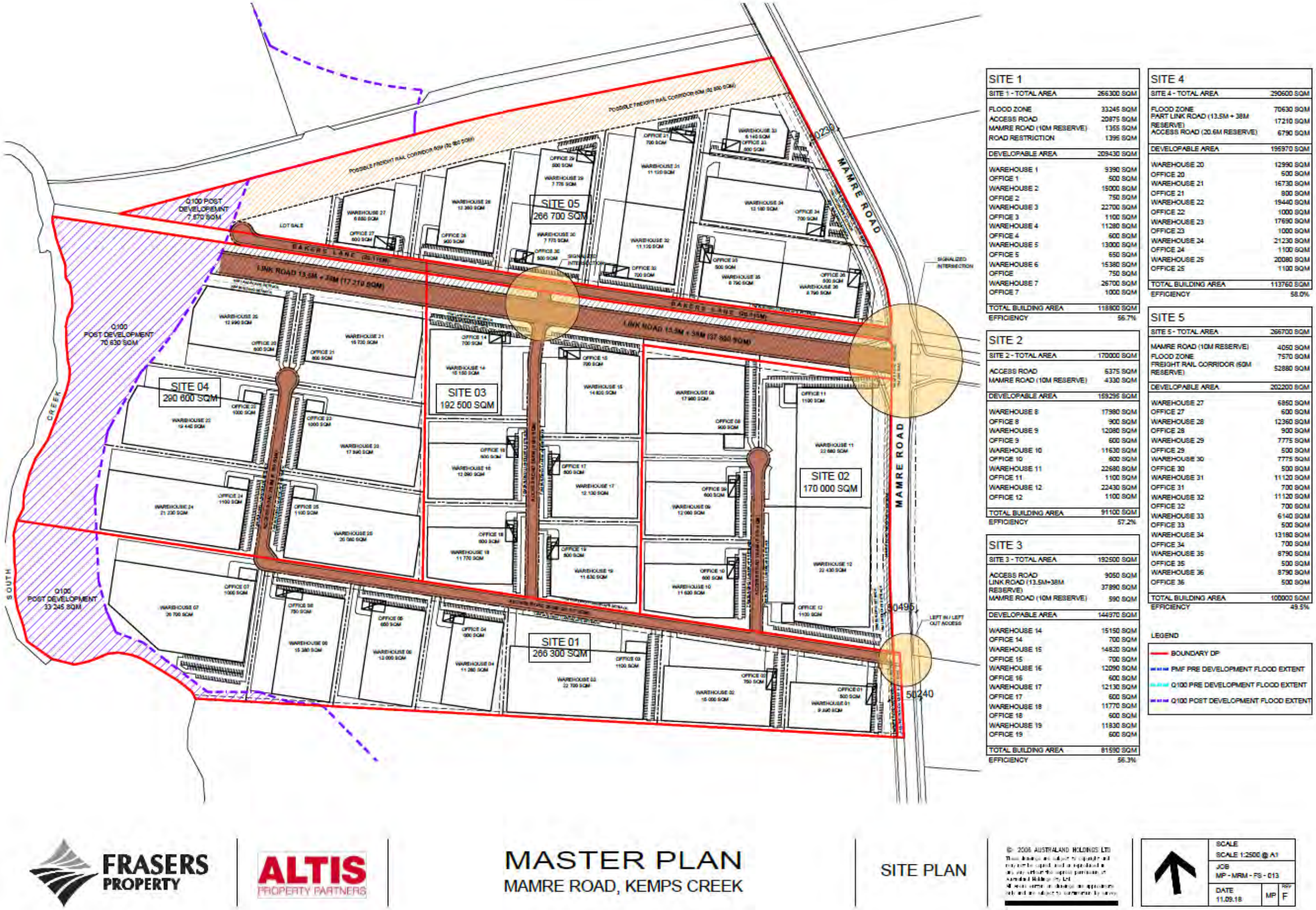
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

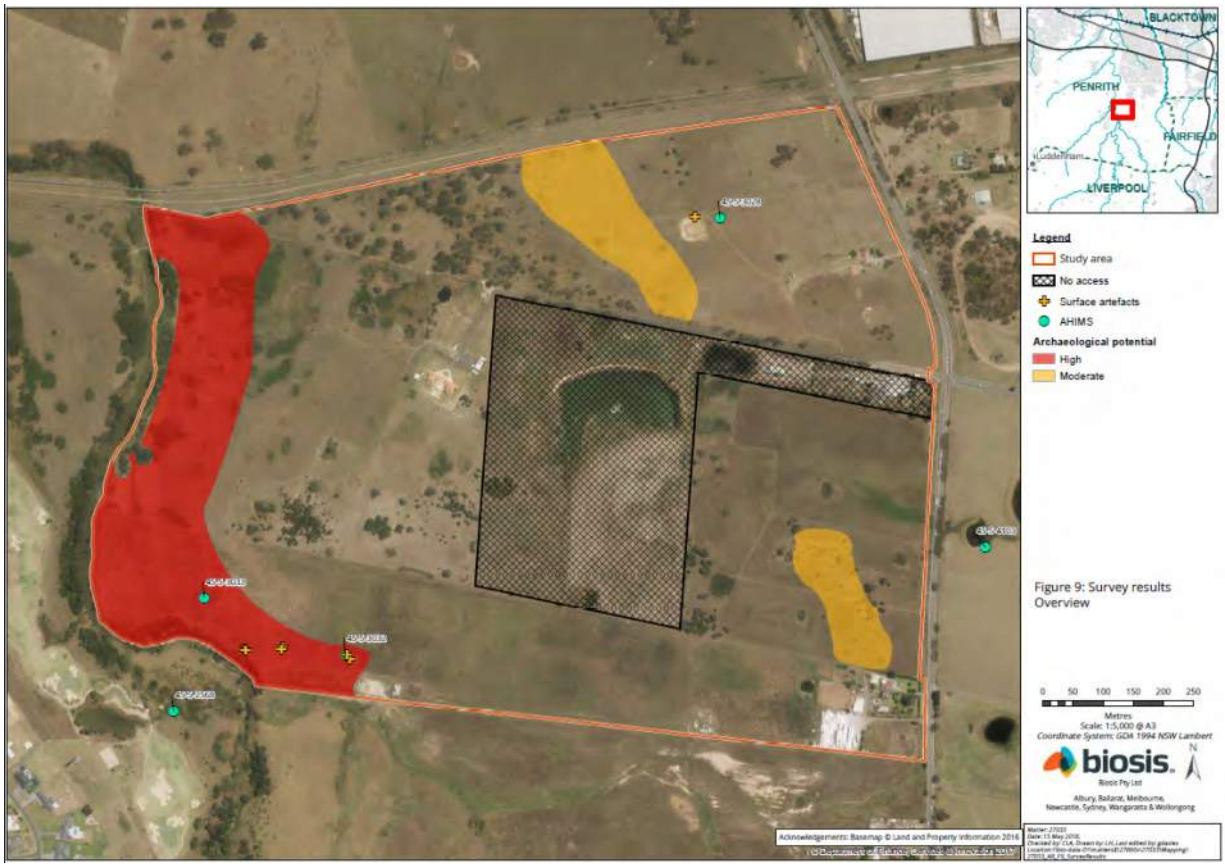


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Darug Boorooberongal Elders Aboriginal Corporation
Uncle Gordon Workman

Dear Uncle Gordon Workman,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

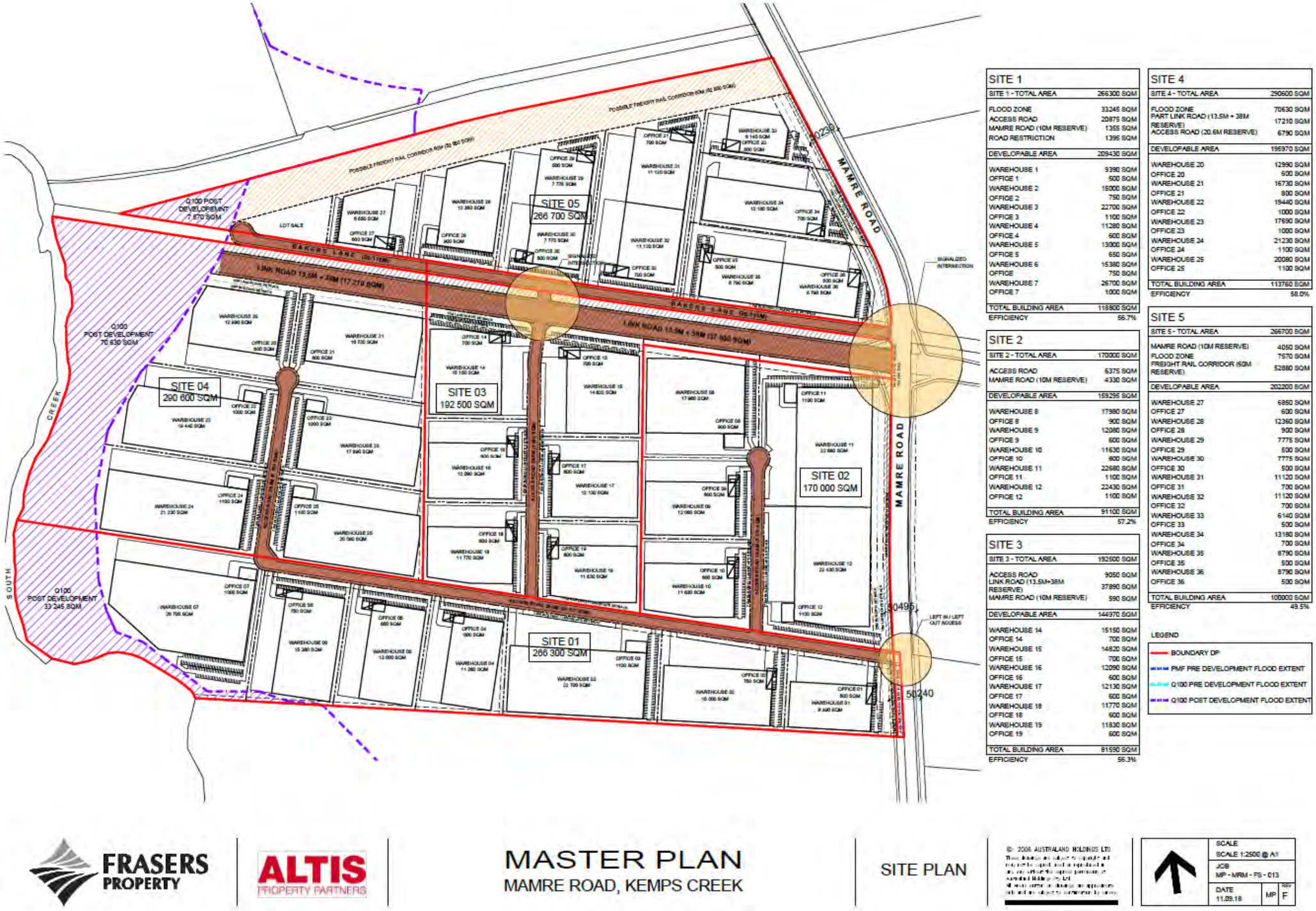
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
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- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
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- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
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  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
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- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

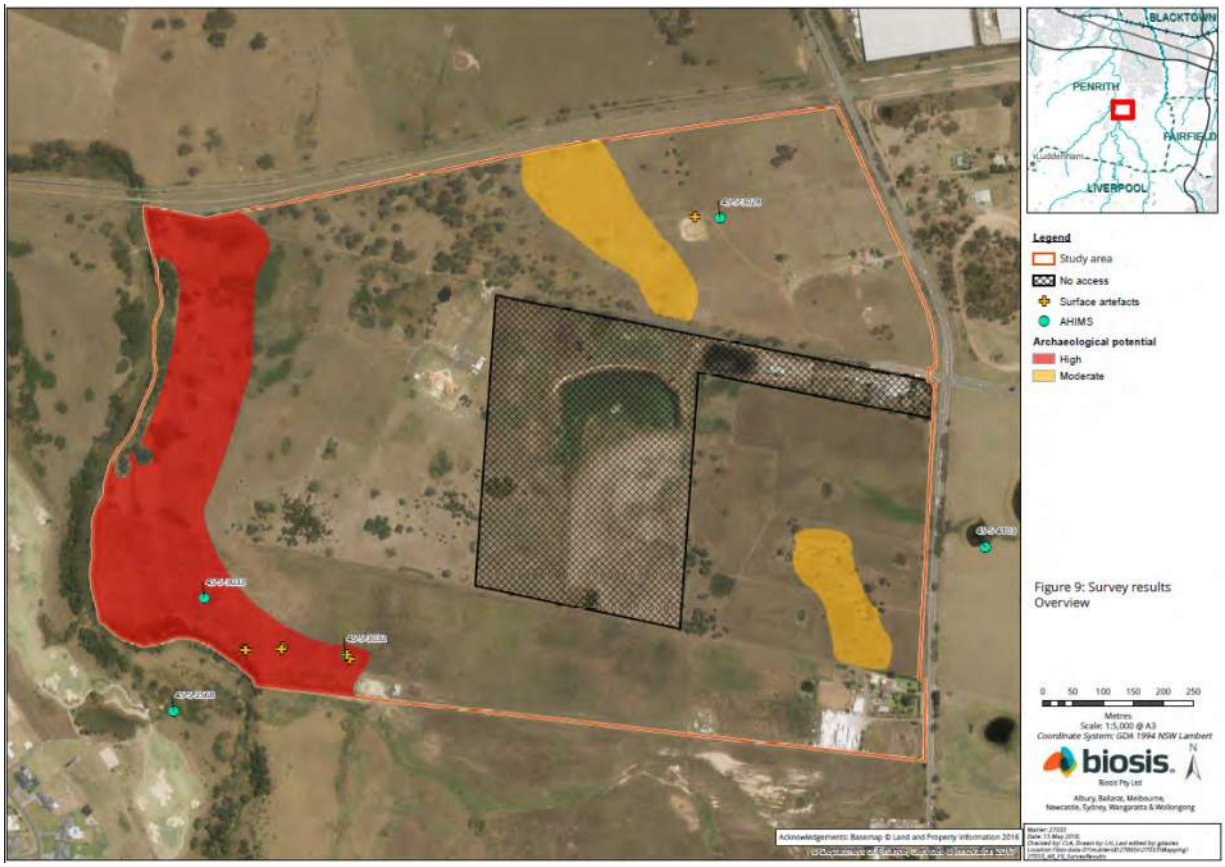

Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
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- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
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- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
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Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Wailwan Aboriginal Digging Group
Philip Boney

Dear Philip Boney,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

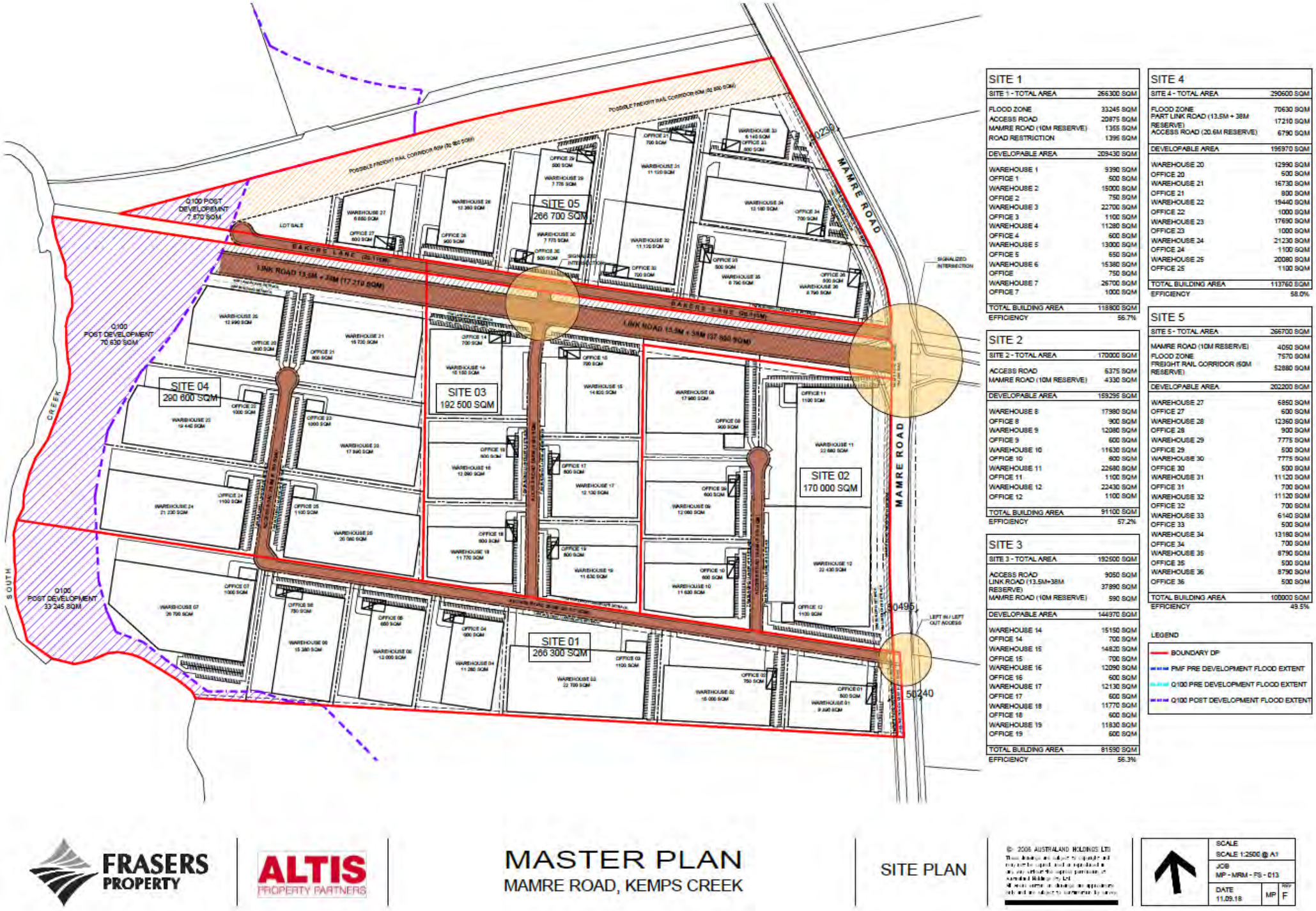
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

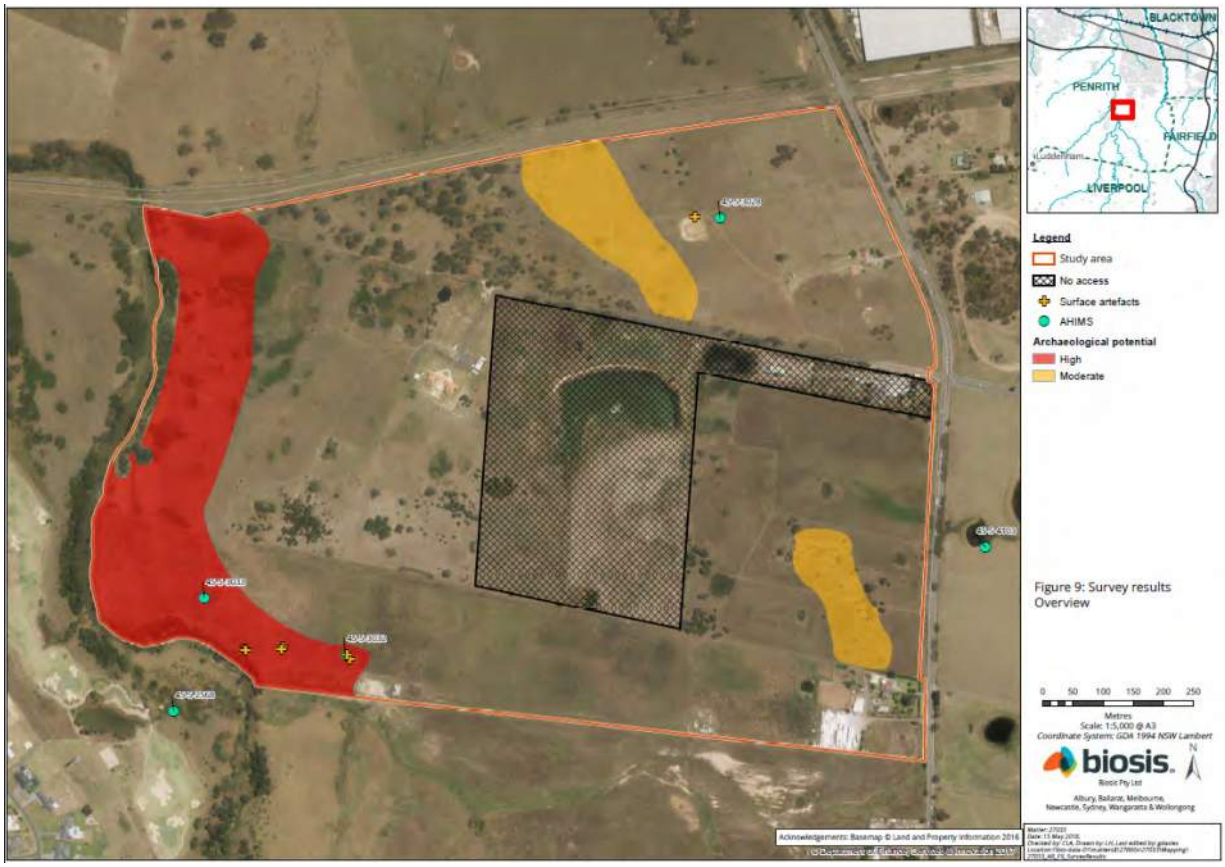


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

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References

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DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Darug Custodian Aboriginal Corporation
Justine Coplin

Dear Justine Coplin,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

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The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

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This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

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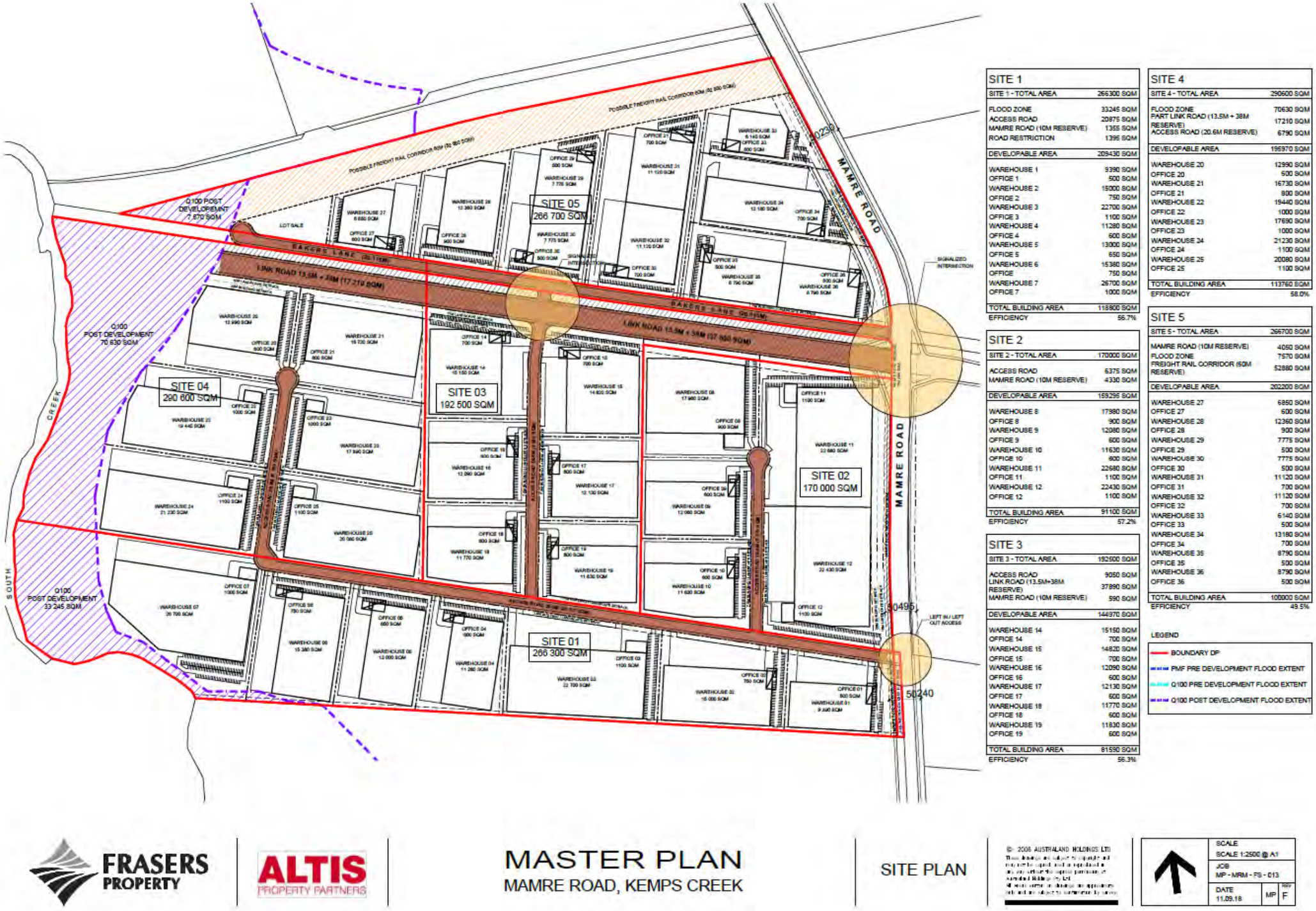
Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

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- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
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- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

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  - Local Aboriginal Land Council (LALC)
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  - National Native Title Tribunal (NNTT)
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  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
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- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
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- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

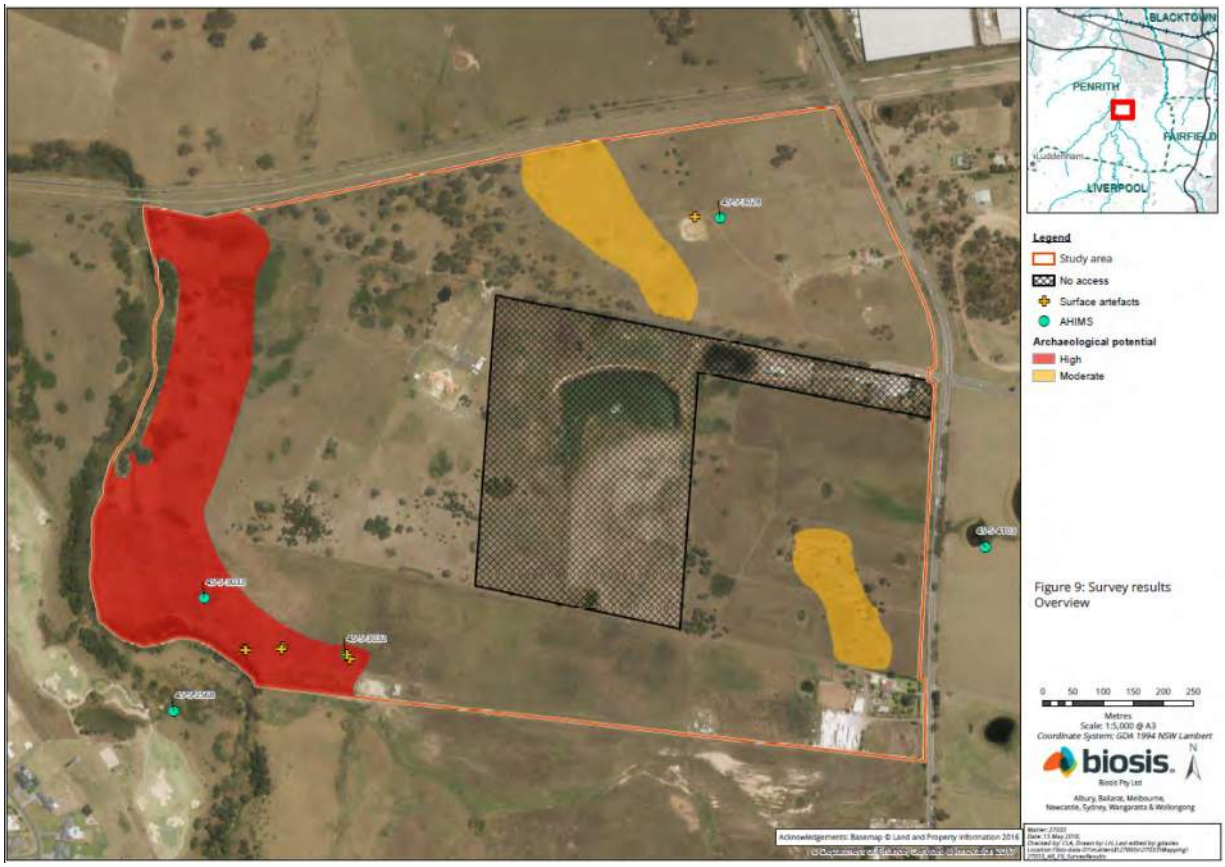


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Darug Aboriginal Land Care
Desmond Dyer

Dear Desmond Dyer,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

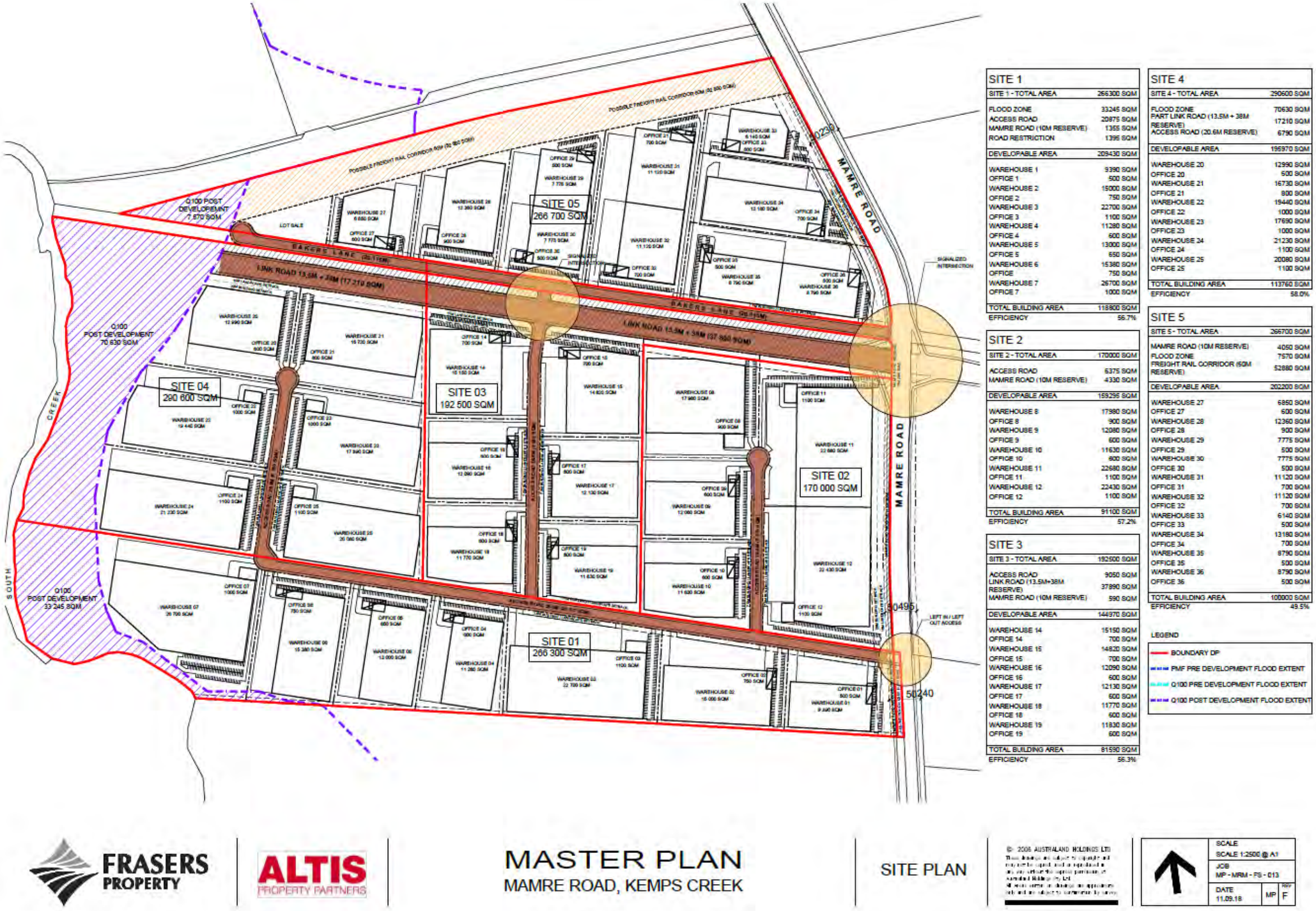
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

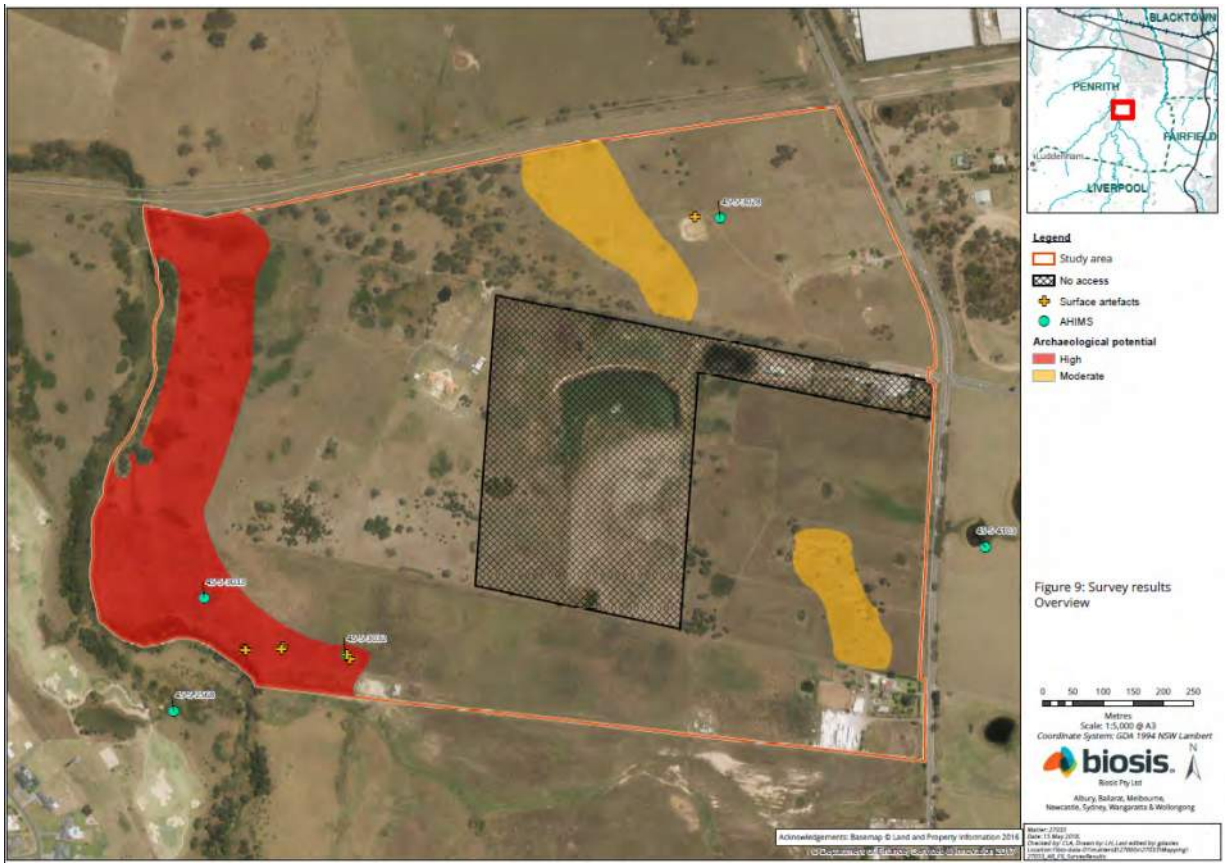


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
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- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
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Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

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Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Gulaga
Wendy Smith

Dear Wendy Smith,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

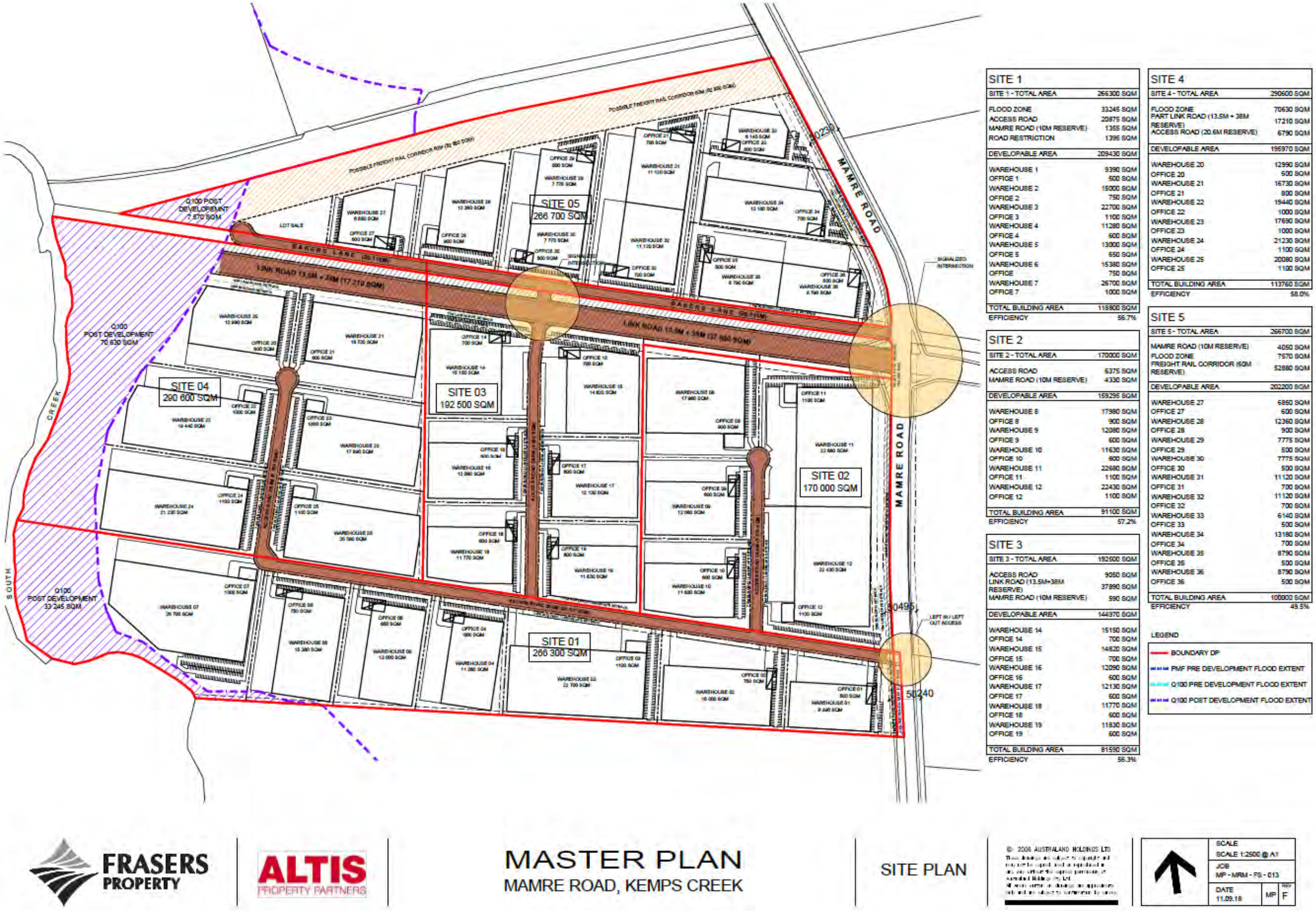
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
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- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

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- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
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- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

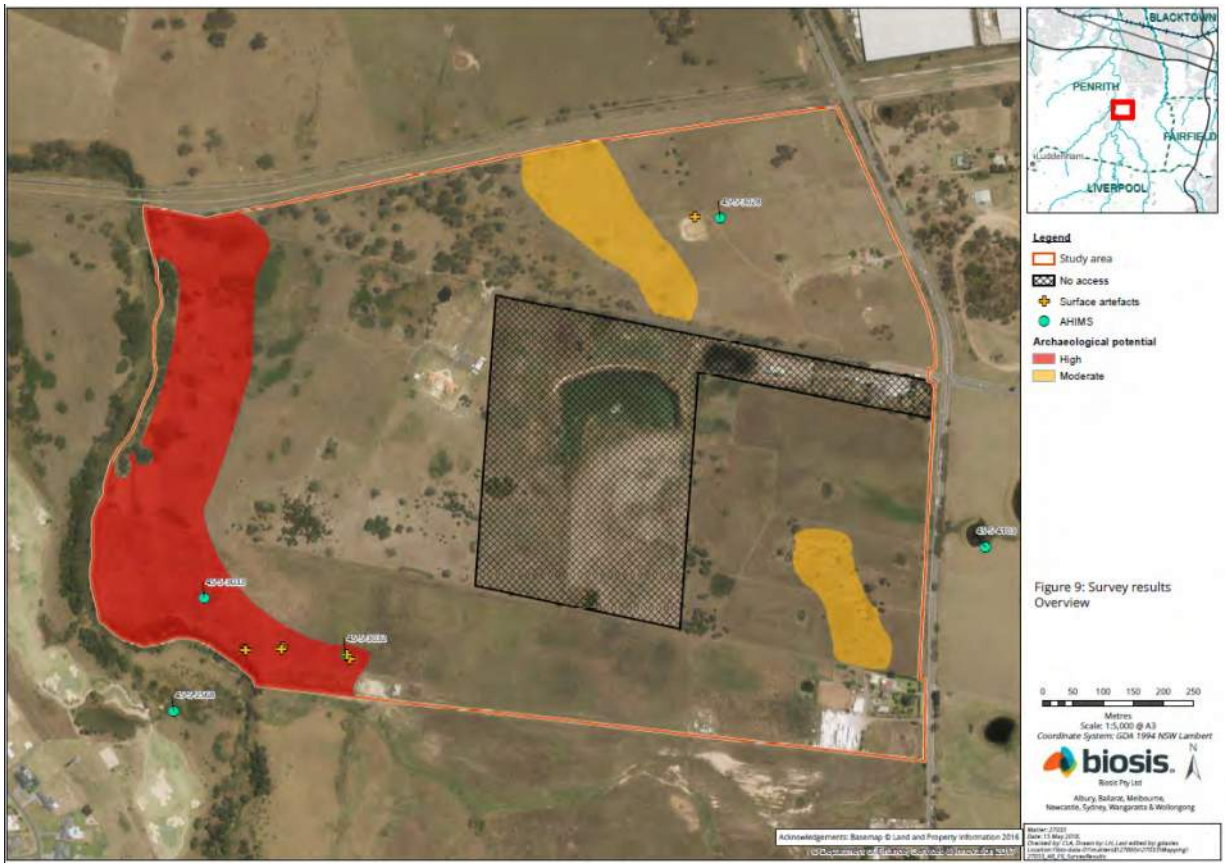


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Darug Land Observations
Anna Workman

Dear Anna Workman,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

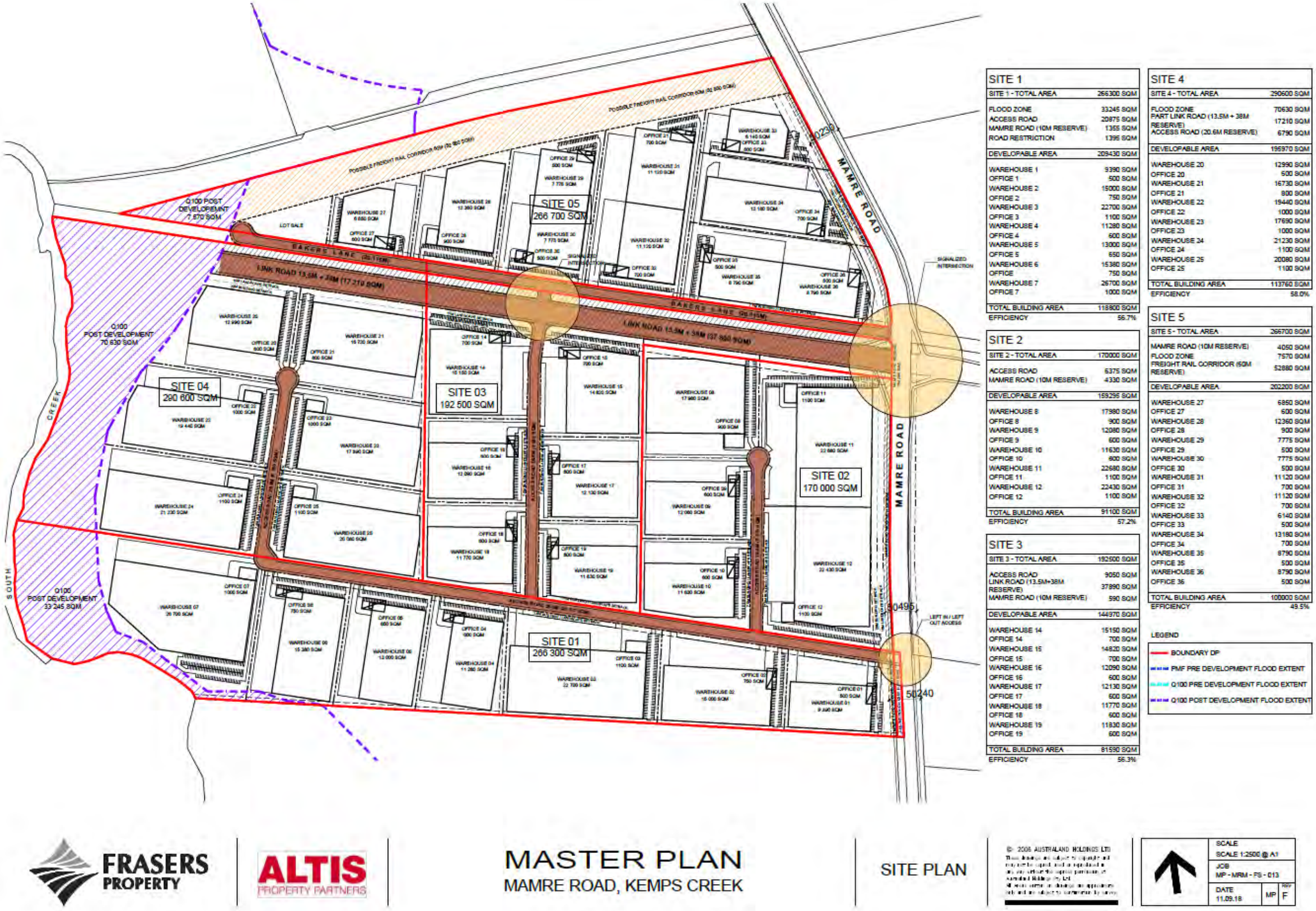
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

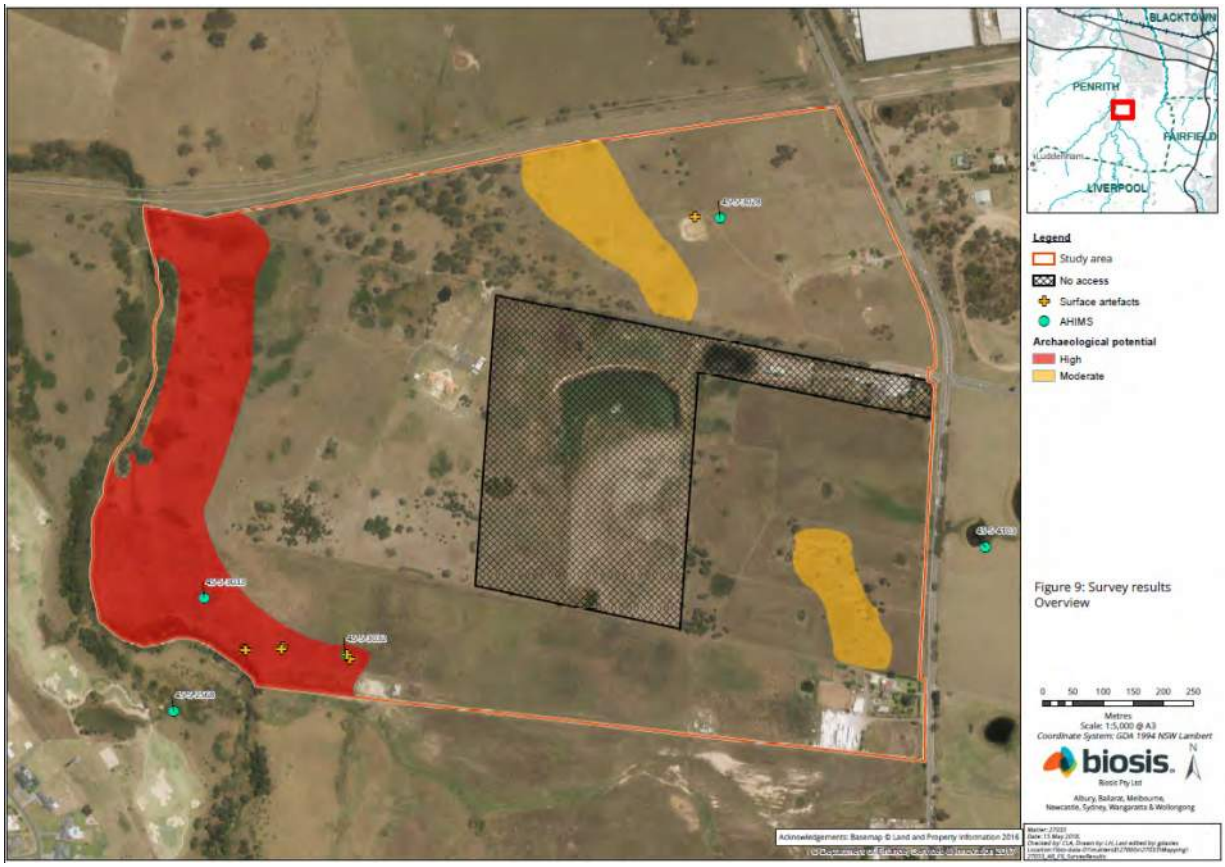


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
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- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
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Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

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Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Murra Bidgee Mullangari Aboriginal Corporation
Ryan Johnson

Dear Ryan Johnson,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

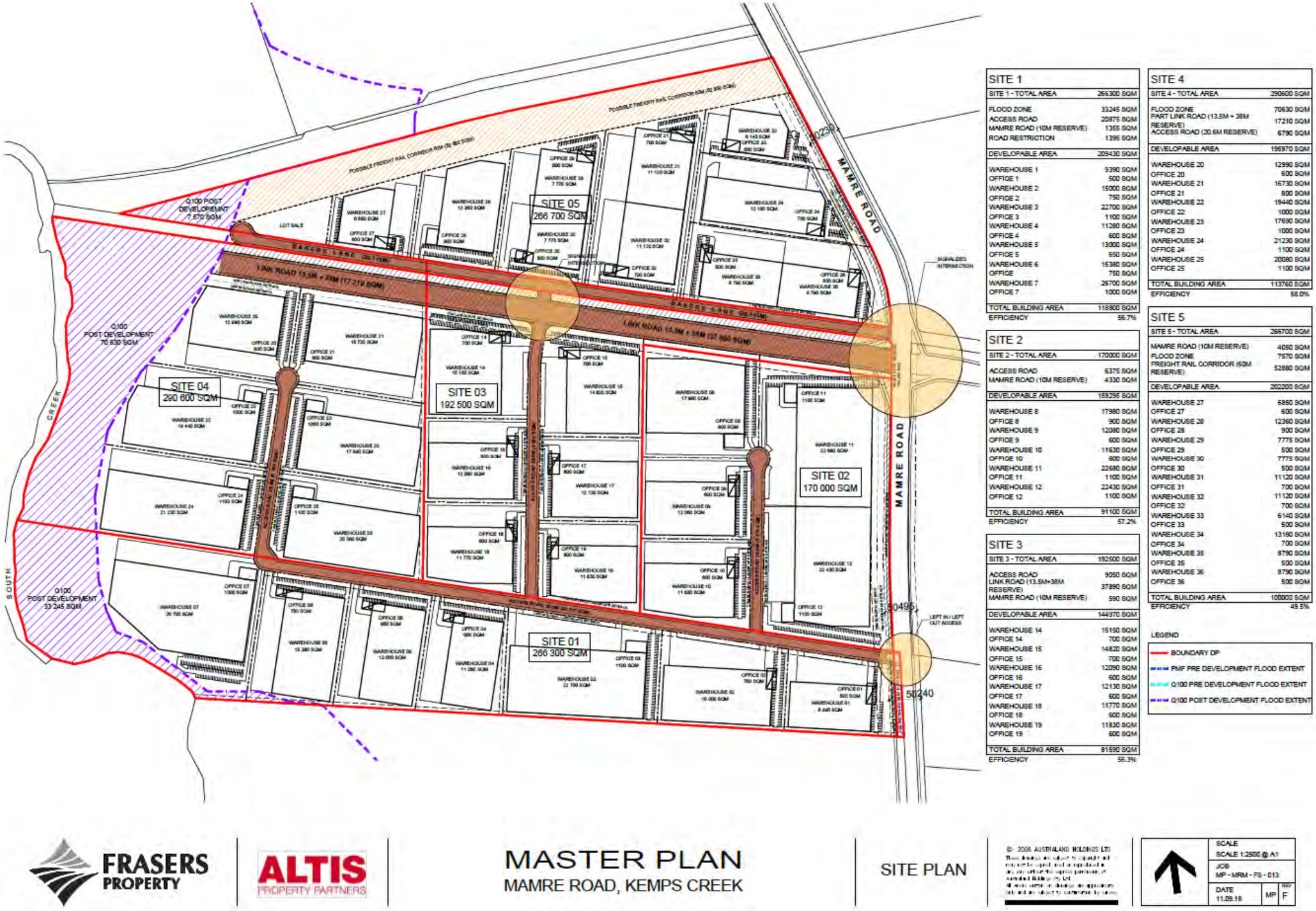
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
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Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
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- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

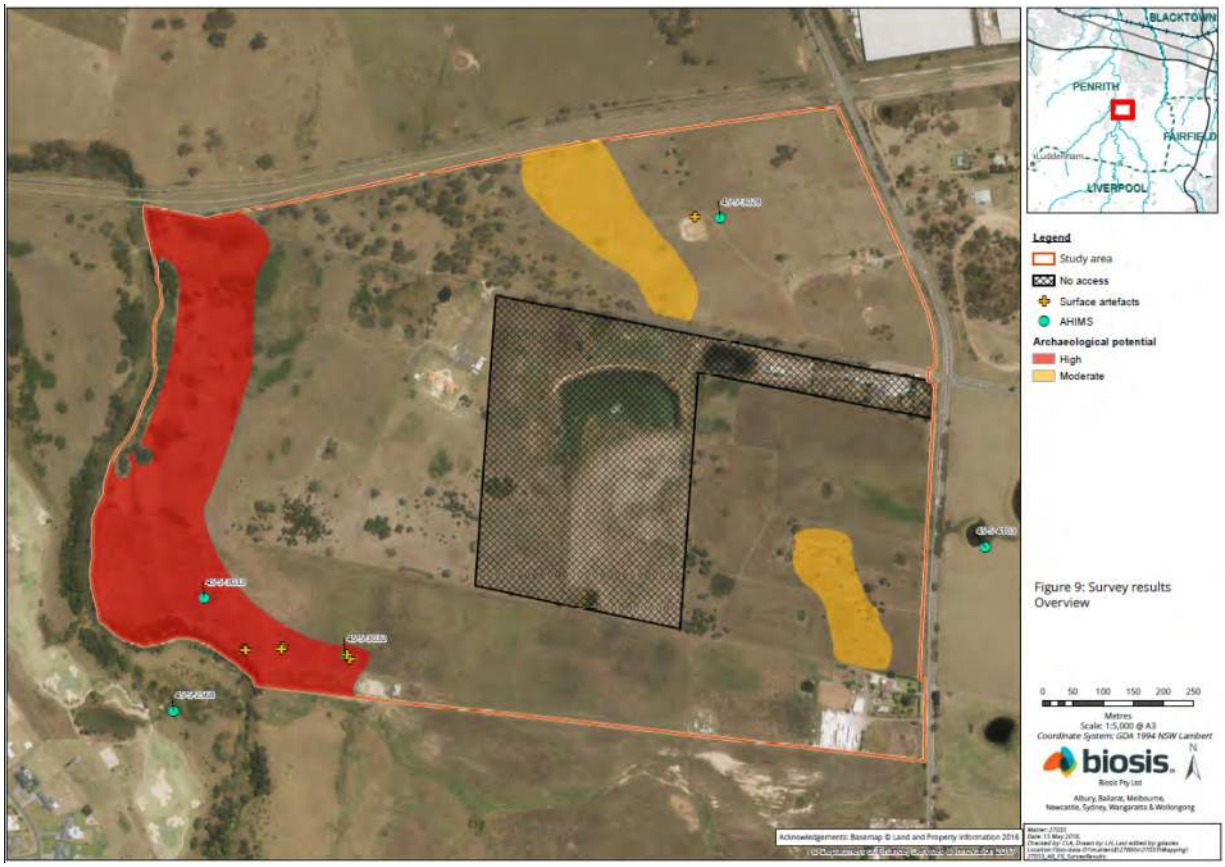


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Muragadi Heritage Indigenous Corporation
Jesse Johnson

Dear Jesse Johnson,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

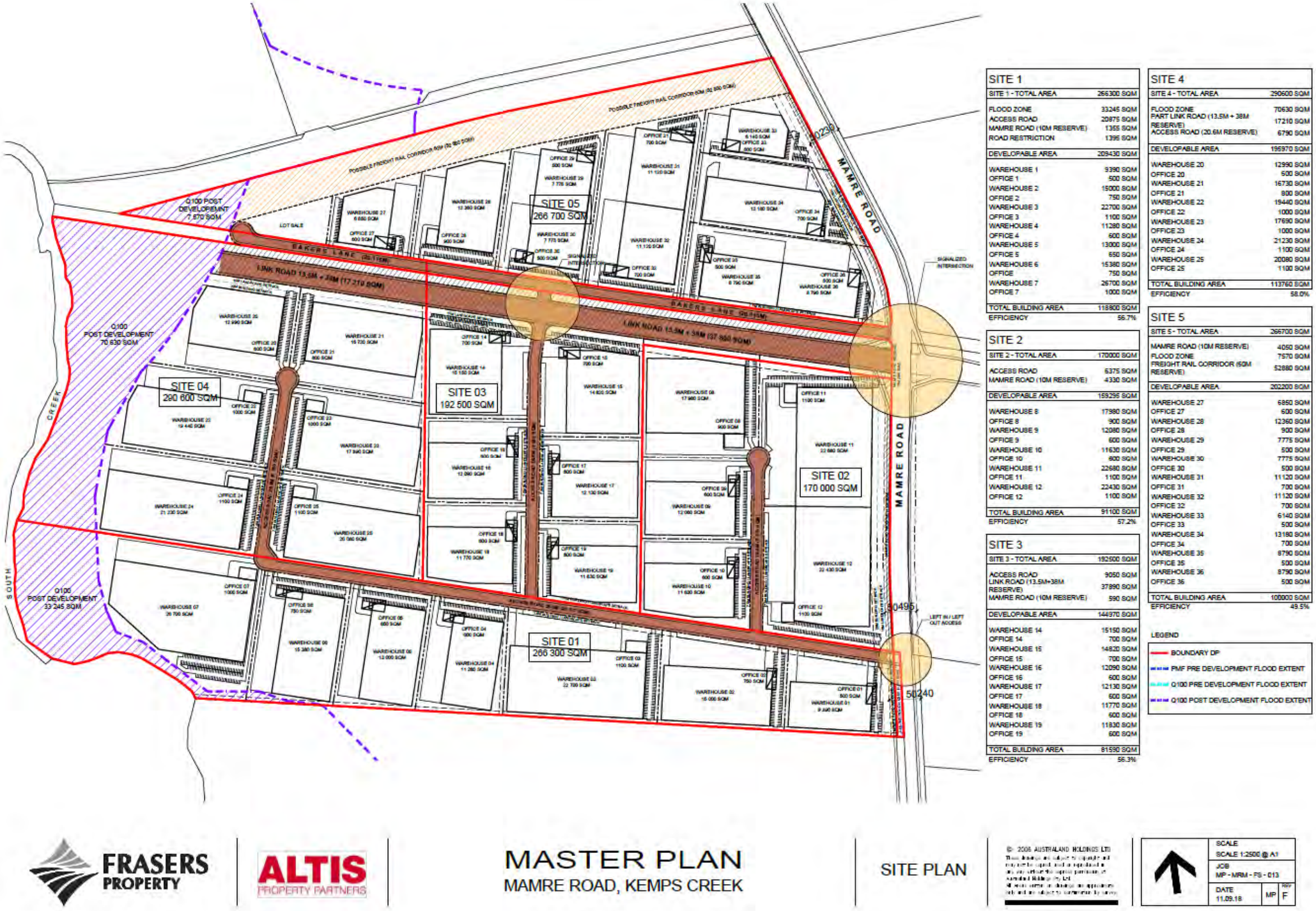
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
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The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

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MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

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Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

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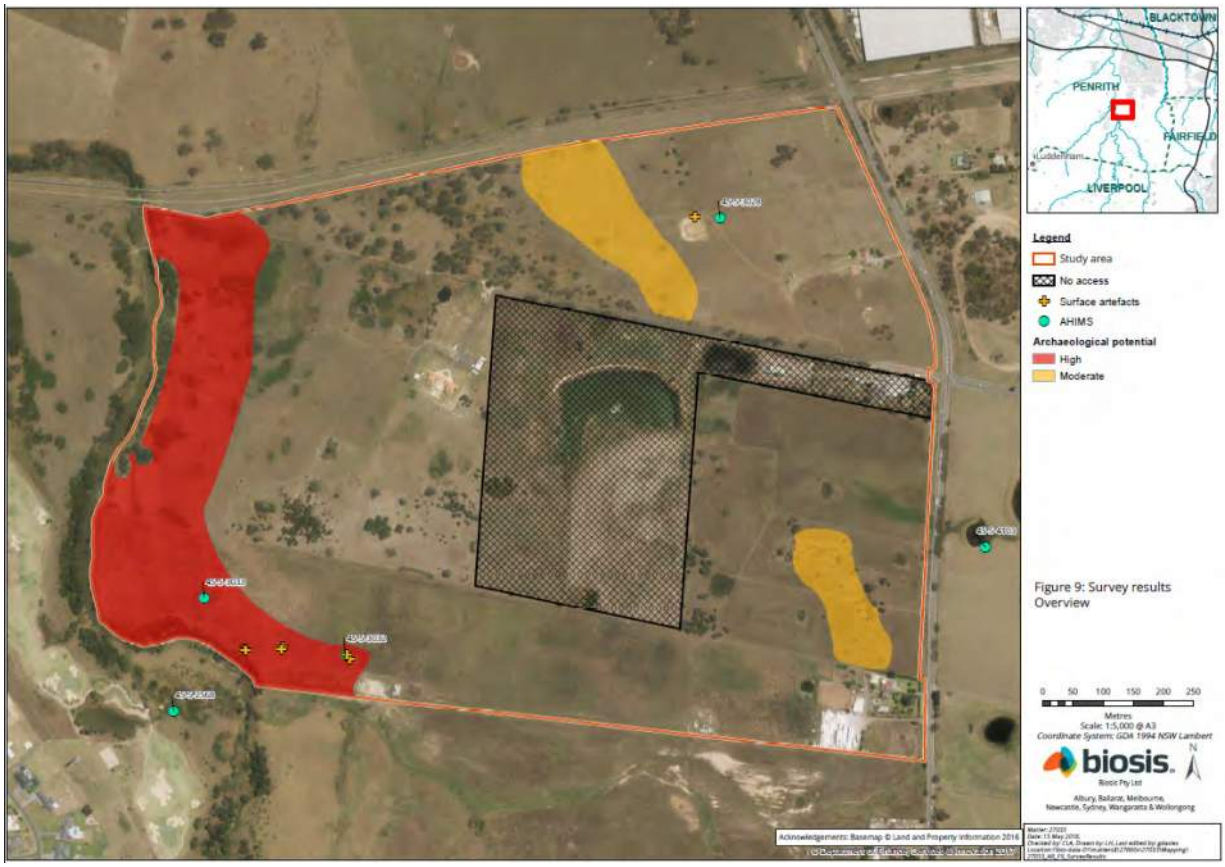

Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

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Responsibilities and roles

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DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Aboriginal Archaeological Service Inc
Andrew Williams

Dear Andrew Williams,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

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Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

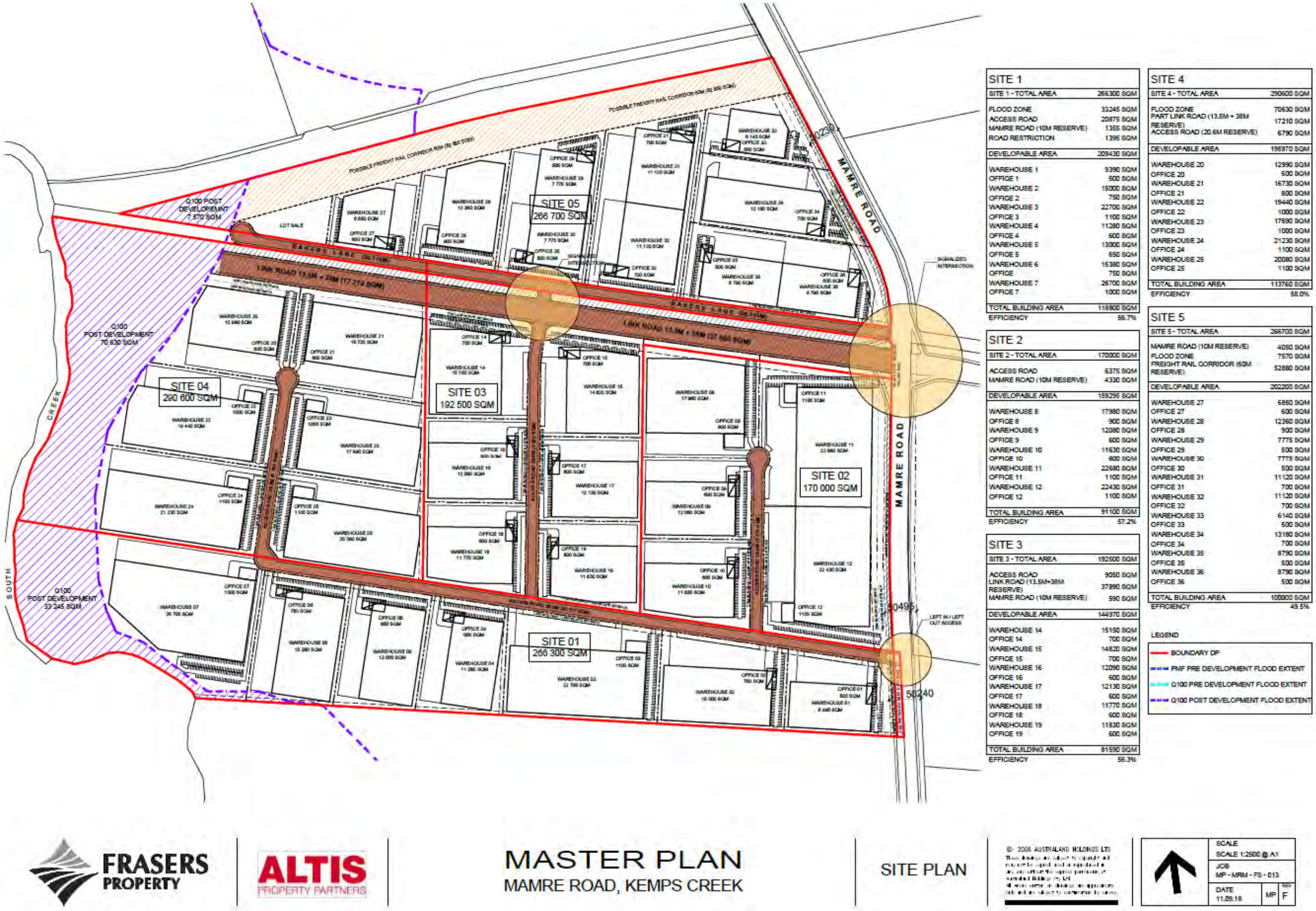
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

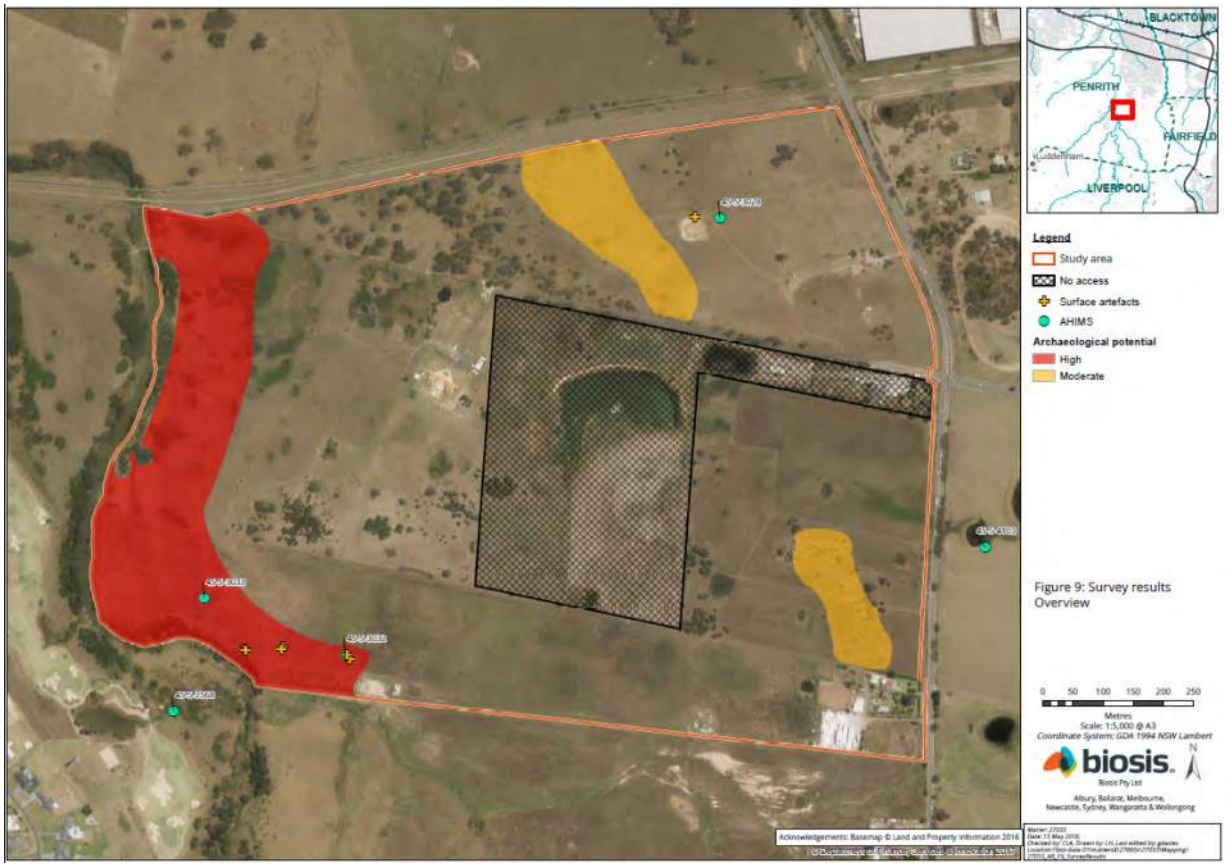


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Tocomwall
Scott Franks

Dear Scott Franks,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

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This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

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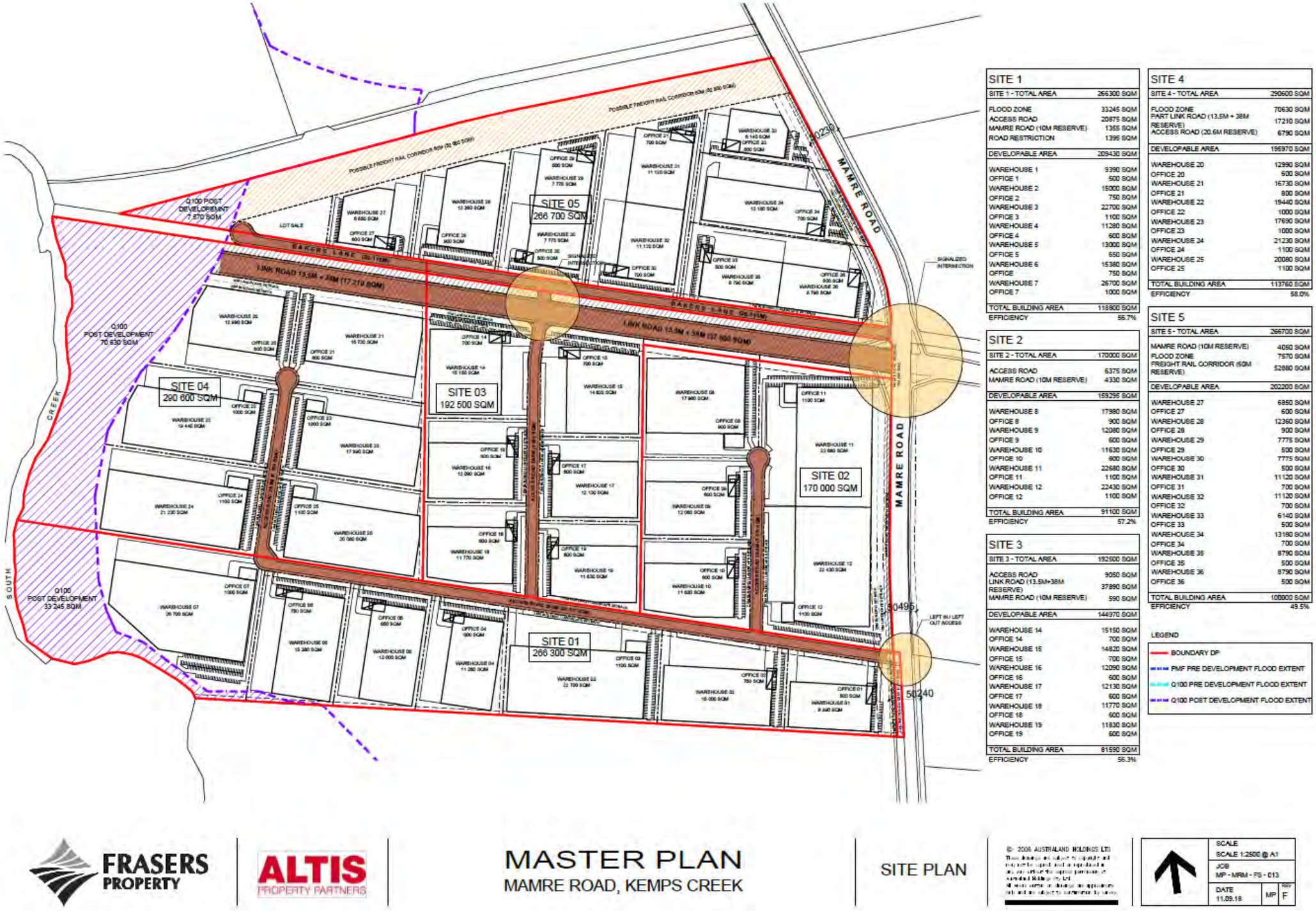
Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

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Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

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  - Office of Environment and Heritage (OEH)
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  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
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- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
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- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
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- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

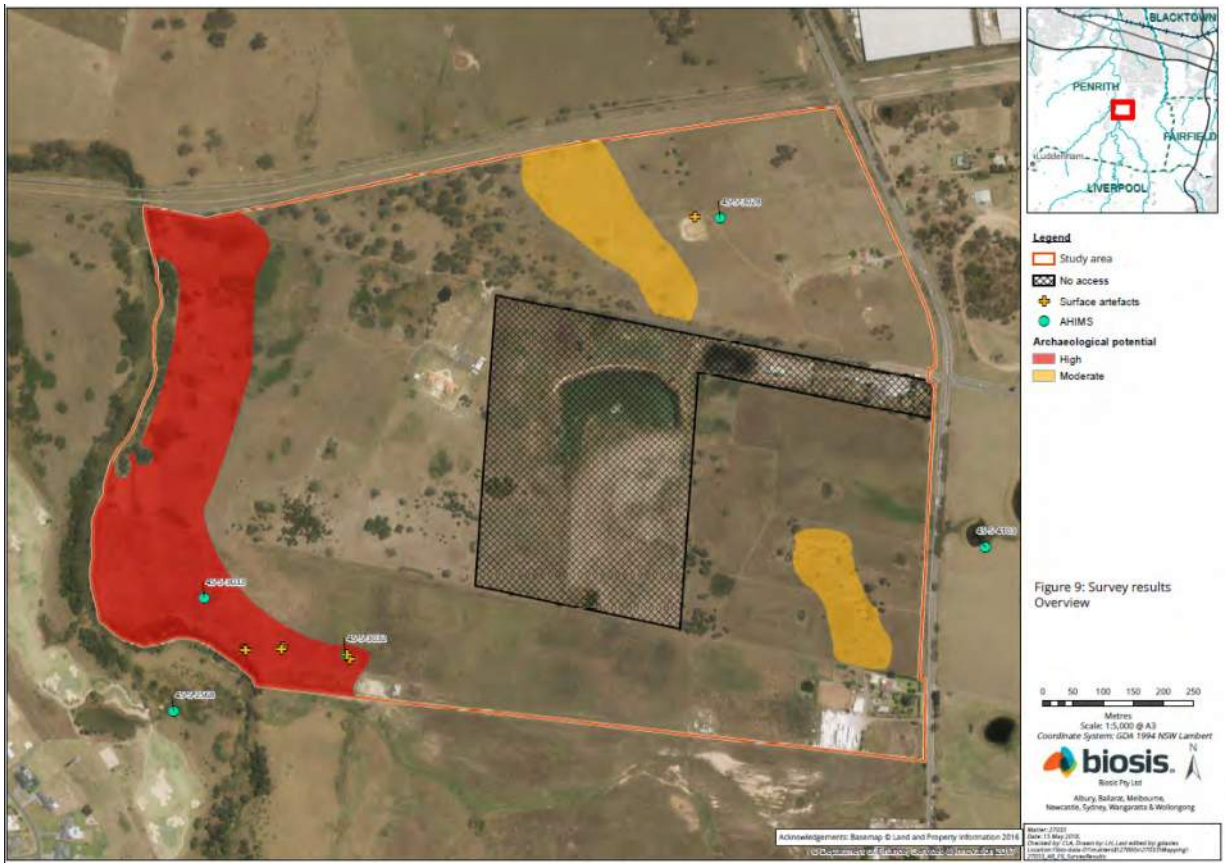

Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
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Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

12 November 2018

Barking Owl Aboriginal Corporation
Jody Kulakowski

Dear Jody Kulakowski,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

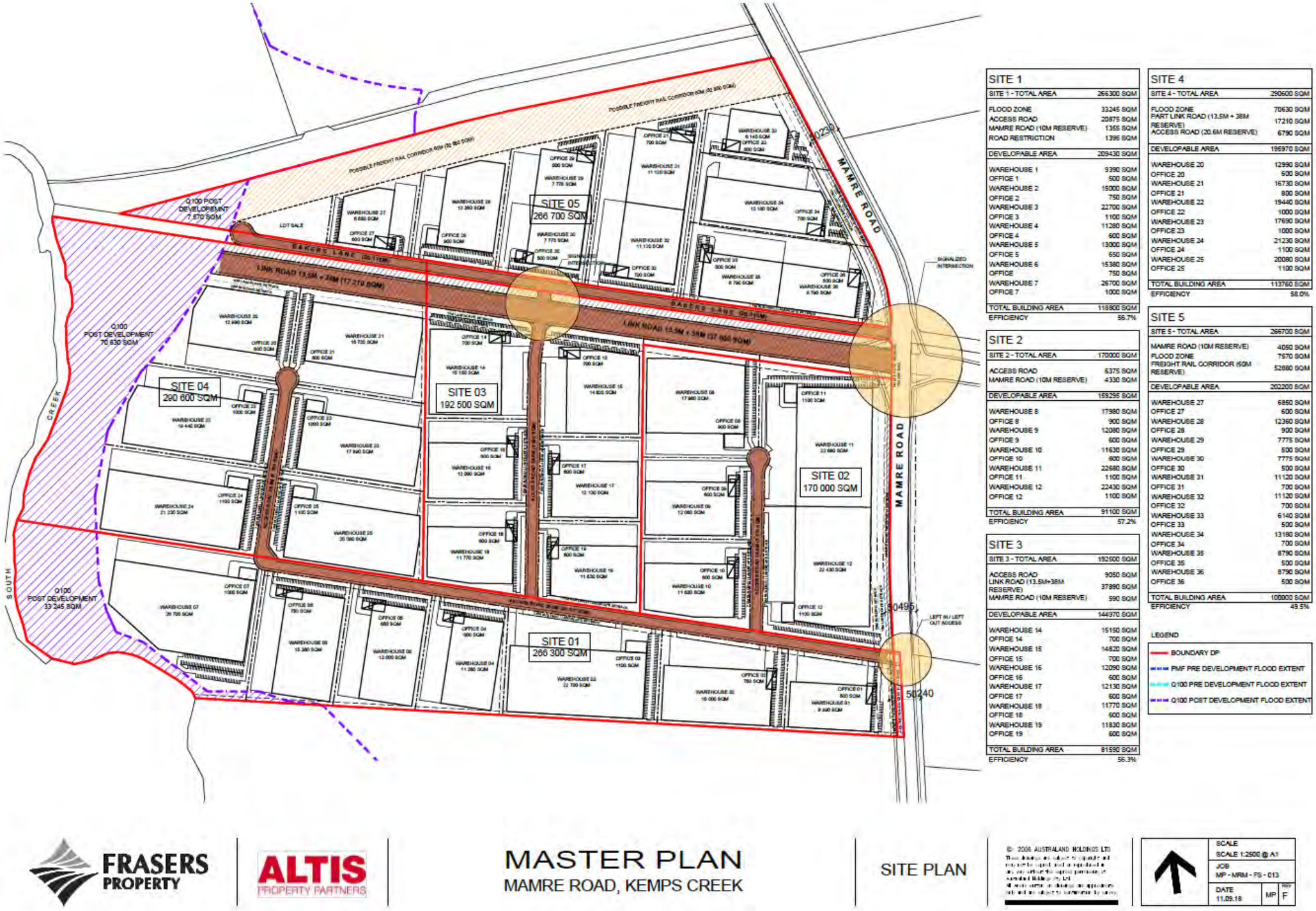
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

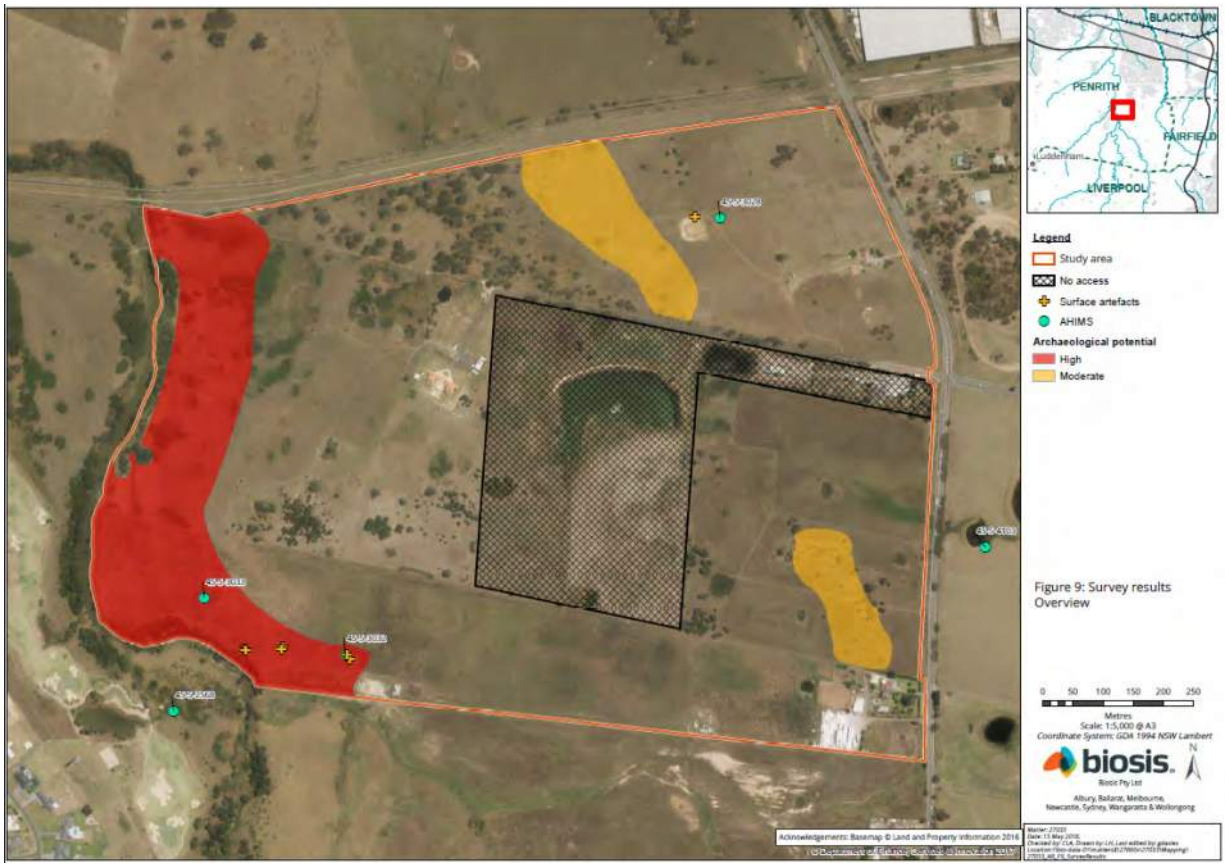


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
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- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
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Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

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Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

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12 November 2018

Barraby Cultural Services
Lee Field

Dear Lee Field,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

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The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

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This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

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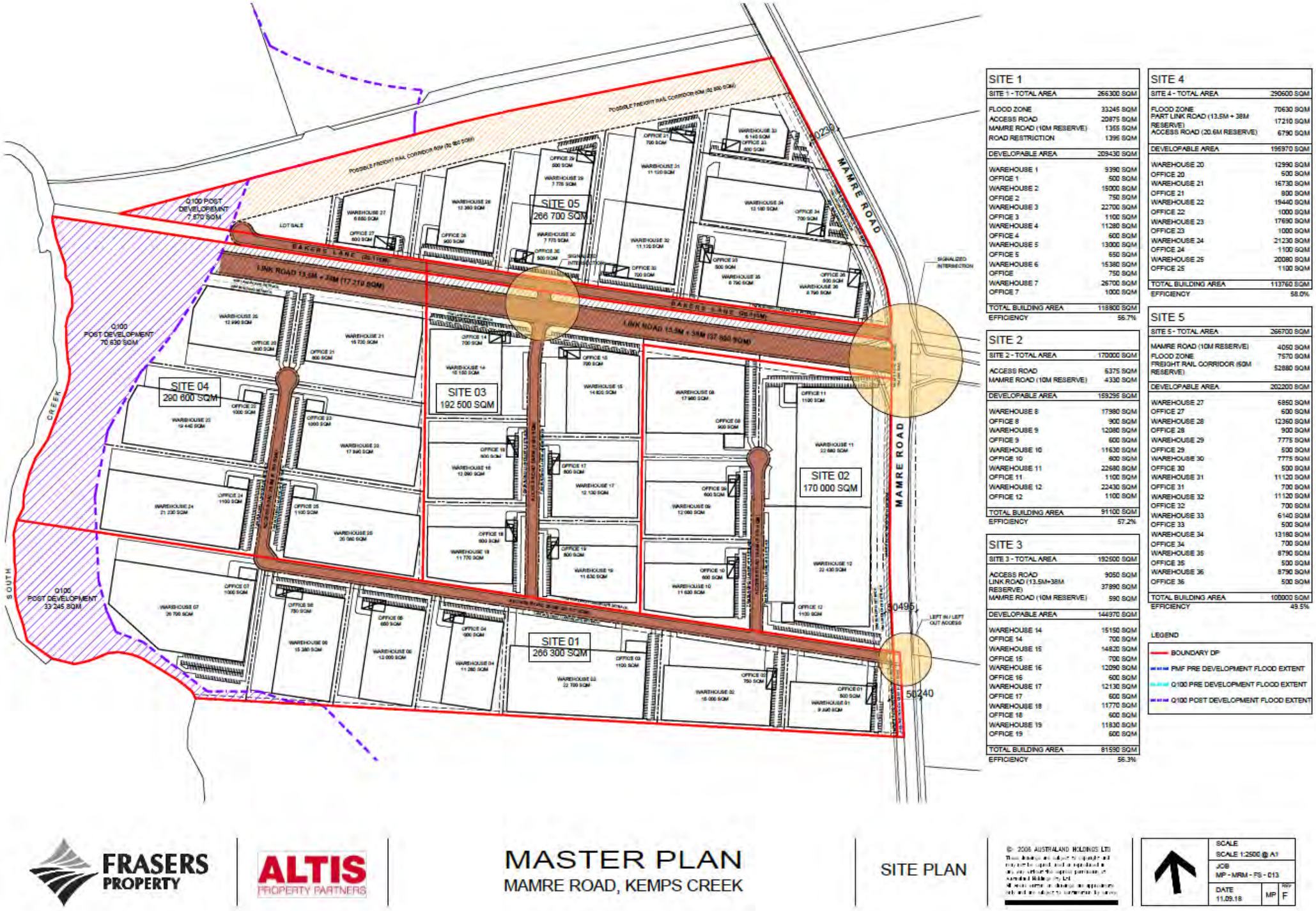
Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

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Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

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Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

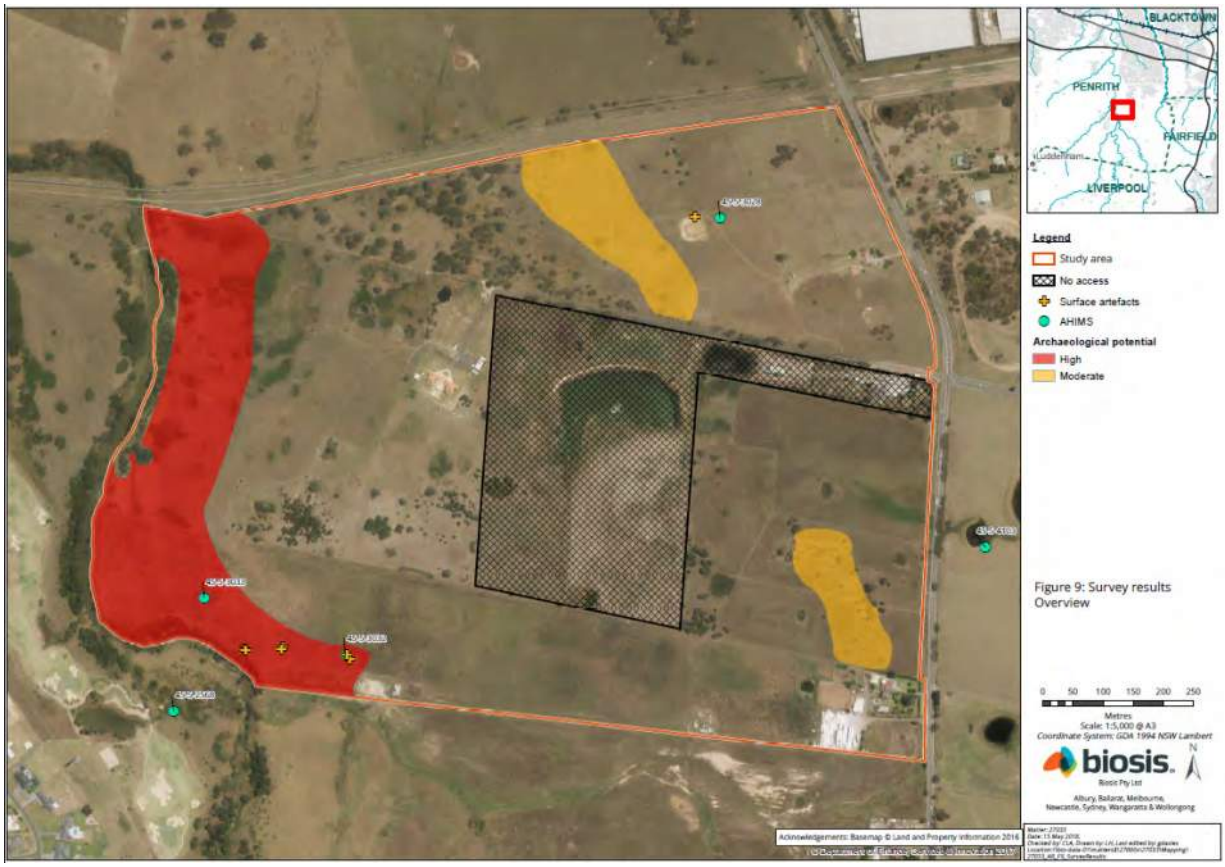


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

13 November 2018

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm10 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

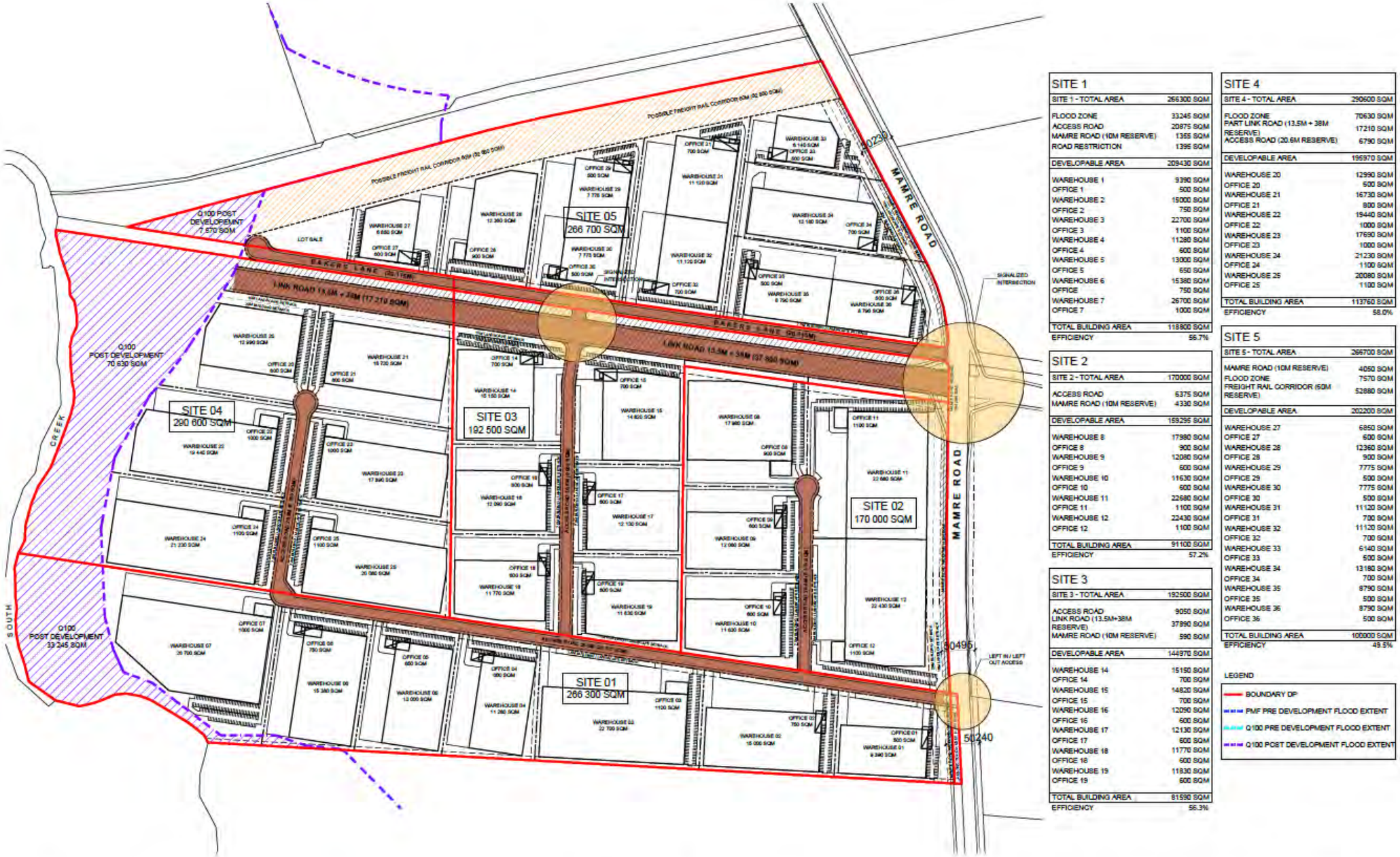
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 3. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

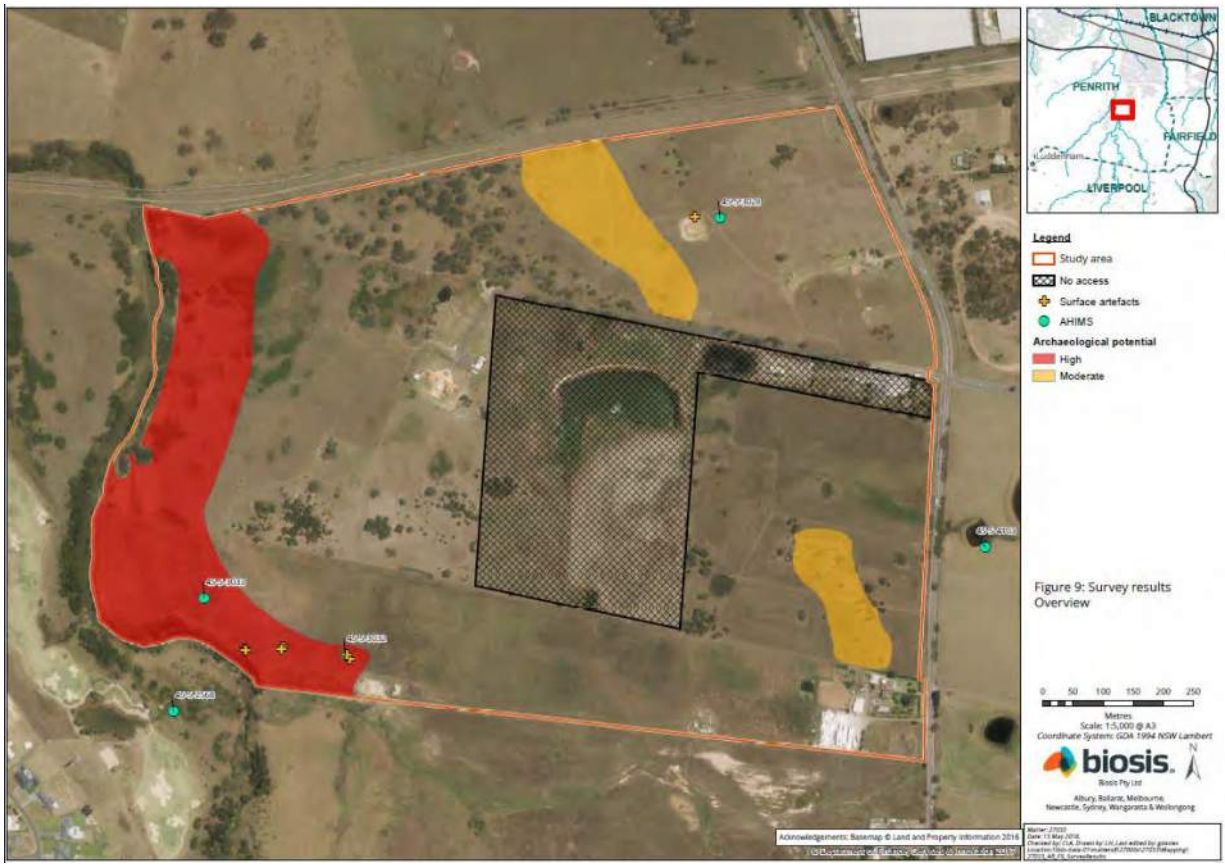


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
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- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
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Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
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Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

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Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

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DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

13 November 2018

Yulay Cultural Services
Arika Jalomaki
15 Rowley Place
Airds NSW 2560

Dear Arika,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

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The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm11 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

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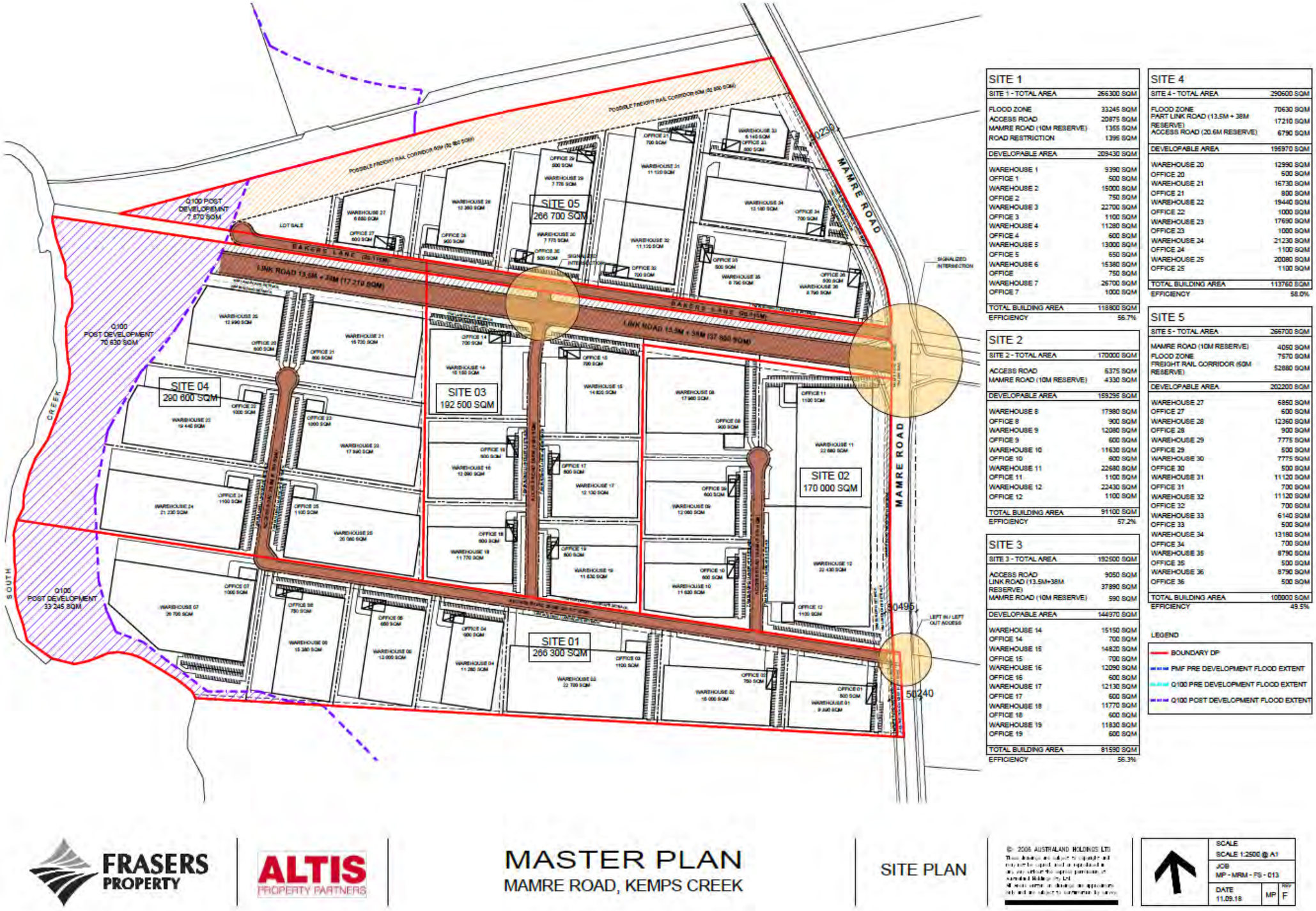
Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

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- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
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  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
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- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

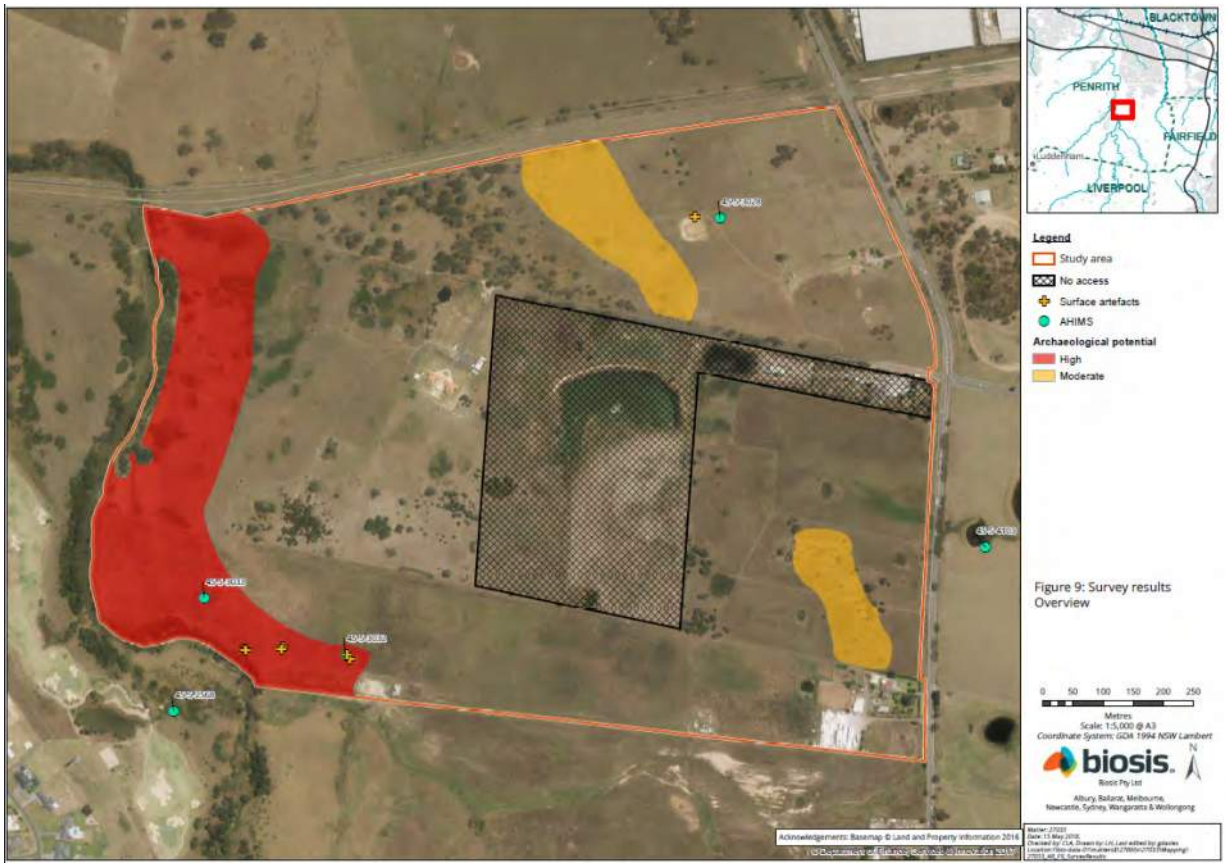


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

13 November 2018

Yurrandaali Cultural Services
Bo Field
11 Waterhouse Place
Airds NSW 2560

Dear Bo,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm11 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

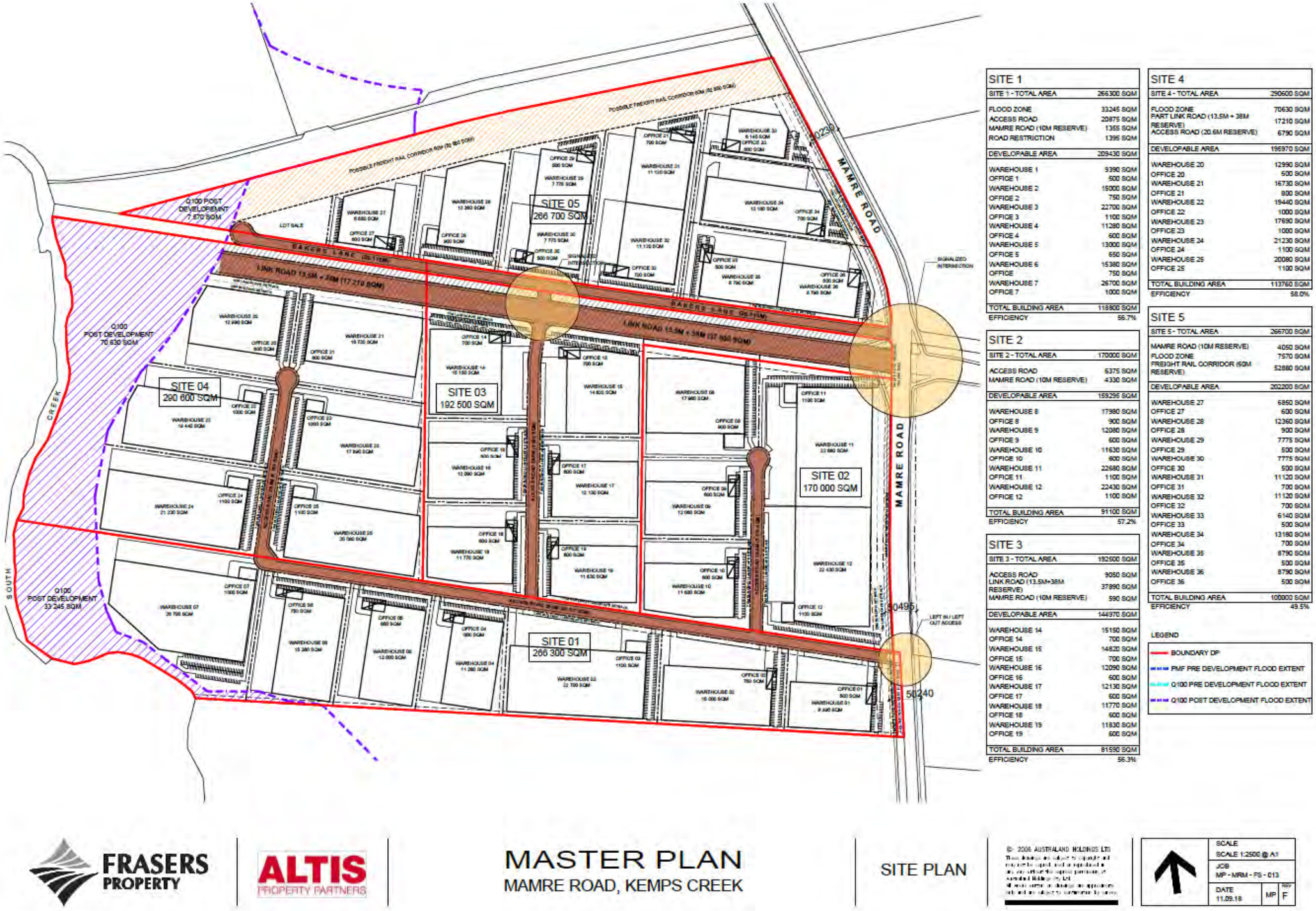
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

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Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

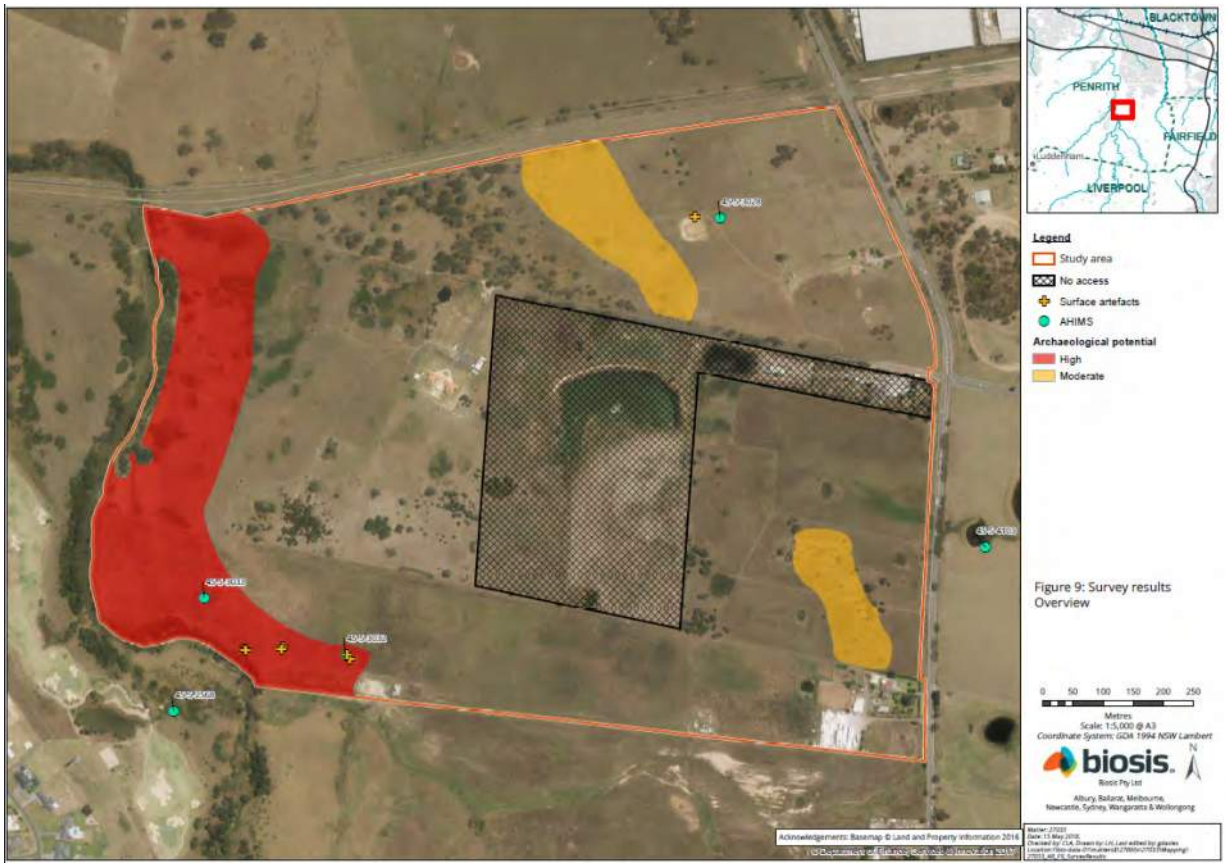

Plate 1 Survey results

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DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

13 November 2018

Darug Tribal Aboriginal Corporation
Dirk Schmitt
PO box 441
Blacktown NSW 2148

Dear Dirk,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

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If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

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Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

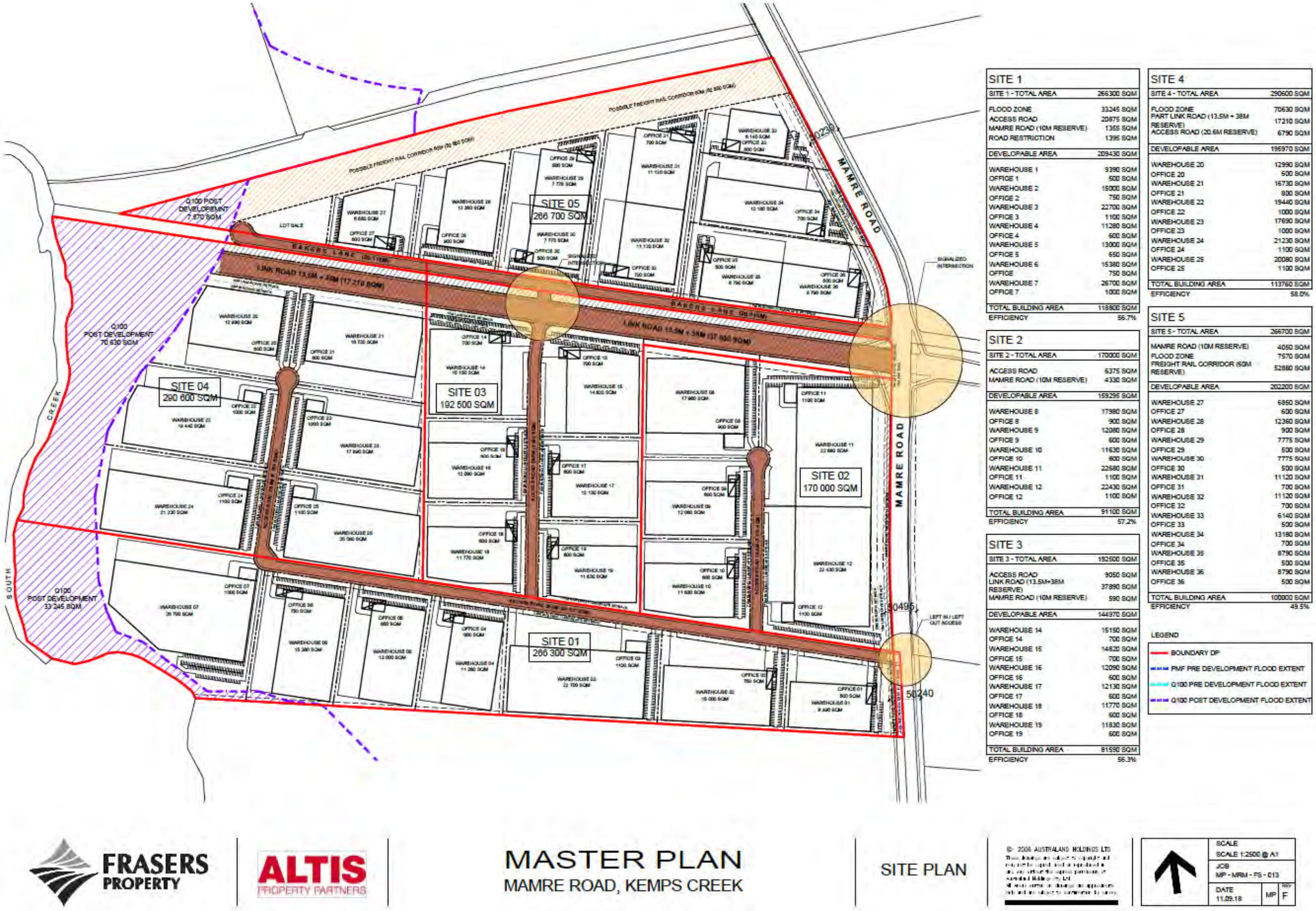
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

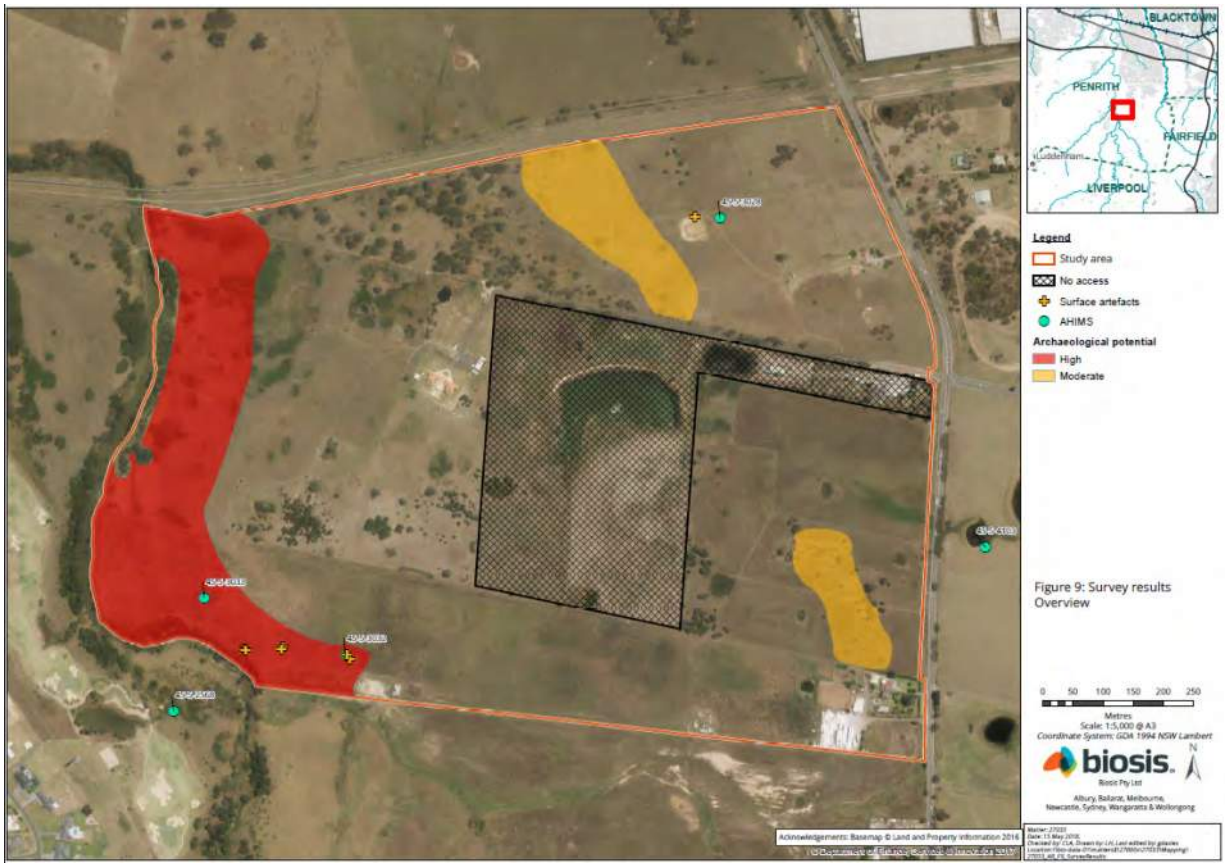


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

13 November 2018

Deerubbin Local Aboriginal Land Council
Steven Randall
PO Box 40
Penrith NSW 2751

Dear Steven,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm11 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

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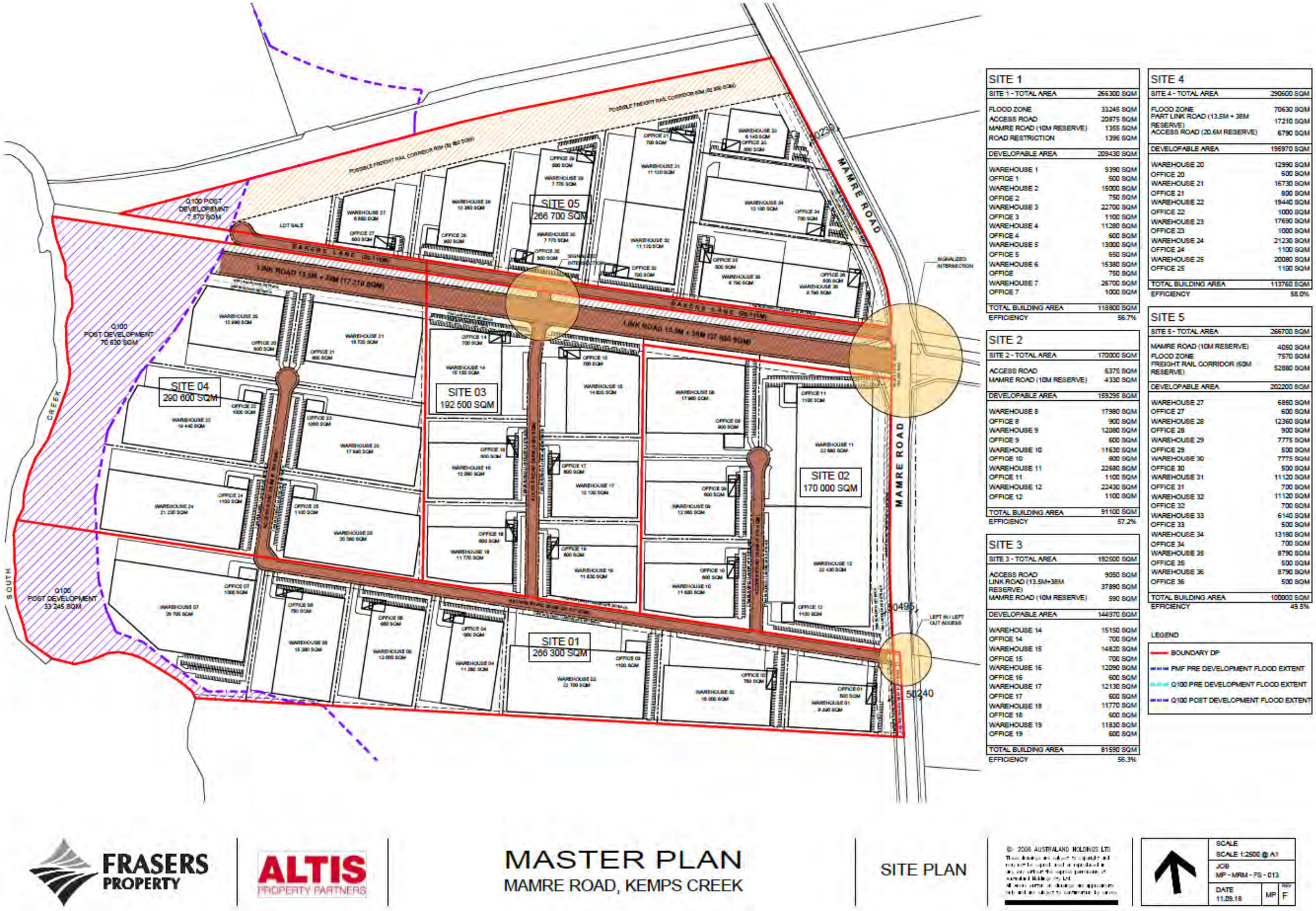
Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
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Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
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- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

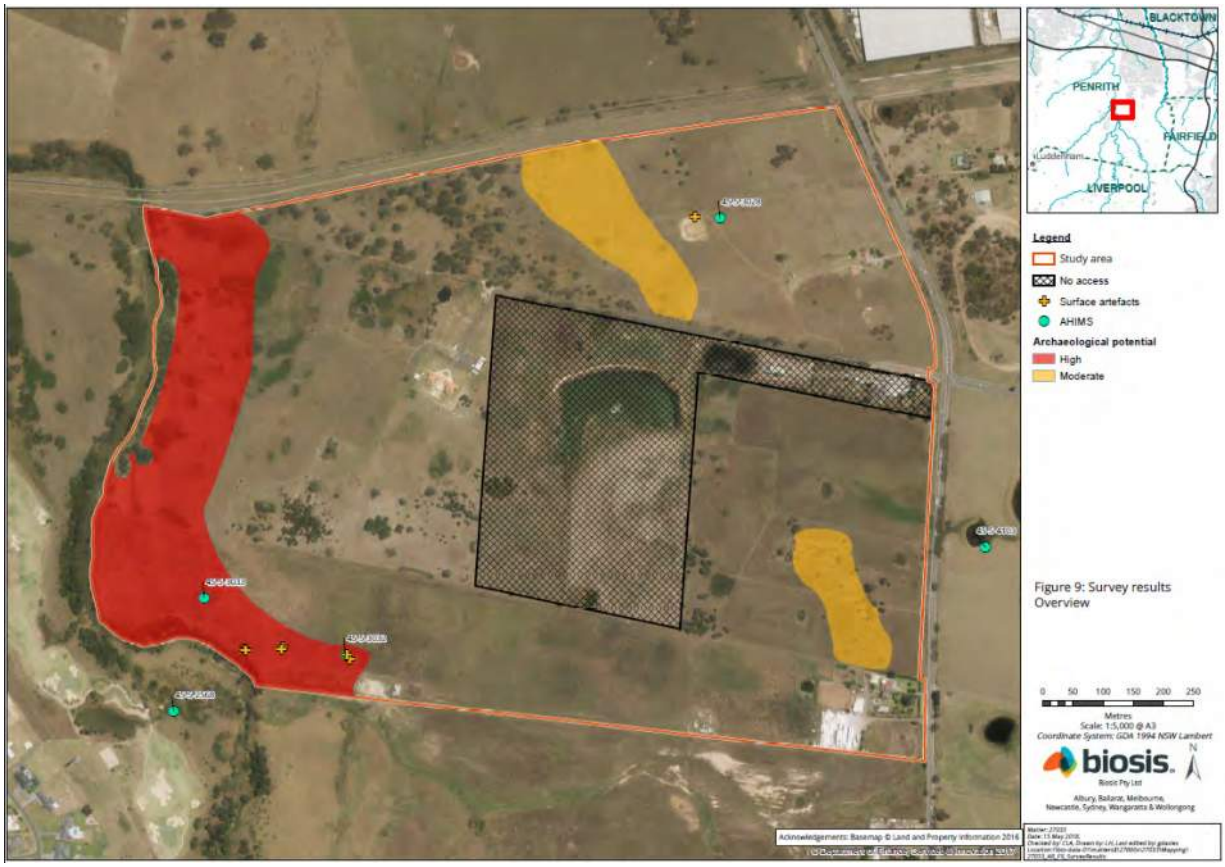

Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
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- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

13 November 2018

Wurrumay Consultancy
Kerrie Slater
89 Pyramid Street
Emu Plains NSW 2750

Dear Kerrie,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

The purpose of the methodology document is to provide you with further information on the background of this assessment, as well as the methodology for how it will be conducted, including any test excavations should they be required.

Please note that comments on the project methodology pack should be received before **4 pm11 December 2018**.

As this project will involve test excavations, the purpose of the second letter is to invite your feedback on the proposed project information and methodology packs, and to assist the proponent in the programing of groups for participation in the test excavations which will be carried out within the study area.

If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

Study area

The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

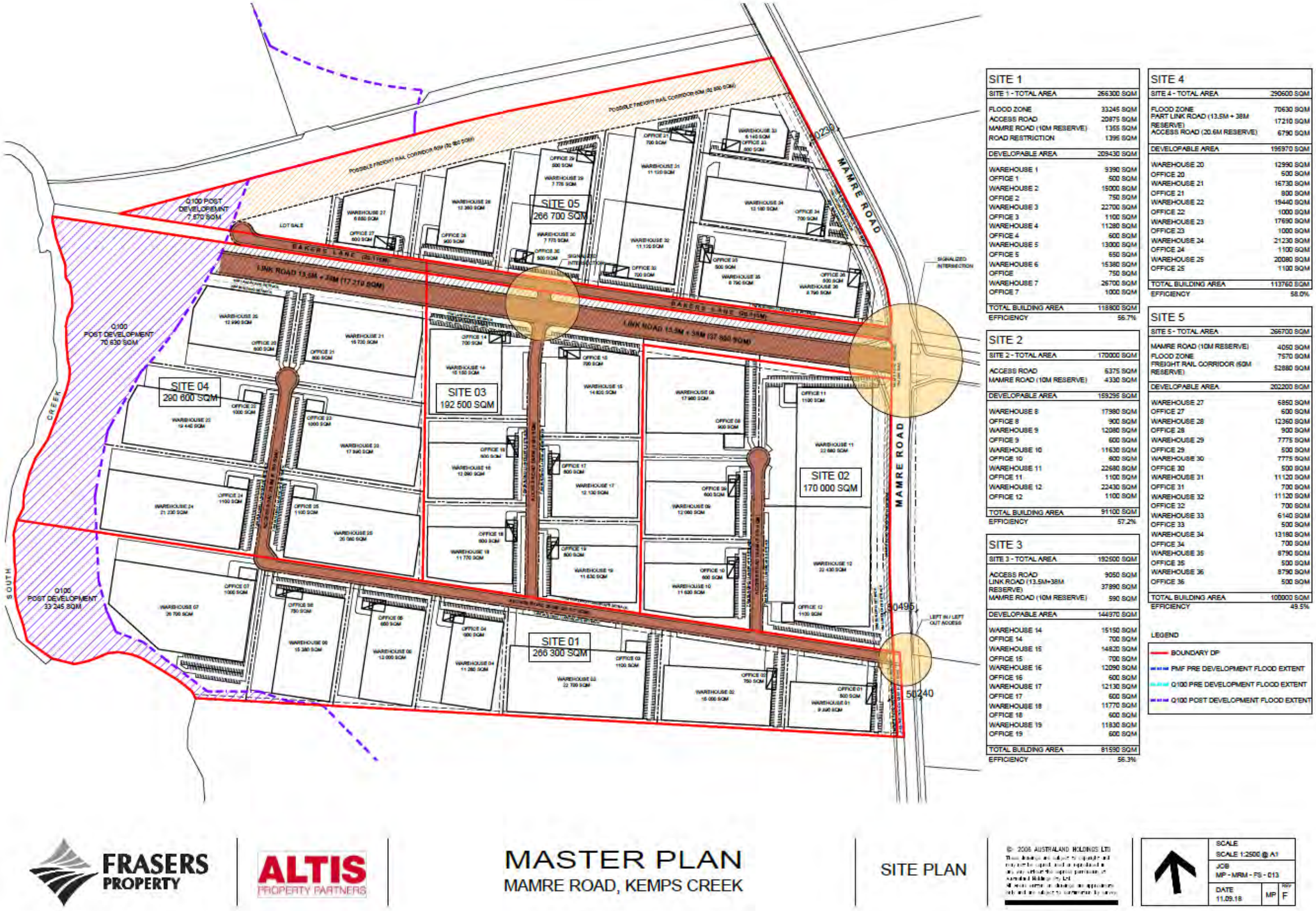
Project

This assessment is being formulated to assess impacts with regard to the SSD application. The proposed impacts under this proposal will include estate works consisting of vegetation clearing, bulk earthworks, subdivision and civil engineering works (for example road, stormwater, sewer and water supply works) and several buildings.

The proposed works are shown in Figure 1. The project will be assessed as a State Significant Development under Section 89(c) of the *Environmental Planning and Assessment Act 1979* and Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*. The project will be assessed by the Planning Assessment Commission (PAC) under delegation from the Minister of Planning.

Biosis Pty Ltd is assisting Altis and Frasers with consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community will follow the consultation requirements. The purpose of the Aboriginal community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment (ACHA).

Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

- Conduct heritage register searches to identify previously recorded cultural heritage sites in or within the vicinity of the proposed study area. Searches will include the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, Commonwealth Heritage List, Register of the National Estate, State Heritage Register, Local Environmental Plan and National Trust heritage lists.
- Conduct additional background research in order to recognise any identifiable regional trends in site distribution and location and provide a site prediction model for the study area.
- Undertake a comprehensive survey of the study area, identifying any previously recorded sites (on AHIMS).
- Record and assess sites identified during the survey in compliance with the guidelines issued by the OEH.
- Assess the scientific significance of all identified Aboriginal cultural heritage sites and places.
- Identify impacts to all identified Aboriginal cultural heritage sites and places based on potential ground disturbance from the proposed works.
- Make recommendations to minimise or mitigate potential impacts of the proposed works upon cultural heritage values within the study area.

Consultation with the Aboriginal community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and input into management options.

Consultation with Aboriginal stakeholders under the consultation guidelines is being undertaken to assist NSW Government by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s) within the study area.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects(s) and/or place(s) within the study area.
- Actively contributing to the development of cultural heritage management plan options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed study area.

- Commenting on the draft assessment reports before they are submitted by the proponent to the determining authority of the proposed realignment.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements which includes:

- **Completed:** Ascertaining the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the proposed study area. This would include writing to the following:
  - Office of Environment and Heritage (OEH)
  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
  - National Native Title Tribunal (NNTT)
  - Native Title Services Corporation Limited (NTSCORP Limited)
  - Relevant Local Councils
  - Relevant Catchment Management Authorities.
- **Completed:** Biosis will undertake the 'Placement of Notification' (Public Notice) in *The Daily Advertiser*, on behalf of SINSW, that must include details of the proponent, the project, the exact location, and statement of the purpose of the community consultation in preparation for possible test excavations. The Public Notice is also an invitation for Aboriginal people who hold relevant cultural knowledge about the study area. A closing date for the registration must be included and be no less than **14 days**. **Registration closed on 7 November 2018.**
- **Completed:** Aboriginal people or groups identified would be provided with notification of the proposed project via Biosis and given the opportunity to be involved in consultation. **Registrations of interest closed on 7 November 2018.**
- A list of Aboriginal people or groups who register an interest in the project will be forwarded to the OEH and the LALC by Biosis no later than **28 days** following close of registration. This list will not include those people or groups who specified that they did not want their details shared with OEH or the LALC.
- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
- Selected representatives of the registered Aboriginal parties will be given the opportunity to participate in test excavations within the study area.
- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

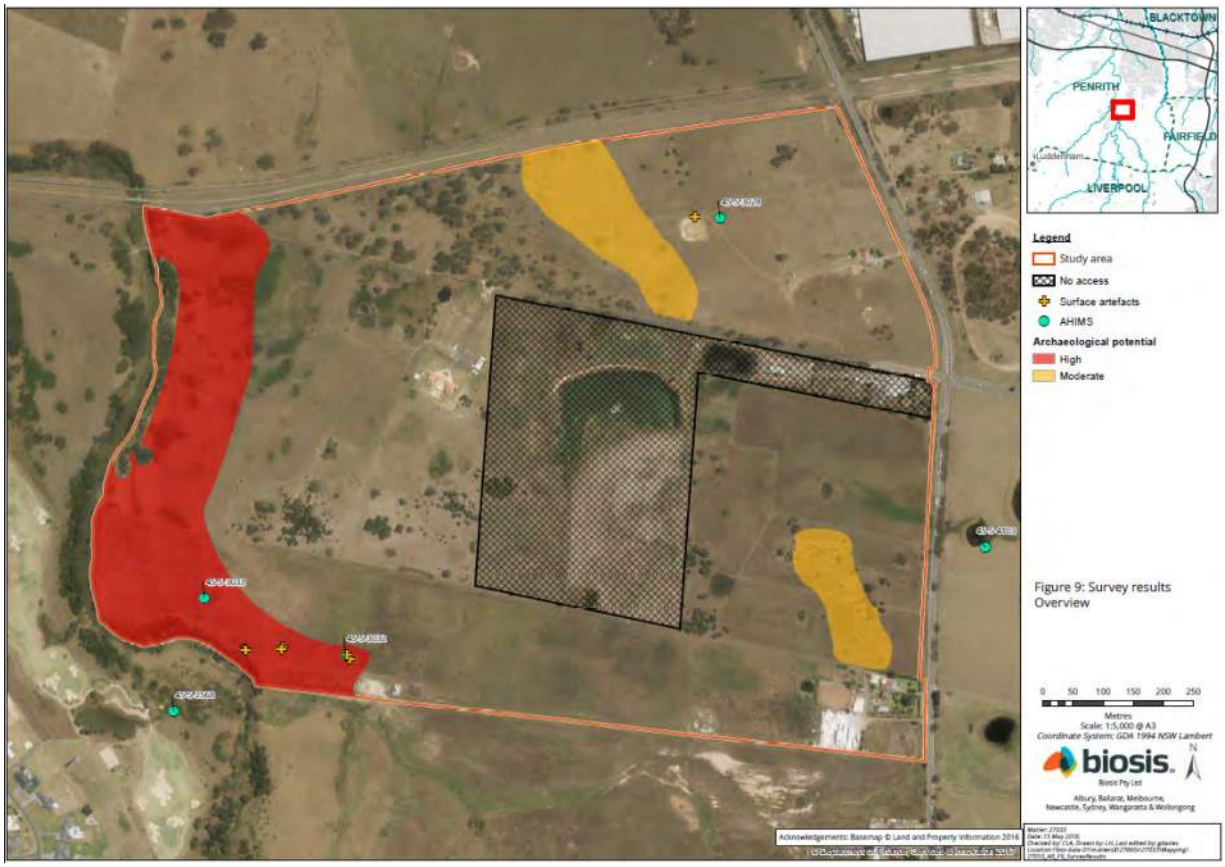


Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
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Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

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Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

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DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

13 November 2018

Phil Khan
78 Forbes Street
Emu Plains NSW 2750

Dear Phil,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 2: Project Information

Our Ref: Matter 27033

Thank you for your registration of interest in this project. We are writing to you in order to provide you with the project information and methodology packs for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW). This information has been provided in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

In this letter you will find the project information pack, and attached to this mail out is the following document: *Biosis 2018. Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Project methodology.*

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If you have any queries regarding the project or the information in this letter, please don't hesitate to contact Biosis at the email address below.

Yours sincerely,

James Cole

Consultant Archaeologist
jcole@biosis.com.au

Project information

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide registered Aboriginal parties with information about the proposed project and the scope of the Aboriginal archaeology and cultural heritage investigations and assessment.

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The study area consists of five lots immediately to the south of the Warragamba water pipeline on the western side of Mamre Road, from 657-769 Mamre Road Kemps Creek NSW 2178. It includes Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

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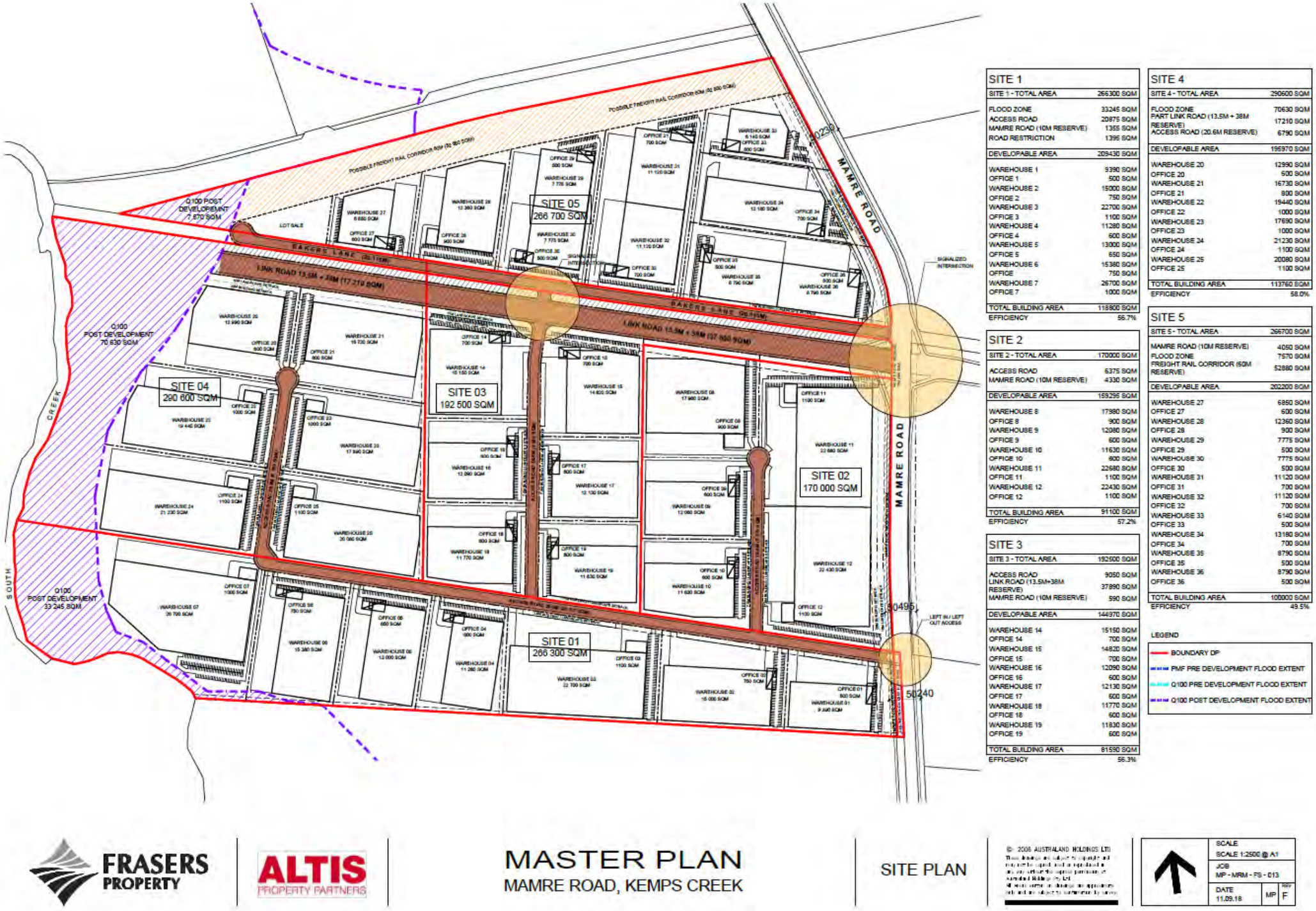
Figure 1 Proposed development master plan (Altis Property Partners and Frasers Property, September 2018)



Aboriginal cultural heritage assessment process

The assessment process includes the following steps:

Background research

Background research has been undertaken in order to identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment area. Background research will be conducted in line with the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the code'). Background research for the project included the following tasks:

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  - Local Aboriginal Land Council (LALC)
  - Office of the Registrar (Aboriginal Land Rights Act 1983)
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- Biosis will provide details of the project and methodology for the archaeological assessment to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of the Biosis providing the methodology document.
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- The DRAFT ACHA and Archaeological Report will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.

Field survey

An Aboriginal archaeological survey of the assessment area has been undertaken in accordance with the guidelines outlined in the code in order to identify any previously unknown Aboriginal objects, sites or places, should they be present. Identified sites were recorded to the standard set by OEH.

Known sites identified by the AHIMS search which are within the assessment area were inspected to determine their current condition. Biosis' assessment identified four Aboriginal sites within the study area, and three areas of archaeological potential as outlined below and shown in Plate 1.

MSP-01 (AHIMS# Pending)

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

MSP-02 (AHIMS# Pending)

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of two silcrete complete flakes.

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

MSP-03 (AHIMS# Pending)

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammerstone (Plate 15, Plate 16).

The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

MSP-04 (AHIMS# Pending)

MSP-04 consists of an artefact site located across a flat within Lot 22 DP 258414. A total of three stone artefacts recorded. These artefacts consisted of one silcrete complete flake, one silcrete proximal flake fragment, and one fragment of debitage. Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context (Plate 17, Plate 18). This site was recorded at the AHIMS location of EPTA10 (AHIMS#45-5-3032), however based on the context presented in Section 3.2.4, it is unlikely that the two sites are associated.

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

EPTA3 (AHIMS# 45-5-3028)

EPTA3 consists of an archaeological deposit approximately 50 metres east of a dam within Lot 34 DP 1118173, adjacent to an informal access track. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

EPTA10 (AHIMS# 45-5-3032)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer; however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location

EPTA11 (AHIMS# 45-5-3033)

EPTA10 consists of an archaeological deposit within Lot 22 DP 258414. As the site card for this site lacks significant detail, it is not possible to provide further information on the artefacts which were identified here by Navin Officer, however it is considered likely that this site has been recorded at the incorrect location, and is actually present to the north-east of the study area as outlined in Section 3.2.4. The site location of this site was revisited as a part of this survey, however no evidence was identified of test excavations having occurred at that location.

Areas of archaeological potential

The survey identified a number of areas which are considered to have the potential to retain subsurface archaeological deposits. Previous assessments within the local area have identified archaeological potential across the banks of higher order creeklines, at the confluences of two or more creeklines, levees, and other rises above the surrounding floodplain.

Landforms matching this description were targeted as a part of the archaeological survey. Owing to the relatively low relief of the study area, with an overall gradient of approximately 0.92%, these often consisted of low rises which form localised high points adjacent to resource gathering zones.

The largest area of potential identified with this study area is located along its western boundary along the banks of South Creek. Given its proximity to the creekline, which is the largest perennial water course locally, it is considered that this area would have been a favourable location for camping. In addition to this, archaeological deposits have previously been identified locally in similar contexts to those identified within the study area, and within the South Creek Soil Landscape. The location of this area as an elevated rise over South Creek would have made it a good location for Aboriginal camping.

An area of archaeological potential has also been identified within Lot 34 DP 1118173. This area is located across a low rise to the east of a large open depression, which based on the variety of vegetation within it appears to be at least periodically inundated. This open depression would provide a good resource gathering zone, while the slightly elevated area to its east would lay above the inundated area and would have provided a more favourable camping location. This area of archaeological potential is located at the mapped interface of the South Creek and Blacktown Soil Landscapes, with the majority of previously identified PADs locally recorded within the Blacktown Soil Landscape.

An area of archaeological potential was identified within Lot Y DP 421633. Locally this appeared to be a higher point within the study area with a good outlook to the west toward South Creek. Immediately to the west are lower lying areas which may have held water periodically, although the hydrology of this area has been heavily impacted by the excavation of dams within Lot X DP 421633.

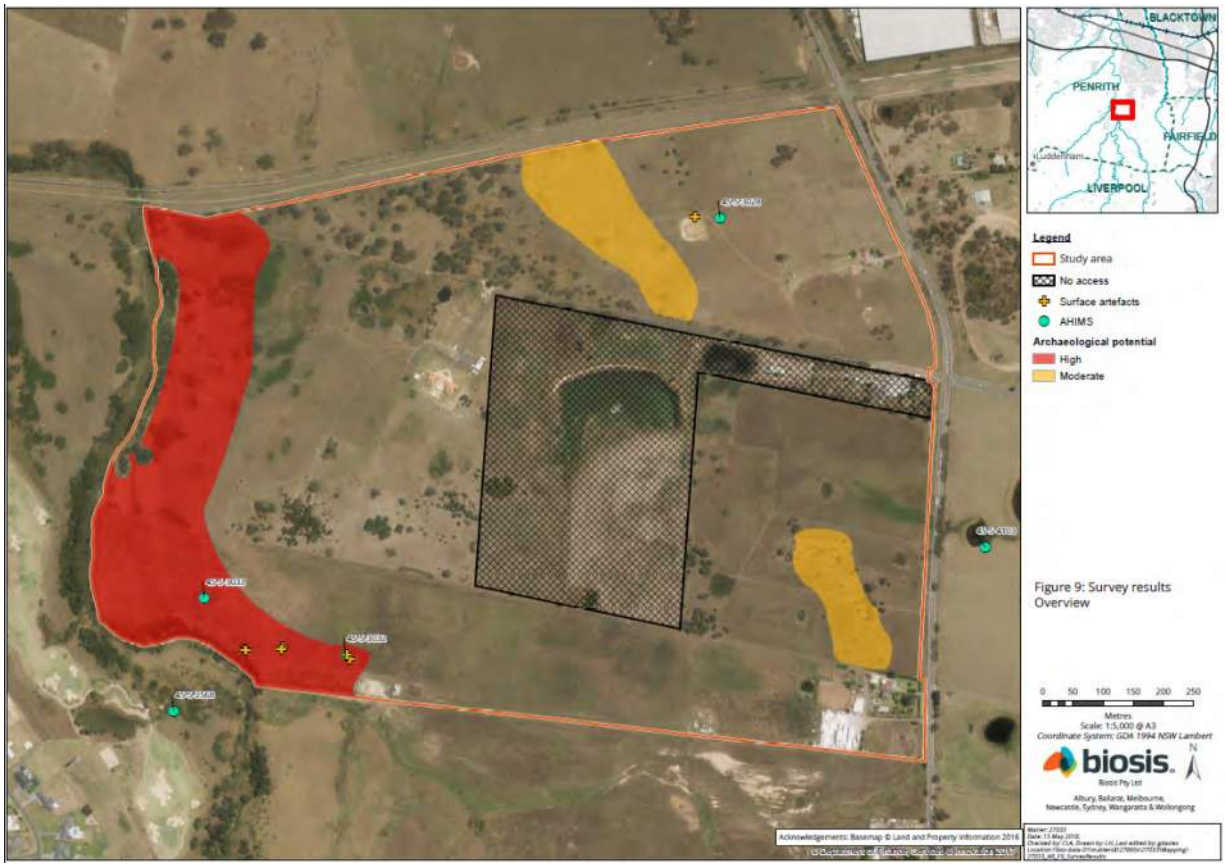

Plate 1 Survey results

Test excavation

The survey has identified the need for further assessment in the form of test excavations, this will be undertaken in accordance with the code. Further information on the methodology for this test excavation and the areas of potential archaeological deposit within the study area is available in the project methodology.

Reporting

A draft report will be prepared in accordance with the code and will include:

- background and project description
- a summary and analysis of the findings including the presence and location of registered or new identified Aboriginal artefacts or heritage items within the study area
- a summary of any other relevant studies or surveys which have relevance to the assessment area
- a summary of the landscape features of the site which may indicate a history of Aboriginal activity
- a summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape
- the potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects
- survey and test excavation results (if required)
- legislative implications of the proposed works
- recommendations and justification for further assessment (if required)
- mitigation measures (if any) required for the works to proceed
- mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

Registered Aboriginal parties will be provided with the draft report for comment and allowed 28 days for review.

The final report will incorporate all comments.

Project schedule

The proposed schedule and broad time allocations for the consultation stages are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community consultation – advertising of project, Notification to stakeholders etc.	Completed	Project advertised in *The Daily Advertiser* on 9 October 2018; notices sent to stakeholders 3 October 2018.
Aboriginal stakeholder registration period	Completed	Registration period ran from 24 October 2018 to 7 November 2018.
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work	8 November 2018 to 6 December 2018	28 days review time allowed under OEH Aboriginal community consultation guidelines.
Test excavations	TBC	Dependent on results of archaeological survey
Information gathering		Until finalisation of the report

Action	Timeframe	Notes
Review of the draft report	TBC	28 days review time allowed under OEH Aboriginal community consultation guidelines
Completion and finalisation of report	TBC	

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are invited to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010a, p.16). Biosis and the proponent, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process (DECCW 2010a, pp.16–17).

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

Appendix 4 Stage 3: Gathering information about cultural significance

Stage 3: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment: Methodology

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide RAPs with the proposed methodology for the cultural heritage and archaeological assessment.

Assessment methodology

An archaeological survey was undertaken at an earlier stage of the project prior to the commencement of Aboriginal consultation, attended by two Biosis archaeologists and a representative of the Deerubbin Local Aboriginal Land Council.

Aims of the survey

The principle aims of the survey were to:

- Provide RAPs an opportunity to view the study area and to discuss previously identified Aboriginal object(s) and/or place(s) in or within close proximity to the study area.
- To undertake a systematic survey of the study area, while targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.

Survey methodology

The survey methods are intended to assess and understand the landforms and to determine whether any archaeological material from Aboriginal occupation or land use exists within the study area. Identification of natural soil deposits within the study area will be undertaken if possible. Photographs and recording techniques will be incorporated into the survey including representative photographs of survey units, landforms, vegetation coverage, ground surface visibility and the recording of soil information for each survey unit. Any Aboriginal objects observed during the survey will be documented and photographed. No artefacts discovered during the survey component are to be removed from the site.

Recording during the survey followed the guidelines of the OEH, in particular the *Code of Practice for Archaeological Investigation of Aboriginal objects in New South Wales* (DECCW 2010b) (the code).

Specific information that was recorded during the survey includes:

- Aboriginal objects or sites present in the study area
- survey coverage
- survey effectiveness
- any resources that may have potentially been exploited by Aboriginal people
- landforms and general soil information
- photographs of the site indicating landforms
- evidence of disturbance

- Aboriginal artefacts, culturally modified trees, shell middens or any other Aboriginal sites.

Distinguishing landform elements and their association with Aboriginal cultural heritage assisted with the identification of site patterning, though with the awareness of the following limitations:

- The degree of ground surface visibility (GSV) and amount of exposed areas can significantly bias the discovery of surface artefacts.
- Cultural material exposed on the surface is not necessarily representative of the potential extent of the site (either horizontally or vertically).

Information about the presence of potentially exploitable resources helps contribute to predictions of the Aboriginal sites that may occur within the study area. Information about ground surface visibility, distance visibility and areas of exposures help to provide a general indication of the effectiveness of the survey for identifying Aboriginal cultural heritage exposed to the surface. Observable disturbances are also considered when assessing the integrity of known or potential sites in an area. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements will be recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

Test excavation methodology

As the survey identified areas of archaeological potential (shown in the project information document) which will be impacted by the proposed works. it will be necessary to complete test excavations in advance of the proposed development. Test excavations will be undertaken in accordance with the code as outline below.

Aims of the sub-surface test excavations

The principle objectives of the subsurface test excavations would be to identify and understand the nature, extent and significance of any archaeological sites located within areas of archaeological potential.

The aims of the testing program would be to:

- Determine whether sub-surface archaeological deposits exist which may be impacted by the development.
- To determine the extent and nature of such deposits (if present).
- Identify if the archaeological material occurs in an intact, undisturbed context, by examining the soil profile and stratigraphy.
- Analyse and interpret any archaeological finds (such as stone artefacts, shell midden deposits, etc.) recovered during the testing program.
- Inform current knowledge of Aboriginal occupation and land use models of the region.
- Provide management and mitigation measures for Aboriginal archaeological objects located during the subsurface testing program.

Test excavation sampling strategy

Test excavations across the study area would conform to the following methodology:

- Test excavations will be undertaken in areas identified as having the potential to contain Aboriginal cultural material.
- Test excavations will be conducted in 50 x 50 centimetre units.
- The test excavation units will be excavated by hand (inclusive of trowels, spades and other hand tools) along transects at intervals of between 10 – 20 metres or other justifiable and regular spacing (being no smaller than five metres).
- The first test pit within a site or Potential Archaeological Deposit (PAD) area will be excavated in five centimetre spits; the subsequent test pits conducted within the site or PAD area can then be excavated in either 10 centimetre spits or stratigraphic units (whichever is smaller) to the base of Aboriginal object-bearing units being the removal of the A-horizon soil deposit down to the sterile clay or bedrock layer (B-horizon).
- If the depth of deposit prevents reaching sterile deposits within the 50 x 50 centimetre test pit, additional 50 x 50 centimetre test pits may be excavated adjacent to the original test pit (for example expanding the test pit to 50 x 100 centimetres) to reach the sterile deposits.
- Test pits may be combined and excavated as necessary in 50 x 50 centimetre units for the purposes of further understanding site characteristics. Note that under the Code, the maximum area that can be excavated in any one continuous area is three metres squared (3 m^2).
- The Code dictates that the maximum surface area of all test excavation units must be no greater than 0.5% of the PAD or area being investigated.
- All excavated soil will be sieved in 5mm sieves. Dry sieving will be attempted in the first instance, however wet sieving may be used if deposits cannot be dry sieved.
- All cultural material will be collected, bagged and clearly labelled. They will be temporarily stored in the Biosis office for analysis (at Unit 14, 17-27 Power Avenue, Alexandria).
- The following documentation will be taken for the test pit:
    - unique test pit identification number
    - GPS coordinate
    - munsell soil colour, texture and pH
    - amount and location of cultural material within the deposit
    - nature of disturbance where present
    - stratigraphy
    - archaeological features (if present)
    - photographic records
    - spit records.

- The test excavation unit must be backfilled as soon as practicable due to safety issues.
- An AHIMS Site Impact Recording form will be completed and submitted to the AHIMS Registrar for any sites impacted during test excavations.
- In the event that suspected human remains are identified works will immediately cease and the NSW Police and OEH will be notified.
- Test excavations will cease when enough information* has been recovered to adequately characterise the objects present with regard to their nature and significance.

*Enough information is defined by OEH as meaning "the sample of excavated material clearly and self-evidently demonstrates the deposit's nature and significance. This may include things like locally or regionally high object density: presence of rare or representative objects: presence of archaeological features: or locally or regionally significant deposits stratified or not." (DECCW 2010b).

Storage of cultural material

Any cultural material identified during test excavations will be temporarily stored in the Biosis, Sydney office for analysis (Unit 14, 17-27 Power Avenue, Alexandria).

Once the cultural material has been analysed, the cultural material can be managed in the following manners:

- Cultural material can be held by the Aboriginal community under a care and control agreement.
- Cultural material can be returned to country and reburied as soon as practicable in a secure location in accordance with Requirements 16b and 26 of the Code of Practice.

Biosis requests any comments regarding the care and control of any cultural material be included as part of the review of this assessment methodology.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

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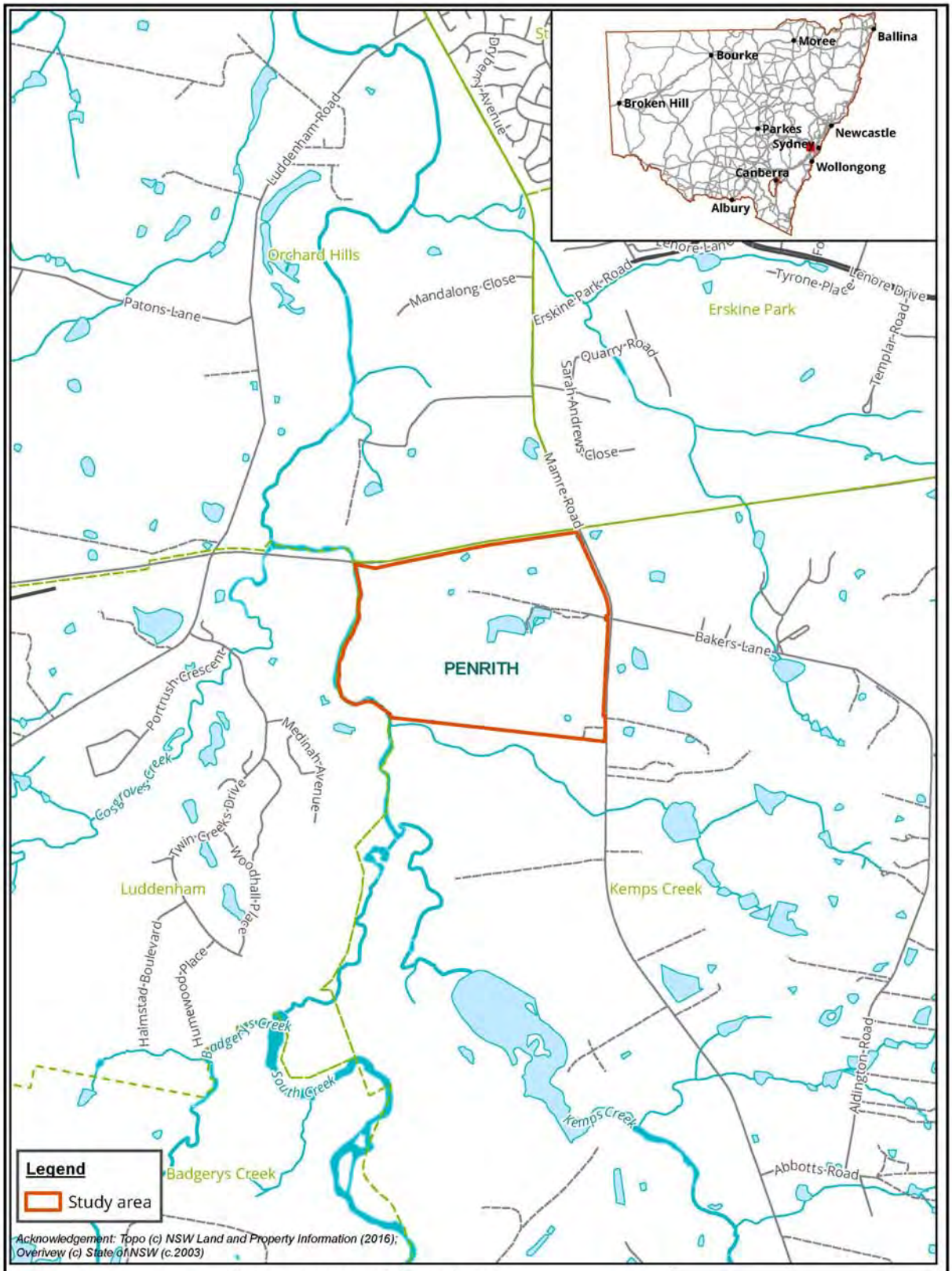

Figure 1: Location of the study area

Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
Date: 20 April 2018,
Checked by: SJK, Drawn by: LH, Last edited by: lwilson
Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

13 November 2018

Yulay Cultural Services

Arika Jalomaki

15 Rowley Place

Airds NSW 2560

Dear Arika,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

This letter is being provided to all the Registered Aboriginal Parties (RAPs) who registered their interest in the consultation process for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW) (Figure 1, Figure 2).

In accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements), we provide the proposed methodology for the Aboriginal Cultural Heritage Assessment (ACHA) for your review and feedback.

It would be appreciated if you would provide feedback on the methodology presented in this letter to Biosis Pty Ltd by **4 pm Tuesday 11 December 2018** either by email, phone or return mail.

Please address feedback on the methodology to:

James Cole
Biosis Pty Ltd
14, 17-17 Power Avenue
Alexandria NSW 2015
jcole@biosis.com.au

Please do not hesitate to contact me if you require additional information or have any queries about the methodology or information provided.

Kind regards,

James Cole

Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

biosis.com.au

Consultant Archaeologist

Stage 3: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment: Methodology

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide RAPs with the proposed methodology for the cultural heritage and archaeological assessment.

Assessment methodology

An archaeological survey was undertaken at an earlier stage of the project prior to the commencement of Aboriginal consultation, attended by two Biosis archaeologists and a representative of the Deerubbin Local Aboriginal Land Council.

Aims of the survey

The principle aims of the survey were to:

- Provide RAPs an opportunity to view the study area and to discuss previously identified Aboriginal object(s) and/or place(s) in or within close proximity to the study area.
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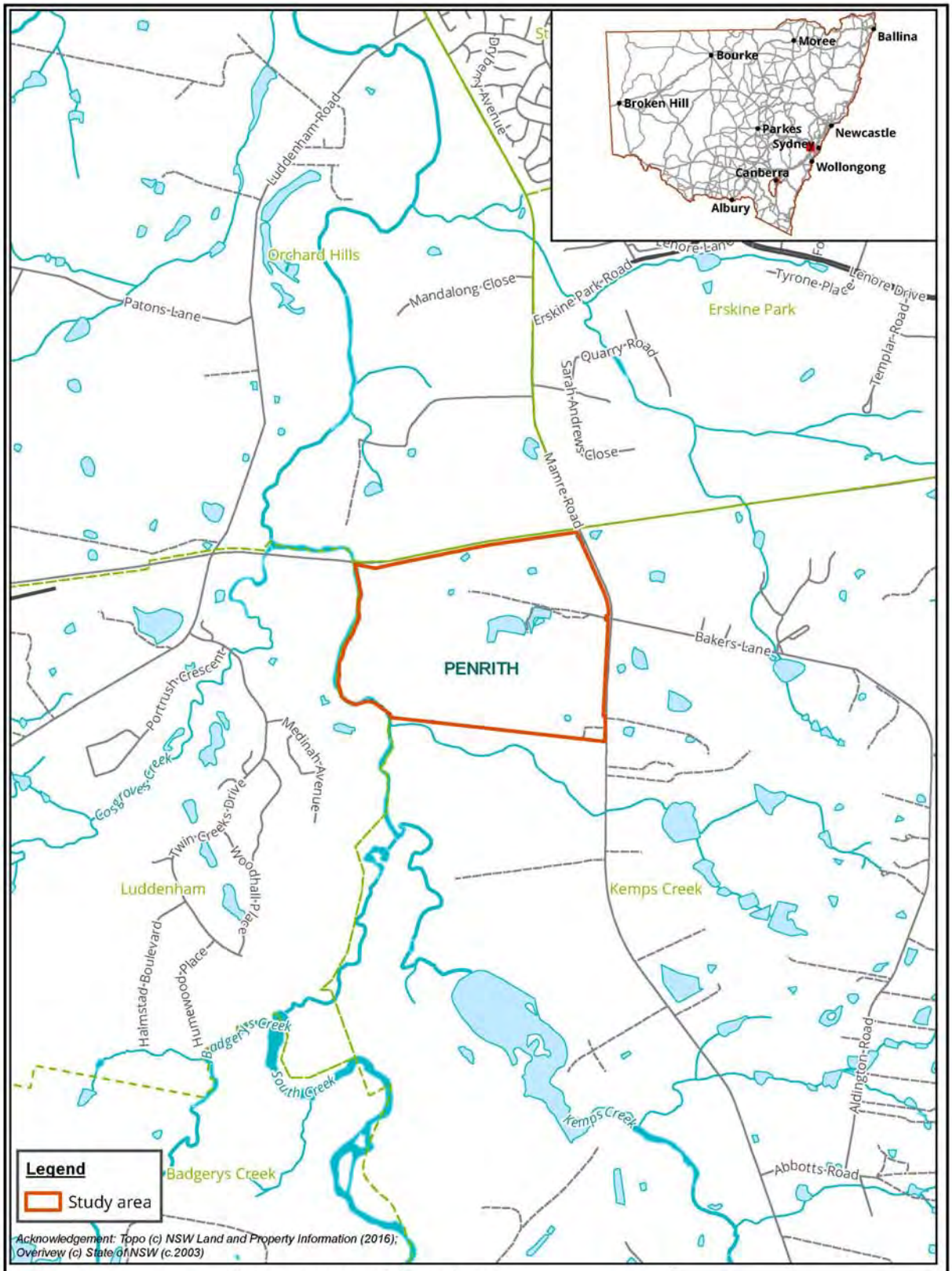

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13 November 2018

Yurrandaali Cultural Services

Bo Field

11 Waterhouse Place

Airds NSW 2560

Dear Bo,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

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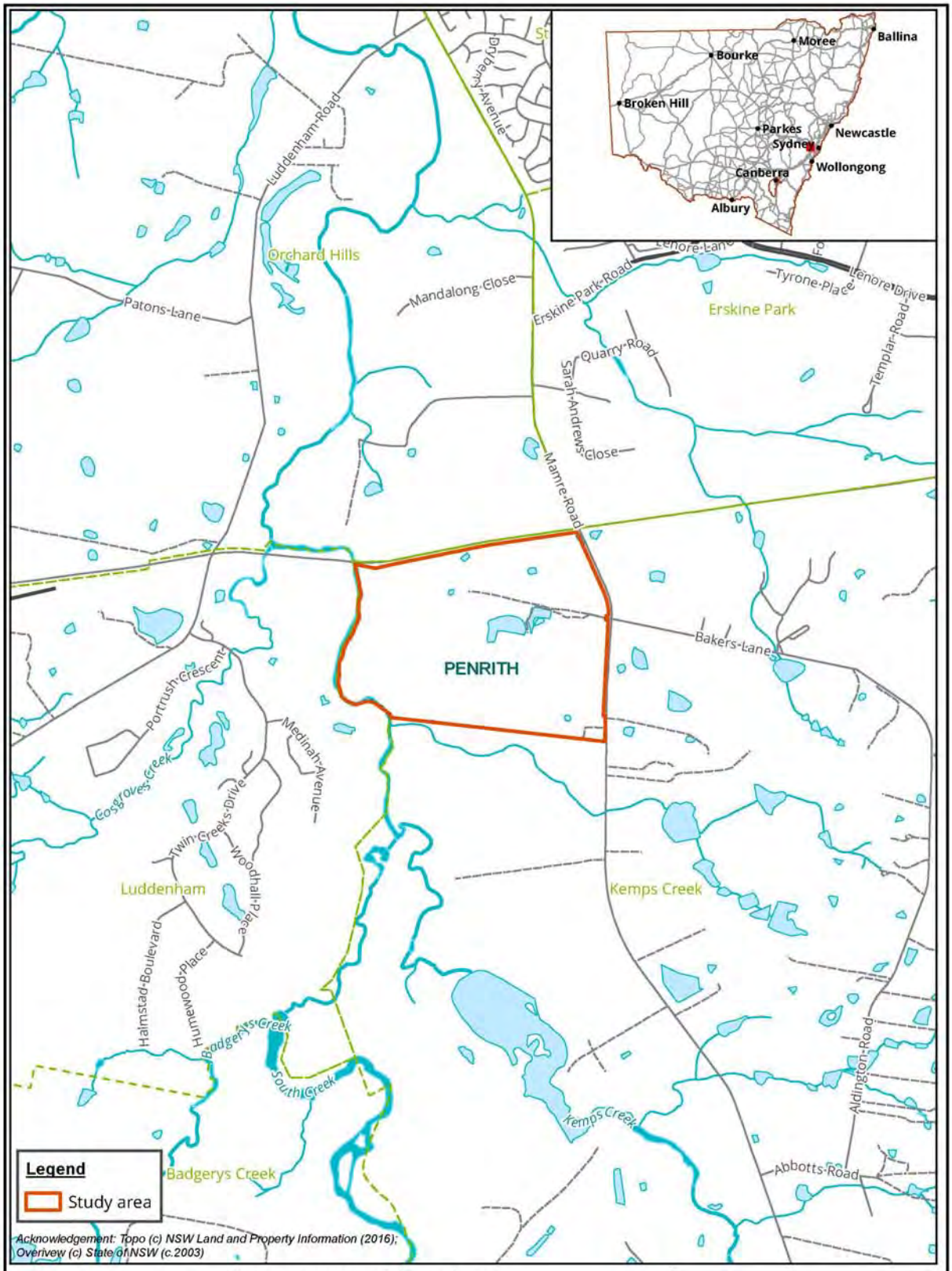

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Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
Date: 20 April 2018,
Checked by: SJK, Drawn by: LH, Last edited by: lwilson
Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

13 November 2018

Darug Tribal Aboriginal Corporation

Dirk Schmitt

PO box 441

Blacktown NSW 2148

Dear Dirk,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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14, 17-17 Power Avenue
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Biosis Pty Ltd
Sydney Resource Group

Unit 14, 17-27 Power Avenue
Alexandria NSW 2015

Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

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Consultant Archaeologist

Stage 3: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment: Methodology

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- survey coverage
- survey effectiveness
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- Aboriginal artefacts, culturally modified trees, shell middens or any other Aboriginal sites.

Distinguishing landform elements and their association with Aboriginal cultural heritage assisted with the identification of site patterning, though with the awareness of the following limitations:

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Information about the presence of potentially exploitable resources helps contribute to predictions of the Aboriginal sites that may occur within the study area. Information about ground surface visibility, distance visibility and areas of exposures help to provide a general indication of the effectiveness of the survey for identifying Aboriginal cultural heritage exposed to the surface. Observable disturbances are also considered when assessing the integrity of known or potential sites in an area. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements will be recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

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As the survey identified areas of archaeological potential (shown in the project information document) which will be impacted by the proposed works. it will be necessary to complete test excavations in advance of the proposed development. Test excavations will be undertaken in accordance with the code as outline below.

Aims of the sub-surface test excavations

The principle objectives of the subsurface test excavations would be to identify and understand the nature, extent and significance of any archaeological sites located within areas of archaeological potential.

The aims of the testing program would be to:

- Determine whether sub-surface archaeological deposits exist which may be impacted by the development.
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- Analyse and interpret any archaeological finds (such as stone artefacts, shell midden deposits, etc.) recovered during the testing program.
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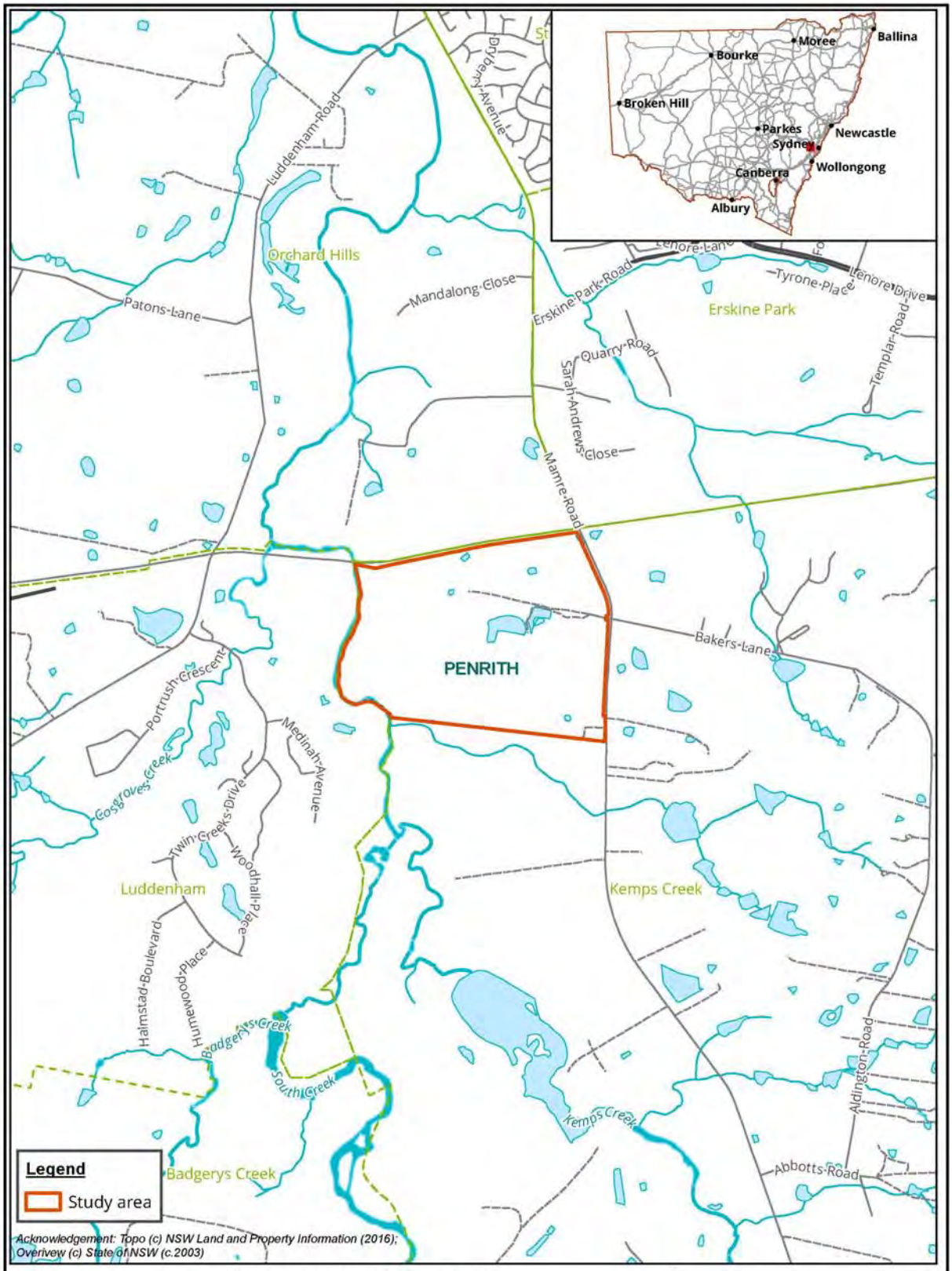

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Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

13 November 2018

Deerubbin Local Aboriginal Land Council

Steven Randall

PO Box 40

Penrith NSW 2751

Dear Steven,

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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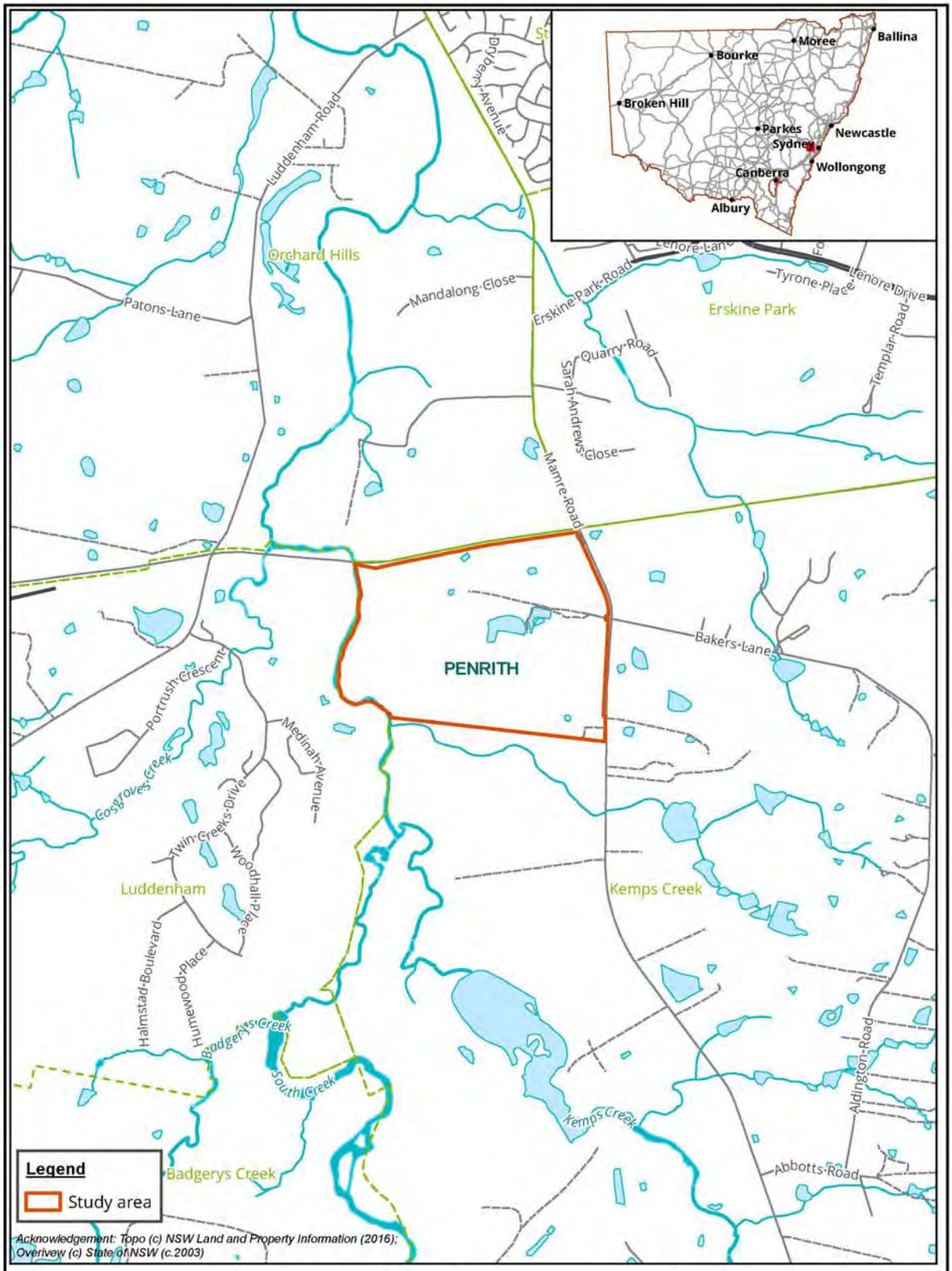

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13 November 2018

Wurrumay Consultancy

Kerrie Slater

89 Pyramid Street

Emu Plains NSW 2750

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RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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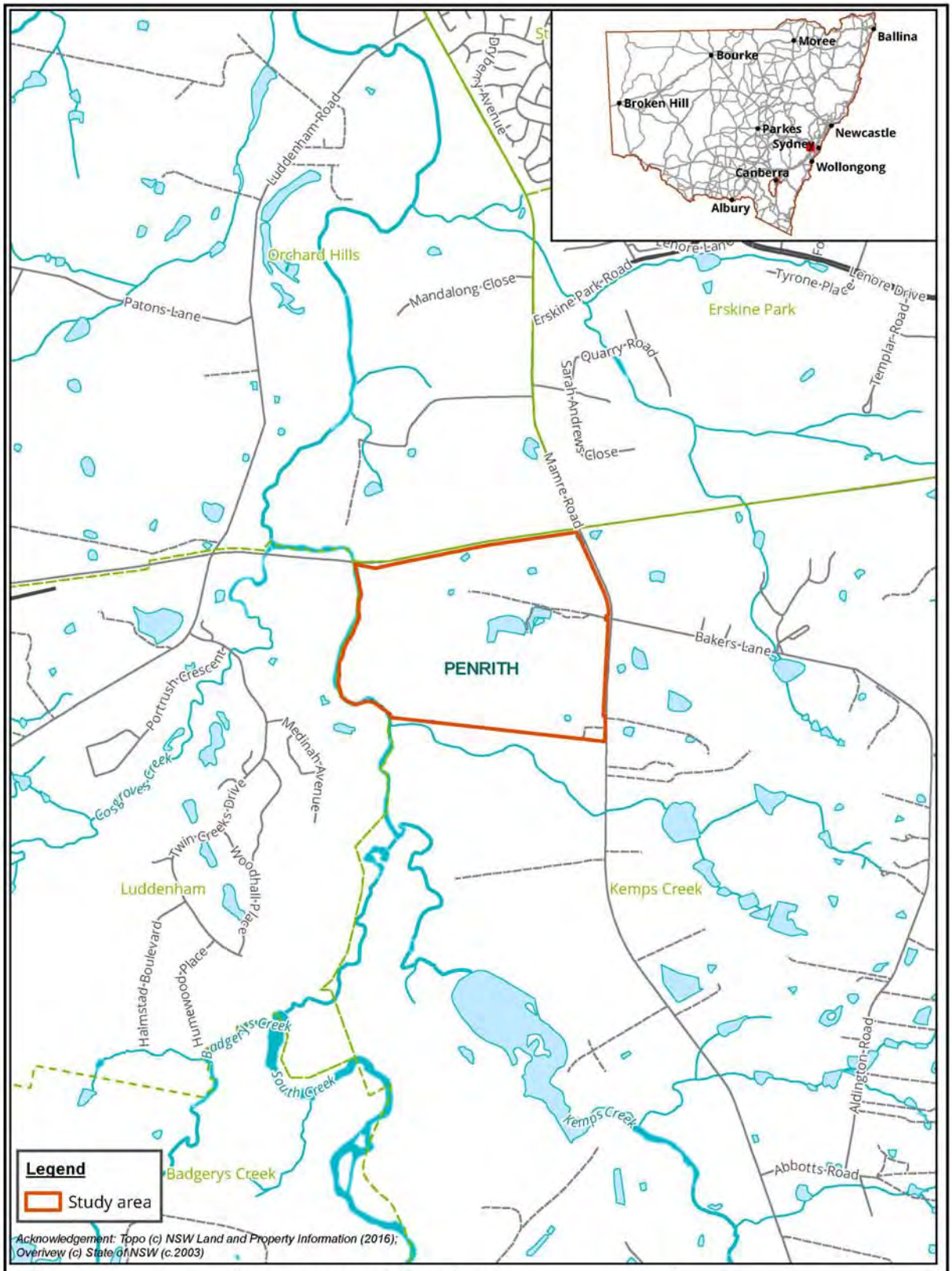

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13 November 2018

Phil Khan

78 Forbes Street

Emu Plains NSW 2750

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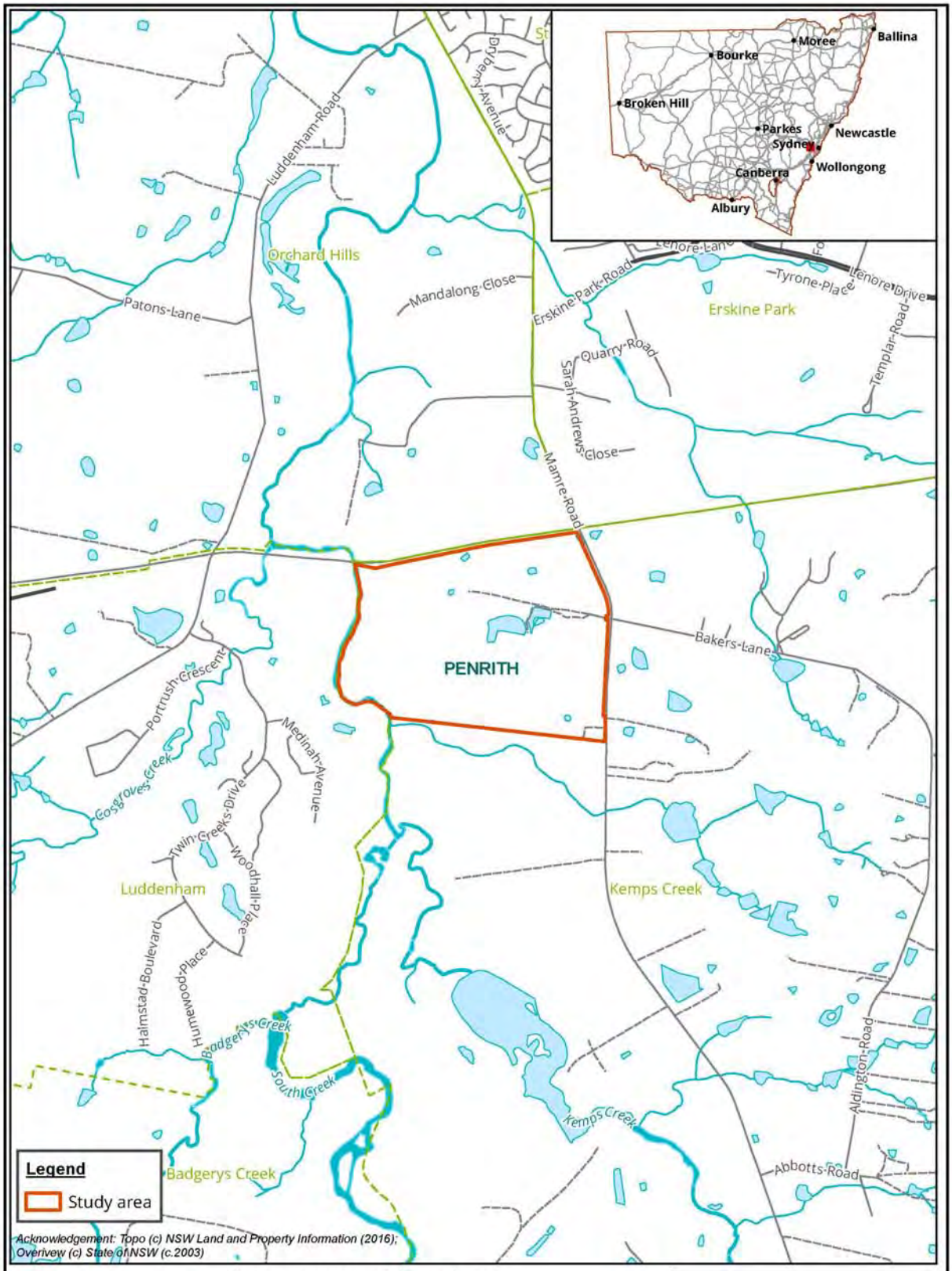

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Matter: 27033
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Figure 2: Study area detail

12 November 2018

Didge Ngunawal Clan

Lilly Carrol and Paul Boyd

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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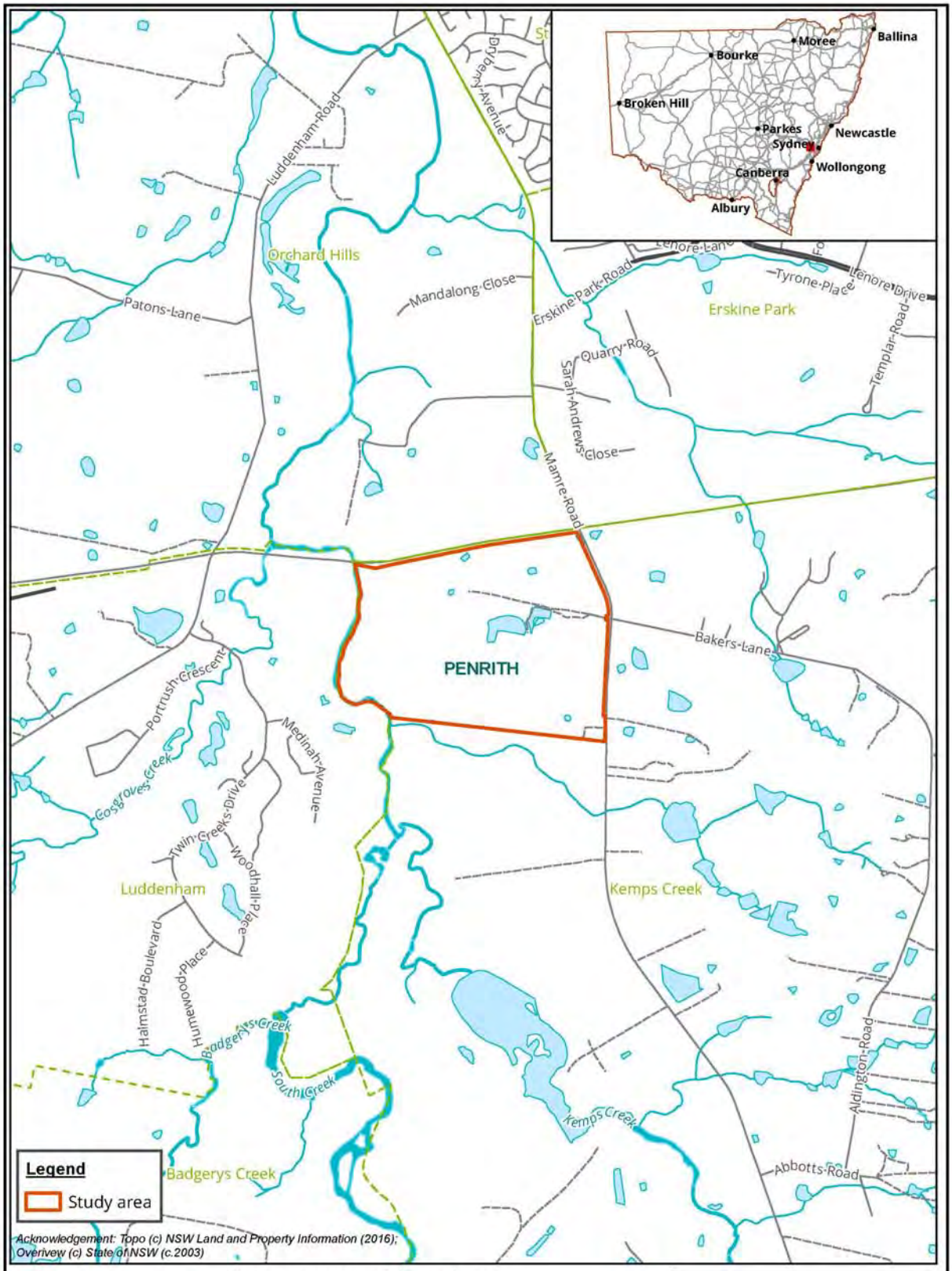

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Darug Boorooberongal Elders Aboriginal Corporation

Uncle Gordon Workman

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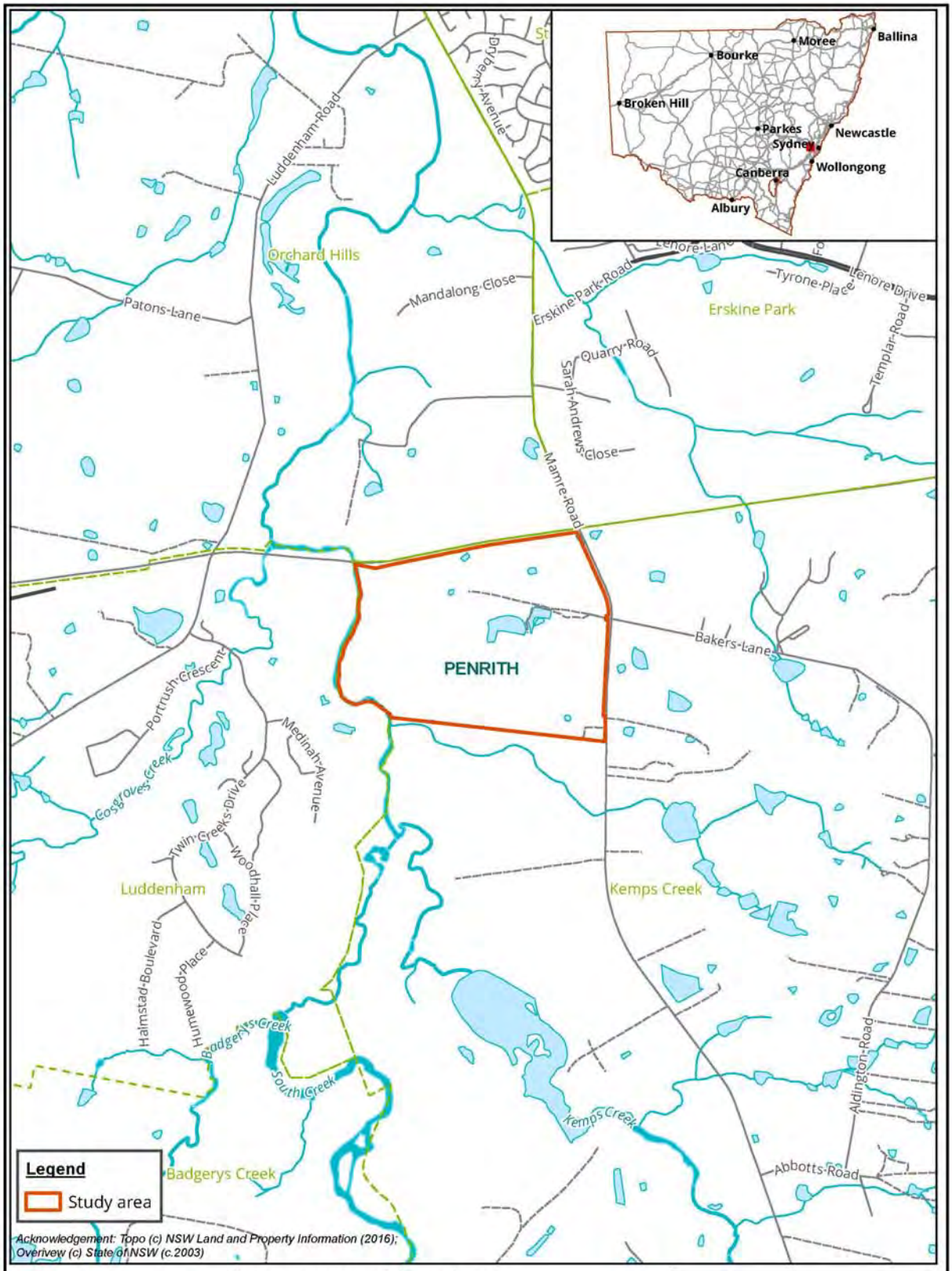

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Wailwan Aboriginal Digging Group

Philip Boney

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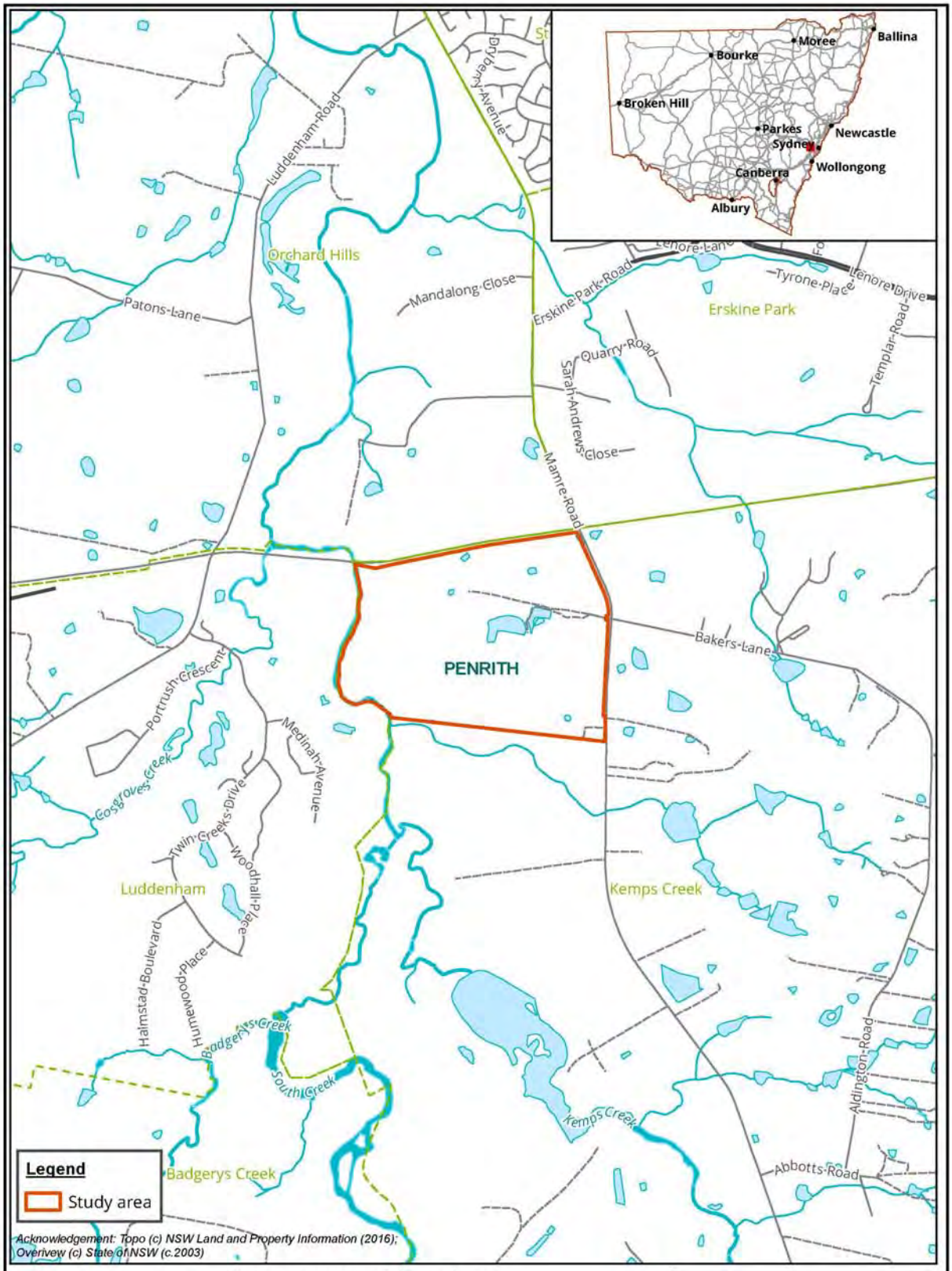

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Matter: 27033
Date: 20 April 2018,
Checked by: SJK, Drawn by: LH, Last edited by: lwilson
Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

12 November 2018

Darug Custodian Aboriginal Corporation

Justine Coplin

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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ACN 006 175 097
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Consultant Archaeologist

Stage 3: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment: Methodology

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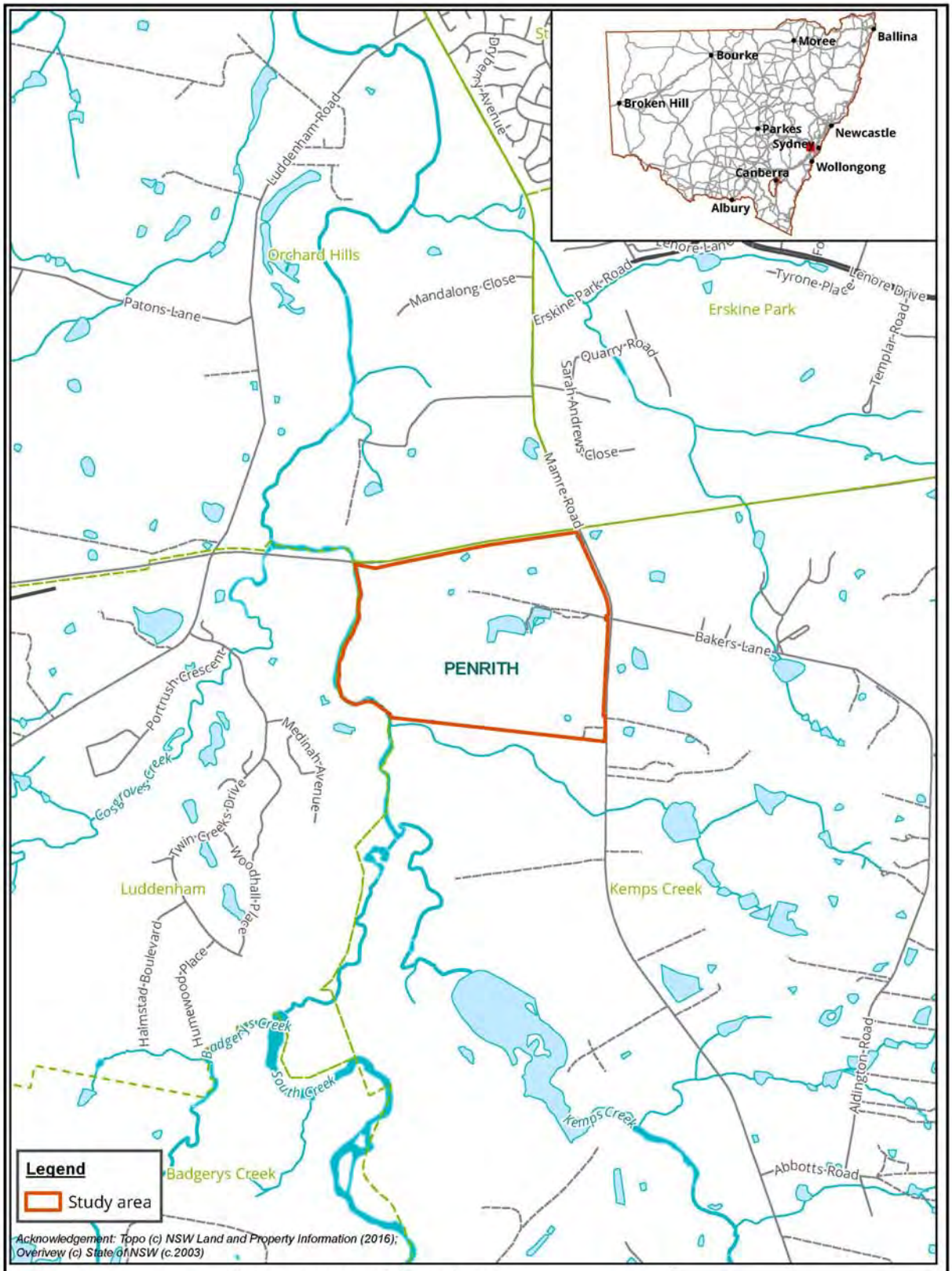

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12 November 2018

Darug Aboriginal Land Care

Desmond Dyer

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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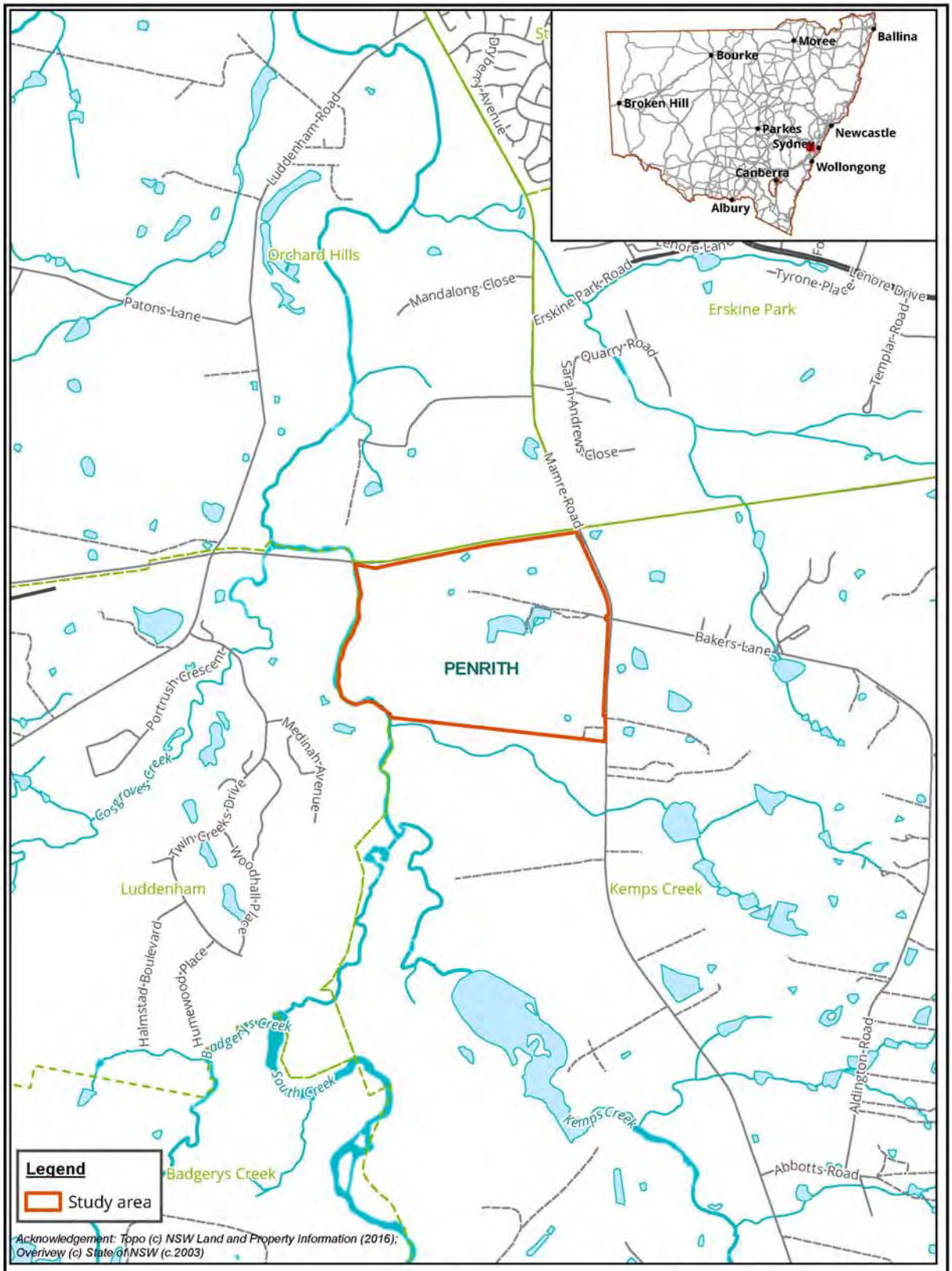

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12 November 2018

Gulaga

Wendy Smith

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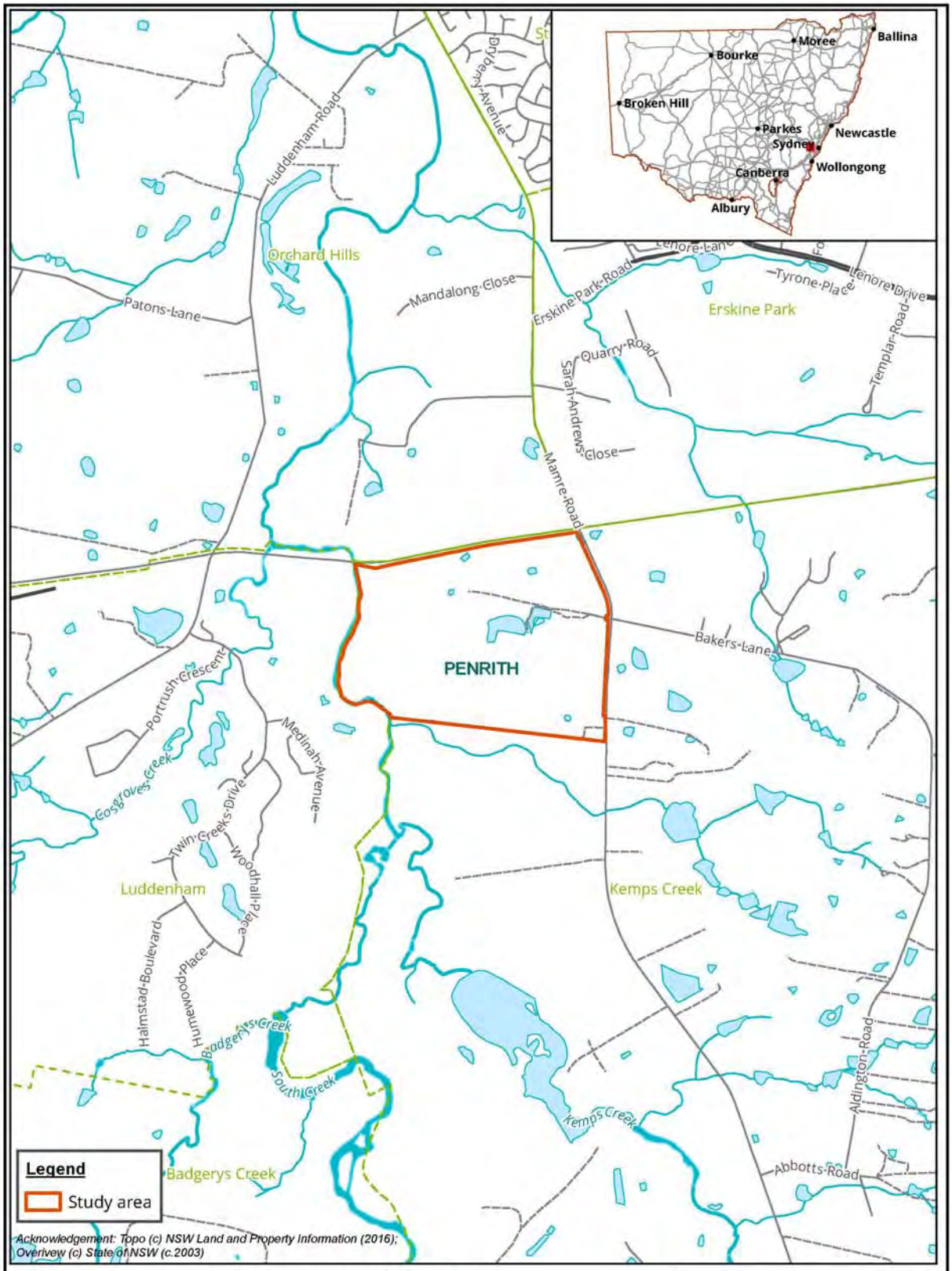

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Matter: 27033
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Checked by: SJK, Drawn by: LH, Last edited by: lwilson
Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

12 November 2018

Darug Land Observations

Anna Workman

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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Phone: 02 9101 8700

ACN 006 175 097
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Stage 3: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment: Methodology

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The principle objectives of the subsurface test excavations would be to identify and understand the nature, extent and significance of any archaeological sites located within areas of archaeological potential.

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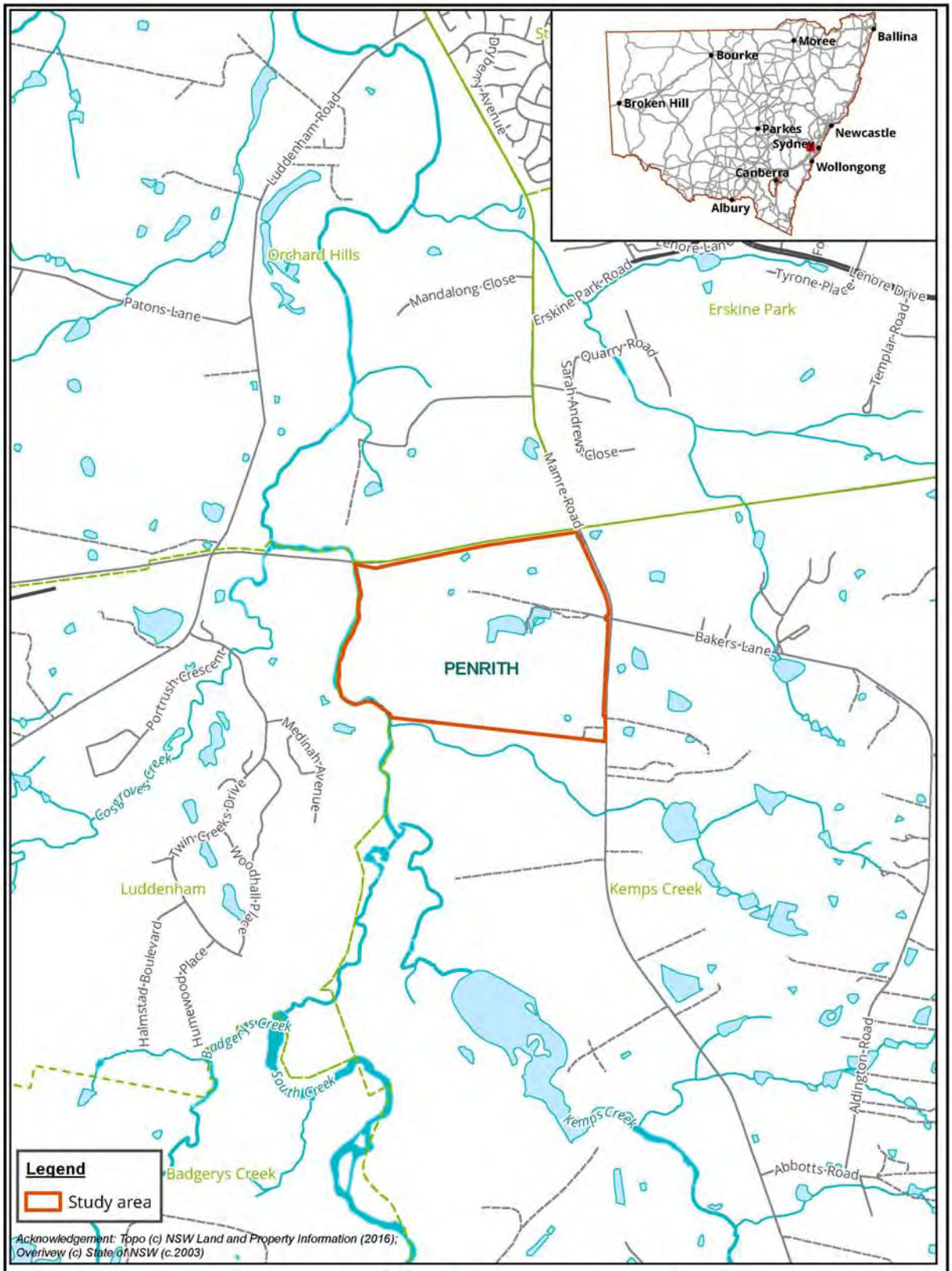

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12 November 2018

Murra Bidgee Mullangari Aboriginal Corporation

Ryan Johnson

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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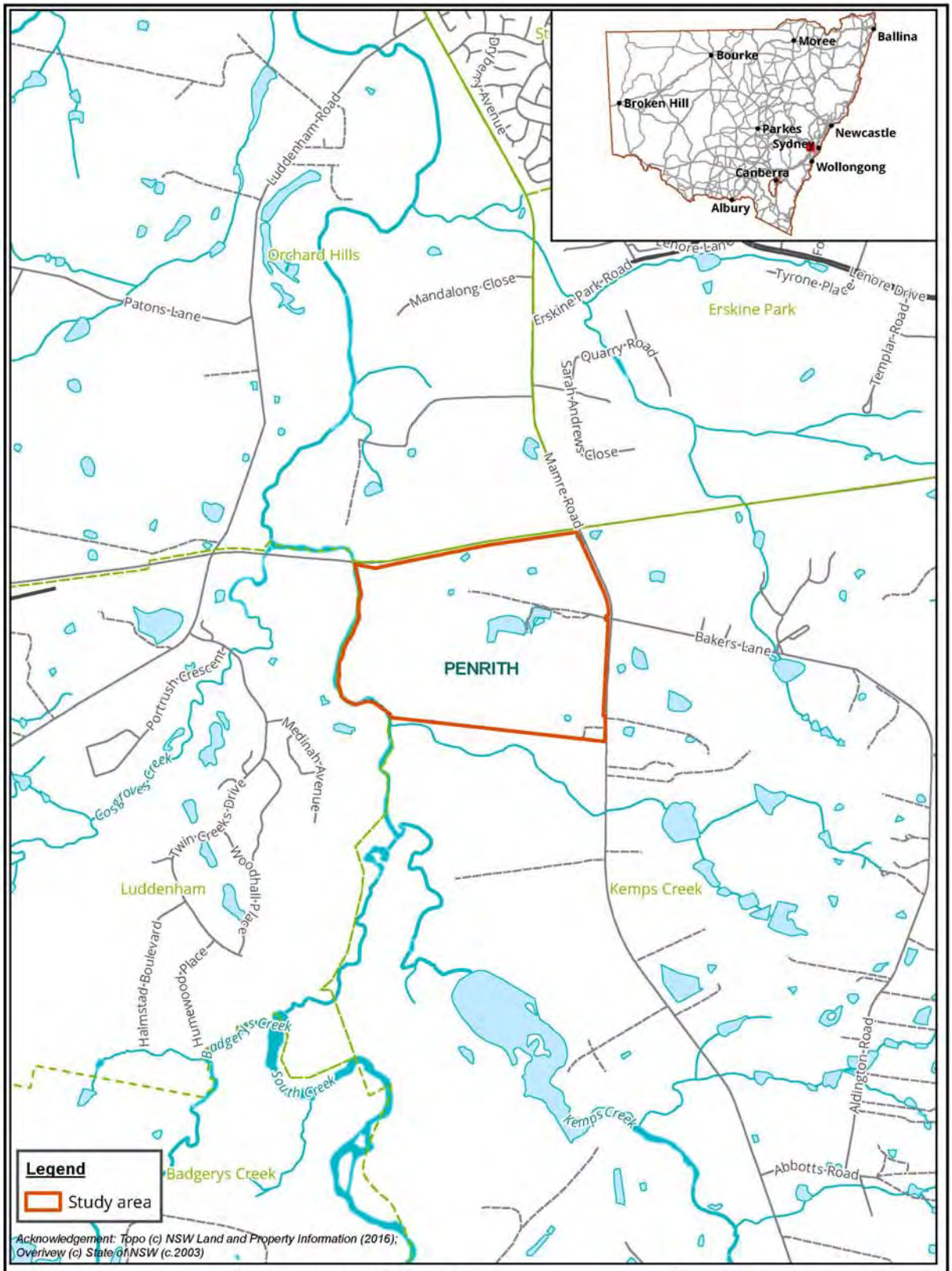

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Muragadi Heritage Indigenous Corporation

Jesse Johnson

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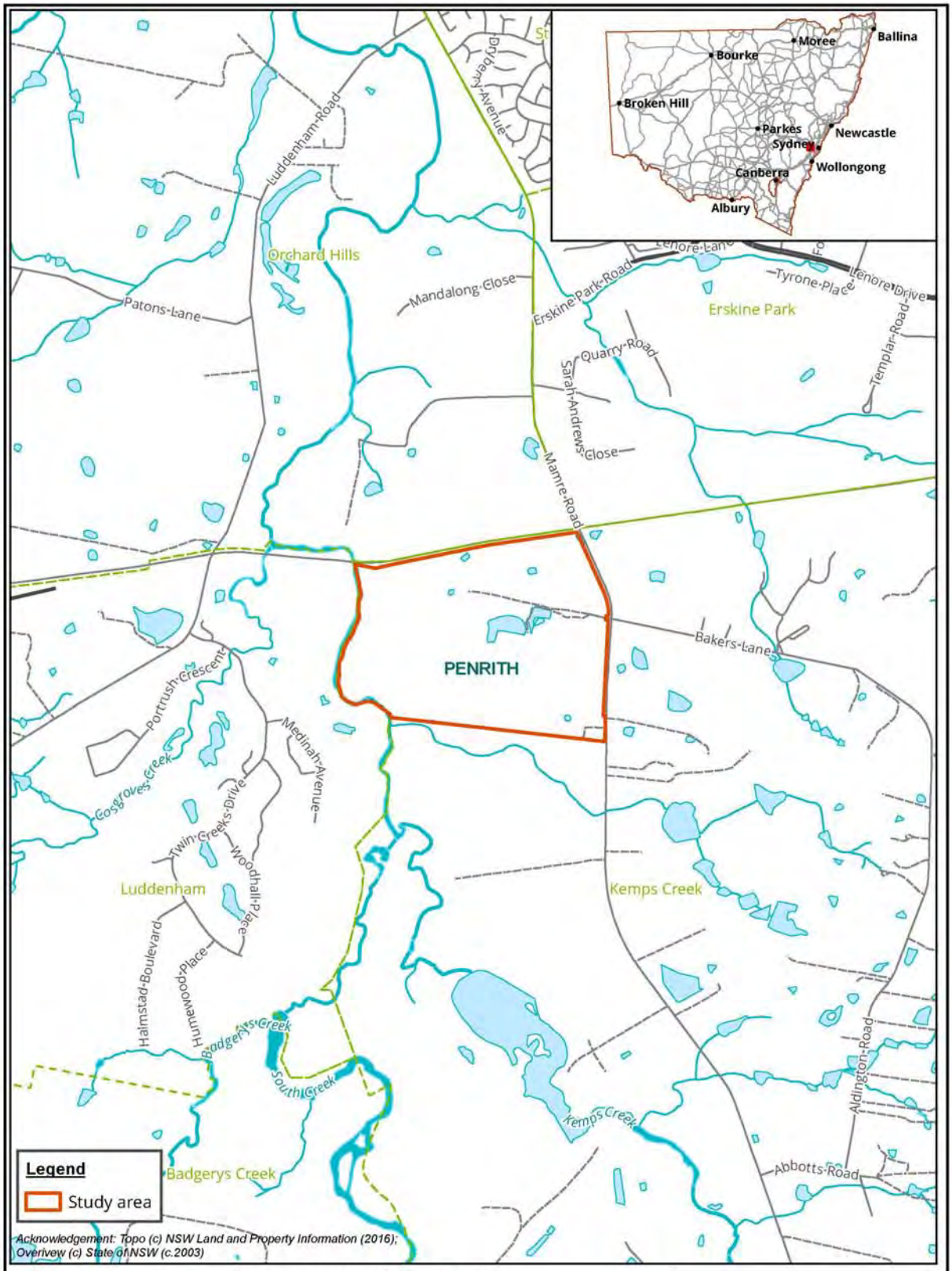

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Matter: 27033
Date: 20 April 2018,
Checked by: SJK, Drawn by: LH, Last edited by: lwilson
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Figure 2: Study area detail

12 November 2018

Aboriginal Archaeological Service Inc

Andrew Williams

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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The principle objectives of the subsurface test excavations would be to identify and understand the nature, extent and significance of any archaeological sites located within areas of archaeological potential.

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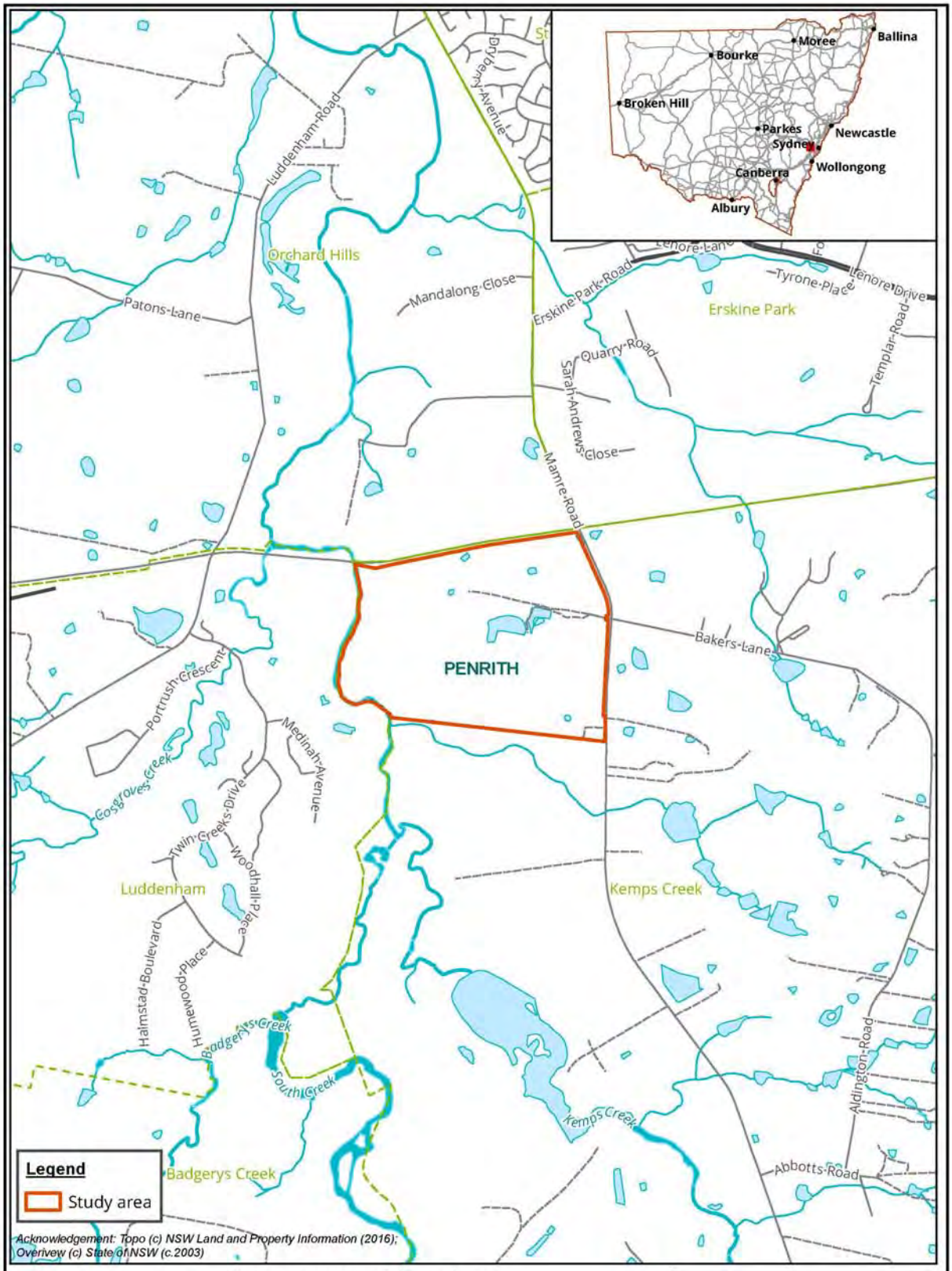

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12 November 2018

Tocomwall

Scott Franks

RE: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment – Stage 3 consultation project methodology

Our Ref: Matter 27033

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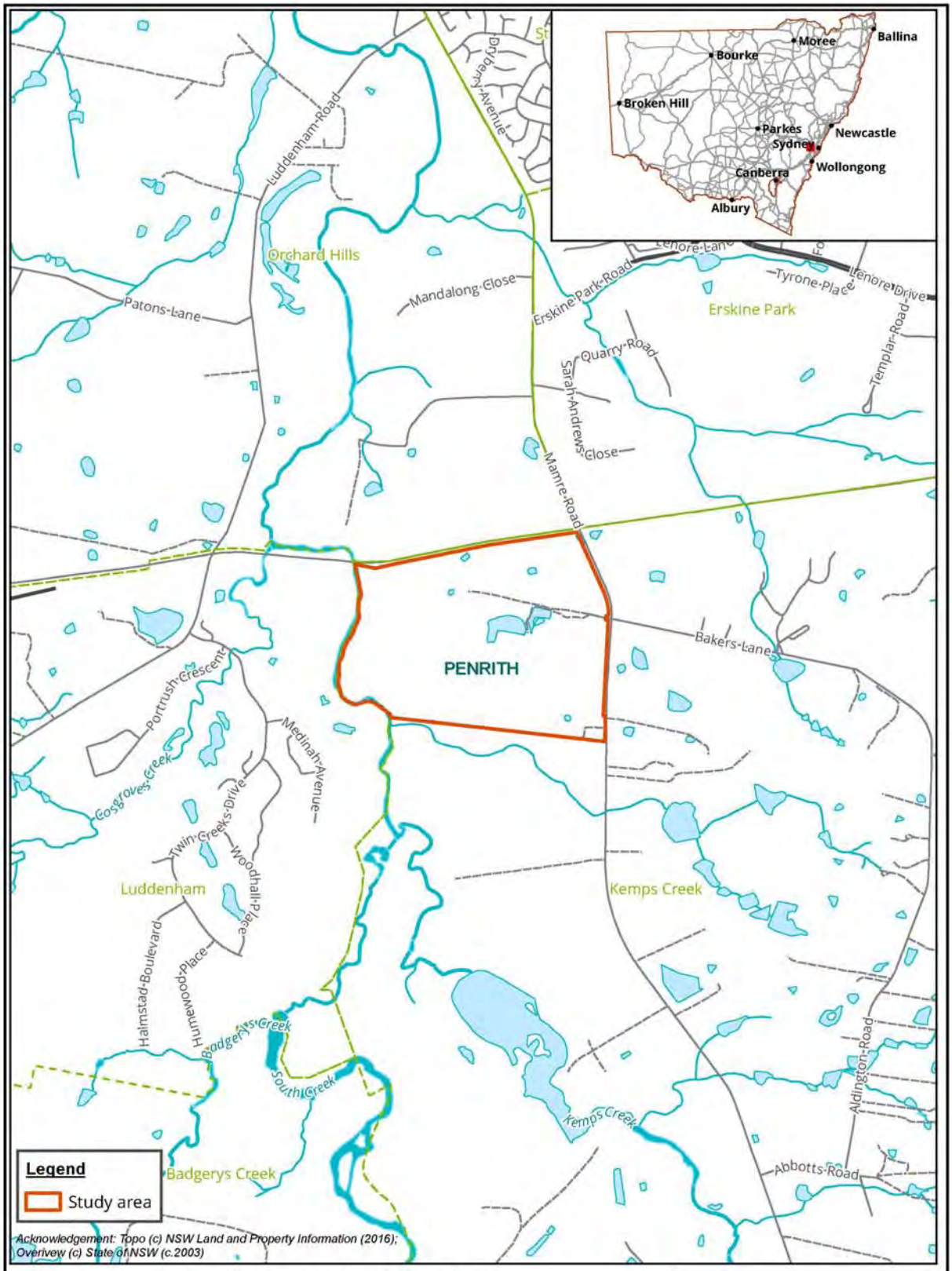

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12 November 2018

Barking Owl Aboriginal Corporation

Jody Kulakowski

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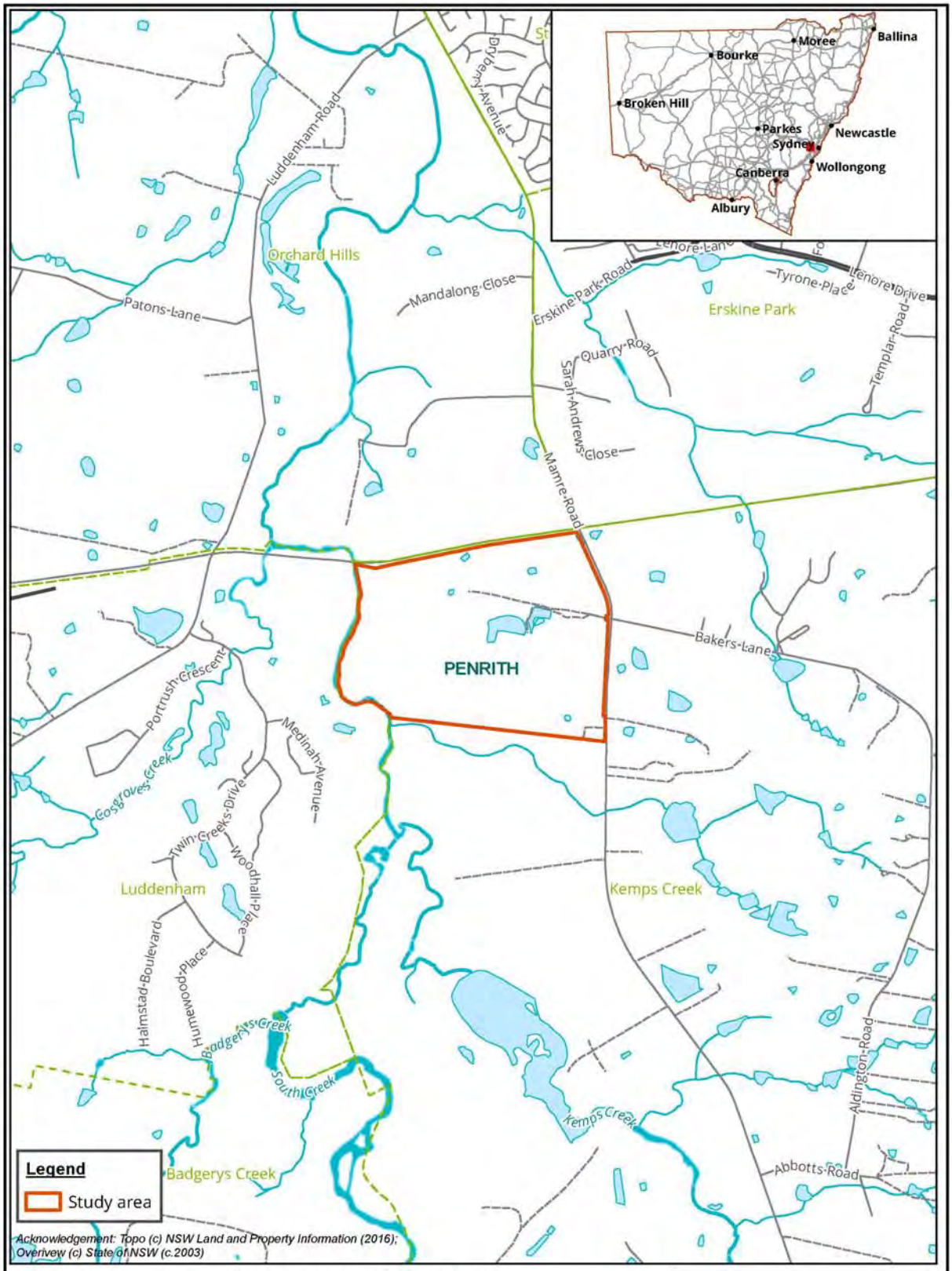

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Barraby Cultural Services

Lee Field

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Phone: 02 9101 8700

ACN 006 175 097
ABN 65 006 175 097

Email: sydney@biosis.com.au

biosis.com.au

Consultant Archaeologist

Stage 3: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment: Methodology

The following information has been provided in accordance with the consultation requirements. The aim of this document is to provide RAPs with the proposed methodology for the cultural heritage and archaeological assessment.

Assessment methodology

An archaeological survey was undertaken at an earlier stage of the project prior to the commencement of Aboriginal consultation, attended by two Biosis archaeologists and a representative of the Deerubbin Local Aboriginal Land Council.

Aims of the survey

The principle aims of the survey were to:

- Provide RAPs an opportunity to view the study area and to discuss previously identified Aboriginal object(s) and/or place(s) in or within close proximity to the study area.
- To undertake a systematic survey of the study area, while targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.

Survey methodology

The survey methods are intended to assess and understand the landforms and to determine whether any archaeological material from Aboriginal occupation or land use exists within the study area. Identification of natural soil deposits within the study area will be undertaken if possible. Photographs and recording techniques will be incorporated into the survey including representative photographs of survey units, landforms, vegetation coverage, ground surface visibility and the recording of soil information for each survey unit. Any Aboriginal objects observed during the survey will be documented and photographed. No artefacts discovered during the survey component are to be removed from the site.

Recording during the survey followed the guidelines of the OEH, in particular the *Code of Practice for Archaeological Investigation of Aboriginal objects in New South Wales* (DECCW 2010b) (the code).

Specific information that was recorded during the survey includes:

- Aboriginal objects or sites present in the study area
- survey coverage
- survey effectiveness
- any resources that may have potentially been exploited by Aboriginal people
- landforms and general soil information
- photographs of the site indicating landforms
- evidence of disturbance

- Aboriginal artefacts, culturally modified trees, shell middens or any other Aboriginal sites.

Distinguishing landform elements and their association with Aboriginal cultural heritage assisted with the identification of site patterning, though with the awareness of the following limitations:

- The degree of ground surface visibility (GSV) and amount of exposed areas can significantly bias the discovery of surface artefacts.
- Cultural material exposed on the surface is not necessarily representative of the potential extent of the site (either horizontally or vertically).

Information about the presence of potentially exploitable resources helps contribute to predictions of the Aboriginal sites that may occur within the study area. Information about ground surface visibility, distance visibility and areas of exposures help to provide a general indication of the effectiveness of the survey for identifying Aboriginal cultural heritage exposed to the surface. Observable disturbances are also considered when assessing the integrity of known or potential sites in an area. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements will be recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

Test excavation methodology

As the survey identified areas of archaeological potential (shown in the project information document) which will be impacted by the proposed works. it will be necessary to complete test excavations in advance of the proposed development. Test excavations will be undertaken in accordance with the code as outline below.

Aims of the sub-surface test excavations

The principle objectives of the subsurface test excavations would be to identify and understand the nature, extent and significance of any archaeological sites located within areas of archaeological potential.

The aims of the testing program would be to:

- Determine whether sub-surface archaeological deposits exist which may be impacted by the development.
- To determine the extent and nature of such deposits (if present).
- Identify if the archaeological material occurs in an intact, undisturbed context, by examining the soil profile and stratigraphy.
- Analyse and interpret any archaeological finds (such as stone artefacts, shell midden deposits, etc.) recovered during the testing program.
- Inform current knowledge of Aboriginal occupation and land use models of the region.
- Provide management and mitigation measures for Aboriginal archaeological objects located during the subsurface testing program.

Test excavation sampling strategy

Test excavations across the study area would conform to the following methodology:

- Test excavations will be undertaken in areas identified as having the potential to contain Aboriginal cultural material.
- Test excavations will be conducted in 50 x 50 centimetre units.
- The test excavation units will be excavated by hand (inclusive of trowels, spades and other hand tools) along transects at intervals of between 10 – 20 metres or other justifiable and regular spacing (being no smaller than five metres).
- The first test pit within a site or Potential Archaeological Deposit (PAD) area will be excavated in five centimetre spits; the subsequent test pits conducted within the site or PAD area can then be excavated in either 10 centimetre spits or stratigraphic units (whichever is smaller) to the base of Aboriginal object-bearing units being the removal of the A-horizon soil deposit down to the sterile clay or bedrock layer (B-horizon).
- If the depth of deposit prevents reaching sterile deposits within the 50 x 50 centimetre test pit, additional 50 x 50 centimetre test pits may be excavated adjacent to the original test pit (for example expanding the test pit to 50 x 100 centimetres) to reach the sterile deposits.
- Test pits may be combined and excavated as necessary in 50 x 50 centimetre units for the purposes of further understanding site characteristics. Note that under the Code, the maximum area that can be excavated in any one continuous area is three metres squared (3 m^2).
- The Code dictates that the maximum surface area of all test excavation units must be no greater than 0.5% of the PAD or area being investigated.
- All excavated soil will be sieved in 5mm sieves. Dry sieving will be attempted in the first instance, however wet sieving may be used if deposits cannot be dry sieved.
- All cultural material will be collected, bagged and clearly labelled. They will be temporarily stored in the Biosis office for analysis (at Unit 14, 17-27 Power Avenue, Alexandria).
- The following documentation will be taken for the test pit:
    - unique test pit identification number
    - GPS coordinate
    - munsell soil colour, texture and pH
    - amount and location of cultural material within the deposit
    - nature of disturbance where present
    - stratigraphy
    - archaeological features (if present)
    - photographic records
    - spit records.

- The test excavation unit must be backfilled as soon as practicable due to safety issues.
- An AHIMS Site Impact Recording form will be completed and submitted to the AHIMS Registrar for any sites impacted during test excavations.
- In the event that suspected human remains are identified works will immediately cease and the NSW Police and OEH will be notified.
- Test excavations will cease when enough information* has been recovered to adequately characterise the objects present with regard to their nature and significance.

*Enough information is defined by OEH as meaning "the sample of excavated material clearly and self-evidently demonstrates the deposit's nature and significance. This may include things like locally or regionally high object density: presence of rare or representative objects: presence of archaeological features: or locally or regionally significant deposits stratified or not." (DECCW 2010b).

Storage of cultural material

Any cultural material identified during test excavations will be temporarily stored in the Biosis, Sydney office for analysis (Unit 14, 17-27 Power Avenue, Alexandria).

Once the cultural material has been analysed, the cultural material can be managed in the following manners:

- Cultural material can be held by the Aboriginal community under a care and control agreement.
- Cultural material can be returned to country and reburied as soon as practicable in a secure location in accordance with Requirements 16b and 26 of the Code of Practice.

Biosis requests any comments regarding the care and control of any cultural material be included as part of the review of this assessment methodology.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

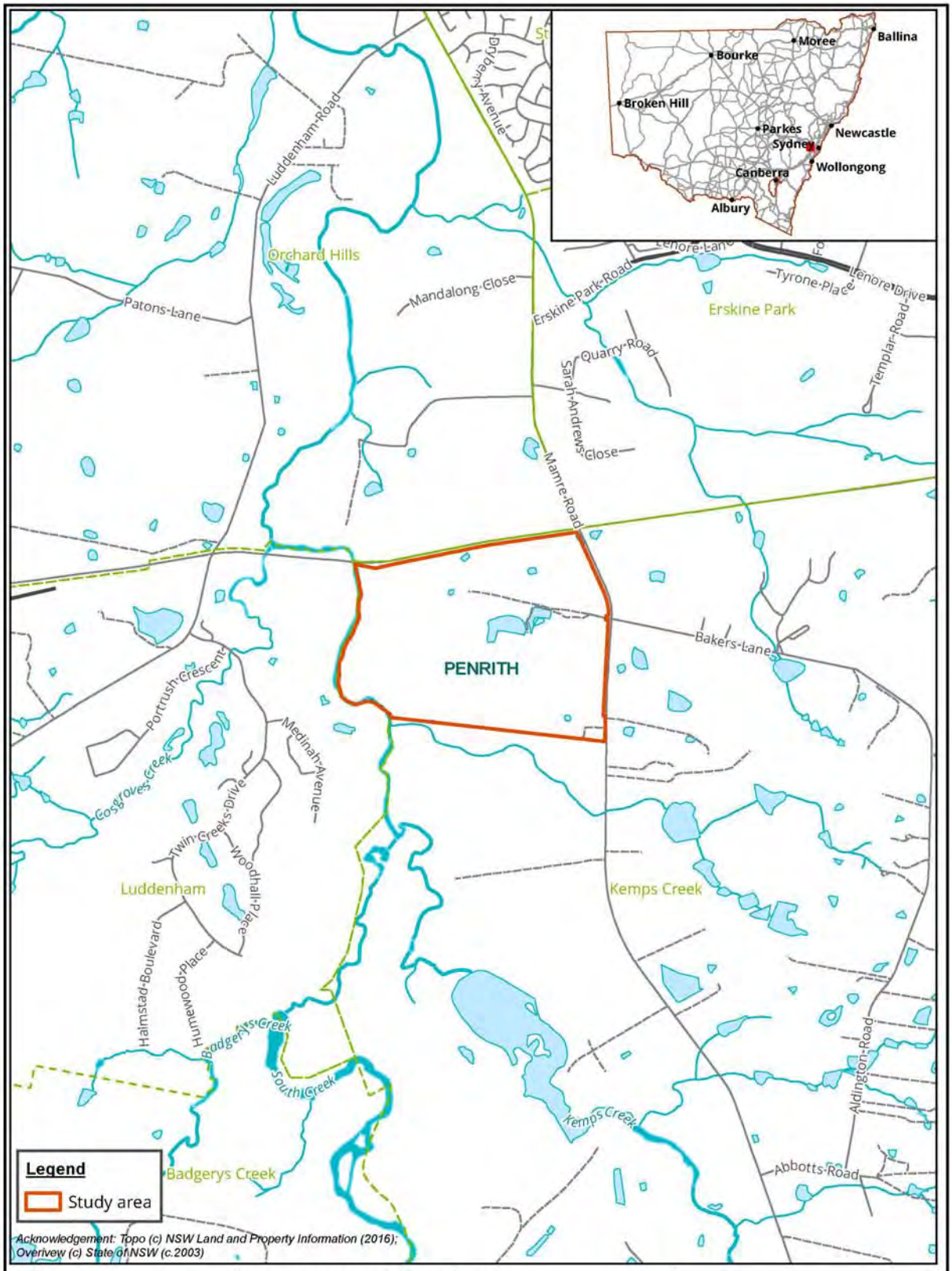

Figure 1: Location of the study area

Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
Date: 20 April 2018,
Checked by: SJK, Drawn by: LH, Last edited by: lwilson
Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

Anthea Vella

From: desmond dyer <desmond4552@hotmail.com>
Sent: Saturday, 17 November 2018 11:03 AM
To: Mathew Smith
Subject: Re: 27033 Mamre Road ACHA stage 2 and 3 consultation
Attachments: Archo report.doc

Hi Mathew,

Hope this letter is okay in it we agree with the Methodology
and explained what we would like for care and control of Artefacts

kind regards
Des

From: Mathew Smith
Sent: Monday, 12 November 2018 4:51 PM
To: 'desmond4552@hotmail.com'
Subject: 27033 Mamre Road ACHA stage 2 and 3 consultation
Hi Desmond,

Please find attached the stage 2 project information and stage 3 project methodology documentation in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010*. It would be appreciated if you could provide feedback on the attached methodology Pty Ltd by **4 pm Monday 10 December 2018** either by email, phone or return mail.

Kind regards,

Mat

Mathew Smith
Project Archaeologist
M: 0409 991 176
D: (02) 4201 1090
E: msmith@biosis.com.au

Leaders in Ecology and Heritage Consulting

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Darug Aboriginal Land care

Uncle Des Dyer

18 a Perigee Close
Doonside
NSW 2767
ABN 71 301 006 047

James Cole
Archaeologist
Biosis
14, 17-17 Power Avenue
Alexandria 2015
NSW

Re: Mamre South Precinct Stage 3.

Dear, James,

The Darug Aboriginal Land care/ Uncle Des Dyer, has no objections to the planned development.

We have read your report and agree with the recommendations, and Methodology the salvage excavation in your report.

We ask that native plants be used in the landscape .

We ask that while the development is in progress if any Artefacts are uncovered that work stops until the Artefacts can be salvaged and moved.

We make Recommendation that this is strongly heard to for projects !!!!!

We ask that all artefacts be reburied on site out of harm's way, that any rock cravens, and scared tree be preserved, were possible, and be recorded.

Or Artefacts are put in the local museum, or displayed in the foyer of new building with signage on where they came from. If not we would like to see them in the old Parramatta Goal....

The Darug Aboriginal Land care have and always will hold all land specific social, spiritual and have a responsibility to look after the plants , animals creeks rivers on Darug land has cultural values to our organisation.

We are Traditional Owner, our members have lived on Darug land for most of their lives and worked in the area. We have been doing Cultural Heritage Assessments for over 20 years and still do today.

Respectfully yours,

Uncle Des Dyer
Darug Elder
Darug Aboriginal Land Care
Mobile 0408 360 814

Anthea Vella

From: Ryan Johnson <murrabidgeemullangari@yahoo.com.au>
Sent: Wednesday, 21 November 2018 10:50 PM
To: Mathew Smith
Subject: RE: 27033 Mamre Road ACHA stage 2 and 3 consultation

Hi Matthew,
I have read the ACHA stage 2 and 3 consultation for the above project and endorse the recommendations made by Biosis, please feel free to contact me if you require further information.
Thanks

Ryan Johnson | **Murra Bidgee Mullangari**

Aboriginal Corporation Cultural Heritage

A: PO Box 246, Seven Hills, NSW, 2147
E: murrabidgeemullangari@yahoo.com.au
ICN: 8112

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From: Mathew Smith [mailto:MSmith@biosis.com.au]
Sent: Monday, 12 November 2018 4:54 PM
To: 'murrabidgeemullangari@yahoo.com.au'
Subject: 27033 Mamre Road ACHA stage 2 and 3 consultation

Hi Ryan,

Please find attached the stage 2 project information and stage 3 project methodology documentation in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010*. It would be appreciated if you

could provide feedback on the attached methodology Pty Ltd by **4 pm Monday 10 December 2018** either by email, phone or return mail.

Kind regards,

Mat

Mathew Smith
Project Archaeologist
M: 0409 991 176
D: (02) 4201 1090
E: msmith@biosis.com.au

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Anthea Vella

From: Andrew Williams <aas.info@bigpond.com>
Sent: Tuesday, 4 December 2018 12:38 PM
To: Mathew Smith
Cc: Dad Williams
Subject: Re: 27033 Mamre Road ACHA stage 2 and 3 consultation
Attachments: 27033 Mamre South SSD .pdf

Please see attached response

Regards

Andrew Williams

On 12 Nov 2018, at 4:55 pm, Mathew Smith <MSmith@biosis.com.au> wrote:

Hi Andrew,

Please find attached the stage 2 project information and stage 3 project methodology documentation in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010*. It would be appreciated if you could provide feedback on the attached methodology Pty Ltd by **4 pm Monday 10 December 2018** either by email, phone or return mail.

Kind regards,

Mat

Mathew Smith
Project Archaeologist
M: 0409 991 176
D: (02) 4201 1090
E: msmith@biosis.com.au
Leaders in Ecology and Heritage Consulting

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Aboriginal **A**rchaeology **S**ervice
INC: 1400988
2/24 Goodwin Street Narrabeen 2101
Mobile: 0490 126 040
Email: aas.info@bigpond.com

Aboriginal Archaeology Service INC.
Darug Traditional Owners

4th December 2018

Attention: Mathew Smith
Biosis – RE: 27033 – Mamre South SSD – ACHA Stage 2 / Stage 3
Project Information

A.A.S agrees with the recommendations as documented by Biosis Pty Ltd in the Aboriginal Cultural Heritage Assessment Report. AAS would like to see any artefacts collected displayed for all to see in the museum, local library or local government building or reburied in close proximity of the area.

Aboriginal Archaeology Service is seeking *involvement* in all consultation meetings and fieldwork for the above-mentioned project, as we are registered traditional owners of the area. AAS immediate family has lived in the area from 1897 and retains local and oral history on behalf of its first nation people. We have no objection to our information being provided to the Office of Environment and Heritage and the Local Aboriginal Land Council.

AAS can assist with input that can be incorporated into a written assessment of cultural values of the area. We are also able to provide fit staff to assist with work that may involve physical labour. We can provide our schedule of rates and copies of relevant certificates of currency for business insurances on request.

All correspondence should be emailed to AAS.info@bigpond.com and. The area is an important part of our culture and valued by our family.

Yours truly

Andrew Williams

Anthea Vella

From: lee field <barrabyculturalservices@gmail.com>
Sent: Tuesday, 13 November 2018 12:42 PM
To: Mathew Smith
Subject: Re: 27033 Mamre Road ACHA stage 2 and 3 consultation

Dear Mathew

Barraby Cultural Services supports the methodology for this project.

Kind Regards
Lee Field

On Mon, 12 Nov. 2018, 5:57 pm lee field <barrabyculturalservices@gmail.com wrote:

> Received, thank you.
>
> On Mon, 12 Nov. 2018, 4:58 pm Mathew Smith <MSmith@biosis.com.au wrote:
>
> > Hi Lee,
> >
> > Please find attached the stage 2 project information and stage 3 project methodology documentation in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010*. It would be appreciated if you could provide feedback on the attached methodology Pty Ltd by **4 pm Monday 10 December 2018** either by email, phone or return mail.
> >
> > Kind regards,
> >
> > Mat
> >
> > **Mathew Smith**
> > Project Archaeologist
> > M: 0409 991 176
> > D: (02) 4201 1090
> > E: msmith@biosis.com.au
> > Leaders in Ecology and Heritage Consulting
> >
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Anthea Vella

From: Vicki Slater <vicki.slater@hotmail.com>
Sent: Tuesday, 13 November 2018 5:04 PM
To: Mathew Smith
Subject: Re: 27033 Mamre Stage 2 and Stage 3 consultation

Thanks Matt

On 13 Nov. 2018 4:58 pm, Mathew Smith wrote:

> Hi Vicky,
>
> Thank you for your interest in the project. Please find attached stage 2 project information and stage 3 project methodology. If you have any comments on the methodology please respond in writing by 4 PM 10 December 2018.
>
> Kind regards,
>
> Mat
>
> **Mathew Smith**
> Project Archaeologist
> M: 0409 991 176
> D: (02) 4201 1090
> E: msmith@biosis.com.au
>
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>
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Anthea Vella

From: Vicki Slater <Vicki.slater@hotmail.com>
Sent: Tuesday, 20 November 2018 3:52 PM
To: Mathew Smith
Subject: Re: 27033 Mamre Stage 2 and Stage 3 consultation

Thanks Mat

Vicky Slater

From: Mathew Smith
Sent: Tuesday, 13 November 2018 5:58 AM
To: 'vicki.slater@hotmail.com'
Subject: 27033 Mamre Stage 2 and Stage 3 consultation

Hi Vicky,
Thank you for your interest in the project. Please find attached stage 2 project information and stage 3 project methodology. If you have any comments on the methodology please respond in writing by 4 PM 10 December 2018.
Kind regards,
Mat

Mathew Smith
Project Archaeologist
M: 0409 991 176
D: (02) 4201 1090
E: msmith@biosis.com.au

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Anthea Vella

From: arika jalomaki <yulayculturalservices@gmail.com>
Sent: Monday, 19 November 2018 8:42 AM
To: James Cole
Subject: Re: 27033 - Mamre South Precinct SSD - Project Methodology

Dear James

Yulay Cultural Services supports the methodology for this project. We look forward to working with you on this project.

Kind Regards
Arika Jalomaki

On Tuesday, November 13, 2018, James Cole <JCole@biosis.com.au> wrote:

This letter is being provided to all the Registered Aboriginal Parties (RAPs) who registered their interest in the consultation process for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW) (Figure 1, Figure 2).

In accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW 2010a) (consultation requirements), we provide the proposed methodology for the Aboriginal Cultural Heritage Assessment (ACHA) for your review and feedback.

It would be appreciated if you would provide feedback on the methodology presented in this letter to Biosis Pty Ltd by 4 pm Tuesday 11 December 2018 either by email, phone or return mail.

If you have any queries, or would like to discuss the project further, please do not hesitate to get in touch with me.

Kind regards,

James

James Cole
Consultant Archaeologist
M: 0437 856 233
D: (02) 9101 8708
E: jcole@biosis.com.au

biosis
Leaders in Ecology and Heritage Consulting

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Anthea Vella

From: Bo Field <yurrandaali_cs@hotmail.com>
Sent: Monday, 19 November 2018 8:40 AM
To: James Cole
Subject: Re: 27033 - Mamre South Precinct SSD - Project Methodology

Dear James

Yurrandaali Cultural Services supports the methodology for this project.
We look forward to working with you on this project.

Kind Regards
Bo Field

On 13 Nov. 2018 9:09 pm, James Cole wrote:

This letter is being provided to all the Registered Aboriginal Parties (RAPs) who registered their interest in the consultation process for the proposed development at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW) (Figure 1, Figure 2).

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Kind regards,

James

James Cole
Consultant Archaeologist
M: 0437 856 233
D: (02) 9101 8708
E: jcole@biosis.com.au

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Anthea Vella

From: lilly carroll <didgengunawalclan@yahoo.com.au>
Sent: Tuesday, 13 November 2018 7:32 PM
To: Mathew Smith
Subject: Re: 27033 Mamre Road ACHA stage 2 and 3 consultation

Hi Matthew,

DNC has read through the methodology and is happy with it throughout. We recently completed work for the M12 project for Neville Baker and Jacobs which we worked along Mamre Rd and uncovered Axes, Silcrete and other stone tools, so if given the chance we can invite more info about Badgers Creek, Kemp Creek and surrounds,

Kind regards
Paul Boyd & Lilly Carroll
Directors DNC

Sent from Yahoo Mail for iPhone

On Monday, November 12, 2018, 4:48 pm, Mathew Smith wrote:

From: Mathew Smith
Sent: Monday, 12 November 2018 4:48 PM
To: 'didgengunawalclan@yahoo.com.au'
Subject: 27033 Mamre Road ACHA stage 2 and 3 consultation

Hi Lily and Paul,

Please find attached the stage 2 project information and stage 3 project methodology documentation in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010*. It would be appreciated if you could provide feedback on the attached methodology Pty Ltd by **4 pm Monday 10 December 2018** either by email, phone or return mail.

Kind regards,

Mat

Mathew Smith
Project Archaeologist
M: 0409 991 176
D: (02) 4201 1090
E: msmith@biosis.com.au

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Stage 3: Mamre South Precinct SSD application – Aboriginal Cultural Heritage Assessment: Methodology

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- Aboriginal artefacts, culturally modified trees, shell middens or any other Aboriginal sites.

Distinguishing landform elements and their association with Aboriginal cultural heritage assisted with the identification of site patterning, though with the awareness of the following limitations:

- The degree of ground surface visibility (GSV) and amount of exposed areas can significantly bias the discovery of surface artefacts.
- Cultural material exposed on the surface is not necessarily representative of the potential extent of the site (either horizontally or vertically).

Information about the presence of potentially exploitable resources helps contribute to predictions of the Aboriginal sites that may occur within the study area. Information about ground surface visibility, distance visibility and areas of exposures help to provide a general indication of the effectiveness of the survey for identifying Aboriginal cultural heritage exposed to the surface. Observable disturbances are also considered when assessing the integrity of known or potential sites in an area. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements will be recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

Test excavation methodology

As the survey identified areas of archaeological potential (shown in the project information document) which will be impacted by the proposed works. it will be necessary to complete test excavations in advance of the proposed development. Test excavations will be undertaken in accordance with the code as outline below.

Aims of the sub-surface test excavations

The principle objectives of the subsurface test excavations would be to identify and understand the nature, extent and significance of any archaeological sites located within areas of archaeological potential.

The aims of the testing program would be to:

- Determine whether sub-surface archaeological deposits exist which may be impacted by the development.
- To determine the extent and nature of such deposits (if present).
- Identify if the archaeological material occurs in an intact, undisturbed context, by examining the soil profile and stratigraphy.
- Analyse and interpret any archaeological finds (such as stone artefacts, shell midden deposits, etc.) recovered during the testing program.
- Inform current knowledge of Aboriginal occupation and land use models of the region.
- Provide management and mitigation measures for Aboriginal archaeological objects located during the subsurface testing program.

Test excavation sampling strategy

Test excavations across the study area would conform to the following methodology:

- Test excavations will be undertaken in areas identified as having the potential to contain Aboriginal cultural material.
- Test excavations will be conducted in 50 x 50 centimetre units.
- The test excavation units will be excavated by hand (inclusive of trowels, spades and other hand tools) along transects at intervals of between 10 – 20 metres or other justifiable and regular spacing (being no smaller than five metres).
- The first test pit within a site or Potential Archaeological Deposit (PAD) area will be excavated in five centimetre spits; the subsequent test pits conducted within the site or PAD area can then be excavated in either 10 centimetre spits or stratigraphic units (whichever is smaller) to the base of Aboriginal object-bearing units being the removal of the A-horizon soil deposit down to the sterile clay or bedrock layer (B-horizon).
- If the depth of deposit prevents reaching sterile deposits within the 50 x 50 centimetre test pit, additional 50 x 50 centimetre test pits may be excavated adjacent to the original test pit (for example expanding the test pit to 50 x 100 centimetres) to reach the sterile deposits.
- Test pits may be combined and excavated as necessary in 50 x 50 centimetre units for the purposes of further understanding site characteristics. Note that under the Code, the maximum area that can be excavated in any one continuous area is three metres squared (3 m^2).
- The Code dictates that the maximum surface area of all test excavation units must be no greater than 0.5% of the PAD or area being investigated.
- All excavated soil will be sieved in 5mm sieves. Dry sieving will be attempted in the first instance, however wet sieving may be used if deposits cannot be dry sieved.
- All cultural material will be collected, bagged and clearly labelled. They will be temporarily stored in the Biosis office for analysis (at Unit 14, 17-27 Power Avenue, Alexandria).
- The following documentation will be taken for the test pit:
    - unique test pit identification number
    - GPS coordinate
    - munsell soil colour, texture and pH
    - amount and location of cultural material within the deposit
    - nature of disturbance where present
    - stratigraphy
    - archaeological features (if present)

- photographic records
- spit records.

- The test excavation unit must be backfilled as soon as practicable due to safety issues.
- An AHIMS Site Impact Recording form will be completed and submitted to the AHIMS Registrar for any sites impacted during test excavations.
- In the event that suspected human remains are identified works will immediately cease and the NSW Police and OEH will be notified.
- Test excavations will cease when enough information* has been recovered to adequately characterise the objects present with regard to their nature and significance.

*Enough information is defined by OEH as meaning "the sample of excavated material clearly and self-evidently demonstrates the deposit's nature and significance. This may include things like locally or regionally high object density: presence of rare or representative objects: presence of archaeological features: or locally or regionally significant deposits stratified or not." (DECCW 2010b).

Storage of cultural material

Any cultural material identified during test excavations will be temporarily stored in the Biosis, Sydney office for analysis (Unit 14, 17-27 Power Avenue, Alexandria).

Once the cultural material has been analysed, the cultural material can be managed in the following manners:

- Cultural material can be held by the Aboriginal community under a care and control agreement.
- Cultural material can be returned to country and reburied as soon as practicable in a secure location in accordance with Requirements 16b and 26 of the Code of Practice.

Biosis requests any comments regarding the care and control of any cultural material be included as part of the review of this assessment methodology.

References

DECCW 2010a, 'Aboriginal cultural heritage consultation requirements for proponents'.

DECCW 2010b, 'Code of practice for archaeological investigation of aboriginal objects in New South Wales'.

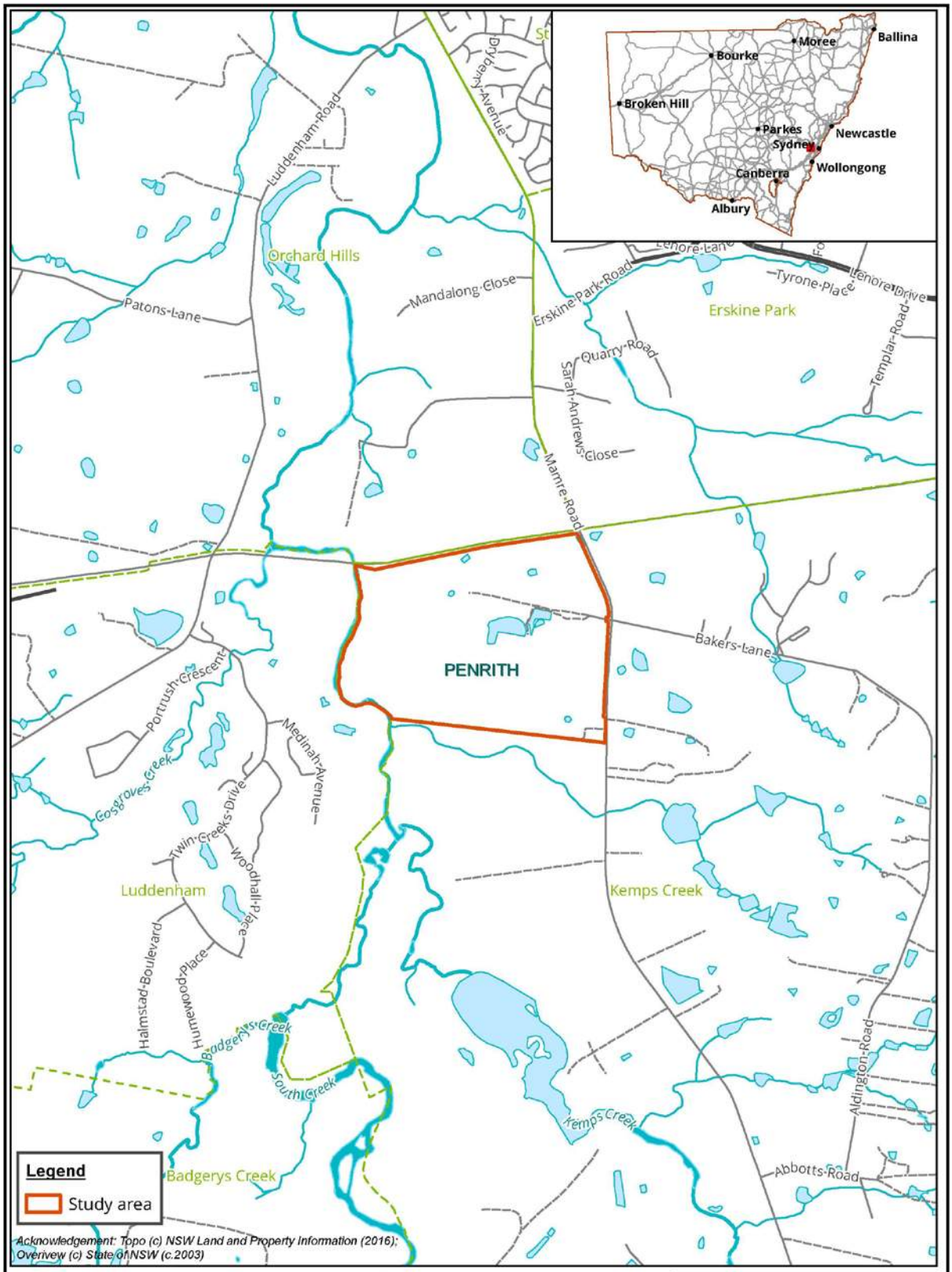

Figure 1: Location of the study area

Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 27033
Date: 20 April 2018,
Checked by: SJK, Drawn by: LH, Last edited by: lwilson
Location:P:\27000s\27033\Mapping\

Figure 2: Study area detail

Mathew Smith

From: Anthea Vella
Sent: Thursday, 13 December 2018 4:41 PM
To: 'gs.ach@environment.nsw.gov.au'
Cc: James Cole; Dr Amanda Markham
Subject: 27033 Mamre South Test Excavation Methodology
Attachments: 27033.Mamre.South.Test.Excavation.Methodology.OEH.pdf

To whom it may concern,

Biosis will be conducting test excavations under the code of practice at Mamre South, Kemps Creek. As per requirement 15c of the code of practice, please refer to the relevant details regarding the test excavations below. I have also attached the methodology for the test excavations.

- The study area is located at 657-769 Mamre Road, Kemps Creek
- Legal entity contact details:

  Stephen O'Connor
  Project Director – Altis Property Partners
  GPO Box 4456 Sydney NSW 2001
  stephen.oconnor@altisproperty.com.au

- Biosis contact details:

  Dr Amanda Markham
  Biosis Pty Ltd
  Unit 14 17-27 Power Avenue
  Alexandria, NSW 2015

AMarkham@biosis.com.au

- Excavations will commence on the 8 January 2019, and are estimated to conclude by the 8 March 2019
- Any Aboriginal objects uncovered during the test excavations will be temporarily stored at the Sydney Biosis office (Unit 14 17-27 Power Avenue, Alexandria NSW 2015) as detailed in the attached methodology.

If you have any questions please contact us.

Kind regards,

Anthea

Anthea Vella
Research Assistant Heritage
M: 0427 463 834
D: (02) 4911 4047
E: avella@biosis.com.au

Leaders in Ecology and Heritage Consulting

Please be advised that our office is closed from 5pm on Friday 21st of Decemb
We will reopen on Monday 7th of January 2019.

The information transmitted including attachments is intended only for the person or entity to which it is addressed and may contain copyright material, or information that is confidential or is exempt from disclosure by law. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient is strictly prohibited. If you received this in error, please contact the sender and delete the material from your computer. The views expressed in this email are those of the sender except where the sender expressly and with authority states them to be the views of Biosis Pty Ltd. Biosis Pty Ltd does not represent that this email is free of errors, viruses or interference. When using email to communicate with Biosis Pty Ltd, access to that information by Biosis Pty Ltd personnel is strictly limited and controlled.

Appendix 5 Stage 4: Review of draft cultural heritage assessment report

28 February 2019

Aboriginal Archaeological Service Inc.
Andrew Williams
2/24 Goodwin Street
Narrabeen NSW 2101

Dear Andrew Williams,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

Following up on your registration for the Mamre South Precinct SSD Aboriginal cultural heritage assessment (ACHA), enclosed is a copy of the Draft ACHA and archaeological report (AR) for the project for your review. Once comments have been received by registered Aboriginal parties (RAPs), the comments will be incorporated into a final report which will then be issued to all RAPs for their records.

In accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010), we provide the ACHA and AR for your review and feedback. If you would like further information, please do not hesitate to contact us. It would be appreciated if you would provide feedback on the report to Biosis by **5pm 28 March 2019** either by email, return mail or a phone call. Please address feedback to:

Amanda Markham
Biosis Pty Ltd
Unit 14, 17-27 Power Avenue
Alexandria NSW 2015
amarkham@biosis.com.au

If you have any queries regarding the study area or the information in this letter, please don't hesitate to contact us in the office on (02) 9101 8700.

Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Barking Owl Aboriginal Corporation
Jody Kulakowski
2-65/69 Wehlow Street
Mt Druitt NSW 2770

Dear Jody Kulakowski,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

Following up on your registration for the Mamre South Precinct SSD Aboriginal cultural heritage assessment (ACHA), enclosed is a copy of the Draft ACHA and archaeological report (AR) for the project for your review. Once comments have been received by registered Aboriginal parties (RAPs), the comments will be incorporated into a final report which will then be issued to all RAPs for their records.

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amarkham@biosis.com.au

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Barraby Cultural Services
Lee Field
11 Waterhouse Place
Airds NSW 2540

Dear Lee Field,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

Following up on your registration for the Mamre South Precinct SSD Aboriginal cultural heritage assessment (ACHA), enclosed is a copy of the Draft ACHA and archaeological report (AR) for the project for your review. Once comments have been received by registered Aboriginal parties (RAPs), the comments will be incorporated into a final report which will then be issued to all RAPs for their records.

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amarkham@biosis.com.au

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Corroborree Aboriginal Corporation
Marilyn Carroll-Johnson
PO Box 3340
Rouse Hill NSW 2155

Dear Marilyn Carroll-Johnson,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Darug Aboriginal Land Care
Desmond Dyer
18a Perigee Close
Doonside NSW 2767

Dear Desmond Dyer,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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amarkham@biosis.com.au

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Darug Boorooberongal Elders Aboriginal Corporation
Uncle Gordon Workman
PO Box 14
Doonside NSW 2767

Dear Uncle Gordon Workman,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

Following up on your registration for the Mamre South Precinct SSD Aboriginal cultural heritage assessment (ACHA), enclosed is a copy of the Draft ACHA and archaeological report (AR) for the project for your review. Once comments have been received by registered Aboriginal parties (RAPs), the comments will be incorporated into a final report which will then be issued to all RAPs for their records.

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Darug Custodian Aboriginal Corporation
Justine Coplin
PO Box 81
Windsor NSW 2756

Dear Justine Coplin,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

Following up on your registration for the Mamre South Precinct SSD Aboriginal cultural heritage assessment (ACHA), enclosed is a copy of the Draft ACHA and archaeological report (AR) for the project for your review. Once comments have been received by registered Aboriginal parties (RAPs), the comments will be incorporated into a final report which will then be issued to all RAPs for their records.

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amarkham@biosis.com.au

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Darug Land Observations
Jamie Workman and Anna Workman
PO Box 173
Ulladulla NSW 2539

Dear Jamie Workman and Anna Workman,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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amarkham@biosis.com.au

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Darug Tribal Aboriginal Corporation
Dirk Schmitt
PO box 441
Blacktown NSW 2148

Dear Dirk Schmitt,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

Following up on your registration for the Mamre South Precinct SSD Aboriginal cultural heritage assessment (ACHA), enclosed is a copy of the Draft ACHA and archaeological report (AR) for the project for your review. Once comments have been received by registered Aboriginal parties (RAPs), the comments will be incorporated into a final report which will then be issued to all RAPs for their records.

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Deerubbin Local Aboriginal Land Council
Steven Randall
PO Box 40
Penrith NSW 2751

Dear Steven Randall,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Didge Ngunawal Clan
Lilly and Paul Carrol and Boyd
7 Siskin Street
Quakers Hill NSW 2763

Dear Lilly and Paul Carrol and Boyd,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Gulaga
Wendy Smith

Dear Wendy Smith,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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amarkham@biosis.com.au

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Kawul Cultural Services
Vicky Slater
89 Pyramid Street
Emu Plains NSW 2750

Dear Vicky Slater,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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Alexandria NSW 2015
amarkham@biosis.com.au

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Muragadi Heritage Indigenous Corporation
Jesse Johnson
5 Hession road
Nelson NSW 2765

Dear Jesse Johnson,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

Following up on your registration for the Mamre South Precinct SSD Aboriginal cultural heritage assessment (ACHA), enclosed is a copy of the Draft ACHA and archaeological report (AR) for the project for your review. Once comments have been received by registered Aboriginal parties (RAPs), the comments will be incorporated into a final report which will then be issued to all RAPs for their records.

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Murra Bidgee Mullangari Aboriginal Corporation
Ryan Johnson
PO Box 246
Seven Hills NSW 2147

Dear Ryan Johnson,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Tocomwall
Scott Franks
PO Box 76
Caringbah NSW 1495

Dear Scott Franks,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Wailwan Aboriginal Digging Group
Philip Boney

Dear Philip Boney,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

Following up on your registration for the Mamre South Precinct SSD Aboriginal cultural heritage assessment (ACHA), enclosed is a copy of the Draft ACHA and archaeological report (AR) for the project for your review. Once comments have been received by registered Aboriginal parties (RAPs), the comments will be incorporated into a final report which will then be issued to all RAPs for their records.

In accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010), we provide the ACHA and AR for your review and feedback. If you would like further information, please do not hesitate to contact us. It would be appreciated if you would provide feedback on the report to Biosis by **5pm 28 March 2019** either by email, return mail or a phone call. Please address feedback to:

Amanda Markham
Biosis Pty Ltd
Unit 14, 17-27 Power Avenue
Alexandria NSW 2015
amarkham@biosis.com.au

If you have any queries regarding the study area or the information in this letter, please don't hesitate to contact us in the office on (02) 9101 8700.

Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Wurrumay Consultancy
Kerrie Slater
89 Pyramid Street
Emu Plains NSW 2750

Dear Kerrie Slater,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Yulay Cultural Services
Arika Jalomaki
15 Rowley Place
Airds NSW 2560

Dear Arika Jalomaki,

RE: Mamre South Precinct State Significant Development (SSD), Kemps Creek, New South Wales – Draft Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR)
Our Ref: Matter 29083

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Yurrandaali Cultural Services
Bo Field
11 Waterhouse Place
Airds NSW 2560

Dear Bo Field,

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

28 February 2019

Phil Khan
78 Forbes Street
Emu Plains NSW 2750

Dear Phil Khan,

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Our Ref: Matter 29083

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Yours sincerely,

Ashley Bridge
Research Assistant - Heritage

Ashley Bridge

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'murrabidgeemullangari@yahoo.com.au'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Attachments: 29083.Stage4.DraftACHAandAR.FIN01.20190228..pdf

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Kind Regards,
Ashley Bridge

Ashley Bridge
Research Assistant - Heritage
M: 0437 689 734
D: (02) 9101 8721
E: abridge@biosis.com.au

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Ashley Bridge

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'muragadi@yahoo.com.au'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Attachments: 29083.Stage4.DraftACHAandAR.FIN01.20190228..pdf

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Ashley Bridge

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'vicki.slater@hotmail.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Attachments: 29083.Stage4.DraftACHAandAR.FIN01.20190228..pdf

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From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'gulagachts@gmail.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'didgengunawalclan@yahoo.com.au'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'srandall@deerubbin.org.au'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'yurrandaali_cs@hotmail.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'yulayculturalservices@gmail.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'waarlan12@outlook.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'scott@tocomwall.com.au'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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To: 'boorooberongal@outlook.com'
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From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'desmond4552@hotmail.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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E: abridge@biosis.com.au

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Ashley Bridge

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'corroboreecorp@bigpond.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Attachments: 29083.Stage4.DraftACHAandAR.FIN01.20190228..pdf

Good Afternoon,

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https://spaces.hightail.com/receive/ynFaTHZiRh

It would be appreciated if you would provide feedback on the report to Biosis, by 5pm Thursday 28 March 2019.

Please do not hesitate to contact Biosis with any queries you might have,

Kind Regards,
Ashley Bridge

Ashley Bridge
Research Assistant - Heritage
M: 0437 689 734
D: (02) 9101 8721
E: abridge@biosis.com.au

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Ashley Bridge

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'barrabyculturalservices@gmail.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Attachments: 29083.Stage4.DraftACHAandAR.FIN01.20190228..pdf

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Sent: Thursday, 28 February 2019 3:59 PM
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Ashley Bridge

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'aas.info@bigpond.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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Ashley Bridge

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'philipkhan.acn@live.com.au'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
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Ashley Bridge

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'darug_tribal@live.com.au'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Attachments: 29083.Stage4.DraftACHAandAR.FIN01.20190228..pdf

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Ashley Bridge

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:59 PM
To: 'daruglandobservations@gmail.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Attachments: 29083.Stage4.DraftACHAandAR.FIN01.20190228..pdf

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Ashley Bridge

From: Muragadi <muragadi@yahoo.com.au>
Sent: Friday, 1 March 2019 12:52 PM
To: Ashley Bridge
Subject: RE: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR

Hi Ashley
Has this project been completed, I'm having trouble opening the file.
Thanks
Anthony

From: Ashley Bridge [mailto:ABridge@biosis.com.au]
Sent: Thursday, 28 February 2019 3:59 PM
To: 'muragadi@yahoo.com.au'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR

Good Afternoon,

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Research Assistant - Heritage
M: 0437 689 734
D: (02) 9101 8721
E: abridge@biosis.com.au

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Ashley Bridge

From: Ashley Bridge
Sent: Wednesday, 27 March 2019 12:02 PM
To: 'Muragadi'
Subject: RE: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR

Hi Anthony,

I just wanted to touch base to make sure you had been able to access the ACHA and AR for the below project? As comments close tomorrow and I did not receive a response from you regarding the usb, I wanted to make sure you were able to comment on the reports prior to the deadline.

I have attached a new link to the files in case you were still having trouble with access.

https://spaces.hightail.com/receive/5voT7wBrgF

Please contact me on any of the details below if you have any more trouble,

Kind Regards,
Ashley Bridge

From: Ashley Bridge
Sent: Friday, 1 March 2019 1:13 PM
To: 'Muragadi'
Subject: RE: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR

Hi Anthony,

The link is valid until mid-April, however in order to access the files I believe you will need an account with Hightail.
If you still cannot access the files, I am happy to send them via mail on a USB.
Please let me know what works best for you,

Kind Regards,
Ashley

From: Muragadi <muragadi@yahoo.com.au>
Sent: Friday, 1 March 2019 12:52 PM
To: Ashley Bridge <ABridge@biosis.com.au>
Subject: RE: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR

Hi Ashley
Has this project been completed, I'm having trouble opening the file.
Thanks
Anthony

From: Ashley Bridge [mailto:ABridge@biosis.com.au]
Sent: Thursday, 28 February 2019 3:59 PM
To: 'muragadi@yahoo.com.au' <muragadi@yahoo.com.au>
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR

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D: (02) 9101 8721
E: abridge@biosis.com.au

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Ashley Bridge

From: Barking Owl Aboriginal Corporation <barkingowlcorp@gmail.com>
Sent: Tuesday, 5 March 2019 3:06 PM
To: Ashley Bridge
Subject: Re: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR

Perfect thanks Ashley.

On 4 Mar 2019, at 3:03 pm, Ashley Bridge <ABridge@biosis.com.au> wrote:

Hi Jody,
Apologies about that, could you please try the link below, and let me know if you are still having trouble with it?
https://spaces.hightail.com/receive/AIGHOfKCCI
Thank-you.
Kind Regards,
Ashley

Ashley Bridge
Research Assistant - Heritage
M: 0437 689 734
D: (02) 9101 8721
E: abridge@biosis.com.au
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From: Barking Owl Aboriginal Corporation <barkingowlcorp@gmail.com>
Sent: Friday, 1 March 2019 5:40 PM
To: Ashley Bridge <ABridge@biosis.com.au>
Subject: Re: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Hi Ashley,
I was unable to open the link.
Kind regards
Jody Kulakowski
Barking Owl AC

On 28 Feb 2019, at 3:58 pm, Ashley Bridge <ABridge@biosis.com.au> wrote:
https://spaces.hightail.com/receive/ynFaTHZiRh

Barking Owl Aboriginal Corporation
barkingowlcorp@gmail.com

Barking Owl Aboriginal Corporation
barkingowlcorp@gmail.com

Ashley Bridge

From: Darug Land Observations <daruglandobservations@gmail.com>
Sent: Wednesday, 13 March 2019 10:57 AM
To: Dr Amanda Markham
Subject: DRAFT ACHA & AR - Mamre South Precinct State Significant Development
Attachments: AHIP Comments letter BIOSIS (MamreSouth).docx

Hi Amanda,

Please find attached letter in reply to the draft Aboriginal Cultural Heritage Assessment and Archaeological Report for the proposed industrial estate, located at 657-769 Mamre Road, in Kemps Creek.

Look forward to working with you on this project.

Kind Regards,

Anna

Darug Aboriginal Land care

Uncle Des Dyer

18 a Perigee Close
Doonside
NSW 2767
ABN 71 301 006 047

Amanda Markham
Archaeologist
Biosis
Unit 14, 17-27 Power Avenue
Alexandria 2015
NSW

Re: Mamre South Precinct, Kemps Creek .

Dear Amanda,

The Darug Aboriginal Land care/ Uncle Des Dyer, has no objections to the planned development.

We have read your report and agree with the recommendations, in your report. We agree with your Methodology.

We ask that native plants be used in the landscape .

We ask that while the development is in progress if any Artefacts are uncovered that work stops until the Artefacts can be salvaged and moved.

We make Recommendation that this is strongly heard to for projects !!!!!

We ask that all artefacts be reburied on site out of harm's way, that any rock cravens, and scared tree be preserved, were possible, and be recorded.

<u>If not Care and control</u> of Artefacts are put in the local museum, or displayed in the foyer of new building with signage on where they came from. If not we would like to see them in the <u>old Parramatta Goal....</u>

The Darug Aboriginal Land care have and always will hold all land specific social, spiritual and have a responsibility to look after the plants , animals creeks rivers on Darug land has cultural values to our organisation.

We are Traditional Owner, our members have lived on Darug land for most of their lives and worked in the area. We have been doing Cultural Heritage Assessments for over 20 years and still do today.

Respectfully yours,

Uncle Des Dyer
Darug Elder
Darug Aboriginal Land Care
Mobile 0408 360 814

Ashley Bridge

From: desmond dyer <desmond4552@hotmail.com>
Sent: Tuesday, 26 March 2019 12:05 PM
To: Ashley Bridge
Subject: Re: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Attachments: Archo report.doc

Hi Amanda,
hope this letter is okay
Kind regards
Des

From: Ashley Bridge
Sent: Thursday, 28 February 2019 3:58 PM
To: 'desmond4552@hotmail.com'
Subject: 29083 - Mamre South Precinct SSD - Stage 4 draft ACHA and AR
Good Afternoon,

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D: (02) 9101 8721
E: abridge@biosis.com.au

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DARUG LAND
OBSERVATIONS PTY LTD
ABN 27 602 765 453

EMAIL: DARUGLANDOBSERVATIONS@GMAIL.COM
PO BOX 173 ULLADULLA NSW 2539
MOBILE: 0413 687 279

13th March, 2019

Amanda Markham
Biosis Pty Ltd
Unit 14, 17-27 Power Avenue
ALEXANDRIA NSW 2015

Dear Amanda,

RE: MAMRE SOUTH PRECINCT STATE SIGNIFICANT DEVELOPMENT – 657-769 MAMRE ROAD, KEMPS CREEK

Aboriginal Cultural Heritage Assessment & Archaeological Report

Darug Land Observations Pty Ltd (DLO) has reviewed the draft Aboriginal Cultural Heritage Assessment and Archaeological Report, and supports the methodology for the proposed industrial estate including earthworks and the development of industrial infrastructure of Lots X & Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414 and Lot 34 DP 1118173, located at 657-769 Mamre Road, in Kemps Creek.

In relation to the long-term storage of recovered artefacts, we believe that the recovered artefacts should be re-buried on Country (the study area).

Furthermore, Darug Land Observations Pty Ltd would like to be involved in the further archaeological test excavations and all other forms of works to be carried out on the site.

Look forward to working with you on this project.

Yours sincerely,

Jamie Workman
Darug Land Observations Pty Ltd

Uncle Gordon Workman
Darug Elder

Appendix 6 Archaeological report

Mamre South Precinct State Significant Development:

Archaeological Report

FINAL REPORT

Prepared for Altis Property Partners and Frasers Property Industrial Constructions

29 March 2019

Biosis offices

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Email: wangaratta@biosis.com.au

Document information

Report to:	Altis Property Partners and Frasers Property Industrial Constructions
Prepared by:	Ashleigh Keevers-Eastman Anthea Vella & Mathew Smith
Biosis project no.:	29083
File name:	29083.Mamre.South.SSD.AR.FIN01.20190328

Citation: Biosis 2019. Mamre South Precinct State Significant Development: Archaeological Report. Report for Altis Property Partners and Frasers Property Industrial Construction. Authors: A Keevers-Eastman, A Vella & M Smith, Biosis Pty Ltd, Newcastle. Project no. 29083

LGA:	Penrith

Document control

Version	Internal reviewer	Date issued
Draft 01	Amanda Markham	26/02/2019
Draft 01	James Cole	26/02/2019
Final 01	Taryn Gooley	28/03/2019

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Glossary

ACHA	Aboriginal Cultural Heritage Assessment
AHIMS	Aboriginal Heritage Information Management System
Consultation requirements	*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*
DA	Development Application
DECCW	Department of Environment, Climate Change and Water (now OEH)
DP	Deposited Plan
EP&A Act	*Environmental Planning and Assessment Act 1979*
GDA	Geocentric Datum of Australia
GPS	Global Positioning System
GSV	Ground Surface Visibility
ICOMOS	International Council on Monuments and Sites
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
MGA	Map Grid of Australia
NHL	National Heritage List
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NTSCORP	Native Title Services Corporation
OEH	Office of Environment and Heritage
PAD	Potential Archaeological Deposit
Project area	Defined as Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173, 657-769 Mamre Road, Kemps Creek, NSW
RAP	Registered Aboriginal Party
REF	Review of Environmental Factors
REP	Regional Environmental Plan
SEPP	State Environmental Planning Policy
the Code	*Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*

Summary

Biosis Pty Ltd (Biosis) was commissioned by Altis Property Partners and Frasers Property Industrial Constructions to undertake an Aboriginal archaeological investigation for the proposed State Significant Development (SSD) at 657-769 Mamre Road, Kemps Creek, New South Wales (NSW) (the study area). The study area consists primarily of cleared paddocks, with the long term plan for the area being industrial development. It is approximately 12 kilometres south east of Penrith and approximately 50 kilometres west of the Sydney central business district (CBD).

This assessment will support an application to the Department of Planning and the Environment (DPE) for an SSD approval (SSD 9522), and will be included within the Specialist Consultant Studies Compendium that is to accompany an EIS.

A search of the Aboriginal Heritage Information Management System (AHIMS) database identified seven Aboriginal cultural heritage sites registered upon the AHIMS register, within the study area; however, three of these sites (AHIMS 45-5-3028/EPTA3, AHIMS 45-5-3032 /EPTA10 and AHIMS 45-5-3033/EPTA11) have been incorrectly mapped on AHIMS and are actually located outside of the study area.

The Aboriginal community was consulted regarding the heritage management of the project throughout its lifespan. Consultation has been undertaken as per the process outlined in the Department of Environment Climate Change and Water document (DECCW) document, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a) (consultation requirements).

A survey of the study area was undertaken on 31 January 2019. The overall effectiveness of the survey for examining the ground for Aboriginal sites was deemed low and no new Aboriginal sites or areas of potential were identified. A previous survey of the study area was undertaken by Biosis (2018a). The survey was conducted on 30 April 2018 and a total of four previously unrecorded Aboriginal sites were identified during the survey, including two artefact scatters and an isolated find. In addition to this, new artefacts were recorded at one of the previously identified sites within the study area. Three areas of archaeological potential (OA1, OA2 and OA3) were also identified during the survey in the western portion of the study area adjacent to South Creek, and the north-eastern portion of the study area, across a low rise adjacent to an open depression.

Following the survey of the study area, test excavations were undertaken in areas of potential. The results of these test excavations identified sub-surface deposits in all three areas of potential. OA1 and OA2 were located the furthest distance from water and both contained low density artefact deposits, while a high density artefact deposit was identified at OA3 which was located closer to South Creek. The assemblage at OA3 contained a varied artefact deposit including a number of backed artefacts which placed it within the Middle Bondaian phase of occupation, approximately 4,000 to 1,000 years before present.

Strategies have been developed based on the archaeological significance of cultural heritage relevant to the study area. The strategies also take into consideration:

- predicted impacts to Aboriginal cultural heritage
- the planning approvals framework
- current best conservation practice, widely considered to include:
  - the ethos of the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter
  - the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) (the Code).

The recommendations that resulted from the consultation process are provided below.

Management recommendations

Recommendation 1: Further archaeological work in the form of surface salvage and salvage excavation at AHIMS site 45-5-5188/MSP-02 as a part of SSD approval

It is recommended that further archaeological work be conducted for AHIMS site 45-5-5188/MSP-02 in the form of salvage excavation to recover sub-surface artefacts which will be impacted as a part of the proposed development. This would be able to provide further information relating to the artefact typology and material type, as well as the nature of the activities taking place at AHIMS site 45-5-5188/MSP-02. It is recommended that this be undertaken as a condition of the SSD approval. The salvage work for this particular area of the site would not hold up the development of the remaining areas of the estate.

Recommendation 2: Further archaeological work in the form of surface salvage at AHIMS sites 45-5-5184/MSP-01, MSP-07 and MSP-08 as a part of SSD approval

It is recommended that further archaeological work be conducted for AHIMS sites 45-5-5184/MSP-01, 45-5-5185/MSP-02, MSP-07 and MSP-08 in the form of surface salvage to recover any surface artefacts which will be impacted as a part of the proposed development. It is recommended that surface salvage be undertaken as a condition of the SSD approval.

Recommendation 3: No further archaeological work is required for sites MSP-05, MSP-06, MSP-09, MSP-10 and MSP-11

It is recommended that no further archaeological investigation is required for Aboriginal sites MSP-05, MSP-06, MSP-09, MSP-10 and MSP-11 prior to development impacts.

Recommendation 4: Update AHIMS site cards for AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, and 45-5-5189/MSP-03 and lodge AHIMS site cards for newly identified sites MSP-05, MSP-06 and MSP-07, MSP-08, MSP-09, MSP-10, and MSP-11

It is recommended that the AHIMS site cards for previously identified AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, 45-5-5189/MSP-03 be updated to reflect the revised site descriptions following the test excavations discussed in this report.

It is also recommended that AHIMS site cards are prepared and lodged with AHIMS for newly identified sites MSP-05, MSP-06 and MSP-07, MSP-08, MSP-09, MSP-10.

Recommendation 5: Preparation and lodgment of AHIMS site impact recording forms for 45-5-5184/MSP-01, 45-5-5185/MSP-02, 45-5-5189/MSP-03, MSP-05, MSP-06, MSP-07 and MSP-08, MSP-09, MSP-10 and MSP 11

It is recommended that AHIMS site impact recording forms are prepared and lodged with AHIMS for Aboriginal sites 45-5-5184/MSP-01, 45-5-5185/MSP-02, 45-5-518/MSP-03, MSP-05, MSP-06, MSP-07 and MSP-08 MSP-09, MSP-10 and MSP-11 within four months following completion of development impacts or as otherwise stated in SSD approval conditions.

Recommendation 6: Unexpected finds

Discovery of unanticipated Aboriginal objects

All Aboriginal objects and places are protected under the *National Parks and Wildlife Act 1974* (NPW Act). It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

Discovery of unanticipated historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977*. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Do not recommence work at that location unless authorised in writing by OEH.

1 Introduction

1.1 Project background

Biosis was commissioned by Altis Property Partners and Frasers Property Industrial Constructions to undertake an Aboriginal archaeological investigation for the proposed SSD at 657-769 Mamre Road, Kemps Creek, NSW (Figure 1 and Figure 2). The assessment will support an application to DPE for an SSD approval (SSD 9522), and will be included within the Specialist Consultant Studies Compendium that is to accompany the EIS. This assessment follows a previous archaeological survey of the study area (excluding Lot X DP 421633) undertaken by Biosis in 2018 (Biosis Pty Ltd 2018a).

This investigation has been carried out under Part 6 of the NPW Act. It has been undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) (the Code). The Code has been developed to support the process of investigating and assessing Aboriginal cultural heritage by specifying the minimum standards for archaeological investigation undertaken in NSW under the NPW Act. The archaeological investigation must be undertaken in accordance with the requirements of the Code.

This assessment will be assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EP&A Act includes provisions for local government authorities to consider environmental impacts in land-use planning and decision making. Each Local Government Area (LGA) is required to create and maintain a Local Environmental Plan (LEP) that includes Aboriginal and historical heritage items. Local Councils identify items that are of significance within their LGA, and these items are listed on heritage schedules in the local LEP and are protected under the EP&A Act and *Heritage Act 1977.*

1.2 Study area

The study area is located immediately south of the Warragamba water pipeline, on the western side of Mamre Road, at 657-769 Mamre Road, Kemps Creek, NSW (Figure 1 and Figure 2). The study area consists of 5 lots; Lots X and Y DP 421633, Lot 1 DP 1018318, Lot 22 DP 258414, and Lot 34 DP 1118173.

The study area is within the:

- Penrith City Council Local Government Area (LGA).
- Parish of Melville.
- County of Cumberland.

1.3 Planning approvals

This assessment will support an SSD application to be assessed under Part 4 of the EP&A Act. In preparing this assessment, Biosis has taken into account the Secretary's Environmental Assessment Requirements (SEARs) for the project (SSD 9522) relating to Aboriginal heritage, specifically that the EIS must include:

> *An Aboriginal Cultural Heritage Assessment Report prepared in consultation with Aboriginal people and in accordance with Office of Environment and Heritage guidelines.*

Other relevant legislation and planning instruments that will inform this assessment include:

- NPW Act

- NSW *National Parks and Wildlife Amendment Act 2010*
- Infrastructure State Environmental Planning Policy 2007 (SEPP)
- Penrith Local Environmental Plan 2010 (LEP)
- Penrith Development Control Plan 2014 (DCP)
- State Environmental Planning Policy (Western Sydney Employment Area) 2009.

1.4 Objectives of the investigation

The objectives of the investigation can be summarised as follows:

- To identify and consult with any registered Aboriginal stakeholders and the Deerubbin Local Aboriginal Land Council (LALC).
- To conduct extensive background research in order to identify any trends in site distribution and location.
- To search statutory and non-statutory registers and planning instruments to identify listed Aboriginal cultural heritage sites within the study area.
- To highlight environmental information considered relevant to past Aboriginal occupation of the locality, associated land use, and relevant to the identification and integrity/preservation of Aboriginal sites.
- To summarise past Aboriginal occupation in the locality of the study area using ethnohistory and archaeological records.
- To formulate a model to broadly predict the type and character of Aboriginal sites likely to exist throughout the study area, their location, frequency and integrity.
- To conduct a field survey of the study area to locate unrecorded or previously recorded Aboriginal sites and to further assess the archaeological potential of the study area.
- To conduct Archaeological test excavations under the Code in order to determine the nature and significance of areas of areas of moderate and high archaeological potential, and to identify whether sub-surface deposits are present within the study area.
- To assess the significance of any known Aboriginal sites in consultation with the Aboriginal community.
- To identify the impacts of the proposed development on any known or potential Aboriginal sites within the study area.
- To recommend strategies for the management of Aboriginal cultural heritage within the context of the proposed development.

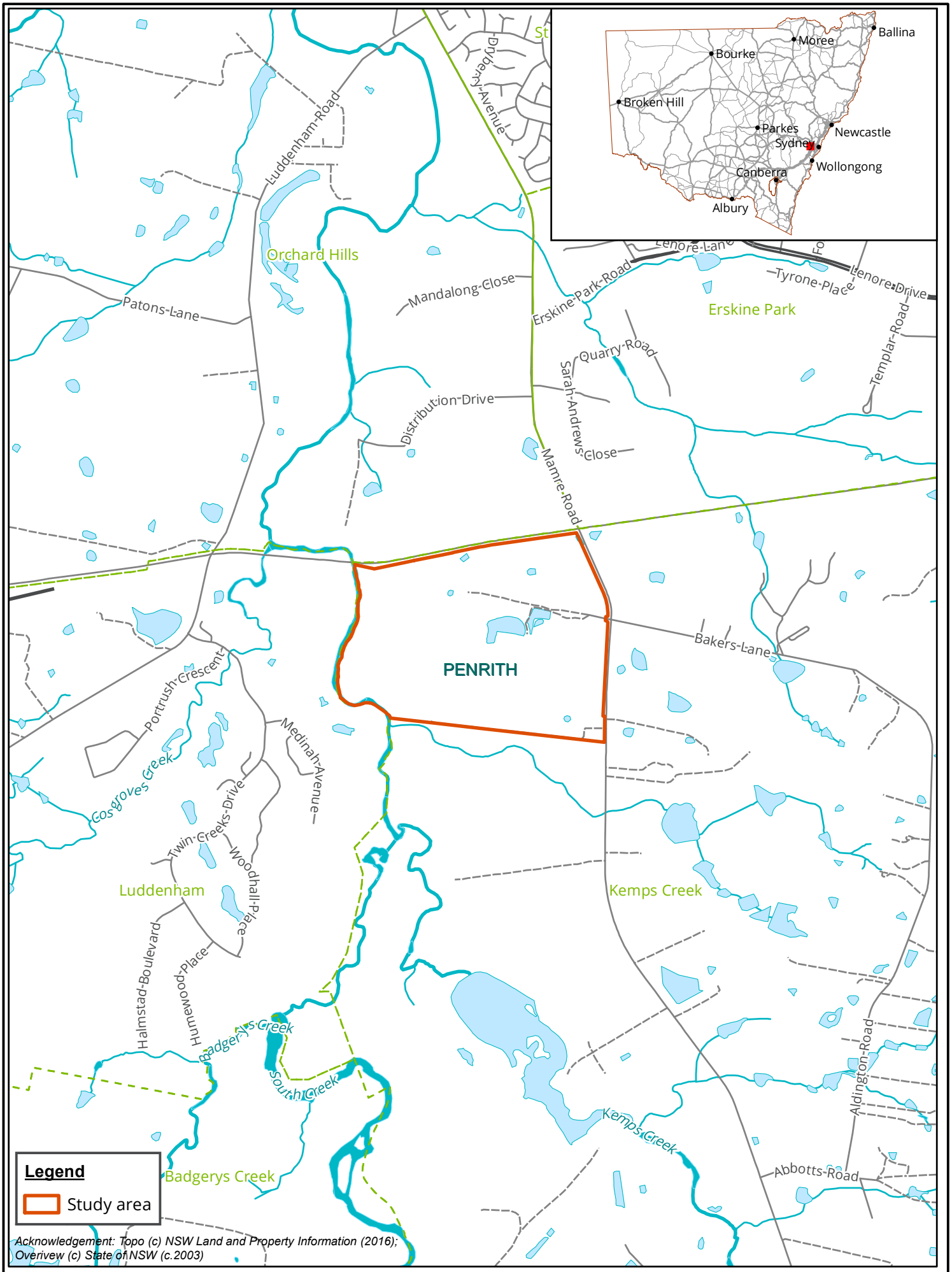
1.5 Investigators and contributors

The roles, previous experience and qualifications of the Biosis project team involved in the preparation of this archaeological report are described below in Table 1.

Table 1 Investigators and contributors

Name and qualifications	Experience summary	Project role
Dr Amanda Markham BA Hons, PhD (Anthropology), Grad. Cert (Archaeology), MA	Amanda joined Biosis in 2017 and is currently a Senior Archaeologist/Anthropologist based in Sydney, NSW. During this time, Amanda has been involved with Aboriginal cultural heritage assessments, Aboriginal Heritage Impact Assessments, Archaeological Assessment & Cultural Heritage Plan as an Archaeologist/Anthropologist for multiple projects across Australia. Amanda has over twenty years' experience in Anthropology and Archaeology, including extensive work in remote outback Australia. She has previously worked for Aboriginal representative bodies, mining and exploration companies, Commonwealth, state and territory government agencies, community groups and Indigenous stakeholder groups. With proven staff and project management skills and an ability to simultaneously oversee multiple large complex projects, Amanda can deliver Frasers Property Industrial Constructions Pty Ltd and Altis Property Partners Pty Ltd outcomes within tight time frames and budget constraints. Amanda has a strong research background, having completed a PhD in Anthropology and worked as a Research Director on multiple projects.	• Quality assurance • Technical advice
Ashleigh Keevers-Eastman BA (Hons)	Ashleigh is a field archaeologist based in Newcastle. Ashleigh completed her Bachelor of Arts, with honours in Ancient History and Classical studies in 2016, and started with Biosis as a research assistant in 2017. Ashleigh has previously volunteered as a Research Assistant for the Cultural Collections at the University of Newcastle. Her research with the Cultural Collections involved the location and transcription of Aboriginal sites in the NSW region, with a particular focus on the Newcastle and Central Coast region. Ashleigh has experience in conducting Aboriginal heritage assessments, field surveys and archaeological test excavations in NSW, to assess Aboriginal cultural significance. Ashleigh's strengths are in consulting with the Aboriginal community to build strong relationships that assist in the assessment of Aboriginal cultural heritage.	• Report author • Test excavations
Mathew Smith BA, BSc (Hons)	Mathew joined Biosis in 2016 and is currently a Field Archaeologist in Wollongong, NSW. Since joining the company Mathew has worked on a number of Aboriginal cultural heritage projects in the Illawarra and Far West regions of NSW, where he has developed his skills in Aboriginal archaeology. As part of these projects Mathew has conducted desktop assessments, archaeological surveys and Aboriginal	• Artefact analysis • Test excavations

	excavations, as well as writing the archaeological reports following these assessments. Mathew specialises in lithic identification and analysis, and has conducted lithic analysis of assemblages from the Illawarra, Sydney and Far West regions. Mathew is a member of the Australian Archaeology Association and the Australian Association of Consulting Archaeologists Inc.	
Anthea Vella BArch, MAHM	Anthea graduated from Flinders University with a Bachelor of Archaeology and has also recently graduated from Flinders University with a Master of Archaeology and Heritage Management. She has experience with desktop assessments, project administration, collating internal and external research, and reporting. Anthea also has experience in Aboriginal test excavations, and Historical excavations. She also has geophysical skills in GPR data collection, processing and interpretation.	• Background research • Test excavation
Ashley Bridge BA MAS (Adv, Hons)	Ashley joined Biosis at the Sydney Office as a Research Assistant – Heritage in 2018. She completed her Masters in Archaeological Science in 2016, having written a thesis on forensic stature in Australian mass casualty scenarios, developing equations that allow anthropologists to discern stature in a morphologically discontinuous living female Australian population. In 2018, Ashley has undertaken fieldwork for Biosis throughout Sydney, Wollongong and Western New South Wales, with a focus in both Aboriginal and historical archaeology. This has allowed her to further develop her skills in Aboriginal and historical excavations in Australia, while also honing her skills in reporting and administrative tasks. She also has experience with desktop research and Aboriginal consultation practices in an Australian context.	• Test excavation
Anne Murray BEnv, MGIS-RS	Anne is a recent graduate with a year of professional experience in GIS in the environmental consulting sector. Prior to joining Biosis in 2018, Anne has worked as a Graduate GIS Specialist for an environmental consultancy. Anne was responsible for preparing maps, analysing data and managing databases for consultants and a variety of public and private Frasers Property Industrial Constructions Pty Ltd and Altis Property Partners Pty Ltds. Anne has completed a Masters of GIS and Remote Sensing including studies in cartography, spatial analysis, image analysis and integrated GIS and Remote Sensing. She graduated with distinction and was awarded the Executive Dean's Award for Academic Excellence.	• GIS



Acknowledgement: Topo (c) NSW Land and Property Information (2016); Overivew (c) State of NSW (c.2003)

biosis

Biosis Pty Ltd
Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Figure 1: Location of the study area

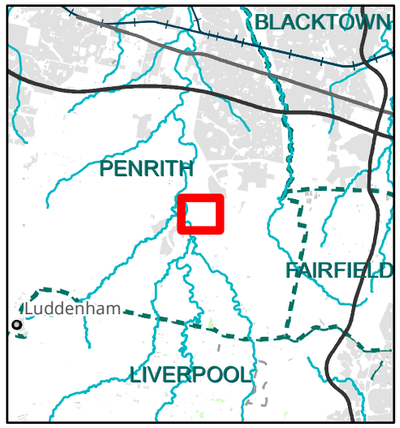
Matter: 29083
Date: 22 February 2019,
Checked by: AKE, Drawn by: AEDM, Last edited by: amurray
Location:P:\29000s\29083\Mapping\

0 250 500 750 1,000
Metres

N

Scale 1:25,000 @ A4, GDA 1994 NSW Lambert

Acknowledgements: Basemap © Land and Property Information 2016



Legend

Study area

Figure 2: Study area detail

0 50 100 150 200 250

Metres

Scale: 1:5,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 29083
Date: 27 February 2019,
Checked by: AKE, Drawn by: AEDM, Last edited by: amurray
Location:P:\29000s\29083\Mapping
29083_F2_StudyArea

2 Proposed development

This assessment has been formulated to assess impacts with regards to Aboriginal cultural heritage within the SSD application area (study area). The proposed development is for an industrial estate that will include earthworks and the development of industrial infrastructure. The study area will be subdivided into lots of 1 to 3 hectares and access to the new industrial estate will be provided via the new Southern Link Road, Bakers Lane, and from a new estate access road off Mamre Road, within the southern portion of the study area.

The proposed impacts for the industrial development will include vegetation clearance, demolition, bulk earthworks, subdivision, Construction of industrial infrastructure and buildings, and civil engineering works such as the construction of roads, stormwater drainages, sewer works, and water supply works. The proposed works are shown in Figure 3.

DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS ON SITE.

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REVISION	DESCRIPTION	DATE
A	DA ISSUE	04.05.18
B	DA ISSUE	13.06.18
D	DA ISSUE	14.09.18
F	DA ISSUE	05.12.18
G	DA ISSUE	19.12.18
H	DA ISSUE	29.03.19

DEVELOPMENT AREAS		
LOT 21	8.7377 ha	
WAREHOUSE	11	48341 SQM
OFFICE	11A	1200 SQM
DOCK OFFICE	11A	50 SQM
OFFICE	11B	1200 SQM
DOCK OFFICE	11B	50 SQM
		50841 SQM
LOT 22	3.2245 ha	
WAREHOUSE	8	18480 SQM
OFFICE	8	840 SQM
DOCK OFFICE	8	50 SQM
		19370 SQM
LOT 23	4.4970 ha	
WAREHOUSE	9	13020 SQM
OFFICE	9	710 SQM
DOCK OFFICE	9	50 SQM
WAREHOUSE	10	12785 SQM
OFFICE	10	710 SQM
DOCK OFFICE	10	50 SQM
		27325 SQM
LOT 51	3.8821 ha	
WAREHOUSE	35	9020 SQM
OFFICE	35	550 SQM
WAREHOUSE	36	9020 SQM
OFFICE	36	550 SQM
		19140 SQM
LOT 53	5.1304 ha	
WAREHOUSE	33	21995 SQM
OFFICE	33	1150 SQM
		23145 SQM
LOT 54	5.1591 ha	
WAREHOUSE	31	11375 SQM
OFFICE	31	550 SQM
WAREHOUSE	32	11375 SQM
OFFICE	32	550 SQM
		23850 SQM
TOTAL	30.63 ha	163671 SQM

BULK EARTHWORKS STAGE BOUNDARIES

BE STAGE 1

BE STAGE 2

EXISTING FLOODPLAIN

PROPOSED ROADS

ALTIS PROPERTY PARTNERS

FRASERS PROPERTY

COMMERCIAL & INDUSTRIAL DIVISION
1 HOMEBUSH BAY DRIVE
BUILDING C, LEVEL 3
RHODES NSW 2138
PO BOX 3307
RHODES NSW 2138
PHONE 02 9767 2000
FAX 02 9767 2908

PROJECT
STATE SIGNIFICANT DEVELOPMENT APPLICATION PLAN FOR KEMPS CREEK

ADDRESS
MAMRE ROAD & BAKERS LANE
KEMPS CREEK

DRAWING TITLE
STATE BULK EARTHWORKS & BUILDING PLAN

SCALE	1:2500 @ A1
DRAWN	MP
CHECKED	JQ
DATE	28.03.2019
JOB NUMBER	0000-00-000

DRAWING NUMBER SSD-MRM-DA-001 ISSUE H

01 - STATE SIGNIFICANT DEVELOPMENT APPLICATION PLAN
SCALE - 1:2500 @ A1

ALL LEVELS ARE INDICATIVE AND SHOULD BE READ IN CONJUNCTION WITH CIVIL ENGINEER'S DRAWINGS. FOR FINAL LEVELS OF ALL EARTHWORKS.

ALL LEVELS ARE TO BE +/- 1000mm.

3 Desktop assessment

The desktop assessment involves researching and reviewing existing archaeological studies and reports relevant to the study area and surrounding region. This information is combined to develop an Aboriginal site prediction model for the study area, and to identify known Aboriginal sites and/or places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the Code.

3.1 Landscape context

It is important to consider the local environment of the study area any heritage assessment. The local environmental characteristics can influence human occupation and associated land use and consequently the distribution and character of cultural material. Environmental characteristics and geomorphological processes can affect the preservation of cultural heritage materials to varying degrees or even destroy them completely. Lastly landscape features can contribute to the cultural significance that places can have for people.

3.1.1 Topography and hydrology

Topographically, the entire study area is located on a broad formation of alluvial plains/flats sloping very gently down toward South Creek from the lower slope landforms along the eastern boundary of the study area. Riparian corridors along creeklines are also present (Figure 4). The alluvial plains landform pattern is defined as having extremely low relief (Speight 2009, p.59). Shallow to deep alluvial stream channels are typically sparse to widely spaced, forming a unidirectional, integrated network. There may be frequently active erosion and aggradation by channelled and overbank stream flow, or the landforms can be relicts from these processes. Typical landform elements associated with alluvial plain landforms present within the study area include stream channels, levees, backswamps, and channel fill. Levees are very long, low, narrow, nearly level, sinuous ridges immediately adjacent to a stream channel built up by overbank flow; present on both sides of the stream channel as a result of periodic flooding and depositional events. During large floods the stream flows out of the channel and over the floodplain, resulting in both erosion and burial of cultural material. Old, abandoned channels also form an oxbow lake, or backswamp (Rapp & Hill 2006, p.69), and are present where deposits of fine silts and clays settle after a flood.

The geomorphological processes associated with alluvial plains are characterised by a high degree of sediment movement and deposition. It is therefore likely that Aboriginal artefacts will be present within an alluvial plain landform and they may have been displaced over time from their original location, or would be relatively intact after being deposited underneath new layers over time. Artefacts are most likely to be present within deep deposits formed by overbank flow within levees, the banks of backswamps and oxbow lakes.

South Creek flows north to south along the western boundary of the study area, as a sixth order perennial water source. A second order tributary of South Creek flows west to east adjacent to the southern boundary of the study area through a lower lying plain that extends south from the study area.

Stream order is recognised as a factor which assists the development of predictive modelling, and has seen extensive use in the Sydney region, most notably by (Jo McDonald Cultural Heritage Management Pty Ltd 2000, 2005a, 2005, 2006, 2008). Predictive models which have been developed for the region have a tendency to favour higher order streams as the locations of campsites as they would have been more likely to provide a stable source of water and by extension other resources which would have been used by Aboriginal groups.

The stream order system used for this assessment was originally developed by Strahler (1952), and works by adding streams together at their confluence to create a higher order stream, that is, two first order streams meet to form a second order stream, two second order streams meet to form a third order stream, and so on (see Plate 1).

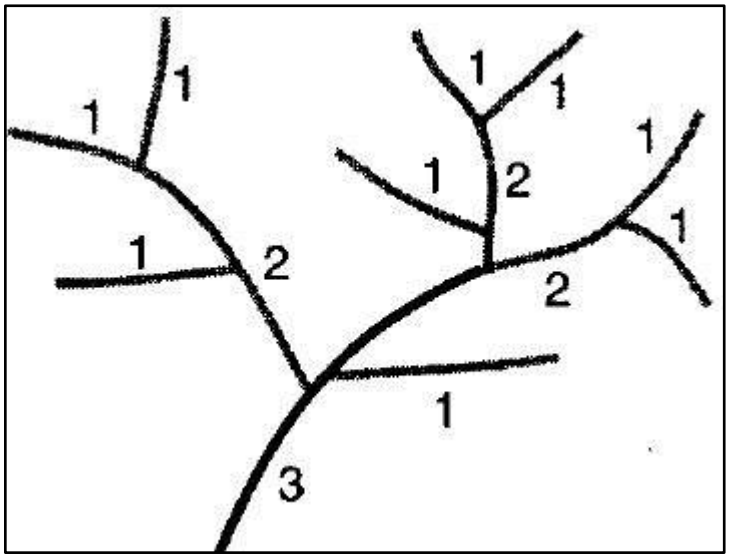


Plate 1 Diagram showing Strahler stream order (Ritter et al. 1995, p.151)

As stream order increases, so does the likelihood that the stream would be a perennial source of water. As a 6th order perennial water source, the proximity of South Creek can be considered a good indicator of the potential for Aboriginal occupation within the study area. Predictive modelling for the Cumberland Plains region suggests that artefact density and site complexity decreases in relation to decreasing Strahler order. Therefore, the artefact density and complexity of potential archaeological deposits will likely decrease with increasing distance from high Strahler order water sources, and subsequently with decreasing Strahler order (Jo McDonald Cultural Heritage Management 1997, Jo McDonald Cultural Heritage Management 2006, Dominic Steele Consulting Archaeology 2003, White & McDonald 2010).

3.1.2 Geology and soil landscapes

An understanding of both the underlying geological formations and soil landscapes within the vicinity of the study area can assist in predictive modelling. The study area is located within Cumberland Lowlands physiographic region that consists of low lying, gently undulating plains and low hills on Wianamatta Group shales and sandstones with a dense drainage net of predominantly northward flowing channels (Bannerman & Hazelton 1990a, p.2). The Wianamatta formation, which underlies the study area, tends to contain low relief landforms with well-developed drainage systems. This in turn makes water sources, which form an important part of the prehistoric landscape, easier to locate. These water sources can be good indicators of potential Aboriginal occupation.

The study area is contained within the Bringelly Shale formation (Figure 5). This formation consists of a shale (claystone and siltstone), carbonaceous claystone, laminate and fine to medium-grained lithic sandstone (Bannerman & Hazelton 1990a, p.3). Aboriginal artefact scatter sites are common across this formation, as are potential archaeological deposits (PADs). The presence of underlying shale deposits suggests that sites commonly found within sandstone formations, such as grinding grooves and rock shelters/rock art, are less likely to be present.

A small portion of the study area along South Creek, is situated upon Quaternary Alluvium formations, derived from the Wianamatta Group. This geological unit roughly underlies the South Creek soil landscape. It has been determined that Quaternary Alluvial deposits have the potential to contain a disproportionately higher number of cultural material (Attenbrow 2002, pp.49–50).

There are two soil landscapes that have been defined as occurring in the study area, Blacktown and South Creek (Bannerman & Hazelton 1990a) (Figure 6). Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. Because they are defined by a combination of soils, topography, vegetation and weathering conditions, soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure.

Blacktown soil landscape covers the eastern topographies of the study area. The Blacktown soil landscape is a residual landscape and consists of gently undulating rises, broad rounded crests and gently inclined slopes with a gradient of less than 5%. Local relief within the Blacktown soil landscape is up to 30 metres and rocky outcropping is absent. The soils are shallow to moderately deep at less than 100 centimetres, and can be hard setting with moderate erodability. Dominant soils consist of shallow to moderately deep (less than 100 centimetres) red and brown podzols on crests and on well drained topographies, and deep (150 to 300 centimetres) yellow podzolic soils and soloths on lower slopes and drainage lines (Bannerman & Hazelton 1990b, p.28). The dominant soil characteristics for the Blacktown landscape are summarised below in Table 2. The upper topsoil - *bt1,* is occasionally absent on crests and hill slopes, but boundaries between the soil materials are usually clear. Due to their age and slow accumulation residual soil landscapes have reasonable potential to contain archaeological deposits in an open context, such as stone artefacts derived from occupation sites. Other occupational evidence may include scarred trees where remnant vegetation survives. However, slow accumulation and high impact of extensive land clearing (usually associated with pastoral and housing development) during more recent times often results in the poor preservation of archaeological material. Associated soil landscapes that occur in association to the Blacktown soil landscape include the South Creek soil landscape which occurs along drainage depressions.

Table 2 Blacktown (*bt)* soil landscape characteristics (Hazelton & Tille 1990, pp.28–30)

Soil Material	Description
Blacktown 1 (*bt1*) - Friable brownish-black loam	Friable brown loam to clay loam with a moderately pedal subangular block structure and rough-faced porous fabric ped fabric. This soil material generally occurs as a topsoil (A horizon). Peds are well defined and range from 2-20 millimetres. Rounded iron indurated fine gravel-sized shale fragments and charcoal fragments sometimes occur as inclusions. Soil colour is brownish black (10YR 2/2), and can also range from dark reddish brown (5YR 3/2) to dark yellowish brown (10yr 3/4). Soil varies from moderately acidic to neutral.
Blacktown 2 (*bt2*) - Hardsetting brown clay loam	Hardsetting brown clay loam to silty clay loam, with an apedal massive to weakly pedal structure and porous earthy fabric. Occurs as an A^2 Horizon soil deposit. Peds range from 20-50 millimetres. Platy, iron indurated gravel sized shale fragments are common, with rare inclusions of charcoal and roots. Soil colour is predominately dark brown (7.5YR 4/3), but can range from dark reddish brown (2.5YR 3/3) to dark brown (10YR 3/3). Soil acidity varies from moderately acidic to slightly acidic.
Blacktown 3 (*bt3*) - Strongly pedal, mottled brown light clay	Brown light to medium clay with strong pedal polyhedral or subangular-blocky structure and smooth faced dense ped fabric that occurs as a subsoil (B horizon). The soil texture increases with depth and peds range from 5-20 millimetres. Fine to coarse gravel sized shale fragments are a common inclusion and often occur within stratified bands, with roots and charcoal rarely being present. Soil colour is brown (7.5YR 4/6),

Soil Material	Description
	and can range from reddish brown (2.5YR 2/6) to brown (10YR 4/6). The pH of this soil material varies from strongly acidic to slightly acidic.
Blacktown 4 (*bt4*) - Light grey plastic mottled clay	Plastic light grey silty clay to heavy clay with moderately pedal polyhedral to subangular blocky structure, and smooth-faced dense ped fabric, that occurs as a deep subsoil deposit overlying shale bedrock (B^3 or C Horizon). Peds range between 2-20 millimetres. Inclusion consists of weathered ironstone concretions and rock fragments. Gravel sized shale fragments and roots occur occasionally, but charcoal is rare within this soil deposit. Red, yellow and brown mottles are present and soil colour is usually light grey (10YR 7/1) or sometimes greyish yellow (2.5YR 6/2). Soil acidity ranges from strongly acidic to moderately acidic.

South Creek soil landscape dominates the western portion of the study area and is associated with drainage depressions and alluvial flats within the area (Bannerman & Hazelton 1990a, pp.68–71). The South Creek soil landscape is characterised as a fluvial soil landscape situated on flat to gently sloping alluvial plains with a gradient of less than 5%, and a local relief of up to 10 metres, with intermittent terraces or levees present. Soils are generally very deep (135-190 centimetres) layered sediments over bedrock or relief soils, with red and yellow podzoilic soils being predominant upon terraces, with some structured grey clays, leached clay and yellow solodic soils also occurring. In areas adjacent to drainage lines where soil evolution has occurred structured plastic clays and structured loams can also be present (Bannerman & Hazelton 1990b, pp.68–69). On high terraces South Creek 1 (*sc1*) and South Creek 2 (*sc2*) soils are usually absent and the soils consist of up to 190cm of stratified light to medium clay over shale bedrock (*sc3*) (Bannerman & Hazelton 1990a, p.70). Pockets of sand or clayey sand also occur as splay or flat deposits from alluvial overflow on floodplains. This is a dynamic landscape associated with active floodplains, resulting in both soil erodibility and deposition. In depositional phases streams may be partially or completely blocked by sedimentation. Fine sands and finer fractions, such as silts and clays are indicative of very low-energy regimes like overbank floodplain deposits (Rapp & Hill 2006, p.69). This soil landscape therefore varies in many areas from erosion to deposition and has the potential to disturb soil sequencing and potentially archaeological deposits. During periods when erosion and deposition do not occur, there are stable surfaces for human occupation. Artefacts in these deposits may have been buried soon after human occupation and may be in their primary context (i.e. *in situ*). Characteristics of dominant soil materials within the South Creek soil landscape are summarised in Table 3.

Table 3 South Creek (*sc*) soil landscape characteristics (Bannerman & Hazelton 1990b, p.69)

Soil Material	Description
South Creek 1 (*sc1*) – Brown apedal single-grained loam	Brown sandy loam to sandy clay loam with a porous and earthy fabric, and a single-grained apedal structure, usually occurring as a topsoil (A horizon). Roots are abundant in surface layers, while small angular or rounded gravels of 2-6 millimetres may occur; other inclusions, such as charcoal, do not occur. Colours range from a dull reddish brown 95YR 4/3) to dull yellowish brown (10YR 4/3), and are generally moderately acidic but can vary between strongly to slightly acidic.
South Creek 2 (*sc2*) – Dull brown clay loam	A hard setting dull brown clay loam to sandy clay loam, usually featuring an apedal massive structure and porous, earthy fabric, occurring as a topsoil (A horizon). There may be occasional areas of weak structure which contain small (2-5 mm) rough-faced subangular blocky peds. Roots are rare and stone and other inclusions do not occur. Colour is generally a dull brown (7.5YR 5/4), but can vary from greyish brown (5YR 4/2) to yellowish brown (10YR 5/6). Ranges from moderately acidic to neutral acidity.
South Creek 3 (*sc3*) – Bright brown clay	A bright brown light to medium clay with a strong pedal structure and dense smooth-faced angular blocky or polyhedral ped fabric (20-50mm in size), usually presenting as a subsoil (B horizon). Occasionally contains enough levels of sand to be classified as a sandy clay. Usually whole coloured, ranging from reddish brown (3YR 4/8) to bright yellowish brown (10YR 5/1), with highly variable pH levels from extremely acidic to neutral. Yellow or grey mottling can occur, and may occupy up to 15% of material volume. Where this madeira presents as a topsoil there may be roots. Small subrounded or subangular gravel (2-20mm) can make up to 50% of the volume, and no charcoal is present.

3.1.3 Landscape resources

The Cumberland Plains region would have provided an abundance of natural resources able to be utilised in a variety of ways by Aboriginal people. Plant fibres were twisted into string, which was used for many purposes, including the weaving of nets, baskets and fishing lines. String was also used for personal adornment. Bark was used in the provision of shelter; a large sheet of bark being propped against a stick to form a gunyah (Attenbrow 2002, pp.113–114).

Current aerial photography shows that beyond the riparian corridor, the study area has been extensively cleared except for a few small stands of remnant vegetation throughout the area. Remnant vegetation within the study area is likely to include a mixture of native Flora associated with the Blacktown and South Creek soil landscapes, and introduced species. Vegetation within the South Creek soil landscape reflects the soil landscapes frequent inundation, which supports common tree species such as the broad-leaved apple *Angophora subvelutina,* Cabbage Gum *Eucalyptus amplifolia,* and Swamp Oak *Casuraina glauca*. Tall spike rushes (such as *Eleocharis sphacelata, Juncus usilatus* and *Polygonum*), have the potential to occur where channels are silted. Upon elevated streambanks tall shrubland consisting of paperbarks *Melaleuca,* and tea trees *Leptospermum* may also occur. However, the South Creek soil landscape has been extensively cleared, and as a direct result is now dominated by noxious weeds, such as Blackberry *Rubus vugalris* (Bannerman & Hazelton 1990b, pp.68–69).

The Blacktown soil landscape would have typically supported open-forest and open-woodland that has been extensively cleared since European contact. Originally the Blacktown soil landscape would have featured woodland and open-forest of Forest Red Gum *Eucalyptus tereticornis,* narrow-leaved Ironbark *Eucalyptus*

crebra, Grey Box *Eucalyptus molucanna,* and Spotted Gum *Corymbia maculata* (Bannerman & Hazelton 1990b, p.29).

Animal products were also used for tool making and fashioning a myriad of utilitarian and ceremonial items. For example, tail sinews are known to have been used to make fastening cord, while 'bone points', which would have functioned as awls or piercers, are often an abundant part of the archaeological record. Brush-tailed Possums were highly prized for their fur and could be fashioned into a cloak (Attenbrow 2002, p.117).

The accessibility of water is a strong indication as to the likelihood for the presence of Aboriginal sites. Rivers, creeks and waterholes provide sources of fresh drinking water, whilst also supplying a habitat for fish and shellfish resources. The presence of permanent water sources would have also attracted a number of animals to the area, that would have been hunted by Aboriginal people (Attenbrow 2002, pp.62–76). Native Fauna that could have been present in the study areas includes, but is not limited to the Australian Brush Tail Possum *Trichosurus vulpecula*, Short-beaked Echidna *Tachyglossus aculeatus*, Swamp Wallaby *Wallabia bicolor*, Rainbow Lorikeet *Trichoglossus moluccanus*, Kookaburra *Dacelo novaeguineae*, Australian Magpie *Cracticus tibicen*, Water Dragon *Intellagama lesueurii*, and Eastern Blue-Tongue *Tiliqua scincoides*.

3.1.4 Land use history

The Orchard Hills area is best known for its World War II defence establishment, located approximately 4 kilometres north-west of the current study area. Historically, the area along Mamre Road has been used for farming and pastoral practices, as well as the establishment of large estates, such as Mamre House, approximately 3 kilometres north of the current study area (Thorpe 1986). . As such it would not be unreasonable to expect the study area had undergone disturbance from activities such as ploughing and grazing. It is firmly established in both Aboriginal and historical archaeology (Brooks et al. 2009, Steinberg 1996) that agriculture, and in particular ploughing, causes extensive disturbance to the upper levels of soil profiles on many sites, with Steinberg claiming that this disturbance extends to approximately 30 centimetres below the surface. These activities disturb the original context of archaeological deposits, redistributing their contents across the ploughed area and disrupting the stratigraphic profiles of the area.

The study area encompasses three initial grants from the 18 December 1805, made up of two 300 acre grants to Ezekiel/Edward Wood (Kingswood) and Richard Fitzgerald (Restitution Farm), and a portion of a 360 acre grand to James Scott (Plate 2). All grants appear to have been historically used as farms, however Richard Fitzgerald was a notable convict with associations with both John MacArthur and Lachlan Macquarie. There is the potential for the study area to contain remains of early homesteads dating to the early nineteenth century.

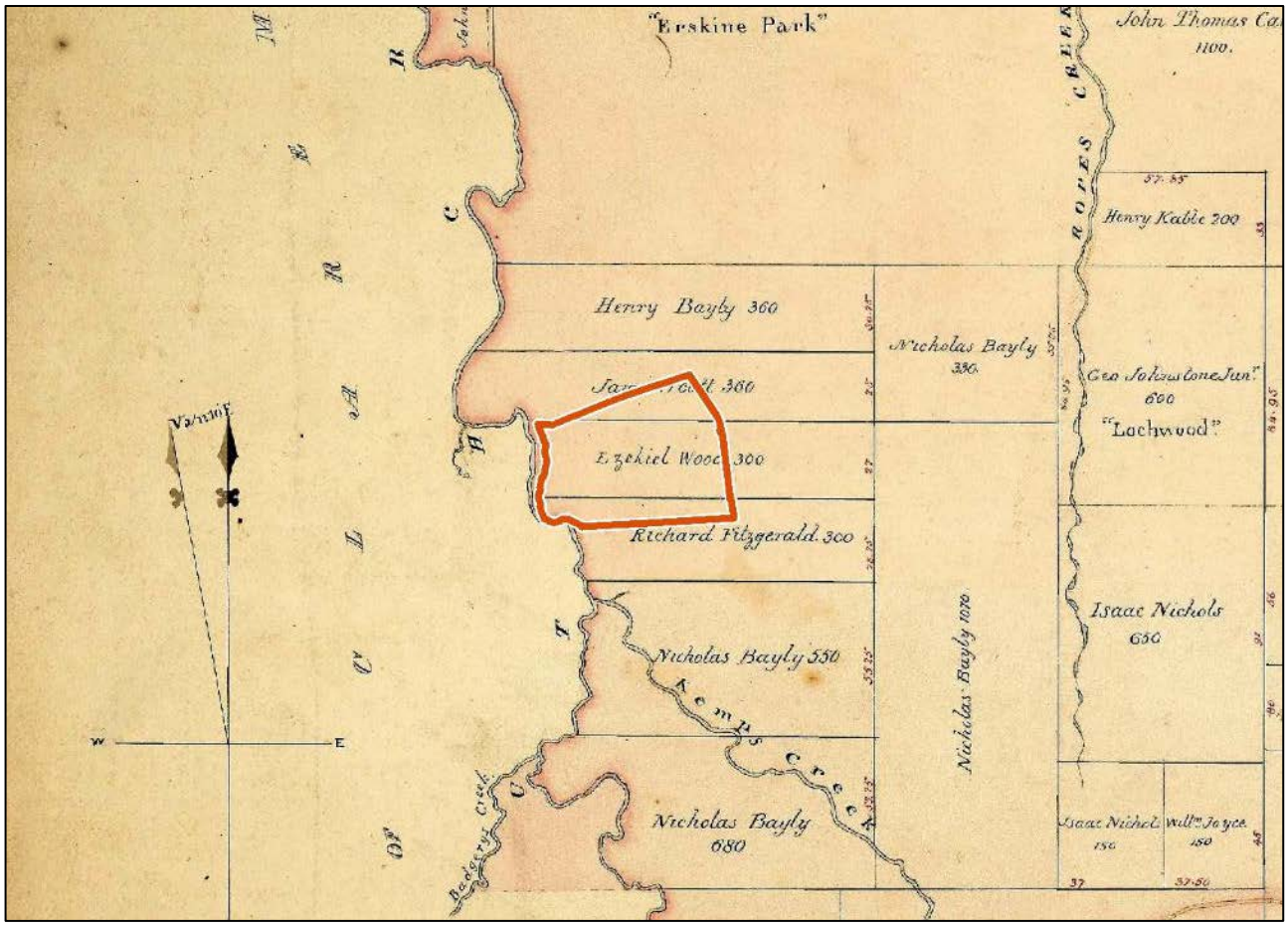
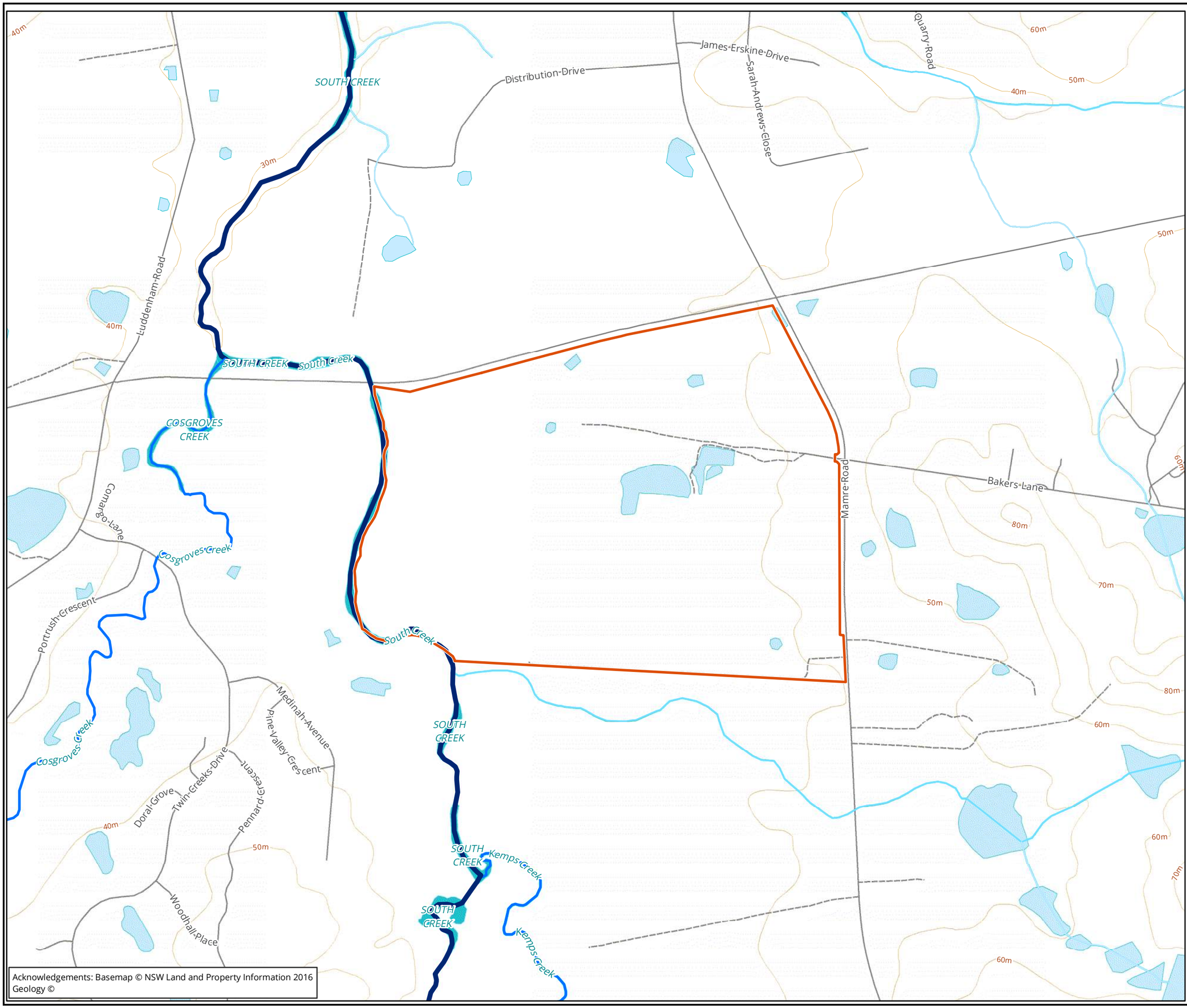
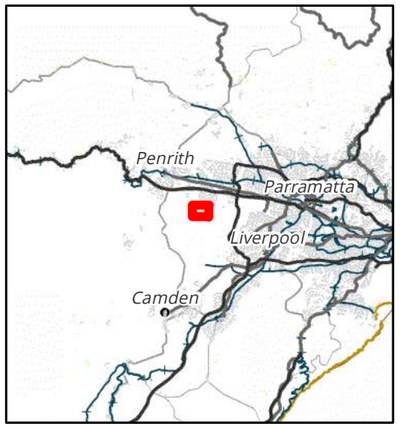


Plate 2 **Excerpt from Parish Map of Melville, showing land grants in the vicinity of the study area (NSW LPI 2015)**





Legend

Study area

Strahler Order

1

2

4

6

Canal-Drain

Natural Watercourse

Figure 4: Hydrology in the vicinity of the study area

0 100 200 300 400 500

Metres

Scale: 1:10,000 @ A3

Coordinate System: GDA 1994 MGA Zone 56

N

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Matter: 29083,
Date: 27 February 2019,
Checked by: AKE, Drawn by: AEDM, Last edited by: amurray
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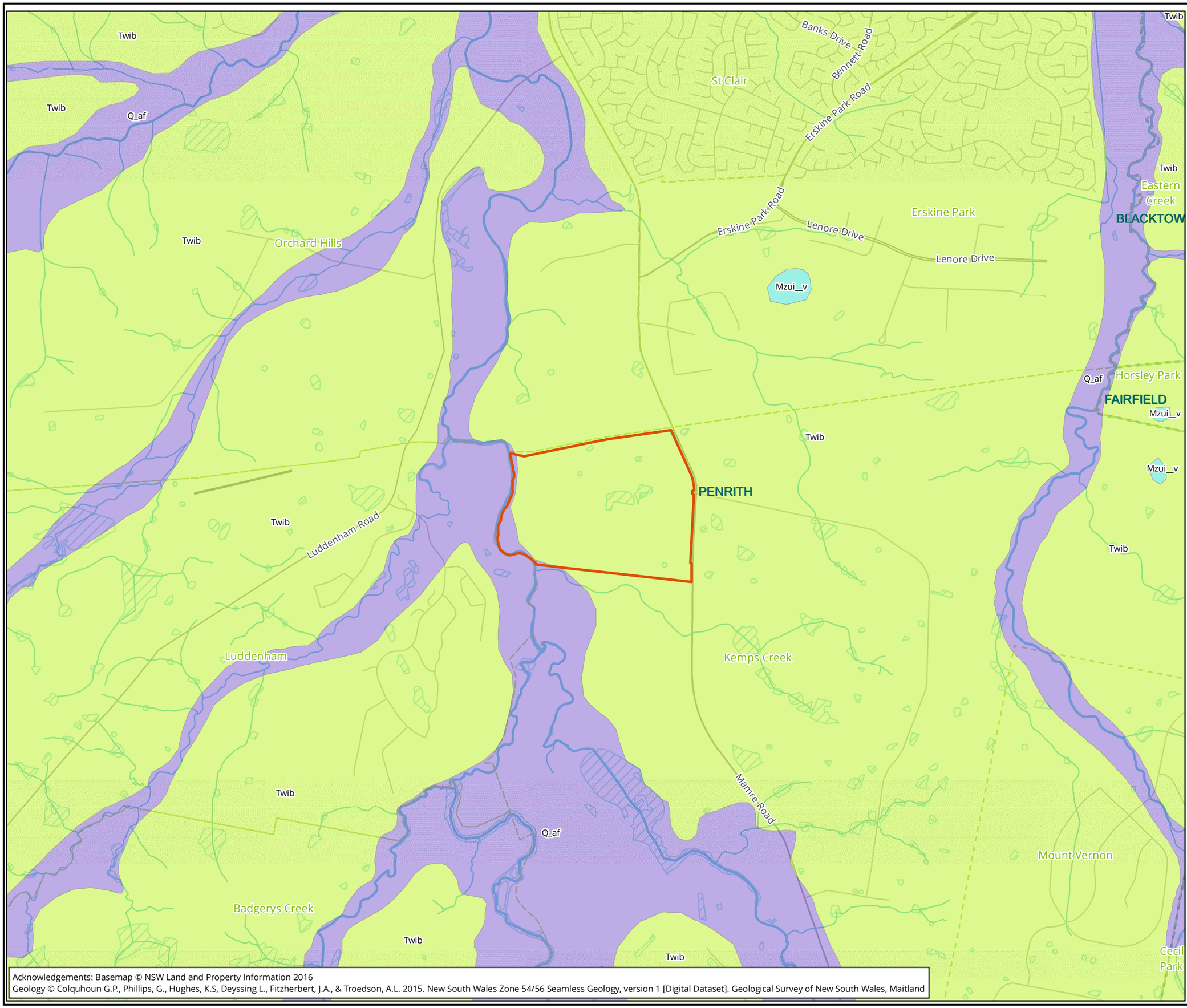

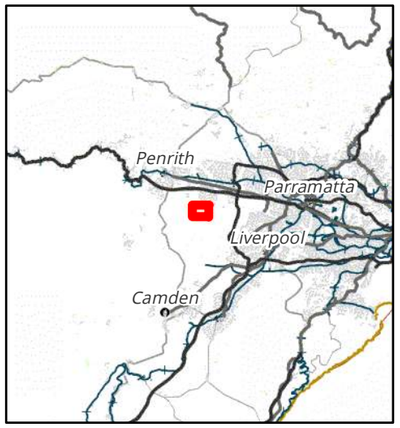

Legend

Study area

Geological Units

Mzui__v - Unnamed Mesozoic igneous

Q_af - Alluvial floodplain deposits

Twib - Bringelly Shale

Figure 5: Geological units within the vicinity of the study area

0 250 500 750 1,000 1,250

Metres

Scale: 1:25,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

N

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Matter: 29083,
Date: 22 February 2019,
Checked by: AKE, Drawn by: AEDM, Last edited by: amurray
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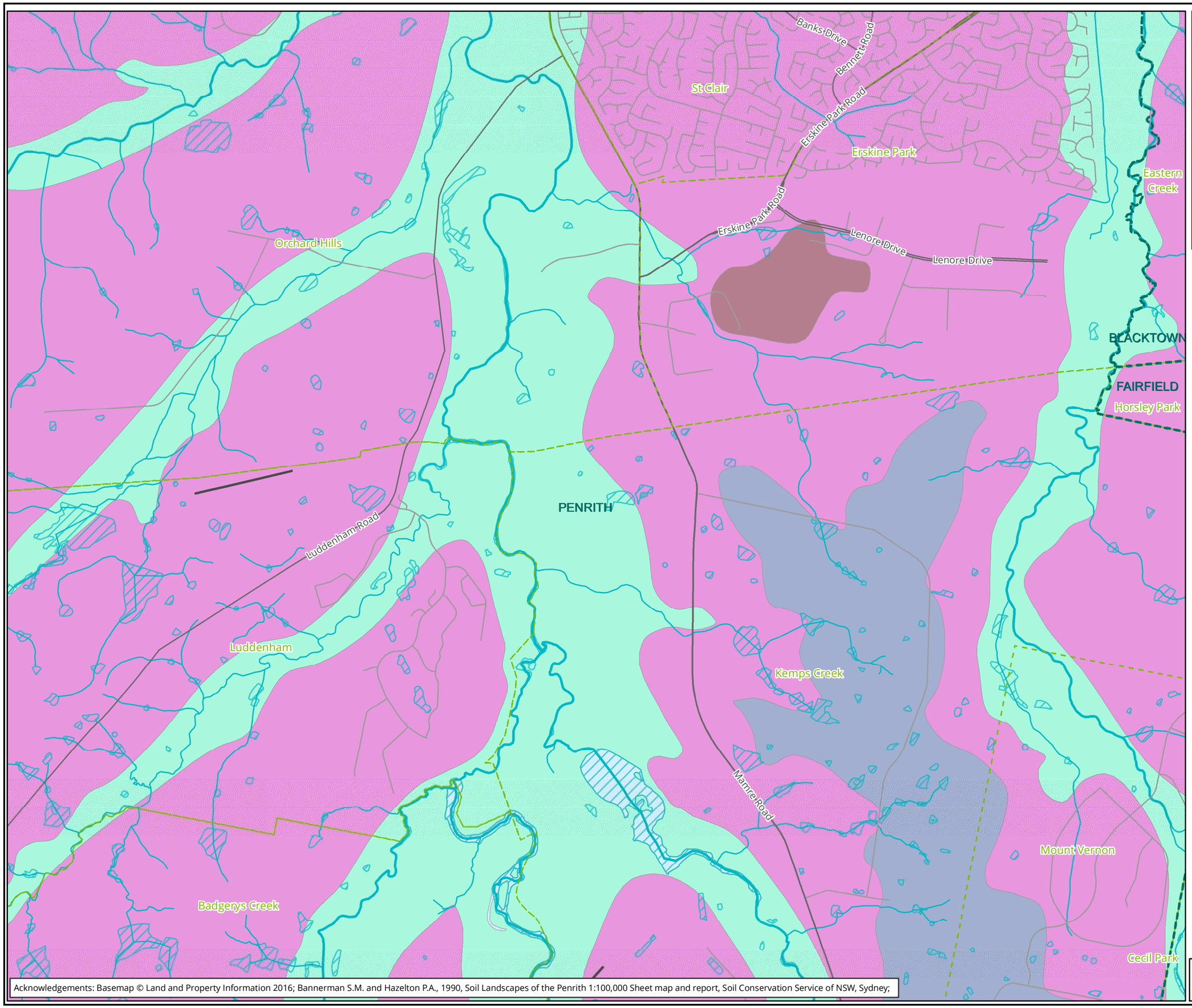
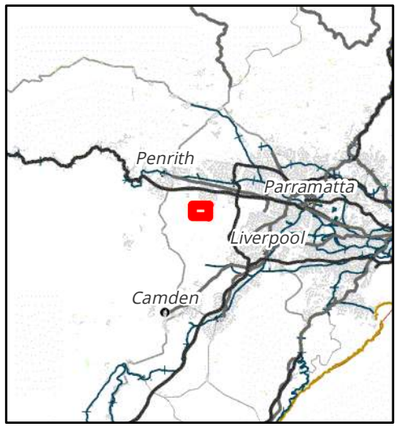
Acknowledgements: Basemap © NSW Land and Property Information 2016
Geology © Colquhoun G.P., Phillips, G., Hughes, K.S, Deyssing L., Fitzherbert, J.A., & Troedson, A.L. 2015. New South Wales Zone 54/56 Seamless Geology, version 1 [Digital Dataset]. Geological Survey of New South Wales, Maitland



Acknowledgements: Basemap © Land and Property Information 2016; Bannerman S.M. and Hazelton P.A., 1990, Soil Landscapes of the Penrith 1:100,000 Sheet map and report, Soil Conservation Service of NSW, Sydney;



Legend

Study area

Soil Landscape units

- bt - BLACKTOWN
- lu - LUDDENHAM
- sc - SOUTH CREEK
- WATER - WATER
- xx - DISTURBED TERRAIN

Figure 6: Soil landscapes in the vicinity of the study area

0 250 500 750 1,000 1,250

Metres

Scale: 1:25,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

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3.2 Previous archaeological work

A large number of cultural heritage surface (surveys) and sub-surface (excavations) investigations have been conducted throughout the region of NSW in the past 30 years. There has been an increasing focus on cultural heritage assessments in NSW due to ever increasing development, along with the legislative requirements for this work and greater cultural awareness of Aboriginal cultural heritage.

The study area falls within the Sydney Basin. Aboriginal occupation in this region dates back well into the Pleistocene period (i.e. before 10,000 years ago). The timing for the human occupation of the Sydney Basin is still uncertain. While there is some possible evidence for occupation of the region around 40,000 years ago, the earliest known radiocarbon date for the Aboriginal occupation of the Sydney Basin is associated with a cultural/archaeological deposit at Parramatta, which was dated to 30,735 ± 407 BP (Jo McDonald Cultural Heritage Management Pty Ltd 2005b, 2005a).

The archaeology of the Sydney Basin region has been well documented through a large number of academic and impact assessment investigations over the past 30 years (e.g. Kohen, J. 1986, Smith 1989, McDonald & Rich 1993). This is particularly evident in the Cumberland Plains region, largely as a result of archaeological studies related to rapid urban development across the area.

3.2.1 Regional overview

A number of Aboriginal cultural heritage investigations have been conducted for the Sydney region. Models for predicting the location and type of Aboriginal sites with a general applicability to the Cumberland Plains region, and thus relevant to the study area have also been formulated, some as a part of these investigations and others from cultural heritage investigations for relatively large developments.

Jo McDonald Cultural Heritage Management (JMCHM) (1997) conducted an archaeological investigation of the Australian Defence Industries (ADI) Site, at Saint Marys, for ADI-Lend Lease Joint Venture. The investigation included the refinement of existing Aboriginal site predictive models, by developing a framework for assessing Aboriginal site representativeness (Jo McDonald Cultural Heritage Management 1997, pp.1–2). To assist in developing this framework, 666 Aboriginal sites registered on the NPWS Site Register were broadly analysed using sites cards (Jo McDonald Cultural Heritage Management 1997, pp.26, 36, 50). The data was analysed using criterion for assessing regional site representativeness and themes for their interpretation described previously by McDonald & Rich (1993) (Jo McDonald Cultural Heritage Management 1997, p.18). A number of regional landscapes within the Cumberland Plains based on geological units and catchments were used as analytical units (Jo McDonald Cultural Heritage Management 1997, pp.17–18, 50).

The key results of the analysis were as follows:

- Sites were predominantly recorded on shale landscapes and shale contact locations (53.6%) followed by Quaternary alluvium (29.5%) with the lowest number located on Tertiary terrace environments (though artefact numbers were highest for this landscape due to the presence of quarry sites) (Jo McDonald Cultural Heritage Management 1997, pp.38, 41, 50).
- Regional landscapes, 'Quaternary alluvium' and 'Tertiary terraces', are over-represented by Aboriginal sites in comparison to shale hill slopes, which are under-represented (Jo McDonald Cultural Heritage Management 1997, pp.39–40, 50).
- Silcrete was the predominate stone artefact raw material throughout the Cumberland Plain though its proportion decreased towards the western margin of the Plain (Jo McDonald Cultural Heritage Management 1997, pp.43, 50).
- Site counts by catchment are low (Jo McDonald Cultural Heritage Management 1997, p.50).

The report concluded Aboriginal site representativeness is still not well understood and difficult to assess, in particular the variation between sites and landscapes (Jo McDonald Cultural Heritage Management 1997, pp.2, 26, 52). Comparison of the recorded surface assemblages with the recorded excavated assemblage for a number of sites revealed a notable disparity between the two techniques, indicating that surface evidence is a poor indicator of the actual site assemblage (Jo McDonald Cultural Heritage Management 1997, pp.47–48).

A model was presented for the ADI site that predicted the character of Aboriginal sites in relation to landscape features; particularly water permanence, lithic resources and landscape unit (Jo McDonald Cultural Heritage Management 1997, pp.55–56). The study concluded that the model is applicable to the Cumberland Plains region, and provides a framework for which the correlation between sites and permanent water can be tested (Jo McDonald Cultural Heritage Management 1997, pp.3, 56–57).

The model predicts the following:

- The frequency and density of Aboriginal sites located in the headwaters of upper tributaries (1st order watercourses) is likely to be low, and such sites are likely to represent a background scatter (Jo McDonald Cultural Heritage Management 1997, p.56).
- The frequency and density of Aboriginal sites located in the middle reaches of minor tributaries (2nd order watercourses) is likely to be low, and such sites are likely to represent single events, for example, one-off camping locations or knapping episodes (Jo McDonald Cultural Heritage Management 1997, p.56).
- The frequency and density of Aboriginal sites located in the lower reaches of tributary creeks (3rd order watercourses) is likely to be greater, and such sites are likely to represent repeated occupation, knapping events and more concentrated activities (Jo McDonald Cultural Heritage Management 1997, p.56).
- The frequency and density of Aboriginal sites located on major creek lines is likely to be greater, and such sites are likely to represent repeated or more permanent occupation and consequently will be more complex (Jo McDonald Cultural Heritage Management 1997, p.56).
- The junctions of creeks may have been a focus of Aboriginal activity (Jo McDonald Cultural Heritage Management 1997, p.56).
- The frequency and density of Aboriginal sites located on ridge tops between drainage lines is likely to be low, and such sites are likely to represent single events (Jo McDonald Cultural Heritage Management 1997, p.57).
- Outcrops of silcrete would have been exploited if known (Jo McDonald Cultural Heritage Management 1997, p.57).
- The general size of stone artefacts is likely to decrease the further they are located from the quarry from which they were obtained. Similarly, the presence of cortex on artefacts is less likely to be present, or occur as smaller percentages the further artefacts are located from the quarry from which they were obtained due to the continued reduction sequence (Jo McDonald Cultural Heritage Management 1997, p.56).
- Sandstone outcrops may have been the focus of camping and art production for sandstone overhangs as well as axe production/sharpening for sandstone platforms (Jo McDonald Cultural Heritage Management Pty Ltd 1998, pp.15–16).

Dominic Steele Consulting Archaeology (DSCA) (2003) undertook test excavation at Wallgrove Road, Eastern Creek, north-east of the study area. The assessment built on a number of previous surveys conducted between 1980 and 2002 within the study area, including Jo McDonald's study from 1997, which had

determined that surface artefacts were not an effective way to characterise archaeological sites. Steele formulated a predictive model based upon this review of previous archaeological investigations in the Rouse Hill area. Some of the key predictive statements relevant to the present study area include:

- Sites along permanent watercourses tended to be more complex than those along ephemeral watercourses, and the ideal site locations were at major confluences.
- There is greater potential for complex archaeological sites to be located subsurface than is demonstrated by surface artefacts, with knapping floors, backed blade manufacturing sites, and other complex sites identified.
- There may be a correlation between artefact density and site function.

A total of 20, one by one metre square pits were excavated as part of the assessment. Deposits were generally shallow, not exceeding 20 centimetres. A total of 38 artefacts were identified by the surface survey and excavation, and the nature of the site was determined to be representative of an area visited sporadically, and likely general background scatter. The deposit consisted primarily of silcrete, with quartz, tuff, and volcanic rock present in lower quantities.

JMCHM (2006) undertook survey and salvage excavation on land once owned by Australia's Wonderland. The predictive modelling employed in the report was similar to that used in other reports across the Cumberland Plain. It was predicted that the size (density and complexity) of archaeological features will vary according to the permanence of water (i.e. ascending stream order), landscape unit and proximity to lithic resources. The following predictive statement were formulated:

- In the headwaters of upper tributaries (i.e. 1st order creeks) archaeological evidence will be sparse and represent little more than a background scatter.
- In the middle reaches of minor tributaries (2nd order creeks) there will be archaeological evidence for sparse but focussed activity (i.e. one-off camp locations, single episode knapping floors).
- In the lower reaches of tributary creeks (3rd order creeks) there will be archaeological evidence for more frequent occupation. This will include repeated occupation by small groups, knapping floors (perhaps used and reused), and evidence of more concentrated activities.
- On major creek lines, such as the lower reaches of Second Ponds and Caddies Creeks (4th order), there will be archaeological evidence for more permanent or repeated occupation. Sites will be complex and may even be stratified.
- Creek junctions may provide foci for site activity; the size of the confluence (in terms of stream ranking nodes) could be expected to influence the size of the site.
- Ridgetop locations between drainage lines will usually contain limited archaeological evidence, although isolated knapping floors or other forms of one-off occupation may be in evidence in such a location." (Jo McDonald Cultural Heritage Management 2006, pp. 8–9)

The aim of the study was to investigate Aboriginal land use of ridgetop and hillslope areas. Test excavations revealed that artefact density on ridgetops and upper slopes was on average lower than landscapes associated with larger streams, with the main exception to this rule being hilltop quarries.

White and McDonald (2010) undertook a review of previous work in the Rouse Hill development area, discussing lithic artefact distribution in previous excavations carried out by JMCHM. The study considered a number of factors including stream order, distance from water, landform, aspect, and distance to silcrete sources. As a result of the assessment, the following statements were made:

- Water supply was a significant factor influencing Aboriginal land use and habitation in the area. There was a correlation between increasing stream order and larger numbers and higher densities of artefacts (from a comparison of 1st, 2nd, and 4th order streams)
- The proximity of water sources in correlation to site location determined that within 1st order stream landscapes, there was no significant correlation between artefact distribution and distance to water. In 2nd order landscapes artefact density was highest within 50 metres of water sources, and declined with increasing distance. In 4th order landscapes, density was highest between 51 to 100 metres from water.
- Artefact density was considered to be lowest on upper slopes and ridgetops, with density increasing on mid and lower slopes. Density was highest in terrace landforms, and lower on creek flats, likely due to repeated flooding events and the subsequent erosion.
- The results of the study showed no significant difference between sites located closer to or further away from silcrete resources. However, 6 kilometres was the maximum distance tested from silcrete outcrops, so the sample is considered representative of a limited study.
- The aspect of sites only appeared to have an influence on sites in the lower parts of valleys and these may have been located to take advantage of steady factors such as the rising/setting sun and wind direction.

The study concluded that the nature of landforms and distance from water had an influence on site distribution, with artefacts becoming more numerous closer to creeks, and along higher order creeklines. The study also determined that although artefacts are found on or within all landforms, landform type influenced artefact distribution, with a preference being for slightly elevated, well-drained topographies in the lower parts of valleys.

Biosis Research (2010) conducted test excavations approximately 4 kilometres north-east of the current Study area in advance of the construction of a link road between Erskine Park Road and Old Wallgrove Road, Erskine Park. A total of 113, 1 by 1 metre pits were excavated across four sites. Two of these sites were the locations of surface finds, while the other two were identified PADs.

- RCIF 1 (45-5-3843) was originally recorded as an isolated artefact site, as one silcrete artefact was found on the edge of a dam during field survey. During test excavations, 16 pits were excavated in a U shape formation around the dam, recovering eight artefacts from four of the pits. It was noted that the land had undergone some disturbance as a result of past land use activities.
- EPLR 1 (45-5-3842) was originally recorded as a low density artefact scatter consisting of two silcrete artefacts located on the northern and southern bank of a shallow tributary creek line. A total of 19 pits were excavated at this site, recovering three artefacts across two pits. Again, the land had seen disturbance from ploughing, stock movement, vehicle movement and fence construction.
- EP PAD 1 east was the portion of EP PAD 1 located on the east side of Ropes Creek. Sub-surface testing was carried out on the floodplain and a slight rise overlooking the floodplain. 27 test pits were excavated in this area, and a total of 52 artefacts were recovered from 10 pits. As with the other excavation units discussed here, it had seen disturbance from past land use activities such as grazing and vehicle movement.
- EP PAD 1 west was the portion of EP PAD 1 located on the west side of Ropes Creek, on the banks and floodplain of the creek. 51 test pits were excavated, with a total of 289 artefacts found in 29 pits; almost all within the top 20 centimetres. Two pits contained artefacts between 20 and 30 centimetres.

A total of 352 artefacts were recovered during excavations, with the majority being comprised of silcrete, along with a number of quartz artefacts. It was noted during excavation that sources of silcrete are naturally

occurring within 3 kilometres of the study area (which would put them between zero and six kilometres from the current study area).

3.2.2 Local overview

A number of Aboriginal cultural heritage investigations have been conducted within an approximately five kilometre buffer of the study area. These investigations are briefly summarised below. Most of these investigations were development driven and include surface and sub-surface investigations.

Dallas (1988) conducted a survey of a portion of the study area, located on and around low lying flood prone land between Cosgroves Creek and South Creek. The survey identified twelve artefact sites, all open camp sites. The predictive model for the study identified the potential for artefact sites, scarred trees, and grinding grooves to be present within the study area. The potential for subsurface deposits was identified for three of twelve sites, situated on well drained topographies overlooking South Creek.

DSCA (2001) developed a research design plan for an archaeological investigation to take place in the same area studied by Dallas (1988). Steele noted the presence of silcrete cobbles (a possible source of raw material for stone artefact production) in the area. It was also noted within predictive modelling that previous finds on the site were well dispersed, with disturbance having been caused by flooding activities, as well as the presence of stock in the study area. The possibility existed that further isolated artefactual material was present along Cosgroves Creek, but given the degree of disturbance, it was unlikely that such material would be substantial, significant or undisturbed (Dominic Steele Consulting Archaeology 2001, p.29). Given the dominant presence of fluvial soils within the current study area, it is possible that similar conditions exist throughout the extent of the study area.

Navin Officer (2005) conducted mechanical excavations at the CSR lands, Erskine Park, to the north-east of the current study area. A total of 256 test pits were excavated, with 285 artefacts being identified across 88 of these pits. It is noted by JMCHM (2008, p.14) that only a sample of the excavated deposit was sieved, and that this may be a contributing factor to the relatively low number of artefacts identified at the site relative to other excavations in the area. The assemblage primarily consisted of silcrete and silicified tuff, making up about 81% of the total assemblage, and contained a range of artefact types, including microblades, bondi points, and backed artefacts. Based on the results of this testing, Navin Officer determined that the site was representative of a transient camp, or for peripheral activity in relation to a larger camping area, and stated had been subject to low intensity occupation (Navin Officer Heritage Consultants Pty Ltd 2005, p.ii).

JMCHM (2008) carried out excavations following the 2000 survey conducted by JMCHM. A total of 8,867 lithics from 298 square metres, indicating a density of 29.8 artefacts per square metre was recovered during excavations. The pattern of artefact distribution within the Austral Land site was considered typical for the Cumberland Plains, and was likely higher due to the proximity of second and 3rd order streams (which indicates a permanent or semi-permanent water source). The area assessed in JMCHM's report contains a number of similarities to the study area, namely its relatively low relief (around 10 metres) (Jo McDonald Cultural Heritage Management 2008, p.7). It was concluded that though site patterning in the area was typical of the Cumberland Plain, artefact density was relational to the number of landscape and resource features in the area, with artefact density decreasing in association with lower order stream lines, and the use of silcrete as a raw material decreasing with increasing distance from silcrete sources. As a whole, the site displayed a higher than average artefact density, likely due to the presence of nearby sources of silcrete (Jo McDonald Cultural Heritage Management 2008, p.i).

Biosis Pty Ltd (2016) undertook an ACHA for City Plan Services on behalf of Altis Property Partners including a field survey in 2015 and test excavations in 2016 for the Mamre West Precinct development. The field survey identified one previously unrecorded Aboriginal site, and areas of low, moderate and high potential were identified. Test excavations were undertaken in 2016 within the SSD application area directly north of the

current study area. Four areas determined to be of high significance were excavated across a total of 164 test pits. A total of 81 artefacts were recovered during test excavations. All four sites are located within the same landform, across two soil landscapes. All four sites consisted of low density artefact scatters that generally showed an increase in artefact density in areas where yellow earth soils were present. Silcrete was the dominant raw material type across the study area and one glass artefact was identified. The assemblage consisted of flakes, flaked pieces and cores, with only two flakes exhibiting retouch. No backed artefacts were recovered. Of the four areas excavated, site MWP-AD2 and MWP-AD4 were assessed to have low significance, MWP-AD1 was assessed as possessing moderate archaeological significance, and MWP-AD4 was assessed possessing high significance, with the highest total of artefacts at 34, scattered across an area of 120 metres by 100 metres.

Biosis (2018a) completed a survey report for the current SSD application area for Altis Property Partners and Frasers Property Industrial Constructions in order to identify Aboriginal sites or areas of archaeological potential that might be present within the study area. A search of the AHIMS database identified three AHIMS sites within the study area; EPTA3 (AHIMS 45-5-3028), EPTA10 (AHIMS 45-5-3032), and EPTA11 (AHIMS 45-5-3033). As part of the field survey these site locations were inspected in an attempt to relocate the Aboriginal heritage items. No evidence of the three AHIMS sites was identified. A total of four previously unrecorded Aboriginal sites were recorded during the survey, including three artefact scatters and an isolated artefact MSP-01(AHIMS 45-5-5187), MSP-02 (AHIMS 45-5-5188), MSP-03 (AHIMS 45-5-5189), and MSP-04 (AHIMS 45-5-5190). Silcrete was the dominant raw material among the artefacts identified within the area surveyed. Three of the four sites are located within the current study area MSP-01(AHIMS 45-5-5187), MSP-02 (AHIMS 45-5-5188) and MSP-03 (AHIMS 45-5-5189). Another site, MSP-04 (AHIMS 45-5-5190) was located during the survey, but this is south of the current study area. An extensive area of high archaeological potential was identified adjacent to the extent of South Creek, within the western portion of the study area. Two additional areas of moderate archaeological potential were also identified upon highpoints within the eastern portion of the study area. A large central portion of the SSD application area (Lot X DP 421633) was un-surveyable due to access restrictions. This portion of the SSD application area is to be surveyed as part of the current (2019) investigation.

Biosis Pty Ltd (2018b) were commissioned by HB+B Property on behalf of Altis Property Partners to undertake Aboriginal archaeological test excavations for the proposed channel realignment 850 metres north of the study area, as part of the Mamre West Precinct SSD. Fifty-six test pits measuring 50 by 50 centimetres were excavated across 5 transects. Soil deposits along Transect 1 and Transect 2 within the eastern portion of the proposed realignment area were shallow (at less than 30 centimetres) with very little topsoil remaining and consisting of silty clay to clay. Only two artefacts were recovered from a single test pit in Transect 2, and were assessed to have low archaeological significance. Soil depth varied within the western portion of the proposed realignment and some natural soil deposits were overlaid with a rubble fill. The results of the test excavations identified an overall low artefact density of 1.57 artefacts per square metre across the site. A maximum of four artefacts to one test pit was reached. It was determined that the eastern portion of the area that was excavated may have previously been swampland and the lack of topsoil, level of historical disturbance and erosion, proximity of the first order drainage line, and position of the area as a low lying landform, may account for the lack of archaeological deposit within this area. The relatively higher ground within the western portion of the study area was considered a more likely site for Aboriginal occupation.

3.2.3 AHIMS site analysis

A search of the AHIMS database (Client ID: 397126) identified 117 Aboriginal archaeological sites within a 6 by 6 kilometre search area, centred on the proposed study area (Figure 7). Six of these registered sites are located within the study area. A summary of the AHIMS sites located within the study area is provided in

Table 4. AHIMS search results are provided in Appendix 1. Table 5 provides the frequencies of Aboriginal site types in the vicinity of the study area.

Table 4 AHIMS sites located within the study area

AHIMS site no	Site name	Site type
45-5-5187	MSP-01	Artefact
45-5-5188	MSP-02	Artefact
45-5-5189	MSP-03	Artefact
45-5-3028	EPTA3	Artefact
45-5-3032	EPTA10	Artefact
45-5-3033	EPTA11	Artefact

The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. These descriptions and maps were relied upon where notable discrepancies occurred.

The site cards for AHIMS sites EPTA3 (AHIMS 45-5-3028), EPTA10 (AHIMS 45-5-3032), and EPTA11 (AHIMS 45-5-3033), were reviewed and discrepancies were identified regarding the location of these AHIMS sites. According to the site cards, EPTA3 (AHIMS 45-5-3028), EPTA10 (AHIMS 45-5-3032), and EPTA11 (AHIMS 45-5-3033) were recorded in March 2005 by Navin Officer during the archaeological subsurface testing program carried out upon CSR Lands, at Erskine Park (Plate 3). The location of the AHIMS site was noted upon the site cards to be at Lenora Lane, Erskine Park, to the north-west of the study area. A field survey carried out by Biosis on the 30 April 2018 attempted to relocated AHIMS sites EPTA3 (AHIMS 45-5-3028), EPTA10 (AHIMS 45-5-3032), and EPTA11 (AHIMS 45-5-3033) within the current SSD application area (Biosis Pty Ltd 2018a). No evidence of previous test excavations was identified at the site locations provided upon the AHIMS database. It can therefore be determined that these AHIMS sites are not located within the current study area.

Plate 3 Location of CSR lands assessed by Navin Officer (2005). The location of Lenore Lane is indicated by the blue arrow

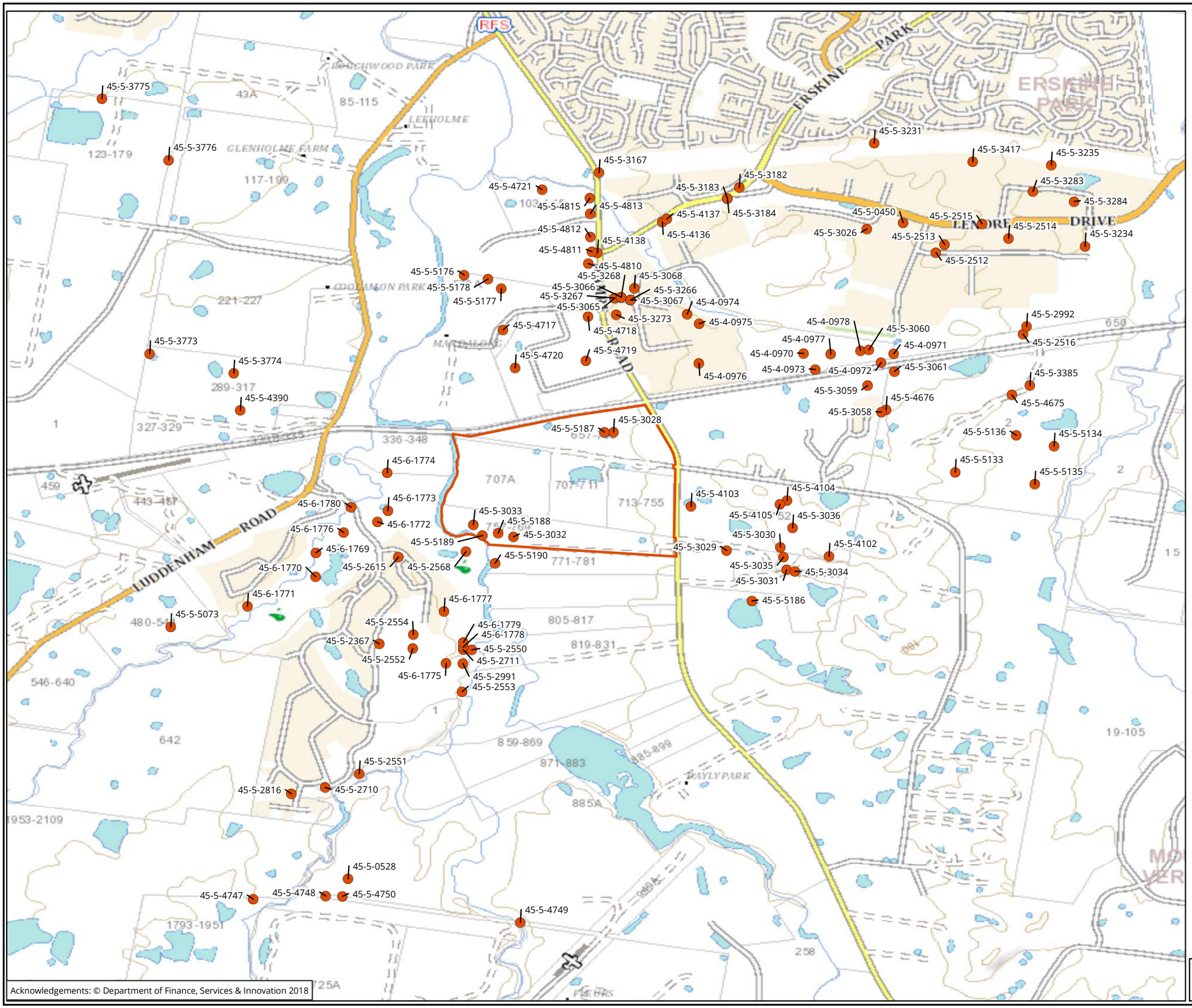
AHIMS sites MSP-01(AHIMS 45-5-5187), MSP-02 (AHIMS 45-5-5188), and MSP-03 (AHIMS 45-5-5189) were recorded within the study area by Biosis in April 2018 (Biosis Pty Ltd 2018a). MSP-02 (AHIMS 45-5-5188) is a highly significant subsurface deposit and MSP-03 (AHIMS 45-5-5189) consists of a low density artefact scatter located within an area of high archaeological potential identified during the field survey, within the proximity of South Creek and its second order tributary in the south-west corner of the study area. MSP-01(AHIMS 45-5-5187) was an isolated artefact located within the north-western portion of the study area.

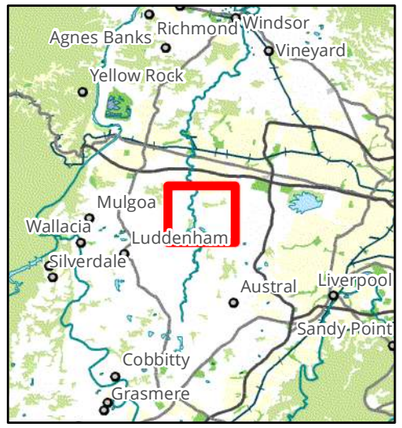
It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area. Some recorded sites consist of more than one element, for example artefacts and potential archaeological deposit, however for the purposes of this breakdown and the predictive modelling, all individual site types will be studied and compared. This explains why there are 120 results presented here, compared to the 117 sites identified in AHIMS.

Table 5 AHIMS site type frequency

Site type	Number of occurrences	Frequency (%)
Artefact	111	93.28
Potential Archaeological Deposit (PAD)	6	5.04
Modified tree (carved or scarred)	2	1.68
Total	119	100.00

A simple analysis of the Aboriginal cultural heritage sites registered within the 6 by 6 kilometre buffer of the study area indicates that artefacts are the most common site type with 93.28% (n=111). PADs and modified trees represented less than 10% of the total site types in the vicinity of the study area, at 5.04% and 1.68% respectively (n=6 and n=2). A majority of previously recorded AHIMS sites appear to have been recorded within the proximity of South Creek and Cosgrove's Creek to the west upon alluvial flood plains within the South Creek soil landscape, or upon well drained topographies such as hillslopes, spurs of crests, to the east nearby Kemps Creek and other lower order tributaries of South Creek, within Luddenham and Blacktown soil landscapes overlying Bringelly shales.





Legend

- Study area
- AHIMS record

Figure 7: AHIMS records near the study area

NOT TO BE MADE PUBLIC

0 250 500 750 1,000 1,250

Metres

Scale: 1:25,000 @ A3

Coordinate System: GCS GDA 1994

Biosis Pty Ltd

Ballarat, Brisbane, Canberra, Melbourne, Sydney,Wangaratta & Wollongong

Matter:
Date: 19 February 2019,
Checked by: amurray, Generated by: amurray
Location:P:\29000s\29083\Mapping
29083_F7_AHIMS.mxd

3.3 Discussion

A review of previous archaeological studies within the region and locality of the study area in correlation to the landscape context of the study area has assisted in the formulation of a predictive model that is applicable for the purpose of this assessment. Previous investigations have determined that artefact and PAD sites are the most likely site types to occur within the study area. Artefact assemblages of both surface and subsurface deposits are likely to be dominated by silcrete according to regional and local studies (Jo McDonald Cultural Heritage Management 1997, Dominic Steele Consulting Archaeology 2003, Navin Officer Heritage Consultants Pty Ltd 2005, Biosis Research 2010, Biosis Pty Ltd 2016). Modified trees also have the potential to occur within the study area where remnant vegetation is present (though limited), particularly in association with Blacktown soils.

Six artefact sites have been previously recorded within the study area, however a review of the site cards for AHIMS sites EPTA3 (AHIMS 45-5-3028), EPTA10 (AHIMS 45-5-3032), EPTA11 (AHIMS 45-5-3033), suggests that the locations of these sites is incorrect as discussed in section 3.2.3. Despite these discrepancies in site location, the presence of three artefact sites MSP-01 (AHIMS 45-5-5187), MSP-02 (AHIMS 45-5-5188), and MSP-03 (AHIMS 45-5-5189) within the study area indicates that there is high potential for further artefact sites to occur. Two of the three sites identified are located within the south-western portion of the study area within close proximity to South Creek and its junction with a second order tributary within an area of high archaeological potential. Creek junctions and confluences have been often associated with foci points for Aboriginal occupation and activity within prior studies, therefore further sites and PAD may exist within the vicinity of these sites (Jo McDonald Cultural Heritage Management 1997, Jo McDonald Cultural Heritage Management 2006). The remaining AHIMS site (MSP-01(AHIMS 45-5-5187)) is located within the upper reaches of the alluvial plains landform within the north-east, upon the Blacktown soil landscape.

According to JMCHM's 1997 study, shale hill landforms have been significantly underrepresented within previous assessments. It was determined that the number of Aboriginal sites recorded within shale hill landforms was higher than those recorded within alluvial flats and terraces; though artefact density was higher within these two latter landforms (Jo McDonald Cultural Heritage Management 2006). Therefore though artefact sites are likely to occur across all landforms throughout the study area, artefact sites or PAD sites identified upon alluvial flats, terraces, or levees, are likely to be more complex, and possess higher artefact densities to those identified upon shale hill landforms and slopes. It can therefore be assumed that the likelihood of Aboriginal sites occurring within the study area, and their complexity and nature, increases with proximity to permanent water sources, such as South Creek which flows along the western boundary of the study area, particularly in the south-western portion of the study area where a second order tributary of South Creek is present (Dominic Steele Consulting Archaeology 2003, Jo McDonald Cultural Heritage Management 2006, Jo McDonald Cultural Heritage Management 2008, White & McDonald 2010).

DSCA 2001 study, which included an assessment of a portion of the current study area, provided further discussion on the geomorphological nature of alluvial flats and plains landforms, in relation to potential cultural deposits. The assessment concluded that sites which had been identified within the locality of the current study area were well dispersed, and there was little potential for intact archaeological deposits to occur. Therefore due to the prevalent presence of fluvial soils and alluvial landforms throughout the extent of the study area, artefact sites have the potential to be widely dispersed due to flooding and deposition activities associated with the South Creek soil landscape and the formation of alluvial landforms with close proximity to South Creek. However, there remains for intact deposits to occur in the absence of these activities throughout the landscape. Topsoil deposits also have the potential to have been disturbed by recent and historical pastoral and agricultural activities within the study area. Furthermore, subsurface deposits throughout the study area may have been subject to ploughing within the past, and therefore could be disturbed up to approximately 300 millimetres (McDonald & Rich 1993).

3.3.1 Predictive model

A model has been formulated to broadly predict the type and character of Aboriginal cultural heritage sites likely to exist throughout the study area and where they are more likely to be located.

This model is based on:

- Site distribution in relation to landscape descriptions within the study area.
- Consideration of site type, raw material types and site densities likely to be present within the study area.
- Findings of the ethnohistorical research on the potential for material traces to present within the study area.
- Potential Aboriginal use of natural resources present or once present within the study area.
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Based on this information, a predictive model has been developed, indicating the site types most likely to be encountered during the survey and subsequent sub-surface investigations across the present study area (Table 6). The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

Table 6 Aboriginal site prediction statements

Site type	Site description	Potential
Flaked stone artefact scatters and isolated artefacts	Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.	**High:** This site type has been recorded in all locally identified soil landscapes, landforms and landform elements, as well as being the most common site type in relation to both geological formations underlying the study area. Three previously identified AHIMS sites are located within the study area and there is high potential for more to be identified.
Potential archaeological deposits (PADs)	Potential sub surface deposits of cultural material.	**High:** This site type has been recorded locally within the Blacktown soil landscape, which covers a portion of the study area. PAD sites also have the potential to occur within alluvial landforms though they may not be *in situ*. This site type represents the second most commonly recorded site type within the vicinity of the study area and has high potential to occur within the study area.
Modified trees	Trees with cultural modifications	**Moderate**: Although there has been extensive clearing within the study area, there is still the potential for this site type to be identified in relation to the riparian corridor along South Creek and in areas where remnant vegetation is present. Modified trees therefore have moderate potential to occur within the study area.

Shell middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	**Low:** Shell middens have not previously been recorded locally. Although there is a higher order South Creek is a permanent source of fresh water and may have provided suitable resources for shell middens to occur, this site type has low potential to occur.
Quarries	Raw stone material procurement sites.	**Low:** There is no record of any quarries being within the study area, though silcrete cobbles have been previously located within the region.
Burials	Aboriginal burial sites.	**Low:** Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. Areas of deep sandy deposits will have the potential for Aboriginal burials. The soil profiles associated with the study area may have deep sandy deposits present, though this site type has not been previously recorded within the vicinity of the study area.
Aboriginal ceremony and Dreaming Sites	Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal informants.	**Low**: There are currently no recorded mythological stories for the study area.
Post-contact sites	These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use.	**Low:** There are no post-contact sites previously recorded in the study area and historical sources do not identify one.
Aboriginal places	Aboriginal places may not contain any 'archaeological' indicators of a site, but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events commenced or particular buildings.	**Low:** There are currently no recorded Aboriginal historical associations for the study area.
Axe grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	**Nil:** The geology of the study area lacks suitable horizontal sandstone rock outcrops for axe-grinding grooves. Therefore there is low potential for axe grinding grooves to occur in the study area.
Rock shelters with art and / or deposit	Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground	**Nil**: This site type will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not

	characterised by cliff lines and escarpments. These naturally formed features may contain rock art, stone artefacts or midden deposits and may also be associated with grinding grooves.	present in the study area or supported by the underlying geology or soil landscapes within the study area.

4 Archaeological survey

A field survey of a portion of the study area, Lot X, DP421633, was undertaken on 31 January 2019. The remainder of the study area had previously been surveyed by Biosis in accordance with the Code in 2018 (Biosis Pty Ltd 2018a). The sampling strategy, methodology and a discussion of results are provided below.

4.1 Archaeological survey objectives

The objectives of the survey were to:

- Undertake a systematic survey of the study area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of PAD.

4.2 Archaeological survey methodology

The survey methods were intended to assess and understand the landforms and to determine whether any archaeological material from Aboriginal occupation or land use exists within the study area.

4.2.1 Sampling strategy

The survey effort targeted those portions of the study area considered to have the highest potential to contain stone artefact sites and areas of archaeological potential. Broadly speaking, the study area was located across a floodplain area, with a gentle slope toward South Creek, with the overall elevation of the study area decreasing by 10 metres in total over approximately 700 metres. Targeted areas included:

- Areas of exposure in the western portion of the floodplain area.
- Rises along the margins of low lying swampy areas and around dams.

4.2.2 Survey methods

The archaeological survey was conducted on foot with a field team of one, Amanda Markham (Senior Archaeologist, Biosis). Recording during the survey followed the archaeological survey requirements of the Code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landform.
- Photographs of the site indicating landform.
- Evidence of disturbance.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, Identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, ground surface visibility and the recording of soil information for each

survey unit were possible. Any potential Aboriginal objects observed during the survey were documented and photographed. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements were recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

4.3 Constraints to the survey

With any archaeological survey there are several factors that influence the effectiveness (the likelihood of finding sites) of the survey. The factors that contributed most to the effectiveness of the survey within the study area were the presence of two large dams, the dense grass and thick, impenetrable crop (corn) cover, which resulted in a large portion of the western end of the study area being inaccessible for the purposes of this survey (Plate 4). This area was also identified as low probability of having Aboriginal sites or objects.

Plate 4 Detail of corn cover within the western end of the study area

4.4 Visibility

In most archaeological reports and guidelines visibility refers to ground surface visibility, and is usually a percentage estimate of the ground surface that is visible and allowing for the detection of (usually stone) artefacts that may be present on the ground surface (DECCW 2010b). Overall visibility within the study area was low, however within areas of exposure it varied between 5 and 100% (Plate 5, Plate 6). The majority of the areas of visibility were associated with areas of thinner ground cover, or areas of exposure (Plate 7).

The vast majority of the study area was subject to dense grass cover, and approximately 17 hectares (42 acres) of land planted with thick corn crops in the western portion, with some small clumps of remnant Tea

Tree and Casuarina species in several locations. Other sections of the study, particularly in the north-eastern portion, were covered by cement pads, sheds, and graveled areas with visibility at 0%.

Plate 5 Typical visibility within the study area, view to the west

Plate 6 Typical visibility within the study area, view to the south

Plate 7 Area of greater visibility within the study area, view to the south

4.5 Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed, and attempts to describe the relationship between those conditions and the likelihood the prevailing conditions provide for the exposure of (buried) archaeological materials. Whilst also usually expressed as a percentage estimate, exposure is different to visibility in that it is in part a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke & Smith 2004, p.79, DECCW 2010b). Overall, the study area displayed areas of exposure around formal and informal tracks such as driveways and pathways, erosion scours, and naturally clear areas around the bases of trees (Plate 8, Plate 9). Overall exposure in the study area was less than 10%, which hindered the overall effectiveness of the survey for identifying surface sites such as stone artefact scatters.

Plate 8 Area of exposure associated with a track, view to the west

Plate 9 Exposure due to dam walls and erosion scouring in the central portion of the study area, view to the west

4.6 Disturbances

Disturbance in the study area is associated with natural and human agents. Natural agents generally affect small areas and include the burrowing and scratching in soil by animals, such as wombats, foxes, rabbits and wallabies, and sometimes exposure from slumping or scouring.

Disturbances associated with recent human action are prevalent in the study area and cover large sections of the land surface. The agents include residential development such as landscaping and construction of residential buildings; farming practices, such as initial vegetation clearance for creation of paddocks, fencing and stock grazing; agricultural practices such as corn cropping, ploughing and tilling; light industrial practices such as produce bays, storage areas and concrete pads, and the creation of artificial dams.

The entirety of the study area has been subject to extensive land clearance, with no old growth trees identified as a part of the archaeological survey. In addition to this, there were observable disturbances associated with cropping and ploughing, residential and commercial development in the study area as well as associated infrastructure such as road and tracks (Plate 8). Two dams were also present within the study area (Plate 9).

In the north-eastern portion of the study area, a rural produce supply store had been established, comprising extensive areas of concrete pads and paths, a residential dwelling and modification of the area by cutting and filling (Plate 10, Plate 11, and Plate 12).

Plate 10 Structures associated with commercial enterprise in the study area, view to the west

Plate 11 Residential dwelling in the eastern portion of the study area, view to the east

Plate 12 Disturbed portion of the study area showing scouring and mounded bank, view to the east

5 Survey analysis and discussion

The archaeological survey was hampered by existing disturbance and by the inaccessibility a large section of the study area in the west and south-west, which was heavily vegetated by dense corn crops. The areas accessible to survey, as well as the cropped section, show evidence of extensive soil modification, due to land clearing, ploughing and tillage, and the construction of residential, agricultural and commercial infrastructure. No Aboriginal sites or areas of archaeological potential were identified during the survey.

Two landforms were identified during the survey, a gentle slope and an open floodplain (Table 7 and Table 8). A large portion of the gentle slope landform was heavily disturbed, with visibility at 0% where sections of the surface area were covered by concrete pads. The open floodplain landform was subject to greater areas of exposure, however, it should be noted that a large portion of this area was also planted with a corn crop and covered by two large dams. Previous inspection of the area (Biosis Pty Ltd 2018a) had suggested that the area had been heavily ploughed and tilled, and that the upper layers of the soil were highly disturbed.

The study area possessed relatively low elevation with an overall gradient of approximately 0.92%. In the central portion of the study area, a prior watercourse which may have provided a suitable location for Aboriginal campsites and resource gathering was specifically targeted. In a previous survey in the area undertaken by Biosis (2018a), Aboriginal sites were identified on areas of exposure on a dam wall built along a minor watercourse, and upon a flat overlooking a creek junction in the south-western portion of the study area. The current survey targeted similar areas of exposure on both dams located within Lot X DP 421633, but no Aboriginal sites were identified.

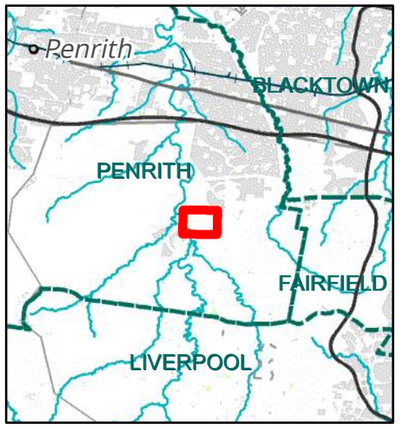
Although the western portions of the study were within 700 metres of the South Creek and potentially suitable as a favourable location for camping, the extensive modification of the landscape suggests low potential for Aboriginal archaeological sites or deposits to remain intact (Figure 8).

Table 7 Survey coverage

Survey unit	Landform	Survey unit area (m²)	Visibility (%)	Exposure (%)	Effective coverage area (m²)	Effective coverage (%)
1	Gentle slope	13994.90	20	20	2803.9	20.04%
2	Floodplain	177906.65	20	5	9551.05	5.37%

Table 8 Landform summary

Landform	Landform area (m²)	Area effectively surveyed (m²)	Landform effectively surveyed (%)	No. of Aboriginal sites	No. of artefacts or features
Gentle slope	172366.80	344.73	0.2	0	0
Floodplain	151920.73	19.05	0.01	3	1



Legend

- Study area
- DP 421633 Lot X
- Survey tracks

Archaeological potential

- Low

Figure 9: Survey results

0 40 80 120 160 200

Metres

Scale: 1:4,500 @ A3

Coordinate System: GDA 1994 MGA Zone 56

N

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6 Test excavations

Following the results of the field survey undertaken by Biosis (2018a) which identified areas of moderate and high potential within the study area, a test excavation program was undertaken. The purpose of test excavations was to characterise the extent, nature and archaeological (scientific) value of potential Aboriginal cultural heritage sites within identified areas of high or moderate archaeological potential. The sampling strategy, methodology and results of the test excavations program are discussed below.

6.1 Test excavation objectives

The principle objectives of the sub-surface test excavation program is to identify and understand the nature, extent and significance of any subsurface archaeological material located within areas of archaeological sensitivity with the study area.

The aims of the testing program are to:

- Determine whether sub-surface archaeological deposits exist which may be impacted upon by the development. If so, to determine the extent and nature of such deposits.
- Identify whether the archaeological material occurs in an intact, undisturbed context, by examining the soil profile and stratigraphy.
- Analyse and interpret any archaeological finds (such as stone artefacts, hearths, knapping floors etc.) recovered during the testing program.
- Inform current knowledge of Aboriginal occupation and land use models of the region.
- Provide management and mitigation measures for Aboriginal archaeological objects located during the subsurface testing program.

6.2 Test excavation methodology

Test excavations were conducted in accordance with requirement 16a of the Code. A total of 274 test pits were excavated across three open areas within the study area. Thirty-seven were excavated at Open Area 1(OA1), 79 were excavated at Open Area 2 (OA2), and 158 were excavated at Open Area 3 (OA3). Transect investigated within OA3 were extended during the test excavation program to include areas previously assessed as having low potential, in order to define the extent and nature of the archaeological deposit that was encountered within OA3.

Test excavations across the study area conformed to the following methodology:

- Test excavations were be undertaken in areas identified as having the potential to contain Aboriginal cultural material.
- Test excavations will be conducted in 50 by 50 centimetre units.
- The test excavation units will be excavated by hand (inclusive of trowels, spades and other hand tools) along transects at intervals of between 10 to 20 metres or other justifiable and regular spacing (being no smaller than five metres).

- The first test pit within a site or Potential Archaeological Deposit (PAD) area will be excavated in five centimetre spits; the subsequent test pits conducted within the site or PAD area can then be excavated in either 10 centimetre spits or stratigraphic units (whichever is smaller) to the base of Aboriginal object-bearing units being the removal of the A-horizon soil deposit down to the sterile clay or bedrock layer (B-horizon).
- If the depth of deposit prevents reaching sterile deposits within the 50 by 50 centimetre test pit, additional 50 by 50 centimetre test pits may be excavated adjacent to the original test pit (for example expanding the test pit to 50 by 100 centimetres) to reach the sterile deposits.
- Test pits may be combined and excavated as necessary in 50 by 50 centimetre units for the purposes of further understanding site characteristics. Note that under the Code, the maximum area that can be excavated in any one continuous area is three metres squared (3 m^2).
- The Code dictates that the maximum surface area of all test excavation units must be no greater than 0.5% of the PAD or area being investigated.
- All excavated soil will be sieved in 5 millimetre sieves. Dry sieving will be attempted in the first instance, however wet sieving may be used if deposits cannot be dry sieved.
- All cultural material will be collected, bagged and clearly labelled. They will be temporarily stored in the Biosis office for analysis (at Unit 14, 17-27 Power Avenue, Alexandria).
- The following documentation will be taken for the test pit:
    - Unique test pit identification number.
    - GPS coordinate.
    - Munsell soil colour, texture and pH.
    - Amount and location of cultural material within the deposit.
    - Nature of disturbance where present.
    - Stratigraphy.
    - Archaeological features (if present).
    - Photographic records.
    - Spit records.
- The test excavation unit must be backfilled as soon as practicable due to safety issues.
- An AHIMS Site Impact Recording form will be completed and submitted to the AHIMS Registrar for any sites impacted during test excavations.
- In the event that suspected human remains are identified works will immediately cease and the NSW Police and OEH will be notified.
- Test excavations will cease when enough information* has been recovered to adequately characterise the objects present with regard to their nature and significance.

*Enough information is defined by OEH as meaning "the sample of excavated material clearly and self-evidently demonstrates the deposit's nature and significance. This may include things like locally or regionally high object density: presence of rare or representative objects: presence of archaeological features: or locally or regionally significant deposits stratified or not." (DECCW 2010b).

6.3 Test excavation results

This section presents results of test excavations carried out within the study area between 7 January and 15 February 2019 in areas of high moderate, and low archaeological potential identified by Biosis in (2018a), and following the field survey undertaken as part of the current assessment. The weather stayed mostly sunny with overcast spells, with high temperatures and high humidity during the test excavation program.

Participants in test excavations included:

- Dr Amanda Markham, Neil Fenley, Ashleigh Keevers-Eastman, Anthea Vella, Matthew Smith, Hannah Morris, Erin Mien, Sebastian Loyzaga (Biosis archaeologists)
- Jamie Gibbs, Jeremy Wallace, Steven Knight (Deerubbin LALC)
- Justine Coplin, Libby Coplin, Lana Wedgwood, Shania Rafter, Tamika McNamara, Jade Paton, Bradley Wilkins (Darug Custodian Aboriginal Corporation)
- Paul Boyd, Jakye Datto, Adam King, Kody McCutchen-King (Didge Ngunawal Clan)

The study area was assessed to contain areas of moderate and high archaeological potential following an initial archaeological survey carried out by Biosis in 2018 (Biosis Pty Ltd 2018a). Moderate potential was assigned to OA1, and OA2, and high potential attributed to OA3. Overall a total of a total of 274 test pits were excavated across 37 transects and 691 artefacts were recovered. Areas previously assessed as possessing low archaeological potential were also investigated as part of the testing program, in order to define the extent and nature of the archaeological deposit identified in OA3. Individual test pit and soil analysis results are provided in Appendix .

Results by open area are shown in Table 9, and results by area of potential are shown in Table 10. A detailed discussion of the results for each open area is provided below.

Table 9 Test excavation results by open area

Open area	Archaeological potential	Open area (m^2)	Area tested (m2)	Open area effectively tested (%)	No. of test pits	No. of artefacts
OA3 (north)	Low	994809.8211	9.50	0.00095%	38	104
OA1	Moderate	21054.15305	9.25	0.0439%	37	16
OA2	Moderate	38913.663	19.75	0.0507%	79	9
OA3 (south east)	High	142259.9329	30.00	0.021%	120	561

Table 10 Test excavation results by low, moderate and high potential

Potential	Potential area (m^2)	Area tested (m^2)	Effectively tested (%)	No. of test pits	No. of artefacts
Low	994809.8211	9.50	0.00095%	38	104
Moderate	59967.81605	29.00	0.048%	116	25
High	142259.9329	30.00	0.021%	120	666

6.3.1 Open Area 1 (OA1)

OA1 is an area of moderate archaeological potential located upon a gentle slope along the extent of the study area. A total of 37 test pits were excavated at 20 metre intervals across 3 transects (transects 2-4) in order to test the archaeological potential of OA1.

Soil stratigraphy generally consisted of moderately compacted dark grey to dark grey brown (10YR 4/2, 10YR 3/2) loamy silt in spit 1 (up to 100 millimetres). Within spit 2 (100-200 millimetres) soils ranged from moderately compacted dark grey (10YR 4/2) clayey silt to silty clay, with four test pits within the north-western extent of transects 2 and 3 containing moderately compacted dark grey (10YR 4/2) loamy silts. Test pits reached base between 120 to 300 millimetres. A majority of test pits finished on orange-brown clays by the end of spit 2. Deposits that extended into spit 3 (200-300 millimetres) consisted of moderately compacted dark grey (10YR 4/2) silty clays. Single instances of brown (10YR 5/3) loamy clays or silty clays within spit 3 occurred in test pit 2 transect 2, and test pit 7 transect 3, respectively. Soils inclusions were highest in spit 2, particularly in transect 3 and 4, ranging from 5-60%. Soil inclusions were significantly lower in spits 1 and 3 overall, generally ranging from 2-10%. Bioturbation was recorded across the extent of the area tested, and soils appeared fairly intact (Plate 13 and Plate 14).

Plate 13 Soil profile in OA1

A total of 16 artefact were recovered during test excavations from 9 test pits, including one tool, a silcrete broken point, from spit 1 of transect 2 test pit 10. Six of the artefacts were recovered from spit 1, and 10 from spit 2. No artefacts came from spit 3. Test pit 4 in transect 3 had the highest density of artefacts; all silcrete angular fragments from spit 2. Silcrete was the dominant raw material type. The results of the test excavations identified two low density artefact scatters, one within the south-eastern extent of the area, and another within the north-western extent.

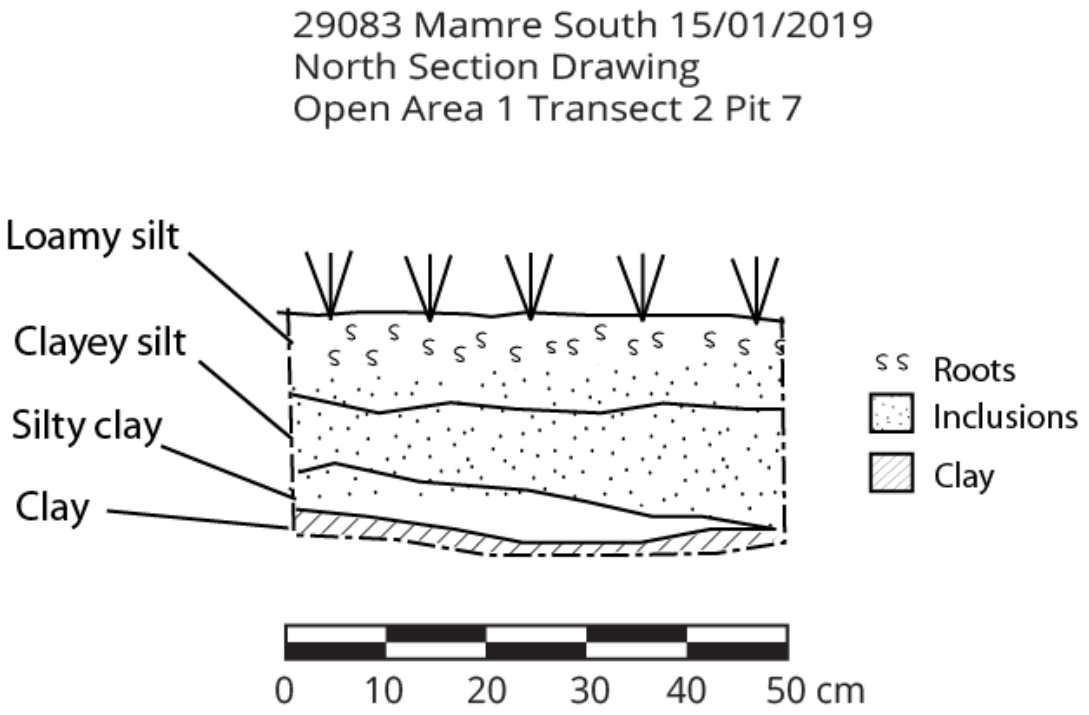

Plate 14 Representative stratigraphic profile in OA1

6.3.2 Open Area 2 (OA2)

OA2 is an area of moderate archaeological potential located upon a gentle slope overlooking an area of frequent inundation that stretches west towards South Creek. A total of 79 test pits were excavated at 20 metre intervals across 6 transects (transects 1-6) in order to test whether subsurface deposits exist in OA2.

In spit 1 (up to 100 millimetres) soil stratigraphy generally consisted of moderately compacted dark grey to dark grey brown (10YR 4/2, 10YR 3/2) loamy silt, or dark brown to brown (7.5YR 3/2, 10YR 5/3) loamy silt. Within spit 2 (100-200 millimetres) soils predominately ranged from moderately compacted dark grey (10YR 4/2), to dark brown, brown or orange brown (10YR 5/4, 10YR 5/3, 10YR 4/2) clayey silt to silty clay. Test pit 1 transect 4 differed from all other test pits, in that is soils consisted of black (10YR 2/1) loamy silt within spit 1, onto red brown (7.5YR 4/6) silty clay within spit 3. Charcoal inclusions were very high within test pit 1 transect 4, at 80%, with large chunks of charcoal present likely from a burnt tree root in spit 3. Test pits reached base between 110 to 460 millimetres. A majority of test pits finished on brown clays with orange, brown and red mottles by the end of spit 3. Deposits that extended into spit 3 (200-300 millimetres) consisted of predominately moderately compacted dark grey, dark brown or orange brown (10YR 4/2, 10YR 4/2,10YR 5/3) silty clays, although soils did vary with some containing highly compacted brown (10YR 5/3) clayey silts , brown (10YR 5/3) loamy clays, and orange brown (10YR 4/2) clays. Soils within spit 4 (300-400 millimetres) remained fairly consistent with spit 3, consisting of dark grey, dark brown or orange brown (10YR 4/2, 10YR 4/2,10YR 5/3) silty clays to orange brown (10YR 4/2) clays. Only two test pits reached spit 5, with a maximum depth of 460 millimetres. Soils inclusions were wide ranging across all spits, varying from 0-80% in spit 1, 5-

80% in spit 2 and 3, 2-70% in spit 4, and 5-40% in spit 5. Bioturbation was recorded across the extent of the area tested, and soils appeared fairly intact (Plate 15 and Plate 16).

Plate 15 Soil profile in OA2

A total of nine artefact were recovered during test excavations from nine test pits. Five of the artefacts were recovered from spit 2, and one from spit 1, and one from spit 3. Seven of the nine artefacts were recovered from dark grey soils. Silcrete was the dominant raw material type. The results of the test excavations identified two low density artefact scatters in the north-western extent of OA2, and two isolated subsurface artefacts within the south-eastern portion.

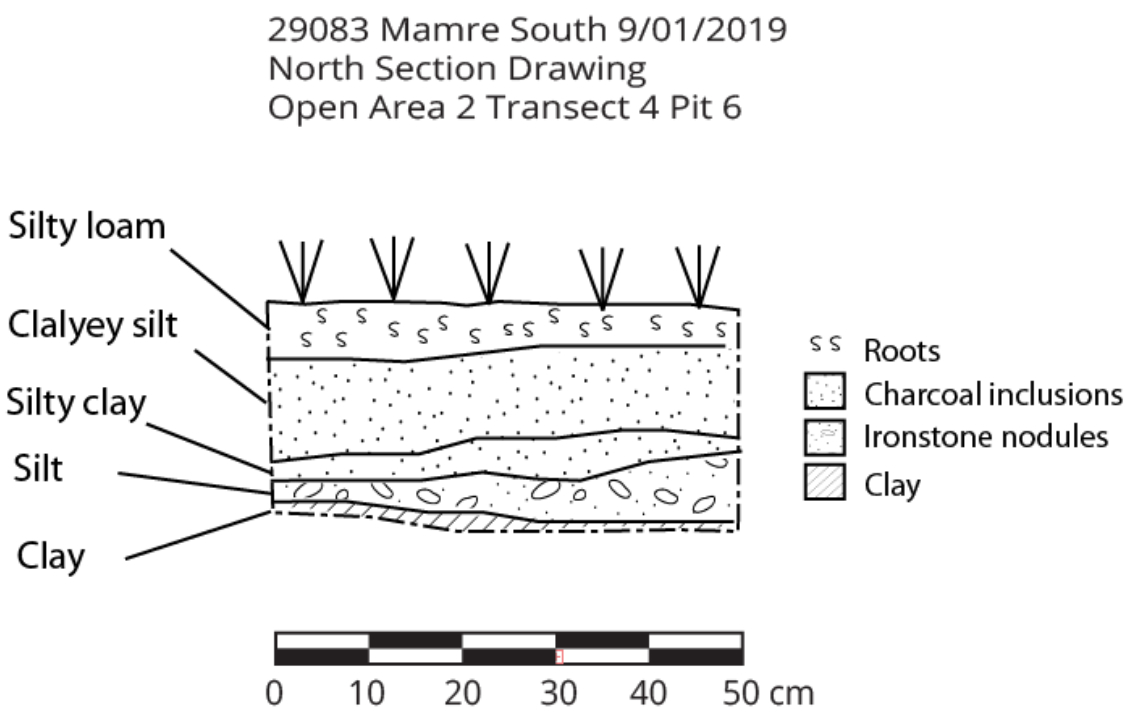

Plate 16 Representative stratigraphic profile at OA2

6.3.3 Open Area 3 (OA3)

A total of 158 test pits were excavated across 28 transects (transects 1-14, 16-25, and A1, 6A, 9A, 7A) within areas identified as possessing high and low archaeological potential across the vast expanse of OA3 , with transects extending north to south along South Creek, and up to the creek junction within the south-western portion of the study area. Transects were spaced at 20 metre intervals in the first instance, however, intervals varied between 10-40 metres when either significant deposits were encounter; resulting in shorter intervals of between 10-20 metres (transects A1, 6A, 9A and 7A), or upon the absence of artefacts along South Creek; where intervals were expanded to 40 metres to further explore the nature of OA3. Where intervals of 40 metres were employed, once the presence of artefacts was identified, the following test pits would recommence at 20 metres.

Soil stratigraphy, disturbance and depth varied across the extent of OA3, likely due to the fluvial and alluvial nature of the soils and the proximity of South Creek, and previous land use, and land clearance. Soils within transect A1, and transects 1-6 were highly disturbed with glass, brick, plastic and fill materials present within all spits. This portion of the study area had been previously used for agricultural purposes, such as tomato farming, and the first 300 millimetres had been heavily disturbed by ploughing. Soils generally consisted of highly compacted dark yellow brown (10YR 4/4) and dark brown (7.5YR 3/2) silty clays within spit 1 (0-100 millimetres), and spit 2 (100-200 millimetres), with some soils consisting of strong brown (10YR 4/6 silty clays with orange and brown mottles. Test pits reached clay base by the end of spit 2 or spit 3 (300 millimetres), with spit 3 predominately consisting of highly compacted dark brown (7.5YR 3/2), or strong brown (10YR 4/6) silty clay to red to orange brown (10YR 4/6, 10YR 4/4) clay. Soil inclusions varied across each spit, from 5-30% in spit 1, 5-40% in spit 2, and from 2-40% in spit 4 (Plate 17 and Plate 20).

Plate 17 Soil profile acorss transects 1-7 in OA3

Soils across transect 7-14, 16, 9A, 7A, and 6A appeared less disturbed than those excavated across transects A1, and 1-6. Soils within spit 1 (0-100 millimetres) of these transects ranged from highly compacted dark yellow brown (10YR 4/4) silty loams, to dark grey brown (10YR 4/2) loamy silts to silt with low levels of inclusions 2-10%. Within spit 2 (100-200 millimetres) soils changed to silty clays of yellowish brown (10YR 4/4) from to predominately dark grey brown (10YR 4/2) in colour, with some brown (7.5YR 5/3) moderately to heavily compacted silty clays occurring in transect 12. Soils within spit 3 remained silty clays encountered in spit 2, finishing on yellow brown, or orange brown clays (Plate 18).

Plate 18 Soil profiles across Transect 7-14 in OA3

Soil depth varied across transects 17-24 reaching base at a depth between 280-800 millimetres, with a majority finishing between 400-500 millimetres. Soils across spit 1 (0-100 millimetres) consisted of dark grey brown (10YR 4/2), dark yellow brown (10YR 4/4), and dark brown (7.5YR 3/3, 7.5YR 3/2) moderately to heavily compacted silts to silty clays, or low to moderately compacted brown (7.5YR 5/3, 7.5YR 3/4) silty loams within areas closer to South Creek. Dominant soil types were interchangeable across spits 2-8 within transect 17-24, however deposits remained consistent within each test pit. Soil types include yellowish brown (10YR 4/4), brown (7.5YR 5/3, 7.5YR 4/3), dark grey brown (10YR 4/2) and reddish brown silts, sandy clays, silty clays, finishing on clays. Soil inclusions were generally low at between 2-15% (Plate 19 and Plate 21).

Plate 19 Soil profiles in transects 17-24 at OA3

668 artefacts were recovered during test excavations within OA3. Artefact density was highest across the study area within spits 1 (n=222) and 2 (n=283), with artefact density more than halving in spit 3 (n=116), and significantly decreasing across spits 4-6, reaching a maximum of 33 in spit 4. No Artefacts were recovered from spit 7. One artefact came from spit 8 of transect 1 pit 1 which was excavated in 50 millimetre spits, as the first test unit within 0A3. Therefore the artefact was located within 350-400 millimetres of deposit. Artefact densities were highest within Transects 7, 8 and 9, at 71, 68, and 90 per test excavation unit. The highest number of artefacts to one test pit was identified in pit 5.1, transect 7, containing 35 artefacts. Artefact density steadily increased between transects A1, and 1-6 within 0A3, ranging from 10-55 artefacts per transect, and subsequently decreased from transects 10-13, varying from 30-39, with artefact density significantly decreasing between transects 14 and 16-25, with a maximum of 21, with no artefacts being recorded in transect 25. Transect 6A, 7A and 9A were excavated to further explore the concentration of artefact around transect 7-9. Artefact density remained fairly consistent with surrounding deposits, with artefact density ranging from 17-19 artefacts per excavation unit, with only test pit 1 from transect 6A containing a low artefact density of 3 artefacts. Silcrete was the dominant raw material type. The results of the test excavations identified a concentration of artefacts within the south-western corner of the study area. Two previously recorded AHIMS sites identified by Biosis in 2018 are located within this area of high concentration, with additional surface artefacts having also been recorded during the test excavations program.

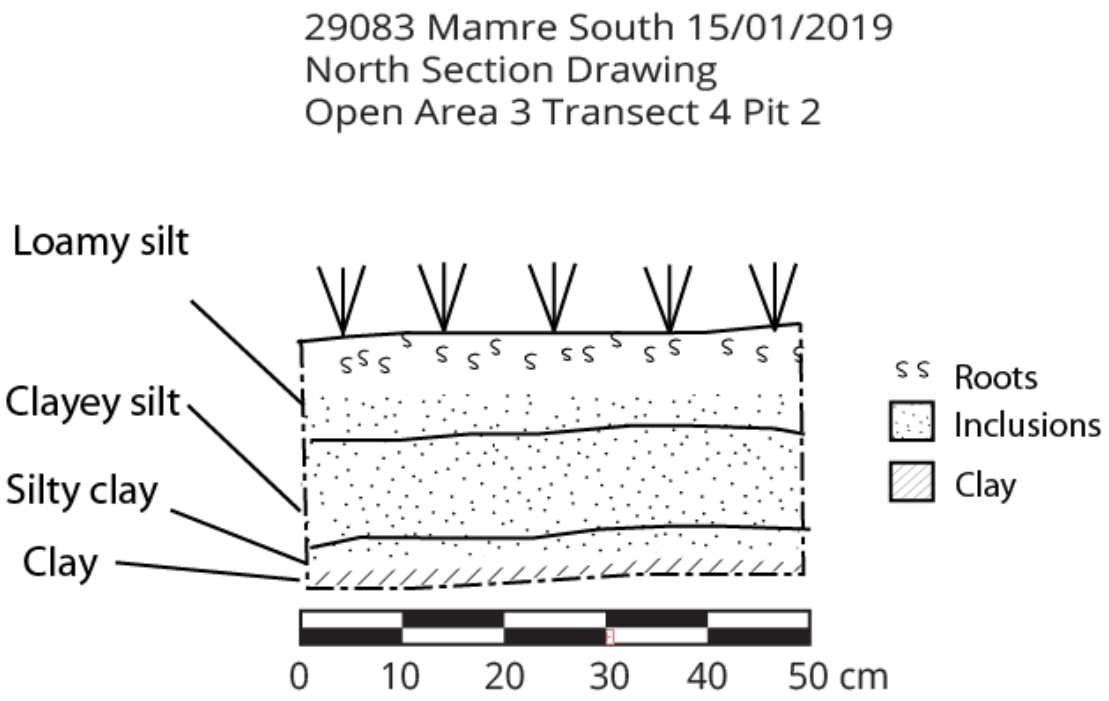

Plate 20 Representative stratigraphic profile (gentle slope) in OA3

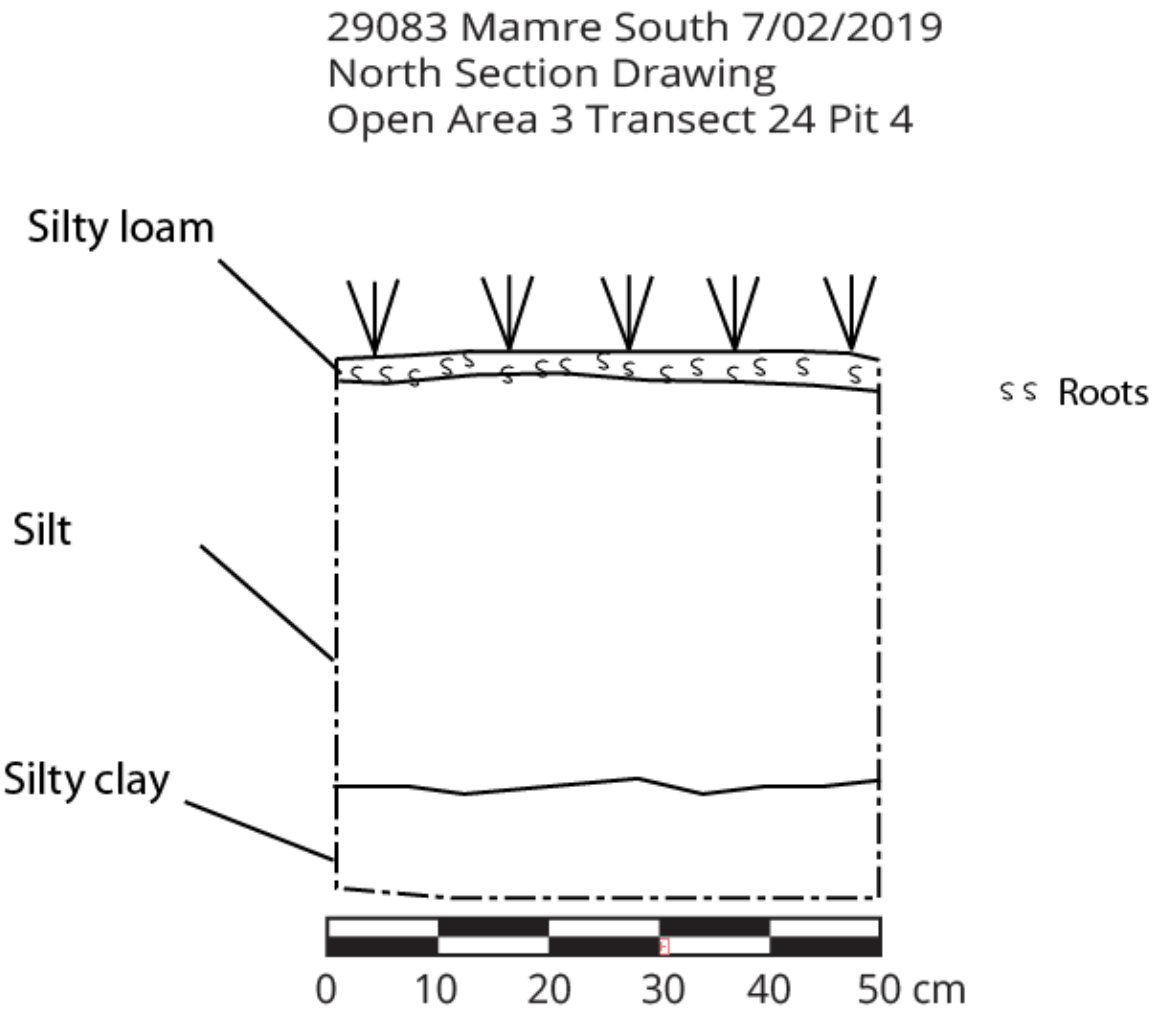

Plate 21 Representative stratigraphic profile (flats) in OA3

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Legend

- Study area
- Test pits

Archaeological potential

- High
- Low
- Moderate

Figure 9.1: Test excavation coverage

0 50 100 150 200 250

Metres

Scale: 1:5,000 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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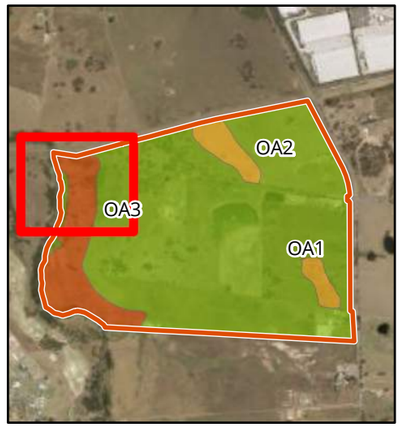

Legend

Study area

Test pits

Archaeological potential

High

Low

Figure 9.2: Test excavation coverage

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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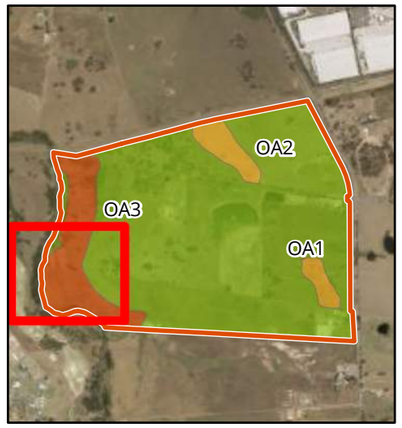

Legend

Study area

Test pits

Archaeological potential

High

Low

Figure 9.3: Test excavation coverage

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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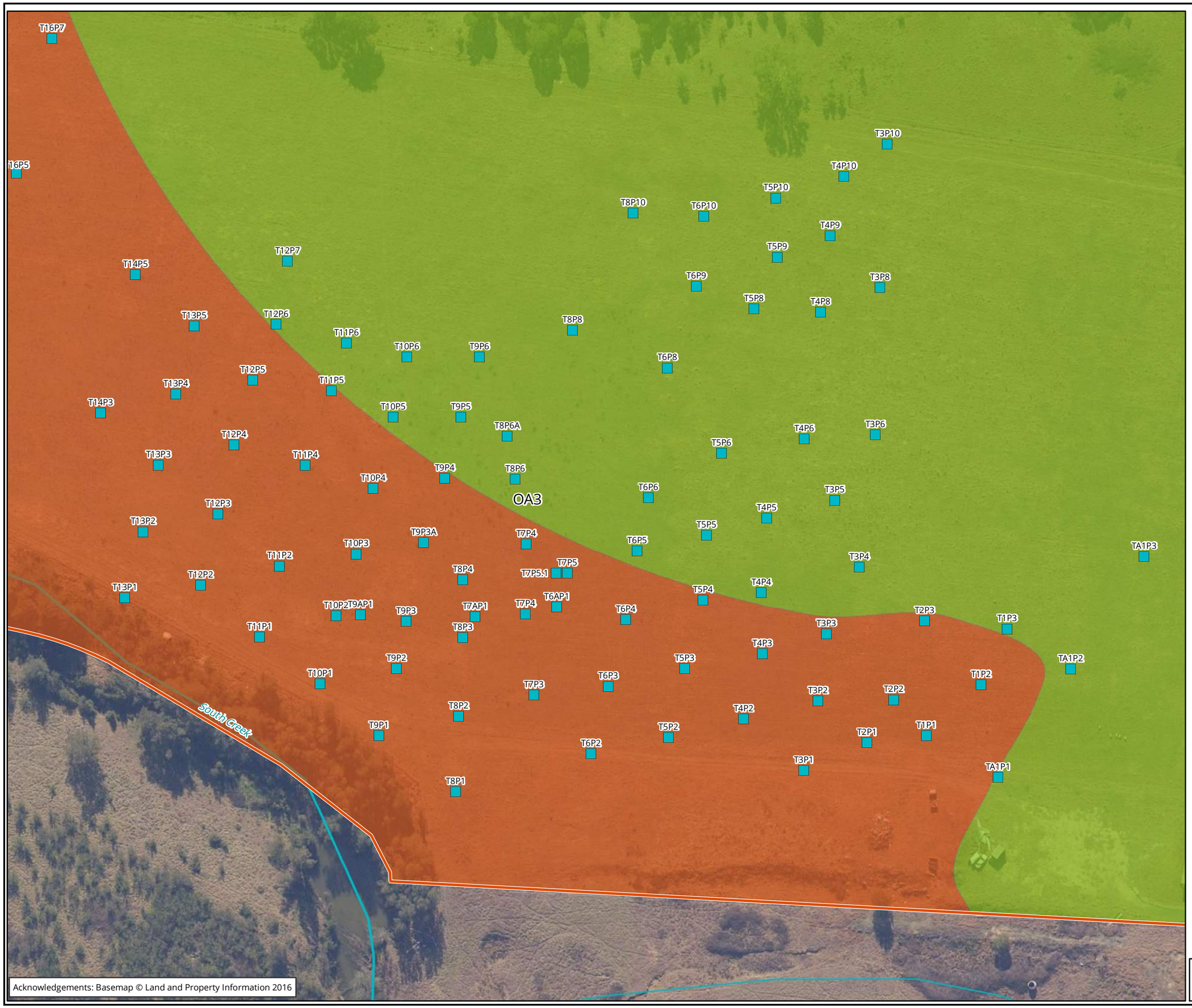

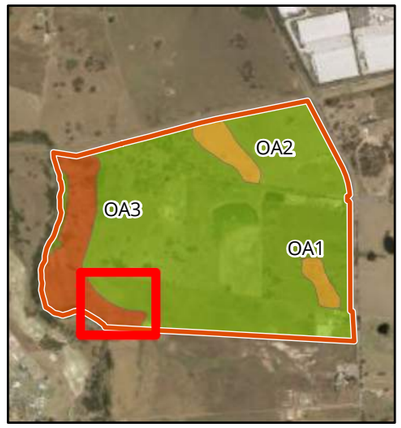

Legend

Study area

Test pits

Archaeological potential

High

Low

Figure 9.4: Test excavation coverage

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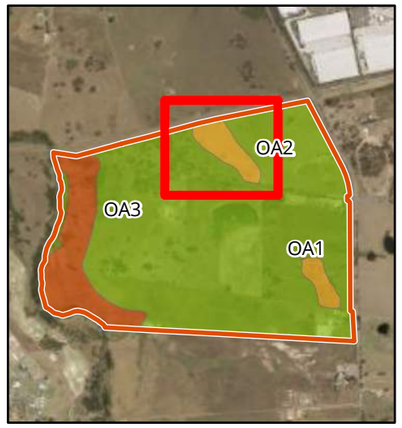

Legend

Study area

Test pits

Archaeological potential

Low

Moderate

Figure 9.5: Test excavation coverage

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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Figure 9.6: Test excavation coverage

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Legend

Study area

Number of artefacts

- 0
- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 35

PAD

Archaeological potential

- High
- Low
- Moderate

Figure 10.1: Test excavation results

0 50 100 150 200 250

Metres

Scale: 1:5,000 @ A3

Coordinate System: GDA 1994 MGA Zone 56

N

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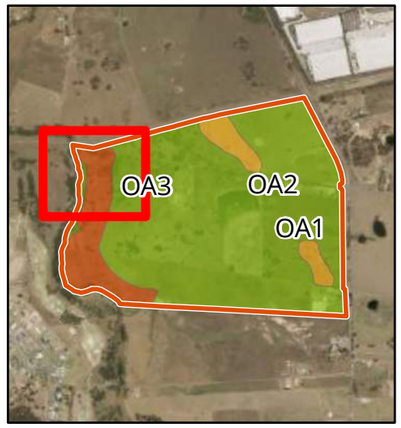

Legend

Study area

Number of artefacts

0

1 - 10

PAD

Archaeological potential

High

Low

Figure 10.2: Test excavation results

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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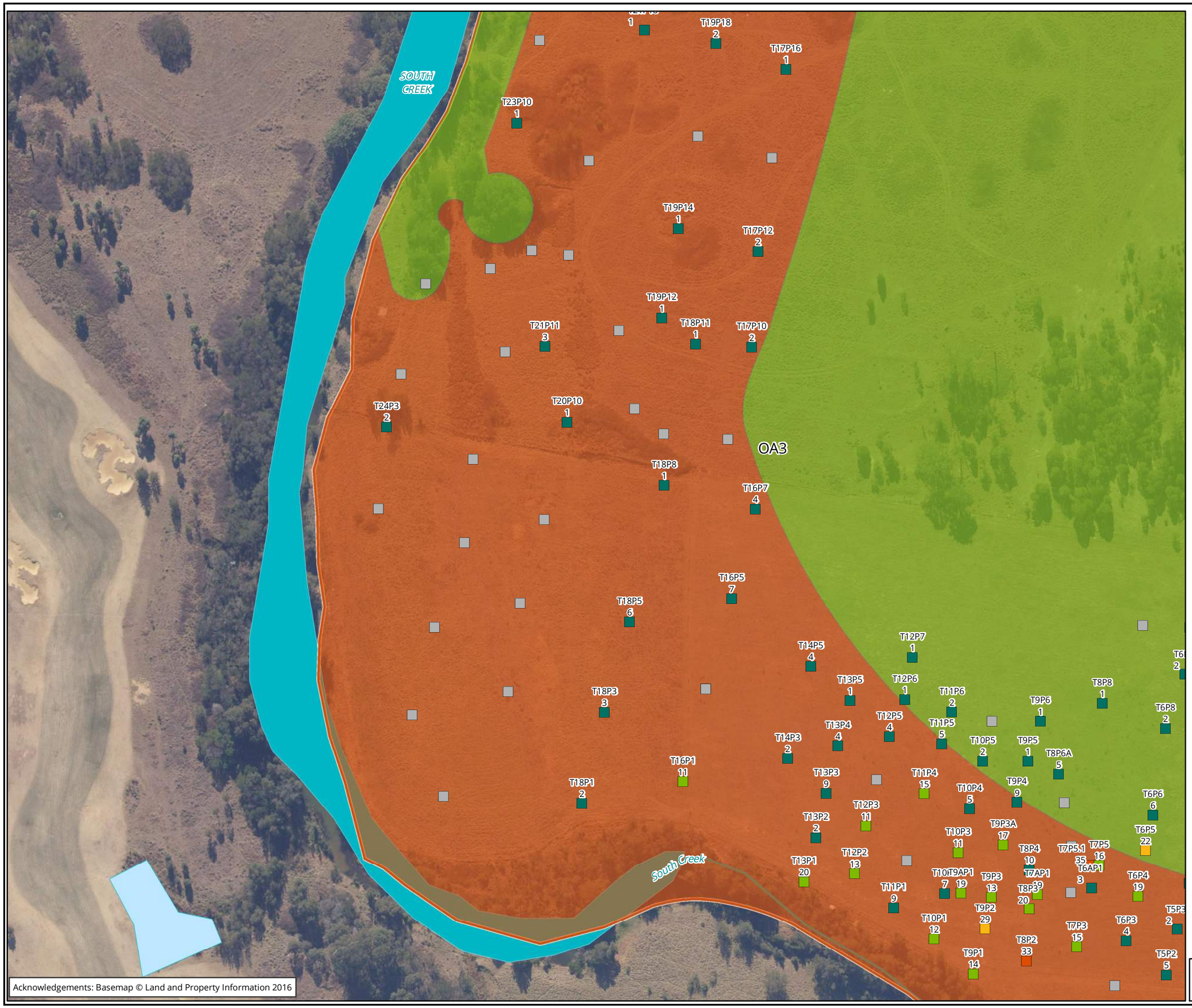

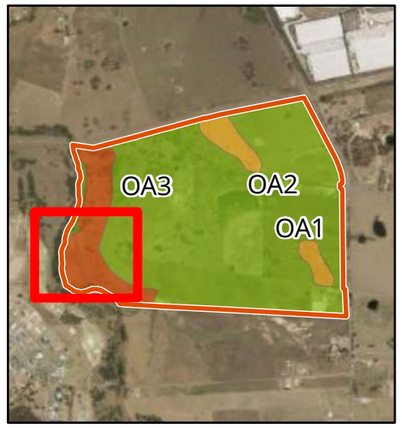

Legend

Study area

Number of artefacts

- 0
- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 35

PAD

Archaeological potential

- High
- Low

Figure 10.3: Test excavation results

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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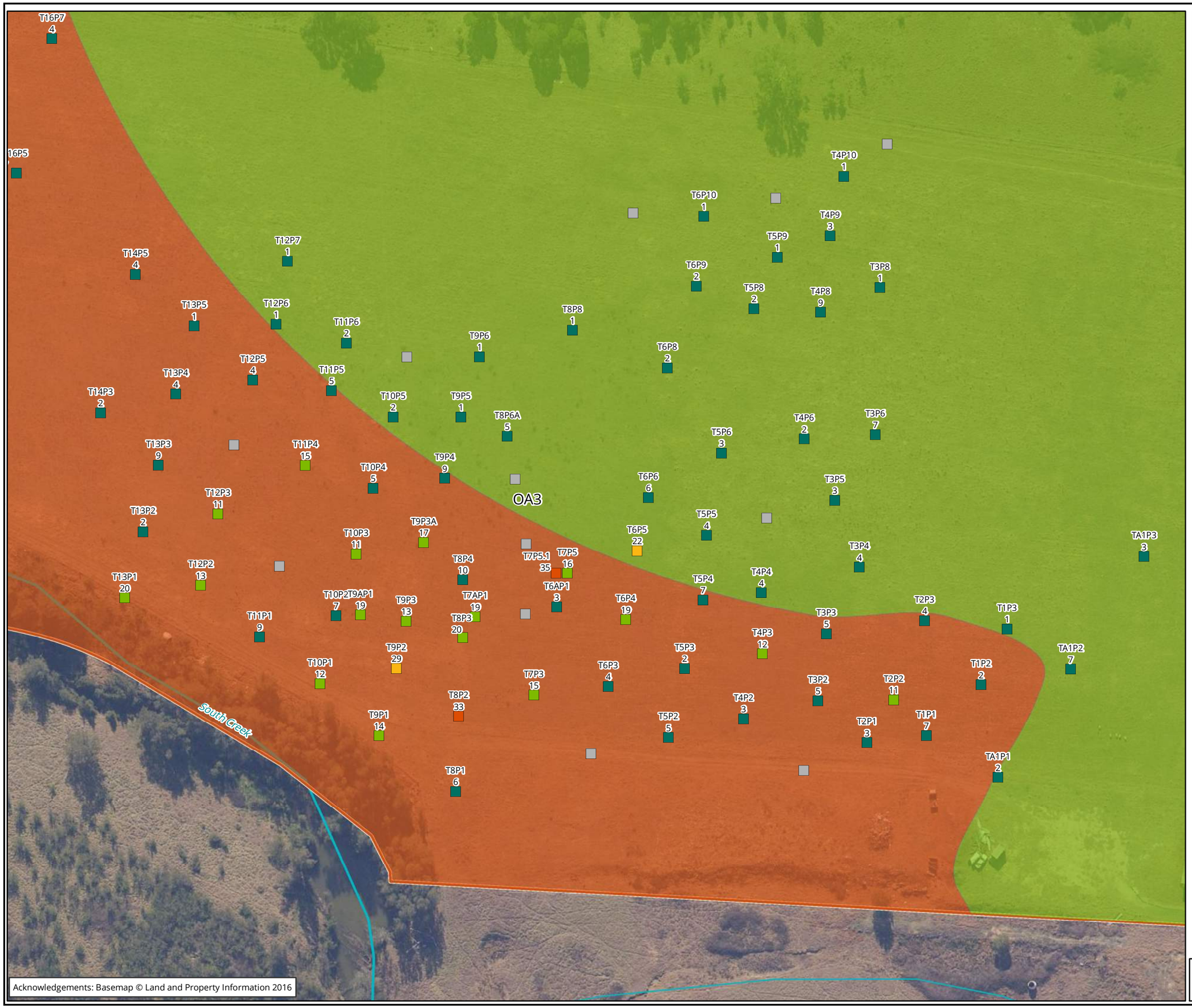

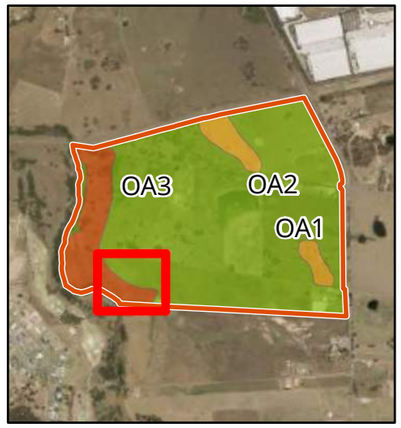

Legend

Study area

Number of artefacts

- 0
- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 35

PAD

Archaeological potential

- High
- Low

Figure 10.4: Test excavation results

0 10 20 30 40 50

Metres

Scale: 1:1,000 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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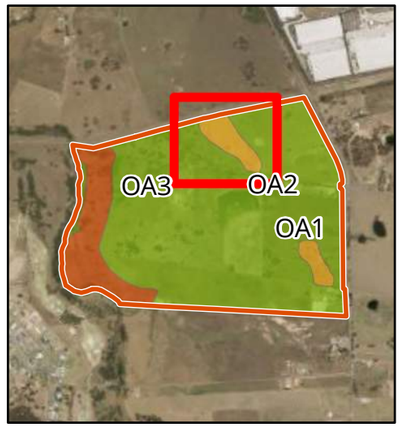

Legend

Study area

Number of artefacts

0

1 - 10

PAD

Archaeological potential

Low

Moderate

Figure 10.5: Test excavation results

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

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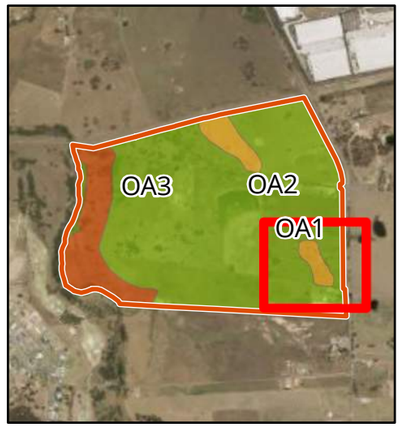

Legend

Study area

Number of artefacts

0

1 - 10

PAD

Archaeological potential

Low

Moderate

Figure 10.6: Test excavation results

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

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7 Analysis and discussion

7.1 Aboriginal sites identified in the study area

Three previously recorded Aboriginal archaeological sites were identified within the study area prior to test excavations: AHIMS 45-5-5187/MSP-01, AHIMS 45-5-5188/MSP-02, AHIMS 45-5-5189/MSP-03. Each of these sites comprised a low density surface artefact site. Following test excavations undertaken in the study area, six new sites were identified: MSP-05, MSP-06, MSP-07, MSP-08, MSP-09 and MSP-10. All six of these sites consisted of low density artefact sites.

MSP-01 (AHIMS #45-5-5187)

AHIMS 45-5-5187/MSP-01 consists of an isolated artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of AHIMS 45-5-3028/EPTA3 (Plate 22). The site is located in a disturbed context and consists of a single silcrete complete flake (Plate 23 and Table 11).

The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

Plate 22 Location of site AHIMS 45-5-5187/MSP-01, view facing west

Plate 23 Silcrete complete flake identified at AHIMS 45-5-5187/MSP-01

Table 11 Surface stone artefacts within AHIMS 45-5-5187/MSP-01

Site	Artefact type	Raw material	Cortex (%)	Platform	Platform length (mm)	Platform width (mm)	Termination	Length (mm)	Width (mm)	Thickness (mm)	Negative flake scars
MSP-01	Complete flake	Silcrete	10	Flaked	4	2	Feather	14	17	7	2

MSP-02 (AHIMS 45-5-5188)

AHIMS 45-5-5188/MSP-02 consisted of a single surface artefact, which test excavations revealed to be of a highly significant subsurface deposit located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10 (Plate 24). Based on the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of 666 artefacts (Plate 25 and Table 12).

The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

Test excavations at this site extends down to the edge of South Creek and indicates that AHIMS 45-5-5188/MSP-02 and AHIMS 45-5-5189/MSP-03 are part of the same site. As a result AHIMS 45-5-5188/MSP-02 and AHIMS 45-5-5190/MSP-03 have been combined into one site AHIMS 45-5-5189/MSP-02. The AHIMS sites cards for both sites will be subsequently updated. A total of 666 sub-surface artefacts were identified across

AHIMS 45-5-5188/MSP-02 and it was found that artefact densities decreased closer to South Creek, with dispersed, low density deposits present along the alluvial flats.

Plate 24 Location of site AHIMS 45-5-5188/MSP-02, view facing north

Plate 25 Silcrete complete flake identified at site AHIMS 45-5-5188/MSP-02

Table 12 Surface stone artefact within AHIMS 45-5-5188/MSP-02

Site	Artefact type	Raw material	Cortex (%)	Platform	Platform length (mm)	Platform width (mm)	Termination	Length (mm)	Width (mm)	Thickness (mm)	Negative flake scars
MSP-02	Complete flake	Silcrete	25	Flaked	4	2	Feather	17	12	9	0

MSP-03 (AHIMS 45-5-5189)

AHIMS 45-5-5189/MSP-03 consists of a surface artefact scatter located across a flat and gentle slope landform within Lot 22 DP 258414 The site is located approximately 100 metres west of the recorded location of AHIMS 45-5-3032/EPTA10. Based upon the surrounding context, which featured a large amount of what appeared to be construction fill, the site is considered to be present within a disturbed context. The site consists of one silcrete complete flake and one broken quartzite hammer stone (Table 13).

The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site.

Test excavations at this sites identified a low density sub-surface deposit located on a high point within the gentle slope landform. This site extends down to the edge of South Creek and indicates that AHIMS 45-5-5189/MSP-03 and AHIMS 45-5-5188/MSP-02 are part of the same site. As a result AHIMS 45-5-5189/MSP-03

and AHIMS 45-5-5188/MSP-02 have been combined into one site AHIMS 45-5-5188/MSP-02. The AHIMS sites cards for both sites will be subsequently updated (see Plate 24 for location of AHIMS 45-5-5188/MSP-02).

Plate 26 Silcrete complete flake identified at site AHIMS 45-5-5189/MSP-03

Table 13 Surface stone artefacts within AHIMS 45-5-5189/MSP-03

Site	Artefact type	Raw material	Cortex (%)	Platform	Platform length (mm)	Platform width (mm)	Termination	Length (mm)	Width (mm)	Thickness (mm)	Negative flake scars
MSP-03	Complete flake	Silcrete	10	Crushed	-	-	Feather	49	27	10	3
MSP-03	Broken hammer stone	Quartzite	50	Cortical	4	2	Feather	36	38	19	-

MSP-05 (AHIMS Pending) (E: 294016 N: 6254604)

MSP-05 consists of a low density sub-surface artefact scatter located on a gentle slope landform in OA2 (Plate 27). The site is located approximately 750 metres east of South Creek. A total of five artefacts were recovered from four test pits across 5793 metres squared. These artefacts consisted of one complete flake, one longitudinal flake fragment and three angular fragments (Appendix). One piece of angular fragment. Two pieces of angular fragment recovered from this site displayed evidence of potlidding and cremated fracturing, suggesting heat shatter.

Plate 27 North-western facing view of MSP-05

MSP-06 (AHIMS Pending) (E: 294126 N: 6254552)

MSP-06 consists of a low density sub-surface artefact located on a gentle slope landform in OA2 (Plate 28). The site is located approximately 800 metres east of South Creek and covers 619 square metres. Two artefacts were recovered from two test pits and consisted of a silcrete angular fragment and a silcrete proximal flake (Appendix).

Plate 28 South facing view of MSP-06

MSP-07 (AHIMS Pending) (E: 294146 N: 6254469)

MSP-07 consists of an isolated sub-surface artefact located on a gentle slope landform in OA2 (Plate 29).The site is located approximately 750 metres east of South Creek and covers 162 square metres. One artefact was recovered from this site consisting of an indurated mudstone tuff (IMT) angular fragment (Appendix).

Plate 29 North west facing view of MSP-07

MSP-08 (AHIMS Pending) (E: 294155 N: 6254417)

MSP-08 consists of an isolated sub-surface artefact located on a gentle slope landform in OA2 (Plate 30). The site is located approximately 750 metres east of South Creek and covers 152 square metres. One artefact was recovered from this site consisting of a quartz bipolar flake (Appendix).

Plate 30 North facing view of MSP-08

MSP-09 (AHIMS Pending) (E: 294469 N: 6253984)

MSP-09 consists of a low density sub-surface artefact scatter located on a gentle slope landform in OA1. The site is located approximately 1 kilometre east of South Creek and has an area of approximately 4027 metres squared (Plate 31). A total of seven artefacts were identified at this site. They consisted of one complete flake, one distal flake, one proximal flake, three angular fragments and one Bondi point fragment (Appendix).

Plate 31 West facing view of MSP-09

MSP-10 (AHIMS Pending) (E: 294548 N: 6253896)

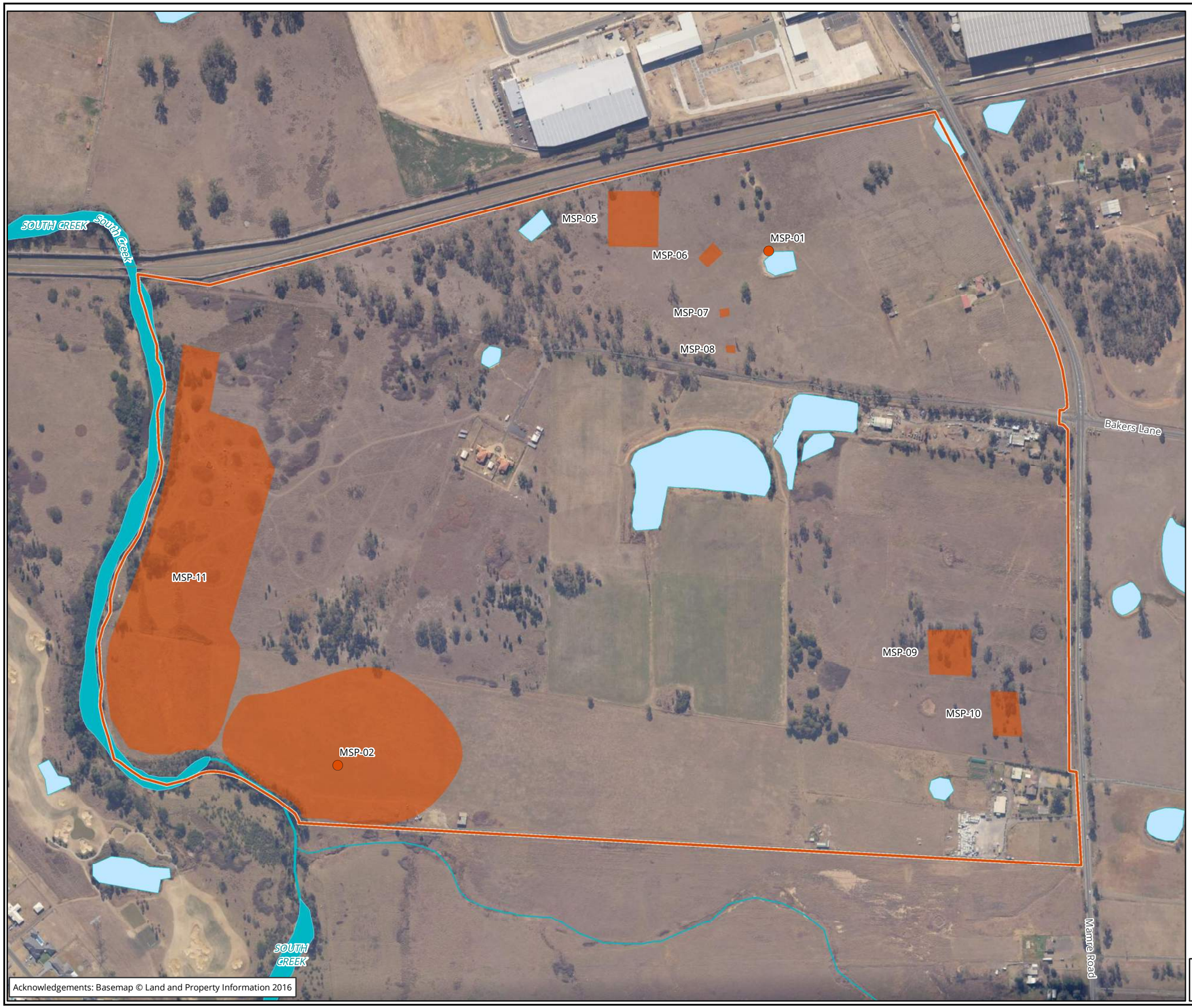
MSP-10 consists of a low density sub-surface artefact scatter located on a gentle slope landform in OA1. The site is located approximately one kilometre east of South Creek and has an area of approximately 2569 metres squared (Plate 32). A total of nine artefacts were identified at this site, comprising one complete flake, one distal flake, one proximal flake, and six pieces of angular fragment (Appendix).

Plate 32 South facing view of MSP-10

MSP-11 (AHIMS Pending) (E: 293382 N: 6254091)

MSP-11 consists of a low density sub-surface deposit located on a gentle slope landform in OA3. The nearest natural water source is a second order ephemeral tributary of South Creek, located approximately 90 metres south of the site. In addition to this, South Creek is located approximately 160 metres west south of the site (Plate 33).

Plate 33 View of MSP-11



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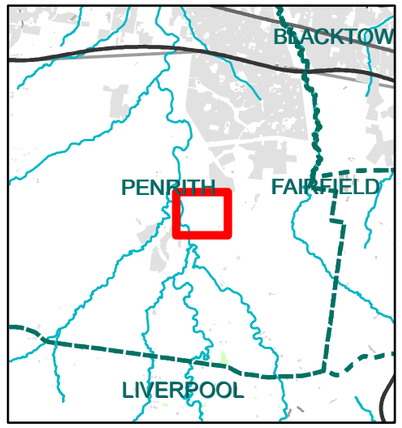

Legend

- Study area
- AHIMS
- Aboriginal heritage sites

Figure 11: Aboriginal heritage sites identified by the assessment

0 50 100 150 200 250

Metres

Scale: 1:5,000 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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7.2 Artefact analysis

7.2.1 Sub-surface stone artefact analysis

A total of 691 artefacts were recorded from the sub-surface excavations at sites OA1, OA2 and OA3, across 274 excavated test pits in total. The highest density of artefacts were recorded at OA3, which contained 666 artefacts out of 158 excavated test pits and accounted for 96.4% of the total sub-surface assemblage. OA1 had a lower density of artefacts, containing 16 artefacts across 37 test pits and accounting for 2.3% of the total assemblage, while OA2 contained 9 artefacts from 79 test pits which amounted to 1.3% of the total sub-surface assemblage.

Open area 1

Assemblage composition

The assemblage recovered from the test pit excavations at OA1 contained 16 artefacts and was dominated by angular fragments making up 56.3% (n=5) of the OA1 assemblage. Complete, distal and proximal flakes each occurred twice (12.5%) and one tool (6.25%) was recorded in the assemblage (Table 14).

Table 14 Artefact assemblage by type at OA1

Artefact type	Frequency (n)	Frequency (%)
Angular fragment	9	56.25
Complete flake	2	12.5
Distal flake	2	12.5
Proximal flake	2	12.5
Tool	1	6.25
Total	16	100

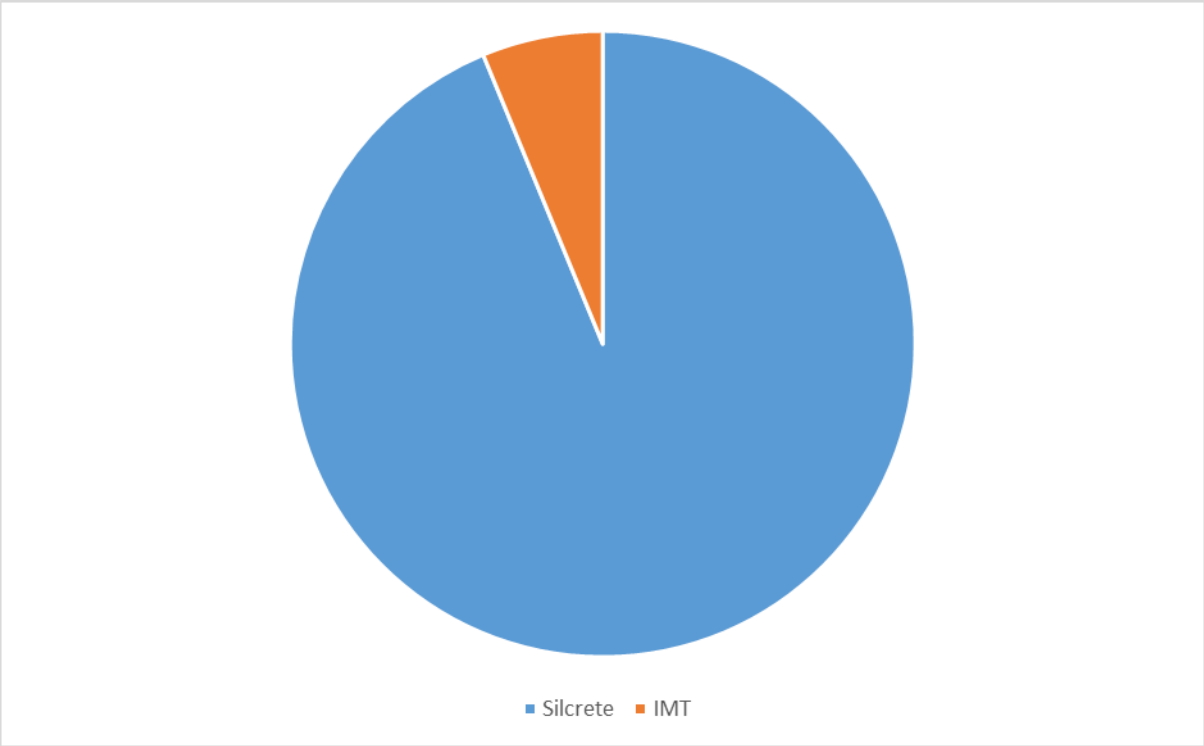
The limited sample size of artefacts identified within OA1 makes it difficult to provide in depth analysis of the assemblage at this site. Artefacts at this site occurred from spit 1 to spit 2, with a clear concentrations of artefacts in spit 2, representing 62.5% (n=10) of the assemblage (Table 15).

Table 15 Concentrations of artefacts per spit at OA1

Spit number (mm)	Count	Percentage
Spit 1 (0-100)	6	37.5
Spit 2 (100-200)	10	62.5
Spit 3 (200-300)	0	0

Raw material procurement

Two raw material types were identified in the assemblage of OA1. The dominant raw material type identified in OA consisted of silcrete making up 93.8% (n=15) of the site assemblage. IMT also occurred once in OA1 making up 6.2% of the site assemblage (Table 16).



Graph 1 Raw material distribution in OA1

The analysis of the cortex on the recorded artefacts shows that the vast majority of artefacts have less than 25% cortex remaining (n=15, 93.8%), with only one artefact containing more than 25% cortex (Graph 1 and Table 16).

Table 16 Percent of cortex on artefacts at OA1

Cortex (%)	Artefact count	Percentage
0-24	15	93.8
25-49	1	6.2
50-74	0	0
75-100	0	0
Total	16	100

Flake analysis

The assemblage of OA1 was entirely made up of flaked platforms (n=4) (Table 17).

Table 17 Artefact assemblage by platform type at OA1

Platform type	Count	Percentage
Flaked	3	100
Total	4	100

Two termination types were present, the most recorded type consisted of hinge terminations making up 75% (n=4) of termination types. One instance of a feather termination was also recorded at OA1 (25%) Table 18).

Table 18 Artefact assemblage by termination type at OA1

Termination type	Count	Percentage
Hinge	3	75
Feather	1	25
Total	4	100.0

Open area 2

Assemblage composition

The assemblage recovered from the test pit excavations at OA2 contained nine artefacts and was dominated by angular fragments making up 55.6% (n=5) of the OA2 assemblage (Table 19). Complete flakes made up 22.2% (n=2) of the assemblage and longitudinal and proximal flakes each occurred once in this assemblage making up 11.1% of the assemblage. No cores or tools were identified at OA2.

Table 19 Artefact assemblage by type at OA2

Artefact type	Frequency (n)	Frequency (%)
Angular fragment	5	56.25
Complete flake	2	22.2
Longitudinal	1	11.1
Proximal flake	1	11.1
Total	9	100

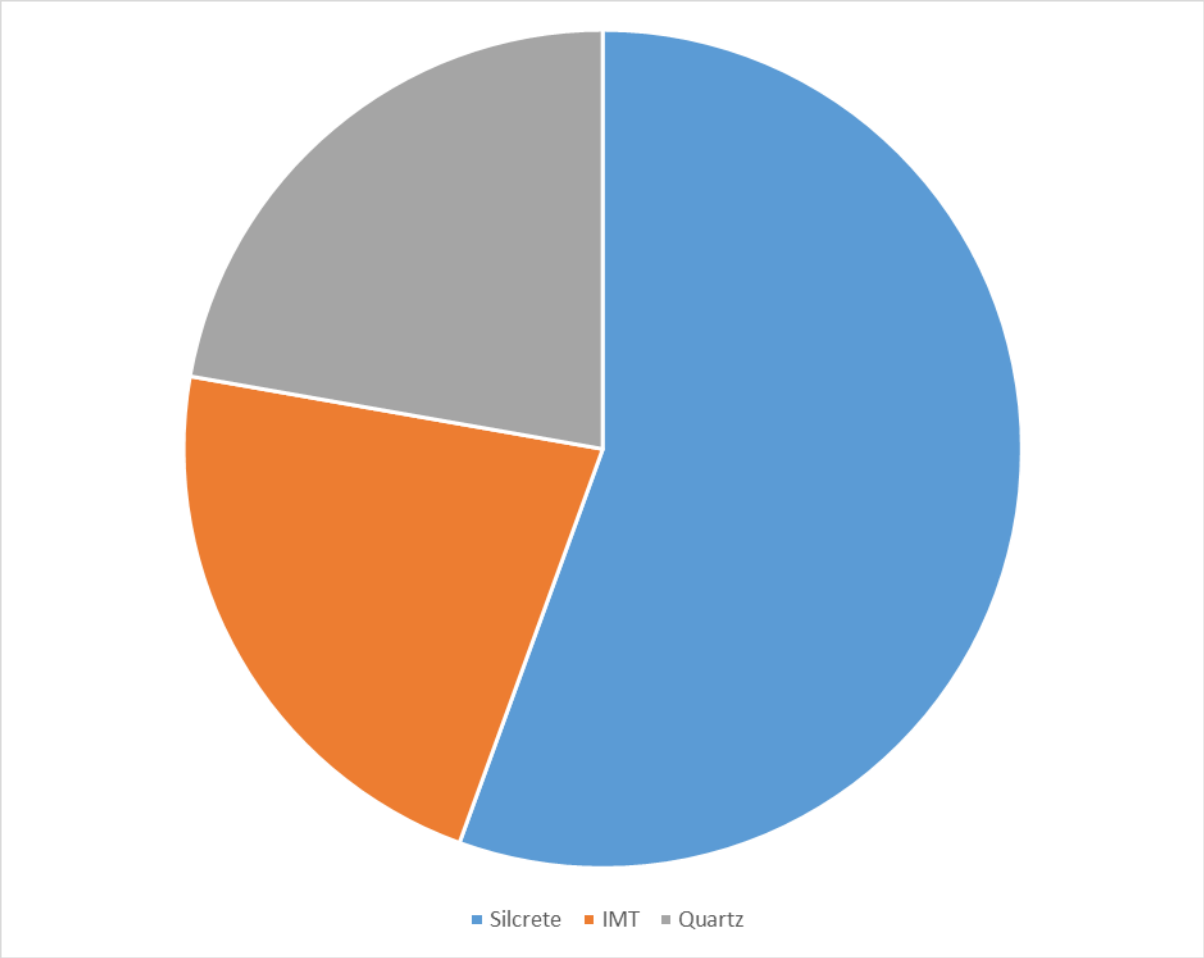
The limited sample size of artefacts identified within OA1 makes it difficult to provide in depth analysis of the assemblage at this site. Artefacts at this site occurred from spit 1 to spit 3, with the highest cluster in spit 2 (55%, n=5) (Table 20).

Table 20 Concentrations of artefacts per spit at OA2

Spit number (mm)	Count	Percentage
Spit 1 (0-100)	3	33.3
Spit 2 (100-200)	5	55.6
Spit 3 (200-300)	1	11.1

Raw material procurement

Three raw material types were identified in the assemblage of OA2. The dominant raw material type identified in OA consisted of silcrete making up 55.6% of the site assemblage (Graph 2). IMT and quarts also occurred in OA2 each making up 22.2% of the site assemblage.



Graph 2 Raw material distribution in OA2

The analysis of the cortex on the recorded artefacts shows that the vast majority of artefacts have less than 25% cortex remaining (n=8, 88.9%), with only one artefact containing more than 25% cortex (Table 21).

Table 21 Percent of cortex on artefacts by site

Cortex (%)	Artefact count	Percentage
0-24	8	88.9

Cortex (%)	Artefact count	Percentage
25-49	1	11.1
50-74	0	0
75-100	0	0
Total	9	100

Flake analysis

Platform types in the assemblage were predominately flaked platforms, accounting for 75% (n=3) of platforms (Table 22). One example of a crushed platform also occurred and made up 25% of the assemblage.

Table 22 Artefact assemblage by platform type

Platform type	Count	Percentage
Crushed	1	24
Flaked	3	75
Total	4	100

There was no dominant termination type found in OA2, but one instance each of feather, axial and plunge terminations were found in the OA2 assemblage (Table 23).

Table 23 Artefact assemblage by termination type

Termination type	Count	Percentage
Axial	1	33.3
Feather	1	33.3
Plunge	1	33.3
Total	3	100.0

Open area 3

Assemblage composition

The assemblage recovered from the test pit excavations was dominated by angular fragments making up 55.9% (n=372) of the total assemblage at OA3 (Table 24). When the different flake types are combined they make up a further 35.3% (n=235), these can then be isolated into further flake types. The most common flake type in the assemblage was complete flakes accounting for 13.8% (n=92) of the entire assemblage. This was followed by distal flakes (8.7%, n=58, proximal flakes (6.2%, n=41), medial flakes (3.9%, n=26, longitudinal flakes (2.3%, n=15) and three redirecting flakes (0.5).

Table 24 Artefact assemblage by type.

Artefact type	Frequency (n)	Frequency (%)
Angular fragment	372	55.9

Artefact type	Frequency (n)	Frequency (%)
Bipolar core	4	0.6
Complete flake	92	13.8
Distal flake	58	8.7
Glass fragment	2	0.3
Grinding base	1	0.2
Grinding fragment	3	0.5
Flake core	1	0.2
Heat shatter	1	0.2
Longitudinal flake	15	2.3
Medial flake	26	3.9
Multi platform core	8	1.2
Potlid	1	0.2
Proximal flake	41	6.2
Redirecting flake	3	0.5
Single platform core	15	2.3
Tool	23	3.5
Total	666	100.0

A total of 28 cores or core fragments were recorded in the assemblage, representing 4.2% of the total assemblage. These cores were broken up into three types with single platform cores (2.3%, n=15) occurring more commonly compared to multiplatform cores (1.2%, n=8) and bipolar cores (0.6%, n=4)

A high number of tools were also recorded in the assemblage (n=23, 3.5%). The majority of these tools consisted of backed artefacts (n=16); although, two scrapers and two burins were also identified in the assemblage.

In order to account for breakage within the artefact assemblage the minimum number of flakes (MNF) has been calculated (Holdaway & Stern 2004, p.15). The minimum number of flakes (MNF) within this assemblage is 165 (Hiscock 2002, p. 255). The ratio of proximal flakes to broken flakes within an assemblage should be theoretically be approximately 1:1. Deviations from this ratio can often indicate misidentification of complete artefacts with step terminations; or that breakage discard within the artefact assemblage differs from standard site assemblages (Holdaway & Stern 2004, p.16).

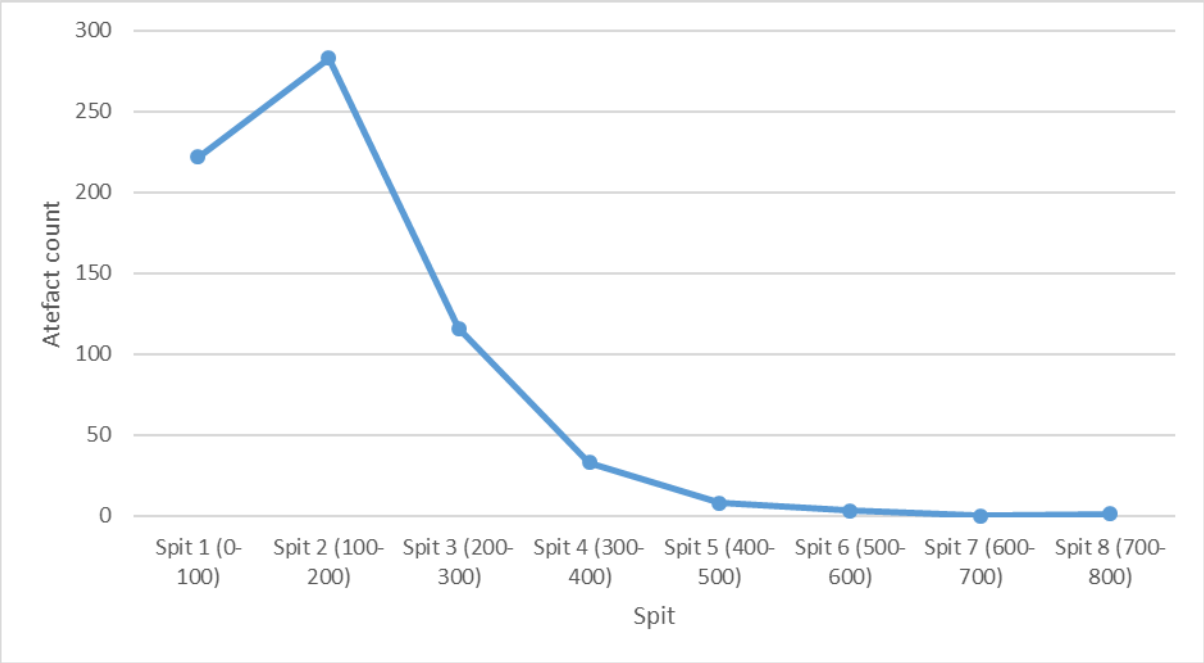
The ratio of proximal to distal flakes within the salvage excavation assemblage is approximately 1:1.4. It is possible that some medial fragments identified within the assemblage are in fact distal fragments with step terminations, or alternately some proximal fragments are complete flakes with step terminations. The high number of tools present within this assemblage, however, indicates that stone tool production at this site was being carried out with the primary purpose of manufacturing backed artefacts. Backed artefacts are generally produced by removing the proximal and/ or distal margins along one lateral margin of a flake using unidirectional or bidirectional retouch. This would explain the small discrepancies in the ratio of proximal to distal flake fragments noted in this assemblage.

Size and vertical distribution

The vertical distribution of artefacts at a site can be a good indicator of occupation intensity as spits with higher concentration are likely to have seen longer or more intensive occupation than spits with smaller artefact concentrations. The results of artefact concentrations by spit shows the highest concentration of artefacts between 100 and 200 mm (42.5%, n=283) and 0 and 100 mm (33.3%, n=222). The concentrations of artefacts also displays a clear trend where concentrations drop of significantly below spit 3 (Table 25 and Graph 3)

Table 25 Concentrations of artefacts per spit at OA3

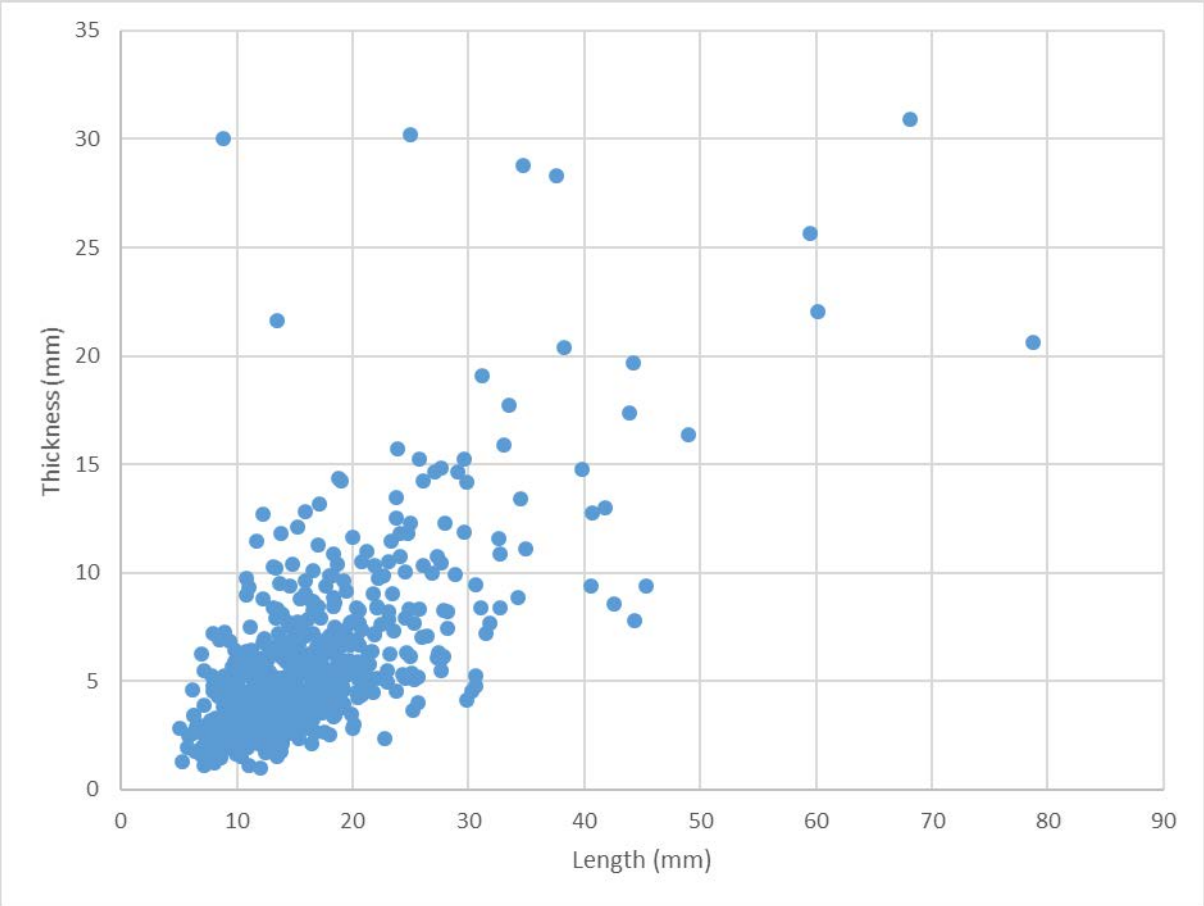
Spit number (mm)	Frequency (n)	Frequency (%)
Spit 1 (0-100)	222	33.3
Spit 2 (100-200)	283	42.5
Spit 3 (200-300)	116	17.4
Spit 4 (300-400)	33	5.0
Spit 5 (400-500)	8	1.2
Spit 6 (500-600)	3	0.5
Spit 7 (600-700)	0	0
Spit 8 (700-800)	1	0.2



Graph 3 concentrations of artefacts by spit

Artefact size in an assemblage can provide information about post depositional processes, raw material procurement and stone reduction. A useful guide to determining post-depositional processes such as trampling and bioturbation in a subsurface assemblage is the measurement of mean length. If the mean length (i.e. the average size) of the artefacts decreases with depth, it is a good indicator that post-depositional processes have occurred and the stone artefacts have been displaced downwards in the soil (Richardson 1992). This is because small artefacts are more likely to be affected by size sorting and soil movement, for example larger numbers of smaller artefacts will move and be sorted to the base of an excavation, while larger artefacts are less likely to move through the soil profile (Baker 1978)

The sizes of artefacts in the overall assemblage shows that the majority of artefacts have lengths less than 30 milimetres and thicknesses less than 15 milimetres (Graph 4). This indicated that the majority of artefacts in the assemblage are relatively small and are likely a result of later stage reduction, where core sizes are smaller and thus will limit flake sizes.



Graph 4 Artefact size (length vs thickness)

The average size of artefacts, measured by the length of artefacts divided by the thickness of artefacts, for each spit shows that there is little variance in artefact size through the soil profile Table 26. The size of artefacts have a standard deviation of 1.42 milimetres across the assemblage and suggests there is little movement of artefacts through the soil profile.

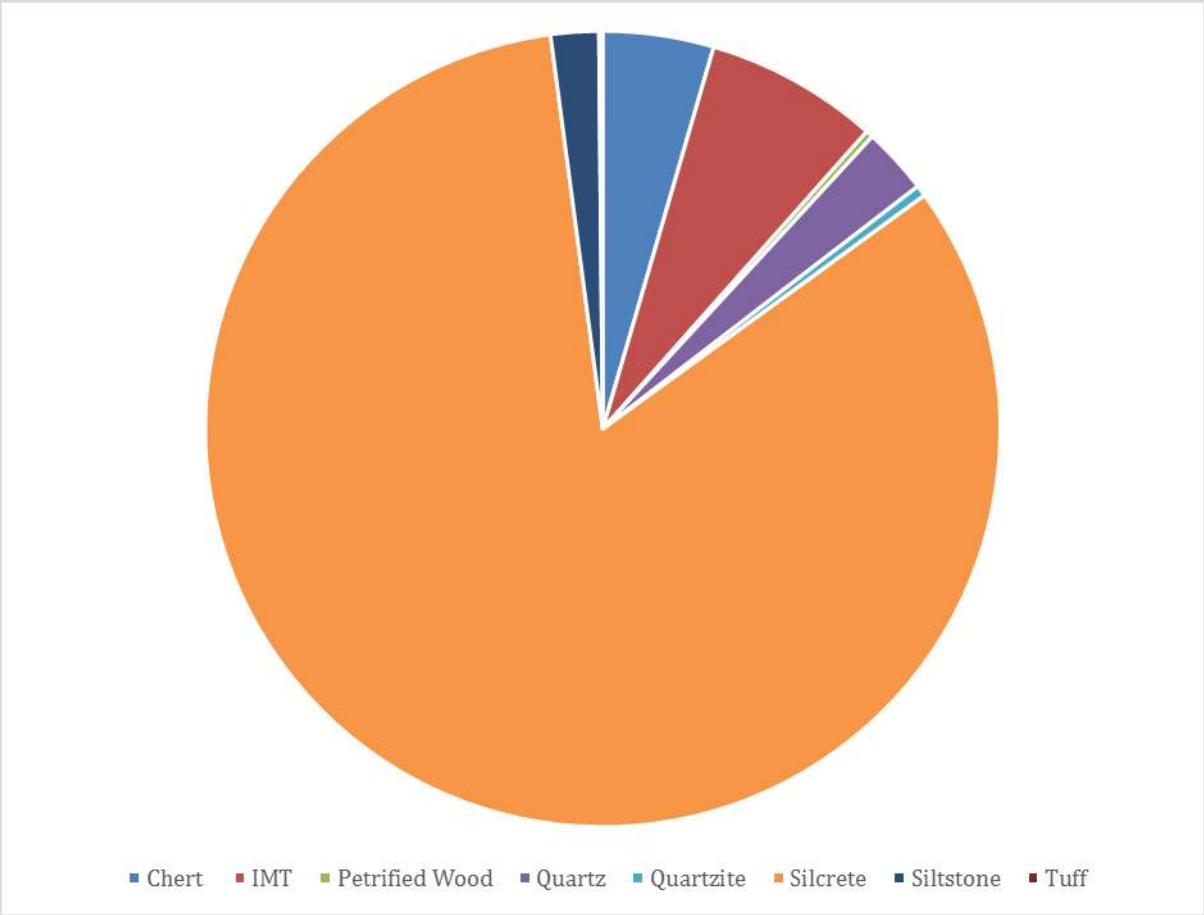
Table 26 Average length/wdith raio of artefacts by spit at OA3

Spit number (100mm)	Average length/thickness (mm)
Spit 1 (0-100)	3.398
Spit 2 (100-200)	3.354
Spit 3 (200-300)	3.325
Spit 4 (300-400)	3.189
Spit 5 (400-500)	2.941
Spit 6 (500-600)	3.180
Spit 7 (600-700)	0.000
Spit 8 (700-800)	2.560

Raw material procurement

Eight raw material types were identified in the assemblage of OA3. The dominant raw material type identified in OA3 consisted of silcrete (n=552, 82.9%). Indurated mudstone tuff (IMT) was the second most common raw material type making up 7.1% (n=47) followed by chert (4.5%, n=30). Less common raw material types in the assemblage include quartz (n=18, 2.7), siltstone (n=13, 2%), quartzite (n=3, 0.5%), petrified wood (n=2, 0.3%) and tuff (n=1, 0.2%) (Graph 5).

It can be concluded that the most accessible raw material stone was silcrete; with a known silcrete source located less than two kilometres from the study area (Jo McDonald Cultural Heritage Management Pty Ltd 2008).



Graph 5 Raw material distribution in OA3

The cortex (weathered exterior of a rock) provides information about the origin of stone sources. Artefacts with a rough cortex were acquired from a primary source, such as an *in situ* outcrop. Artefacts with a smooth or water-rolled cortex originate from a secondary source, such as a river cobble from a waterway. The amount of cortex on an artefact often indicates the distance artefacts were transported from the source (Hiscock & Mitchell 1993, pp.12–17) (. A high percentage of cortex on an artefact can indicate that the source of stone was nearby; while artefacts with less cortex or no cortex were transported further from the source. As cores are transported away from the source they are typically highly reduced and the flakes from these cores are smaller. The amount of cortex present in an assemblage also provides information on the potential uses of a site, as cores and flakes with high cortex are often found at sites were raw material extraction was occurring, whilst small flakes with lower percentages of cortex often dominate faunal and floral resource processing areas further from a raw material source (Odell 2004).

The analysis of the cortex on the recorded artefacts shows that the vast majority of artefacts have less than 25% cortex remaining (n=646, 97%) (Table 27) and is indicative of heavy tertiary reduction occurring in in the study area. Given the proximity of known silcrete sources in the area, the high frequency of artefacts with less than 25% cortex is most likely an indication of site use as described by Odell (Odell 2004). Artefacts at OA3 have undergone early stage reduction to remove primary cortical and secondary flakes before being transported to OA3, accounting for the lack of these cortex on artefacts.

Table 27 Percent of cortex on artefacts by site

Cortex (%)	Artefact count	Percentage
0-24	646	97.0
25-49	11	1.7
50-74	7	1.1
75-100	2	0.3
Total	666	100

Flake analysis

Platform types in the assemblage were predominately flaked platforms, accounting for 76.3% (n=119) (Table 28). The second most common platform type consists of crushed platforms which represented 19.9 (n=31) of the assemblage. Bipolar (1.9%, n=3), cortical (1.3%, n=2) and facetted (0.6%, n=1) platforms were also identified in the assemblage. The small number of bipolar platforms indicates that knappers were using bipolar reduction techniques in the knapping process (Holdaway & Stern 2004, p.11); although the low number of bipolar flakes suggests this was not a primary form of reduction at OA3.

Table 28 Artefact assemblage by platform type

Platform type	Count	Percentage
Bipolar	3	1.9
Cortical	2	1.3
Crushed	31	19.9
facetted	1	0.6
Flaked	119	76.3
Total	156	100

The dominant termination type found in OA3 was feather termination accounting for 72.2%, (n=114) of the assemblage. This was followed by hinge (10.8%, n=17), plunge (7.6%, n=12), axial (6.3%, n=6.3) and step (3.2%, n=5) terminations (Table 29)

Table 29 Artefact assemblage by termination type

Termination type	Count	Percentage
Axial	10	6.3
Feather	114	72.2

Termination type	Count	Percentage
Hinge	17	10.8
Plunge	12	7.6
Step	5	3.2
Total	158	100.0

Core analysis

Cores account for 4.2 % (n=28) of the total OA3 assemblage, with the vast majority of cores identified Three core types were identified within the assemblage, single platform (n=15, 2.3%), multi platform (n=8, 1.2%), and bipolar (n=4, 0.6%). Two of these cores were further classified as micoblade cores.

Silcrete dominates the core assemblage at 78.6% (n=22) followed by IMT at 7.1% (n=2). Chert, quartzite, siltstone and tuff each account for 3.6% of the cores identified (n=1). The number of negative flakes present on cores along with the level of cortex within an assemblage, can indicate the level of reduction which has occurred at a site (Holdaway & Stern 2004, p.96). This in turn can provide an indication of the activities being undertaken at the site and its distance from a raw material source. Of the 28 cores identified within the assemblage, 10 (35.7%) displayed cortex. Each of the 10 cores had no more than 50% cortex remaining. The average number of flake scars recorded on the cores from this assemblage is 3, with the standard deviation from the mean being 2. The relatively low levels of cortex, moderate number of negative scars, and the presence of bipolar cores within the total artefact assemblage indicates that this artefact assemblage is highly reduced.

Tool analysis

A total of 23 tools were recorded at OA3. Backed artefacts were the most common tool type found in the assemblage making up 78.3% of all tools. Backed artefacts were further broken up into bondi points (39.1%, n=9), geometric microliths (13%, n=3), eloura (n=1, 4.3%) and backed artefact fragments (21.7%, n=5). The assemblage at OA3 also included two steep edged scrapers (8.7%, n=2), two dihedral burins (8.7%) and one notched tool (4.3%) (Table 30).

Geometric microliths, and Bondi points along with tools such steep edged scrapers are generally considered to belong to the Australian small tool tradition and are commonly featured in Holocene sites dating to the last 5,000 years in Australia (Holdaway & Stern 2004, p.260, Hiscock 1994, p.267). The manufacture process of backed artefacts will inevitably result in a high number of transversely broken flakes with backing present, such as is seen in the assemblages at OA3 (McBryde 1986, Hiscock 1993). The high number of backed artefact fragments suggests that backed artefact production was possibly occurring at this site, with a focus on the manufacture of Bondi points in particular due to their higher representation in the tool assemblage.

A total of two burins were identified within the artefact assemblage. Burins are made by either snapping or retouching one end of a flake; the retouch scars will extend horizontally across the flake from one lateral margin to the other. One flake is then removed laterally from a corner of the broken or retouched end in order to form a chisel edge (Holdaway & Stern 2004, p.241, Andrefsky 2005, p.161). Burins were used to grave, or chisel very hard materials such as bone (Andrefsky 2005, p.161). While burins were used extensively throughout Europe and North America (Holdaway & Stern 2004, p.241, Andrefsky 2005, p.161), Holdaway and Stern argue that there is no evidence to suggest that burins were commonly used throughout Australia (Holdaway & Stern 2004, p.243). Burin scars are often produced as a result of tool use (such as hitting a tool against a hard surface) or as a by-product of knapping activities, particularly bipolar flaking activities (Holdaway & Stern 2004, p.243).

Table 30 Tool types within the OA3 assemblage

Tool type	Count	Percentage
Bondi point	9	39.1
Geometric microlith	3	13.0
Backed artefact fragment	5	21.7
Steep edged scaper	2	8.7
Eloura	1	4.3
Dihedral burin	2	8.7
Notched	1	4.3
Total	23	100

Angular fragments analysis

Angular fragments make up the majority of the artefact assemblage at this site. An angular fragment is a piece of material that cannot be classified as a proximal, medial, or distal fragment, but has been produced as a result of the knapping process (Holdaway & Stern 2004, p.114, Andrefsky 2001, p.xi). Angular fragments can provide a number of insights into the stone tool reduction process practiced at a site. The most common form of analysis applied to angular fragments is aggregate analysis. This involves separating the angular fragments into size classes and examining the size distribution. The size of an angular fragment is considered to be directly related to the parent piece (core), the size distribution of angular fragments within the artefact assemblage can therefore assist in determining levels of reduction present in the assemblage (Andrefsky 2001, p.2).

The majority of angular fragments identified fall within the 11-20 millimetre size class (68.7%), followed by the 1-10 millimetre size class (14.8%) then the 21-30 millimetre class (13.7%). The remaining 2.7% fall between 31 and 50 millimetres in size (Table 31). This indicates that the stone tool assemblage at this site has been highly reduced suggesting they are at a later stage of the reduction sequence.

The manufacture of specific implements such as backed artefacts can result in the production of very small (less than 2 millimetres) flakes and angular fragments. No angular fragments or flakes measuring less than 5 millimetres were identified within the assemblage; however, this was due to the use of 5 mm sieves during the test excavations and does not represent the absence of backing debitage.

Table 31 Angular fragment size classes

Size class (mm)	Number	Frequency (%)
1-10	55	14.8
11-20	255	68.7
21-30	51	13.7
31-40	8	2.2
41-50	2	0.5
Total	371	100

7.3 Discussion of results

The archaeological test excavations conducted at OA1, OA2 and OA3, and the resulting artefact analysis have contributed to our archaeological understanding of Aboriginal camp sites within the Cumberland Plain region. The information gathered during the archaeological test excavations can be analysed in a number of ways in order to answer a variety of research questions. For the purpose of this report, the analysis has focused on examining whether specific activities, such as backed artefact production, were being conducted within the study area, if the sites can be adequately dated, and, if the assemblage recovered differs from previous archaeological excavations in the region. Four main factors have been considered in order to address the above questions. These include: the stratigraphic integrity of the archeological deposit; artefact type composition; levels of reduction; and stone tool technologies present within the assemblage.

Some evidence of bioturbation such as insect activity and small vegetation root infiltration was observed within all test excavation units across the site. The bioturbation observed is unlikely to have had an effect on the integrity of the archaeological deposit. The site has been historically cleared of vegetation and has a long history of ploughing which has affected the top 30 centimetres of soil. The impact of ploughing activities on subsurface artefact deposits has been investigated multiple times. Odel and Cowan (1987) and Clark and Schofiled (1991) undertook experimental studies of artefact movement from ploughing where a known number of stone artefacts were buried in ploughed fields and their movement and condition were recorded after ploughing. They found that, although artefacts were displaced from their original location, the ploughing did not destroy the spatial distribution of the sites and the artefacts would generally remain within the landform where they were initially deposited. This indicates ploughing is unlikely to have heavily impacted the intactness of sub-surface deposits.

Angular fragments form the bulk of the artefact assemblage identified at OA1, OA2 and OA3. While angular fragments or debitage have historically been considered unimportant, recent studies in lithic debitage have highlighted its importance in understanding stone tool technologies and the level of raw material reduction in artefact assemblages. The size of the debitage present within an assemblage can be directly related to the size of the core being struck and the flake being produced (Andrefsky 2001, p.3). As cores decrease in size, so too do the debitage fragments produced during the knapping process. The same can be said for the production of particular tool types such as scrapers and backed artefacts. As the flake is retouched in order to produce the desired tool or implement, the size of the debitage created as a by-product decreases (Andrefsky 2001, p.4). Archaeological studies on the transport of raw stone materials have identified that the amount of cortex, and the size of flakes and debitage decreases as the distance from a raw material source increases (Holdaway & Stern 2004, p.96). Angular fragments can therefore provide insight into the proximity of a site to a raw stone material source, the level of reduction present within an assemblage, and whether specific tools or implements were being produced at a site.

The majority of angular fragments identified fall within the 11-20 millimetre size class (68.7%), followed by the 1-10 millimetre size class (14.8%) then the 21-30 millimetre class (13.7%). The remaining 2.7% fall between 31 and 50 millimetres in size. This indicates that the stone tool assemblage at this site has been highly reduced, suggesting they are at a later stage of the reduction sequence (Andrefsky 2001, p.4, Holdaway & Stern 2004, p.96).

Analysis of complete flakes, flake fragments, and cores also support the theory that the artefact assemblage is highly reduced. Cortical platforms made up only 1.3% of platform types, and only 3% of the assemblage possessed more than 25% remaining cortex. The high levels of reduction seen within this assemblage would suggest that the stone materials utilised within the study area were not locally sourced; however, silcrete makes up the bulk of the raw material present within the assemblage, comprising 82.9%. As a source of silcrete for use as a raw material has been found within two kilometres of the study area, these results suggest that the highly reduced nature of artefacts may not be related to distance from the raw material.

A number of features present within the artefact assemblage including the level of reduction, the artefact types present, and the knapping techniques utilised can indicate if specific activities were being undertaken within a site. The large number of backed artefacts (Bondi points, geometric microliths, backed flake fragments) (n=18) at various stages of production throughout the site provides compelling evidence that backed artefact production was occurring at the site.

The tool assemblage consisted predominately of backed artefacts (geometric microliths, Bondi points, and backed artefact fragments) at 78.3% (n=18). Geometric microliths, and Bondi points along with tools such as steep edged scrapers are generally considered to belong to the Australian small tool tradition and are commonly featured in Holocene sites dating to the last 5,000 years in Australia (Holdaway & Stern 2004, p.260, Hiscock 1994, p.267). Attempts to further refine the date of the appearance and disappearance of backed artefacts in the archaeological record in Australia have been made by a number of archaeologists (Attenbrow et al. 2009, Attenbrow 2004, Flood 1980, Hiscock 1994), resulting in the Eastern Regional Sequence (ERS). This sequence is broken up into four phases: Pre-Bondaian, Early Bondaian, Middle Bondaian and Late Bondaian. These phases are characterised by changes in raw material use and predominance of artefact types and reduction methods.

Excavations conducted at Warratyi rockshelter in South Australia identified three backed artefacts dating to 30,000–24,000 BP (Hamm et al. 2016, p.280), while excavations conducted at Serpents Glen rockshelter (Karnatukul) in the Carnarvon Ranges in Western Australia identified the earliest evidence of backed artefact use in Australia at 45,570–41,650 BP (McDonald et al. 2018, p.1). A number of other archaeological sites dating to the Pleistocene period have also produced evidence of backed artefact usage across Australia (Slack et al. 2004). Evidence from Serpents Glen rockshelter suggests that while backed artefacts were used during the Pleistocene period, the use and production of backed artefacts increased substantially during the Holocene period (McDonald et al. 2018, p.22).

The earliest evidence of backed artefacts in South Eastern Australia dates to 8,500 BP (Attenbrow et al. 2009). Current archaeological evidence indicates the occurrence of backed artefacts in Aboriginal archaeological assemblages in South Eastern Australia increased significantly from the mid Holocene (around 4,000 – 3,500 BP) (White 2011, Attenbrow et al. 2009, Attenbrow 2004, Flood 1980). According to Flood (1980), the earlier Australian core tool and scraper tradition was phased out by around 5,500 years BP, and was subsequently replaced by the Australian small tool tradition. Flood further argued that there are three phases of the Australian small tool tradition (Early, Middle, and Late). The middle phase is characterised by an increase in backed blades and thumbnail scrapers, while retouched artefacts and other small tools decreased in occurrence during the Late phase (Flood 1980, pp.250–3). Bipolar quartz flaking was also considered typical of the Late phase (Flood 1980, pp.250–3). Flood posited that the Late phase dates to around 770 years BP, however she noted that backed blades had been recorded in deposits dating between 510 -310 years BP (Flood 1980, pp.250–3). Excavations conducted at Upper Mangrove Creek, NSW (Attenbrow et al. 2009, p.2765, Attenbrow 2004), and at Lake George, NSW (Hughes et al. 2014) also appear to support Flood's small tool tradition phases.

There are a number of common theories regarding the function of backed artefacts, including use as barbs or tips for spears, scalpels for circumcisions, symbolic implements associated with ceremonial activities, or hand held or hafted domestic tools (Attenbrow et al. 2009, p.2766). No known ethnographic records of backed artefact use have been identified therefore many of the theories are based entirely on speculation (Attenbrow et al. 2009, p.2766). Usewear and residue analysis conducted on a number of backed artefact assemblages indicate that backed artefacts were used primarily for domestic tasks such as cutting, drilling, and scraping bone, wood, skins and other plant material (Attenbrow et al. 2009, p.2766, White 2011, p.67, McDonald et al. 2018, p.22, Robertson 2009, p.239). Evidence of backed artefacts being utilised as projectile implements (i.e barbs or tips of spears), has also been identified however at much lower frequencies than domestic use (Attenbrow et al. 2009, p.2766, Fullagar et al. 2009). Usewear and residue analysis also indicates

that backed artefacts were frequently hafted, and often displayed evidence of reuse or recycling in the form of tool rotation (McDonald et al. 2018, p.22, Attenbrow et al. 2009, p.2768, White 2011, p.67, Robertson 2009, p.239). Current evidence therefore indicates that backed artefacts were a multi-function tool, with applications to domestic tasks such as food preparation, craft activities such as wood and bone working, and hunting activities (Attenbrow et al. 2009, p.2769).

It is likely the multi-functionality of backed artefacts resulted in their proliferation of artefact assemblages in Australia during the mid-Holocene period. This period is marked by substantial climactic change (reduced temperatures and rainfall) which resulted in unreliable or variable availability of resources. The versatility of backed artefacts coupled with their ease of maintenance and production suggests that their use would have been employed to reduce foraging risks (Attenbrow et al. 2009, p.2769, White 2011, p.68). The available archaeological evidence therefore points to Aboriginal people adapting to a changing environment by utilising pre-existing tool types which provided an advantage for surviving in an era where resources were frequently unreliable or changing (Attenbrow et al. 2009, p.2769).

The high number of backed artefacts consisting predominately of asymmetrical backed Bondi points and the rare appearance of eloura, the relatively small size of cores and tools, the predominance of silcrete and the low use of bipolar flaking, characterise the Middle Bondaian period and place the age of the OA3 artefact assemblage between 4,000 and 1,000 years BP. The large number of backed artefacts and backed artefact fragments identified as part of the assemblage indicates that they were the primary stone tool being produced at the site.

A total of two burins were identified within the artefact assemblage. Burins were used to engrave, or chisel very hard materials such as bone (Andrefsky 2005, p.161). While burins were used extensively throughout Europe and North America (Holdaway & Stern 2004, p.241, Andrefsky 2005, p.161), Holdaway and Stern argue that there is no evidence to suggest that burins were commonly used throughout Australia (Holdaway & Stern 2004, p.243). Burin scars are often produced as a result of tool use (such as hitting a tool against a hard surface) or as a by-product of knapping activities, particularly bipolar flaking activities (Holdaway & Stern 2004, p.243).

The composition of flake platforms and terminations across the site and within individual open areas indicate that the majority of flakes were produced using free hand direct hard-hammer percussion (Holdaway & Stern 2004, p.11). The presence of flakes with crushed platforms combined with a high percentage of crushed, stepped, or broken terminations and a number cores showing bipolar flaking indicate that anvils were also used in the production of flakes at this site, although the low number of bipolar cores indicated it was not a widely used reduction technique. (Holdaway & Stern 2004, p.11).

An archaeological excavation conducted by Jo McDonald Cultural Heritage Management Pty Ltd (2008) on Mamre Road, approximately 1 kilometre from the current study area identified sub-surface assemblages that were comparable to the current study area. Similar to the results of the current investigation, JMCHM identified backed artefacts in densities ranging from 1.4 to 5.4% of the overall assemblage (Jo McDonald Cultural Heritage Management Pty Ltd 2008). Backed artefacts were mostly asymmetrical in shape similar to the current assemblage. Raw materials were also similar in both assemblages with silcrete the dominant raw material type. JMCHM identified a wider range of raw material types; however, this is the result of differences in raw material identification rather than an accurate representation of raw material use in the area.

The evidence gathered during the archaeological test excavations of OA1 OA2 and OA3 indicates that OA3 was likely a long term camp site. The archaeological test excavations conducted at OA3 have identified a high density, relatively intact subsurface deposit. Long term camp sites contain the most diverse artefact assemblages as they were home to the widest range of activities such as food production, craft activities, and tool manufacture (McDonald et al. 2018, p.23). This suggests that the site was well situated in the landscape to

support long-term occupation. The study area is located on an elevated landform situated in an alluvial creek terrace in close proximity to South Creek.

The results of the excavations also provide evidence that backed artefact manufacturing activities were likely occurring at the site and have shown that the artefact assemblage matches with other assemblages found in the region.

8 Scientific values and significance assessment

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community and archaeological (scientific) values. This report will assess scientific values while the ACHA report will detail the cultural values of Aboriginal sites in the study area.

8.1 Introduction to the assessment process

Heritage assessment criteria in NSW fall broadly within the significance values outlined in the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter (Australia ICOMOS 2013). This approach to heritage has been adopted by cultural heritage managers and government agencies as the set of guidelines for best practice heritage management in Australia. These values are provided as background and include:

- **Historical significance** (evolution and association) refers to historic values and 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 in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.
- **Aesthetic significance** (Scenic/architectural qualities, creative accomplishment) refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.
- **Social significance** (contemporary community esteem) refers to the spiritual, traditional, historical or contemporary associations and attachment that the place or area has for the present-day community. Places of social significance have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities can experience a sense of loss should a place of social significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with local communities.
- **Scientific significance** (Archaeological, industrial, educational, research potential and scientific significance values) refers to the importance of a landscape, area, place or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.

The cultural and archaeological significance of Aboriginal and historic sites and places is assessed on the basis of the significance values outlined above. As well as the ICOMOS Burra Charter significance values guidelines, various government agencies have developed formal criteria and guidelines that have application when assessing the significance of heritage places within NSW. Of primary interest are guidelines prepared by the Commonwealth Department of the Environment and Energy, OEH, NSW Department of Planning and Environment. The relevant sections of these guidelines are presented below.

These guidelines state that an area may contain evidence and associations which demonstrate one or any combination of the ICOMOS Burra Charter significance values outlined above in reference to Aboriginal heritage. Reference to each of the values should be made when evaluating archaeological and cultural significance for Aboriginal sites and places.

In addition to the previously outlined heritage values, the OEH Guidelines (OEH 2011) also specify the importance of considering cultural landscapes when determining and assessing Aboriginal heritage values. The principle behind a cultural landscape is that 'the significance of individual features is derived from their inter-relatedness within the cultural landscape'. This means that sites or places cannot be 'assessed in isolation' but must be considered as parts of the wider cultural landscape. Hence the site or place will possibly have values derived from its association with other sites and places. By investigating the associations between sites, places, and (for example) natural resources in the cultural landscape the stories behind the features can be told. The context of the cultural landscape can unlock 'better understanding of the cultural meaning and importance' of sites and places.

Although other values may be considered – such as educational or tourism values – the two principal values that are likely to be addressed in a consideration of Aboriginal sites and places are the cultural/social significance to Aboriginal people and their archaeological or scientific significance to archaeologists. The determinations of archaeological and cultural significance for sites and places should then be expressed as statements of significance that preface a concise discussion of the contributing factors to Aboriginal cultural heritage significance.

8.2 Archaeological (scientific significance) values

Archaeological significance (also called scientific significance, as per the ICOMOS Burra Charter) refers to the value of archaeological objects or sites as they relate to research questions that are of importance to the archaeological community, including indigenous communities, heritage managers and academic archaeologists. Generally the value of this type of significance is determined on the basis of the potential for sites and objects to provide information regarding the past life-ways of people (Burke and Smith 2004, p. 249, NPWS 1999). For this reason, the NPWS summarises the situation as "while various criteria for archaeological significance assessment have been advanced over the years, most of them fall under the heading of archaeological research potential" (NPWS 1999, p. 26). The NPWS criteria for archaeological significance assessment are based largely on the ICOMOS Burra Charter.

Research potential

Research potential is assessed by examining site content and site condition. Site content refers to all cultural materials and organic remains associated with human activity at a site. Site content also refers to the site structure – the size of the site, the patterning of cultural materials within the site, the presence of any stratified deposits and the rarity of particular artefact types. As the site contents criterion is not applicable to scarred trees, the assessment of scarred trees is outlined separately below. Site condition refers to the degree of disturbance to the contents of a site at the time it was recorded. Table 32 and Table 33 outline the site content and site condition rating used for archaeological sites.

Table 32 Site contents ratings used for archaeological sites

Rating	Description
0	No cultural material remaining.
1	Site contains a small number (e.g. 0–10 artefacts) or limited range of cultural materials with no evident stratification.
2	Site contains a larger number, but limited range of cultural materials; and/or some intact stratified deposit remains; and/or are or unusual example(s) of a particular artefact type.
3	Site contains a large number and diverse range of cultural materials; and/or largely intact stratified deposit; and/or surface spatial patterning of cultural materials that still reflect the way in which the cultural materials were deposited.

Table 33 Site condition ratings used for archaeological sites

Rating	Description
0	Site destroyed.
1	Site in a deteriorated condition with a high degree of disturbance; lack of stratified deposits; some cultural materials remaining.
2	Site in a fair to good condition, but with some disturbance.
3	Site in an excellent condition with little or no disturbance. For surface artefact scatters this may mean that the spatial patterning of cultural materials still reflects the way in which the cultural materials were laid down.

Pearson and Sullivan (1995, p.149) note that Aboriginal archaeological sites are generally of high research potential because 'they are the major source of information about Aboriginal prehistory'. Indeed, the often great time depth of Aboriginal archaeological sites gives them research value from a global perspective, as they are an important record of humanity's history. Research potential can also refer to specific local circumstances in space and time – a site may have particular characteristics (well preserved samples for absolute dating, or a series of refitting artefacts, for example) that mean it can provide information about certain aspects of Aboriginal life in the past that other less or alternatively valuable sites may not (Burke & Smith 2004, pp.247–8). When determining research potential value particular emphasis has been placed on the potential for absolute dating of sites.

The following sections provide statements of significance for the Aboriginal archaeological sites recorded during the sub-surface testing for the assessment. The significance of each site follows the assessment process outlined above. This includes a statement of significance based on the categories defined in the Burra Charter. These categories include social, historic, scientific, aesthetic and cultural (in this case archaeological) landscape values. Nomination of the level of value—high, moderate, low or not applicable—for each relevant category is also proposed. Where suitable the determination of cultural (archaeological) landscape value is applied to both individual sites and places (to explore their associations) and also, to the Study Area as a whole. The nomination levels for the archaeological significance of each site are summarised below.

Representativeness

Representativeness refers to the regional distribution of a particular site type. Representativeness is assessed by whether the site is common, occasional, or rare in a given region. Assessments of representativeness are subjectively biased by current knowledge of the distribution and number of archaeological sites in a region. This varies from place to place depending on the extent of archaeological research. Consequently, a site that

is assigned low significance values for contents and condition, but a high significance value for representativeness, can only be regarded as significant in terms of knowledge of the regional archaeology. Any such site should be subject to re-assessment as more archaeological research is undertaken.

Assessment of representativeness also takes into account the contents and condition of a site. For example, in any region there may only be a limited number of sites of any type that have suffered minimal disturbance. Such sites would therefore be given a high significance rating for representativeness, although they may occur commonly within the region. Table 34 outlines the site representativeness ratings used for archaeological sites.

Table 34 Site representativeness ratings used for archaeological sites

Rating	Description
1	Common occurrence.
2	Occasional occurrence.
3	Rare occurrence.

Overall scientific significance ratings for sites, based on a cumulative score for site contents, site integrity and representativeness are provided in Table 35.

Table 35 Scientific significance ratings used for archaeological sites

Rating	Description
1-3	Low scientific significance.
4-6	Moderate scientific significance.
7-9	High scientific significance.

Each site is given a score on the basis of these criteria – the overall scientific significance is determined by the cumulative score. This scoring procedure has been applied to the Aboriginal archaeological sites identified during the survey and sub-surface testing.

8.2.1 Statements of archaeological significance

The following archaeological significance assessment is based on Requirement 11 of the Code. Using the assessment criteria detailed in Scientific Values and Significance Assessment, an assessment of significance was determined and a rating for each site was determined. The results of the archaeological significance assessment are given in Table 36 below.

Table 36 Scientific significance assessment of archaeological sites recorded within the study area

Site name	Site content	Site condition	Representativeness	Scientific significance
MSP-01 (AHIMS 45-5-5187)	1	1	1	3 – Low
MSP-02 (AHIMS 45-5-5188)	3	2	2	7 - High
MSP-05 (AHIMS Pending)	1	1	1	3 - Low
MSP-06 (AHIMS Pending)	1	1	1	3 - Low
MSP-07 (AHIMS Pending)	1	1	1	3 - Low

Site name	Site content	Site condition	Representativeness	Scientific significance
MSP-08 (AHIMS Pending)	1	1	1	3 - Low
MSP-09 (AHIMS Pending)	1	1	1	3 - Low
MSP-10 (AHIMS Pending)	1	1	1	3 - Low
MSP-11 (AHIMS Pending)	1	1	1	3 - Low

Table 37 Statements of scientific significance for archaeological sites recorded within the study area

Site name	Statement of significance
MSP-01 (AHIMS 45-5-5187)	MSP-01 consists of an isolated artefact found on the northern bank of a dam. It is located in a disturbed context, is low density and a common site type in the region. It has been assessed with low scientific significance.
MSP-02 (AHIMS 45-5-5188)	MSP-02 consists of a surface and subsurface artefact scatter on a high point within the gentle slope landform. A total of 666 artefacts were recovered from test excavations and included a number of complete and broken tools including backed geometric microliths and Bondi points. It is possible that tool manufacture was occurring at this site. The artefact deposit at MSP-02 has a high density and contains artefacts types that are uncommon in the region. It has undergone some disturbance due to ploughing but the site is of high scientific significance.
MSP-05 (AHIMS Pending)	MSP-05 consists of a low density sub-surface artefact scatter found on a gentle slope landform. The site consists of five artefacts and is a common site type in the region. This site has been assessed with low scientific significance.
MSP-06 (AHIMS Pending)	MSP-06 consists of a low density sub-surface artefact scatter found on a gentle slope landform. The site consists of two artefacts and is a common site type in the region. This site has been assessed with low scientific significance.
MSP-07 (AHIMS Pending)	MSP-07 consists of an isolated angular fragment found on a gentle slope landform. The site is a common site type in the region and has been assessed with low scientific significance.
MSP-08 (AHIMS Pending)	MSP-08 consists of an isolated quartz bipolar flake found on a gentle slope landform. The site is a common site type in the region and has been assessed with low scientific significance.
MSP-09 (AHIMS Pending)	MSP-09 consists of a low density sub-surface artefact scatter found on a gentle slope landform. The site consists of seven artefacts and is a common site type in the region. This site has been assessed with low scientific significance.
MSP-10 (AHIMS Pending)	MSP-10 consists of a low density sub-surface artefact scatter found on a gentle slope landform. The site consists of nine artefacts and is a common site type in the region. This site has been assessed with low scientific significance.
MSP-11 (AHIMS Pending)	MSP-11 consists of a low density sub-surface artefact scatter found on a gentle slope landform. The site consists of nine artefacts and is a common site type in the region. This site has been assessed with low scientific significance.

9 Impact assessment

As previously outlined, the project proposes to develop the study area into an industrial estate that will include earthworks and the development of industrial infrastructure. The study area will be subdivided into lots of 1 to 3 hectares and access to the new industrial estate will be provided via the new Southern link Road, Bakers Lane, and from a new estate access road off Mamre Road, within the southern portion of the study area.

9.1 Predicted physical impacts

The proposed works will include impacts to Aboriginal sites from vegetation clearance, demolition, bulk earthworks, subdivision, construction of industrial infrastructure and buildings, and civil engineering works such as the construction of roads, stormwater drainages, sewer works, and water supply works.

A summary of impacts is provided below in Table 38

Table 38 Summary of potential archaeological impacts

AHIMS site no.	Site name	Significance	Type of harm	Degree of harm	Consequence of harm
45-5-5187	MSP-01	Low	Direct	Total	Total loss of value
45-5-5188	MSP-02	High	Direct	Partial	Partial loss of Value
Pending	MSP-05	Low	Direct	Total	Total loss of value
Pending	MSP-06	Low	Direct	Total	Total loss of value
Pending	MSP-07	Low	Direct	Total	Total loss of value
Pending	MSP-08	Low	Direct	Total	Total loss of value
Pending	MSP-09	Low	Direct	Total	Total loss of value
Pending	MSP-10	Low	Direct	Total	Total loss of value
Pending	MSP-10	Low	Direct	Total	Total loss of value
Pending	MSP-11	Low	Direct	Total	Total loss of value

9.2 Management and mitigation measures

Ideally, heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of 'doing as much as necessary, as little as possible' (Marquis-Kyle & Walker 1994, p.13). In cases where conservation is not practical, several options for management are available. For sites, management often involves the salvage of features or artefacts, retrieval of information through excavation or collection (especially where impact cannot be avoided) and interpretation.

Avoidance of impact to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable. As noted above, the proposed works cannot avoid impacts to the archaeological sites identified within the study area.

The design plans provided by Altis Property Partners and Frasers Property Industrial Constructions indicate that impacts to the archaeological sites identified during this assessment cannot be avoided by the proposed development. The vast majority of the development footprint is contained to areas of low archaeological potential and previous disturbance. However, 13 of the 30 proposed lots will impact on Aboriginal sites within the study area and complete or partial avoidance is not viable.

It is not feasible for the proposed works to completely avoid impacts to these sites; therefore the following mitigation measures, which considered the principles of ecologically sustainable development (ESD) and intergenerational equity in their design, are proposed below.

Further archaeological work should be undertaken prior to development in the form of salvage excavations and surface salvage for site 45-5-5188/MSP-02 which has been assessed with high scientific significance. The site comprised a high density of sub-surface artefacts within transects 1-14 indicating that this area may have been subject to either repeated use of the area over time or a focused concentration occurring within this one area. In addition, the site showed a high density of artefacts which is more commonly seen on the Cumberland Plain. The southern portion of the site (transects 1-14) revealed high artefact density as well as a higher proportion of non-silcrete artefacts and formal tool types. This possibly indicates specific activities concentrated within one portion of the site and should be further investigated. Further investigation in the form of salvage excavation would also allow a larger assemblage to be recovered and analysed, which would not only increase current understanding of the site but also increases our knowledge of Aboriginal occupation in the local area and on the Cumberland Plain. It would also ensure that any scientific and cultural information that is obtained can be accessed and used by future generations. For this reason, salvage excavation and surface salvage collection following the development of an appropriate salvage methodology in consultation with RAP groups is considered an appropriate management measure given that the proposed development impacts are unavoidable in this location.

AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, along with newly recorded sites MSP-07 and MSP-08 comprise ether low density surface artefacts or single isolated artefacts, all of which have been assessed as being of low archaeological, scientific and cultural significance. It is recommended that surface salvage of these sites is undertaken.

Aboriginal sites MSP-05, MSP-06, MSP-09, MSP-10 and MSP-11 consist of low density artefact deposits. Impacts to these sites cannot be avoided by the proposed works. These sites have been tested as part the current test excavation programs. The artefacts recovered during the test excavations have been catalogued and analysed which has further contributed to our current knowledge of Aboriginal archaeological site types and distributions within the study area and on the Cumberland Plain. The test excavations have increased our current understanding of Aboriginal occupation in the region and will contribute to the scientific and cultural information available to future generations. Further testing and salvage of these sites is not recommended.

10 Recommendations

Strategies have been developed based on the archaeological (significance) of cultural heritage relevant to the study area and influenced by:

- predicted impacts to Aboriginal cultural heritage
- the planning approvals framework
- current best conservation practise, widely considered to include:
  - ethos of the Australia ICOMOS Burra Charter
  - the Code.

Recommendation 1: Further archaeological work in the form of surface salvage and salvage excavation at AHIMS site 45-5-5188/MSP-02 as a part of SSD approval

It is recommended that further archaeological work be conducted for AHIMS site 45-5-5188/MSP-02 in the form of salvage excavation to recover sub-surface artefacts which will be impacted as a part of the proposed development. This would be able to provide further information relating to the artefacts typology and material type, as well as the nature of the activities taking place at AHIMS site 45-5-5188/MSP-02. It is recommended that this be undertaken as a condition of the SSD approval. The salvage work for this particular area of the site would not hold up the development of the remaining areas of the estate.

Recommendation 2: Further archaeological work in the form of surface salvage at AHIMS sites 45-5-5184/MSP-01, MSP-07 and MSP-08 as a part of SSD approval

It is recommended that further archaeological work be conducted for AHIMS sites 45-5-5184/MSP-01, 45-5-5185/MSP-02, MSP-07 and MSP-08 in the form of surface salvage to recover any surface artefacts which will be impacted as a part of the proposed development. It is recommended that surface salvage be undertaken as a condition of the SSD approval.

Recommendation 3: No further archaeological work is required for sites MSP-05, MSP-06, MSP-09, MSP-10 and MSP-11

It is recommended that no further archaeological investigation is required for Aboriginal sites MSP-05, MSP-06, MSP-09, MSP-10 and MSP-11 prior to development impacts.

Recommendation 4: Update AHIMS site cards for AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, and 45-5-5189/MSP-03 and lodge AHIMS site cards for newly identified sites MSP-05, MSP-06 and MSP-07, MSP-08, MSP-09, MSP-10, and MSP-11

It is recommended that the AHIMS site cards for previously identified AHIMS sites 45-5-5187/MSP-01, 45-5-5188/MSP-02, 45-5-5189/MSP-03 be updated to reflect the revised site descriptions following the test excavations discussed in this report.

It is also recommended that AHIMS site cards are prepared and lodged with AHIMS for newly identified sites MSP-05, MSP-06 and MSP-07, MSP-08, MSP-09, MSP-10.

Recommendation 5: Preparation and lodgment of AHIMS site impact recording forms for 45-5-5184/MSP-01, 45-5-5185/MSP-02, 45-5-5189/MSP-03, MSP-05, MSP-06, MSP-07 and MSP-08, MSP-09, MSP-10 and MSP 11

It is recommended that AHIMS site impact recording forms are prepared and lodged with AHIMS for Aboriginal sites 45-5-5184/MSP-01, 45-5-5185/MSP-02, 45-5-518/MSP-03, MSP-05, MSP-06, MSP-07 and MSP-08 MSP-09, MSP-10 and MSP-11 within four months following completion of development impacts or as otherwise stated in SSD approval conditions. Recommendation 6: Unexpected finds

Discovery of Aboriginal objects

All Aboriginal objects and places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

Discovery of unanticipated historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977*. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Do not recommence work at that location unless authorised in writing by OEH.

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Appendices

Appendix 1 AHIMS results

THE FOLLOWING APPENDIX IS NOT TO BE MADE PUBLIC.

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 29083 AV

Client Service ID : 399895

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-2710	DUKE 9	AGD	56	292500	6251800	Open site	Valid	Artefact : -		1345,1539,4737
Contact		Recorders	Dominic Steele Archaeological Consulting					Permits		
45-5-2711	CDG1	AGD	56	293300	6252800	Open site	Valid	Artefact : -		1345,1539,4737
Contact		Recorders	Dominic Steele Archaeological Consulting					Permits		
45-5-2816	IF/1	AGD	56	292300	6251750	Open site	Valid	Artefact : -		4737
Contact		Recorders	Dominic Steele Archaeological Consulting					Permits		
45-5-3385	Oakdale Campsite 4	GDA	56	296733	6254945	Open site	Valid	Artefact : 3		
Contact	Searle	Recorders	Dominic Steele Archaeological Consulting,Mr.Josh Symons					Permits		
45-5-4675	Oakdale West Isolated Find 2 (OW IF 2)	GDA	56	296627	6254876	Open site	Valid	Artefact : -		
Contact		Recorders	Mr.Josh Symons					Permits		
45-5-4676	Oakdale West Isolated Find 3 (OW IF 3)	GDA	56	295882	6254754	Open site	Valid	Artefact : -		
Contact		Recorders	Mr.Josh Symons					Permits		
45-5-4717	Mamre West Precinct - Archaeological Deposit 1 (MWP-AD1)	GDA	56	293591	6255274	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Miss.Shannon Smith					Permits		
45-5-4718	Mamre West Precinct - Archaeological Deposit 2 (MWP-AD2)	GDA	56	294095	6255380	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Miss.Shannon Smith					Permits		
45-5-4719	Mamre West Precinct - Archaeological Deposit 4 (MWP-AD4)	GDA	56	294089	6255064	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Miss.Shannon Smith					Permits		
45-5-4720	Mamre West Precinct - Archaeological Deposit 3 (MWP-AD3)	GDA	56	293670	6255005	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Sydney,Biosis Pty Ltd - Wollongong,Mr.James Cole,Miss.Shannon Sn					Permits		
45-5-4721	Mamre West Precinct - Artefact Scatter 1 (MWP-AS1)	GDA	56	293802	6256278	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Miss.Shannon Smith					Permits		
45-4-0971	EP3 - "Erskine Park 3"	AGD	56	295814	6254965	Open site	Valid	Artefact : -	Open Camp Site	97503
Contact		Recorders	Doctor.Jo McDonald					Permits		
45-4-0972	EP4 - "Erskine Park 4 "	AGD	56	295740	6254900	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
Contact		Recorders	Doctor.Jo McDonald					Permits		
45-4-0973	EP5 - " Erskine Park 5 "	AGD	56	295349	6254843	Open site	Valid	Artefact : -	Isolated Find	97503,98435
Contact		Recorders	Doctor.Jo McDonald					Permits		
45-4-0974	EP7 - "Erskine Park 7"	AGD	56	294580	6255220	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
Contact		Recorders	Doctor.Jo McDonald					Permits	2256	
45-4-0975	EP6 - " Erskine Park 6 "	AGD	56	294652	6255153	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
Contact		Recorders	Doctor.Jo McDonald					Permits		
45-4-0976	EP8 - " Erskine Park 8 "	AGD	56	294657	6254870	Open site	Valid	Artefact : -	Open Camp Site	97503,98435

Report generated by AHIMS Web Service on 19/02/2019 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 291000 - 297000, Northings : 6251100 - 6257100 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 115

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 29083 AV

Client Service ID : 399895

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-4-0977	EP9 - " Erskine Park 9 "	AGD	56	295440	6254955	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-4-0978	EP2 - " Erskine Park 2 "	AGD	56	295615	6254982	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-5-2568	CGD5	AGD	56	293300	6253500	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-4-0970	EP1 - "Esrkine Park 1"	AGD	56	295277	6254955	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald,Stephanie Garling					**Permits**		
45-5-2550	CGD1	AGD	56	293350	6252800	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2551	CGD6	AGD	56	292700	6251900	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2552	CGD3	AGD	56	293000	6252800	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	98435
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2553	CGD4	AGD	56	293300	6252500	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -	Open Camp Site,Scarred Tree	98435
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2554	CGD2	AGD	56	293000	6252900	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2512	Erskine Park Quarry 2 (EPQ2)	AGD	56	296050	6255690	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Doctor.Jo McDonald,Mr.Mark Rawson					**Permits**	2076,2188	
45-5-2513	Erskine Park Quarry 3 (EPQ3)	AGD	56	296100	6255750	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Doctor.Jo McDonald,Mr.Mark Rawson					**Permits**	2076,2188	
45-5-2514	Erskine Park Quarry 4 (EPQ4)	AGD	56	296480	6255800	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Doctor.Jo McDonald,Mr.Mark Rawson					**Permits**	2076,2188	
45-5-2515	Erskine Park Quary 5 (EPQ5)	AGD	56	296320	6255900	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Doctor.Jo McDonald,Mr.Mark Rawson					**Permits**	2076,2188,2189	
45-5-2516	Erskine Park Quarry 6 (EPQ6)	AGD	56	296580	6255120	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Doctor.Jo McDonald,Mr.Mark Rawson					**Permits**	2076,2188	
45-6-1769	Lec 3;	AGD	56	292410	6253470	Open site	Valid	Artefact : -	Open Camp Site	1345
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-5-0450	Erskine Park	AGD	56	295850	6255900	Open site	Valid	Artefact : -	Open Camp Site	1018,98435

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Doctor.Susan Mcintyre-Tamwoy					**Permits**	2076,2154,2189	
45-6-1770	Lec 4;	AGD	56	292410	6253300	Open site	Valid	Artefact : -	Open Camp Site	1345
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-6-1771	Lec 5;	AGD	56	292010	6253080	Open site	Valid	Artefact : -	Open Camp Site	1345
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-6-1772	Lec 6;	AGD	56	292770	6253700	Open site	Valid	Artefact : -	Open Camp Site	1345,97496
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	1586	
45-6-1773	Lec 7;	AGD	56	292830	6253780	Open site	Valid	Artefact : -	Open Camp Site	1345
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-6-1774	Lec 8;	AGD	56	292820	6254050	Open site	Valid	Artefact : -	Open Camp Site	1345,97496
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	1586	
45-6-1775	Lec 9;	AGD	56	293200	6252700	Open site	Valid	Artefact : -	Open Camp Site	1345,98435
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-6-1776	Lec 2;	AGD	56	292570	6253620	Open site	Valid	Artefact : -	Open Camp Site	1345
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-6-1777	Lec10;	AGD	56	293180	6253070	Open site	Valid	Artefact : -	Open Camp Site	1345,97496,98435,99352
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	1586,2056	
45-6-1778	Lec 11;	AGD	56	293300	6252820	Open site	Valid	Artefact : -	Open Camp Site	1345,98435
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-6-1779	Lec 12;	AGD	56	293300	6252850	Open site	Valid	Artefact : -	Open Camp Site	1345,98435,99352
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	2056	
45-6-1780	Lec 1;	AGD	56	292610	6253800	Open site	Valid	Artefact : -	Open Camp Site	1345
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**		
45-5-0528	Fleurs 2 (Fleurs Prospect)	AGD	56	292650	6251150	Open site	Valid	Artefact : -	Open Camp Site	1018
	Contact	**Recorders**	Richard Wright					**Permits**		
45-5-3065	EPR1	AGD	56	294147	6255326	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Susan Mcintyre-Tamwoy					**Permits**	2255	
45-5-3066	EPR2	AGD	56	294184	6255333	Open site	Valid	Artefact : -		
	Contact	**Recorders**	M McIntyre					**Permits**	2255	
45-5-3067	EPR3	AGD	56	294240	6255315	Open site	Valid	Artefact : -		
	Contact	**Recorders**	M McIntyre					**Permits**	2255	
45-5-3068	EPR7	AGD	56	294261	6255398	Open site	Valid	Artefact : -		
	Contact	**Recorders**	M McIntyre					**Permits**	2255	

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 29083 AV

Client Service ID : 399895

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-3058	EV1	AGD	56	295751	6254547	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jim Wheeler					**Permits**		
45-5-3059	EV2	AGD	56	295663	6254735	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jim Wheeler					**Permits**	2237	
45-5-3060	EV3	AGD	56	295666	6254988	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Jim Wheeler					**Permits**	2237,2391	
45-5-3061	EV4	AGD	56	295822	6254837	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Alan Wheatley					**Permits**	2391	
45-5-3028	EPTA3	AGD	56	294160	6254370	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3029	EPTA4	AGD	56	294850	6253540	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3030	EPTA5	AGD	56	295170	6253570	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3031	EPTA6	AGD	56	295210	6253410	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3032	EPTA10	AGD	56	293580	6253610	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3033	EPTA11	AGD	56	293340	6253690	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3034	EP-I 1	AGD	56	295260	6253400	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3035	EP-I 2	AGD	56	295190	6253500	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3036	EP-I 3	AGD	56	295240	6253710	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3026	EPTA2	AGD	56	295635	6255850	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2154	
45-5-2992	Erskine Park Quarry (EPQ1)	AGD	56	296600	6255175	Open site	Valid	Artefact : -		
	Contact T Russell	**Recorders**	Doctor.Jo McDonald,Mr.Mark Rawson					**Permits**	2076,2188	
45-5-2991	TCE 1	AGD	56	293300	6252700	Open site	Valid	Artefact : -		99352
	Contact T Russell	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**	2056	

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Extensive search - Site list report

Your Ref/PO Number : 29083 AV

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-2367	Kemps creek 1 (CK/1);	AGD	56	292800	6252830	Open site	Valid	Artefact : -	Open Camp Site	
Contact		Recorders	Jim Kohen					Permits		
45-5-3417	Erskine Park Lenore Lane 1 (EPLL1)	GDA	56	296359	6256533	Open site	Valid	Artefact : -		
Contact		Recorders	Mr.Kelvin Officer					Permits	2901	
45-5-4102	Kemps Creek IF1	GDA	56	295565	6253701	Open site	Valid	Artefact : 1		
Contact		Recorders	Dominic Steele Archaeological Consulting					Permits		
45-5-4103	Kemps Creeks IF2	GDA	56	294737	6254040	Open site	Valid	Artefact : 1		
Contact		Recorders	Dominic Steele Archaeological Consulting					Permits		
45-5-4104	Kemps Creek (logosoc1)	GDA	56	295307	6254094	Open site	Valid	Artefact : 1		
Contact		Recorders	Dominic Steele Archaeological Consulting					Permits		
45-5-4105	Kemps Creek (logosoc2)	GDA	56	295265	6254066	Open site	Valid	Artefact : -		
Contact		Recorders	Dominic Steele Archaeological Consulting					Permits		
45-5-4136	MR1 (Prospect)	GDA	56	294522	6256063	Open site	Valid	Artefact : 1		
Contact		Recorders	Doctor.Sandra Wallace,Artefact - Cultural Heritage Management					Permits		
45-5-4137	MR2 (Prospect)	GDA	56	294548	6256086	Open site	Valid	Artefact : 1		
Contact		Recorders	Doctor.Sandra Wallace,Artefact - Cultural Heritage Management					Permits		
45-5-4138	MR3 (Prospect)	GDA	56	294142	6255835	Open site	Valid	Artefact : 1		
Contact		Recorders	Doctor.Sandra Wallace,Artefact - Cultural Heritage Management					Permits		
45-5-5073	SSP 7	GDA	56	291662	6253114	Open site	Valid	Artefact : -		
Contact		Recorders	Kelleher Nightingale Consulting Pty Ltd,Miss.Kristen Taylor					Permits		
45-5-5133	Oakdale West 18 Isolated Find 01	GDA	56	296303	6254317	Open site	Valid	Artefact : -		
Contact		Recorders	Artefact - Cultural Heritage Management ,Mrs.Anna darby					Permits		
45-5-5134	Oakdale West 18 Artefact Scatter 02	GDA	56	296886	6254515	Open site	Valid	Artefact : -		
Contact		Recorders	Artefact - Cultural Heritage Management ,Mrs.Anna darby					Permits		
45-5-5135	Oakdale West 18 Artefact Scatter 03	GDA	56	296777	6254242	Open site	Valid	Artefact : -		
Contact		Recorders	Artefact - Cultural Heritage Management ,Mrs.Anna darby					Permits		
45-5-5136	Oakdale West 18 Isolated Find 02	GDA	56	296659	6254589	Open site	Valid	Artefact : -		
Contact		Recorders	Artefact - Cultural Heritage Management ,Mrs.Anna darby					Permits		
45-5-5187	MSP-01	GDA	56	294210	6254558	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					Permits		
45-5-5188	MSP-02	GDA	56	293594	6253823	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					Permits		
45-5-5189	MSP-03	GDA	56	293501	6253805	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					Permits		

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Extensive search - Site list report

Your Ref/PO Number : 29083 AV
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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-5190	MSP-04	GDA	56	293580	6253610	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					Permits		
45-5-5176	MWP-AD9	GDA	56	293351	6255660	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					Permits		
45-5-5177	MWP-AD11	GDA	56	293575	6255570	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					Permits		
45-5-5178	MWP-AD10	GDA	56	293494	6255635	Open site	Valid	Artefact : -		
Contact		Recorders	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					Permits		
45-5-5186	Mamre Road Artefact Scatter 1901 (MAM AS1901)	GDA	56	295114	6253373	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Artefact - Cultural Heritage Management ,Miss.Jennifer Norfolk					Permits		
45-5-2615	Area D	AGD	56	292900	6253450	Open site	Valid	Artefact : -		
Contact		Recorders	Dominic Steele Archaeological Consulting					Permits	1586	
45-5-3167	Mamre Road 1	AGD	56	294034	6256217	Open site	Valid	Artefact : 2		
Contact	Searle	Recorders	Helen Brayshaw					Permits		
45-5-3182	Lenore Lane PAD1(LL-PAD1)	AGD	56	294870	6256130	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
Contact	T Russell	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
45-5-3183	Lenore Lane PAD2(LL-PAD2)	AGD	56	294800	6256050	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
Contact	T Russell	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
45-5-3184	Lenore Lane PAD3(LL-PAD3)	AGD	56	294800	6256050	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
Contact	T Russell	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
45-5-3266	Erskine Park Roadworks (EPR 3)	AGD	56	294240	6255315	Open site	Valid	Artefact : 1		
Contact		Recorders	Doctor.Susan Mcintyre-Tamwoy					Permits		
45-5-3267	Erskine Park Roadworks (EPR 1)	AGD	56	294147	6255326	Open site	Valid	Artefact : 1		
Contact		Recorders	Doctor.Susan Mcintyre-Tamwoy					Permits		
45-5-3268	Erskine Park Roadworks (EPR 2)	AGD	56	294184	6255333	Open site	Valid	Artefact : 1		
Contact		Recorders	Doctor.Susan Mcintyre-Tamwoy					Permits		
45-5-3234	EPRC1	GDA	56	297040	6255945	Open site	Valid	Artefact : -		100562
Contact		Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits	2550,2666	
45-5-3235	Erskine Park 1 (EP1)	AGD	56	296722	6256329	Open site	Valid	Artefact : -		

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Extensive search - Site list report

Your Ref/PO Number : 29083 AV
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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2550,2666	
45-5-3231	EC 1	AGD	56	295666	6256462	Open site	Valid	Artefact : 11		
	Contact T Russell	**Recorders**	Total Earth Care Pty Ltd					**Permits**	2549	
45-5-3283	EPP 1	GDA	56	296722	6256329	Open site	Valid	Artefact : 1		
	Contact S Scanlon	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mr.Charles Dearling					**Permits**		
45-5-3284	EPP 2	GDA	56	296969	6256262	Open site	Valid	Artefact : 1		
	Contact S Scanlon	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mr.Charles Dearling					**Permits**		
45-5-3273	erskine park roadworks (EPR 7)	GDA	56	294262	6255398	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Ms.Tessa Boer-Mah,Doctor.Susan Mcintyre-Tamwoy					**Permits**		
45-5-3773	Luddenham Road 1	GDA	56	291493	6255058	Open site	Valid	Artefact : 1		
	Contact Deerubbin LALC	**Recorders**	Mr.Lyndon Patterson					**Permits**		
45-5-3774	Luddenham Road 2	GDA	56	291997	6254930	Open site	Valid	Artefact : 100		
	Contact Deerubbin LALC	**Recorders**	Mr.Lyndon Patterson					**Permits**		
45-5-3775	Orchard Hills ISO1	GDA	56	291170	6256869	Open site	Valid	Artefact : 1		101683
	Contact	**Recorders**	Fred Appleton					**Permits**		
45-5-3776	Orchard Hills ISO2	GDA	56	291576	6256440	Open site	Valid	Artefact : 1		101683
	Contact	**Recorders**	Mr.John Appleton					**Permits**		
45-5-4390	Luddenham Road 3	GDA	56	292041	6254667	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Miss.Georgia Wright					**Permits**		
45-5-4810	Mamre West Precinct Isolated Find 1 (MWP-IF1)	GDA	56	294089	6255758	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Sydney,Ms.Rebecca Morris					**Permits**		
45-5-4811	Mamre West Precinct Archaeological Deposit 8 (MWP-AD8)	GDA	56	294108	6255844	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Sydney,Ms.Rebecca Morris					**Permits**		
45-5-4812	Mamre West Precinct Archaeological Deposit 7 (MWP-AD7)	GDA	56	294097	6255948	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Sydney,Ms.Rebecca Morris					**Permits**		
45-5-4813	Mamre West Precinct Archaeological Deposit 6 (MWP-AD6)	GDA	56	294092	6256112	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Sydney,Ms.Rebecca Morris					**Permits**		
45-5-4815	Mamre West Precinct Archaeological Deposit 5 (MWP-AD5)	GDA	56	294088	6256225	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Sydney,Ms.Rebecca Morris					**Permits**		
45-5-4748	M12 A2	GDA	56	292624	6251214	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		
45-5-4749	M12 A4	GDA	56	293785	6251051	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		
45-5-4750	M12 A3	GDA	56	292725	6251214	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 19/02/2019 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 291000 - 297000, Northings : 6251100 - 6257100 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 115

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

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 29083 AV

Client Service ID : 399895

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		
45-5-4747	M12 A1	GDA	56	292194	6251184	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		

Report generated by AHIMS Web Service on 19/02/2019 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 291000 - 297000, Northings : 6251100 - 6257100 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 115

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

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 45-5-5187 **Date recorded:** 18-02-2019

Site Location Information

Site name: MSP-01

Easting: 294210 **Northing:** 6254558 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 56 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mrs.	Keats	Samantha

Organisation: Biosis Pty Ltd

Address: 8 Tate Street, Wollongong NSW 2500

Phone: 0242011061 **E-mail:** ahims@biosis.com.au

Site Context Information

Land Form Pattern: Plain **Land Use:** Pastoral/Grazing

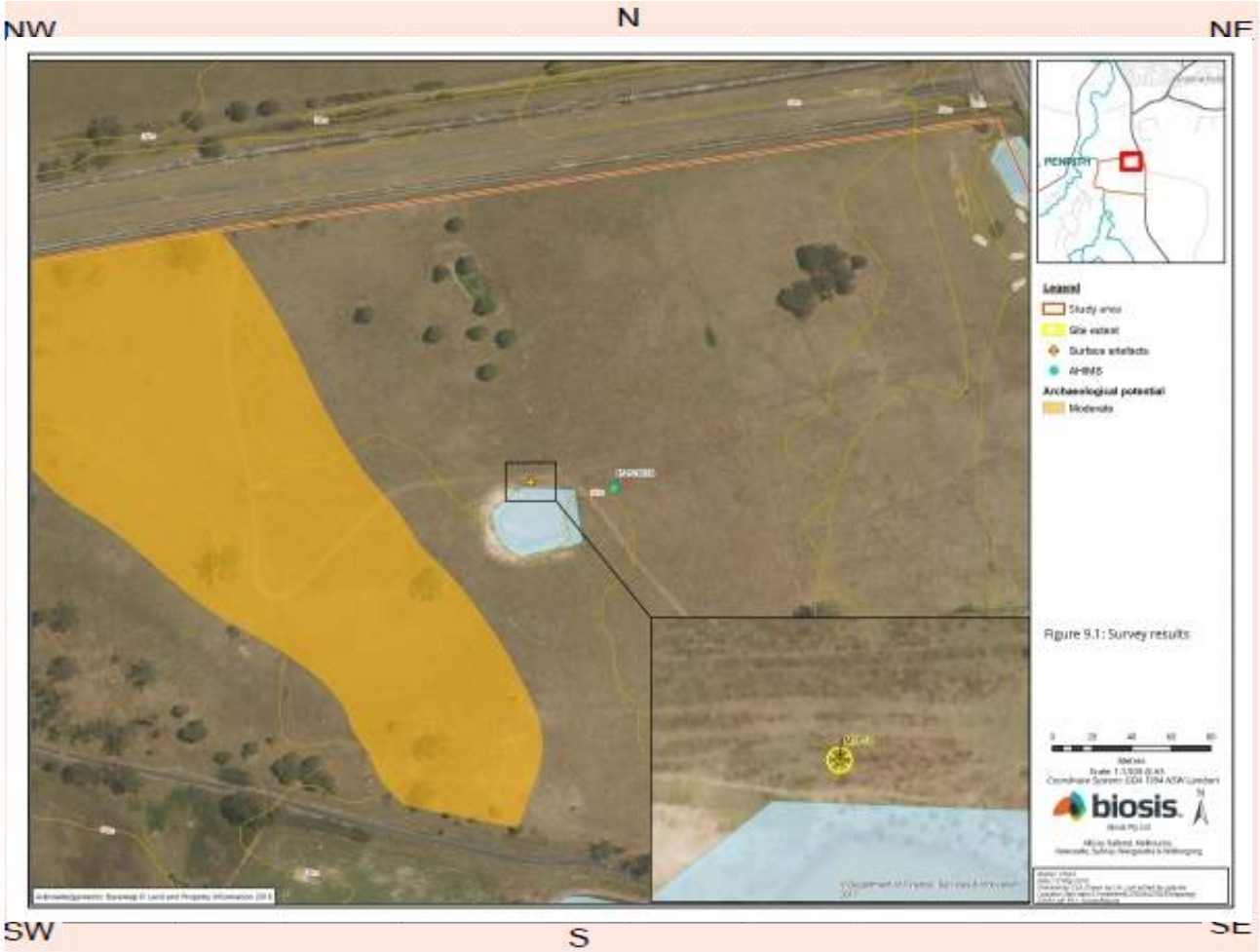
Land Form Unit: Plain **Vegetation:** Cleared

Distance to Water (m): 900 **Primary Report:** Biosis 2018. 27033 Mamre South SSD Application Survey Report.

How to get to the site: The site is located within Lot 34 DP 1118173, on the northern bank of a dam. Approximately 330 meters west of Mamre Road, Kemps Creek

Other site information: The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

Site location map



Site contents information

open/closed site: Open

Site condition: Disturbed

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	1	5	5				

Description:

MSP-01 consists of an artefact site found on the northern bank of a dam in Lot 34 DP 1118173. The site is located approximately 50 metres west of the original recorded location of EPTA3. The site is located in a disturbed context and consists of a single silcrete complete flake.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

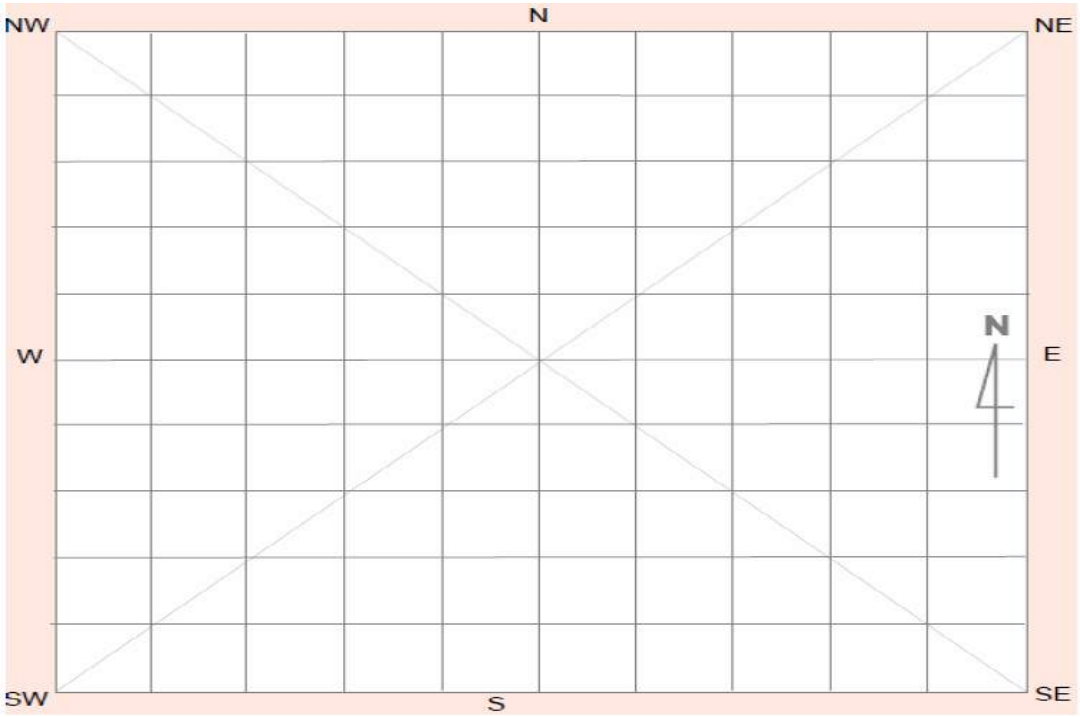
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info: The nearest recorded natural water source to this site is South Creek, located approximately 900 metres to its west, however there is a large depression located approximately 350 metres to its west which appears to be periodically inundated.

Site plan



Site photographs

Description: Location of MSP-01, view west

Description: Silcrete complete flake identified at MSP-01

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 45-5-5188 **Date recorded:** 18-02-2019

Site Location Information

Site name: MSP-02

Easting: 293594 **Northing:** 6253823 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 56 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mrs.	Keats	Samantha

Organisation: Biosis Pty Ltd

Address: 8 Tate Street, Wollongong NSW 2500

Phone: 0242011061 **E-mail:** ahims@biosis.com.au

Site Context Information

Land Form Pattern: Plain **Land Use:** Pastoral/Grazing

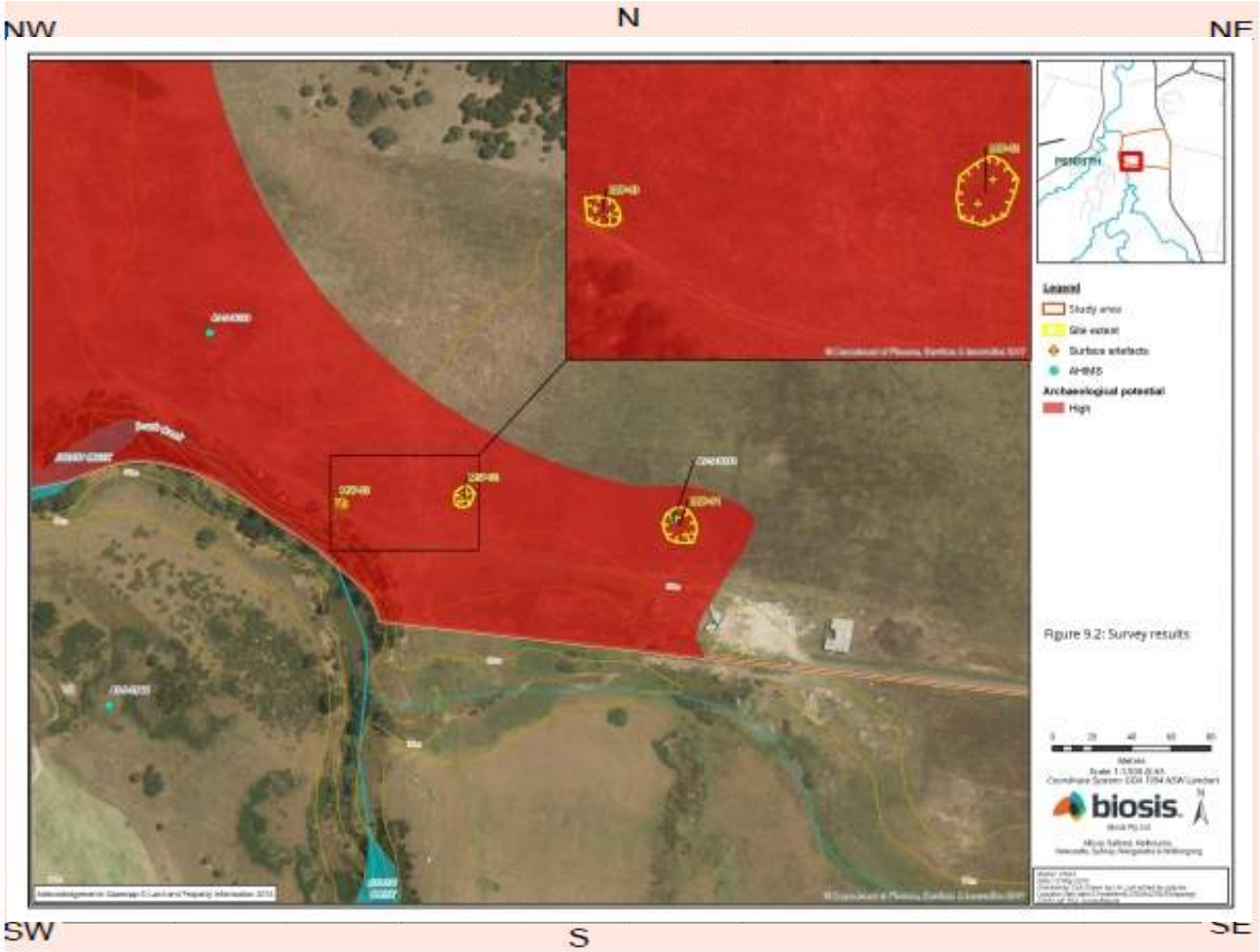
Land Form Unit: Plain **Vegetation:** Cleared

Distance to Water (m): 75 **Primary Report:** Biosis 2018. 27033 Mamre South SSD Application Survey Report.

How to get to the site: The site is located within Lot 22 DP 258414, and is located approximately 1 kilometer west of Mamre Road, Kemps Creek.

Other site information: The site consists of two silcrete complete flakes. The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

Site location map



Site contents information

open/closed site: Open

Site condition: Disturbed

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	2	7.5	7.5				

Description:

MSP-02 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, the site is considered to be present within a disturbed context.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

Description:

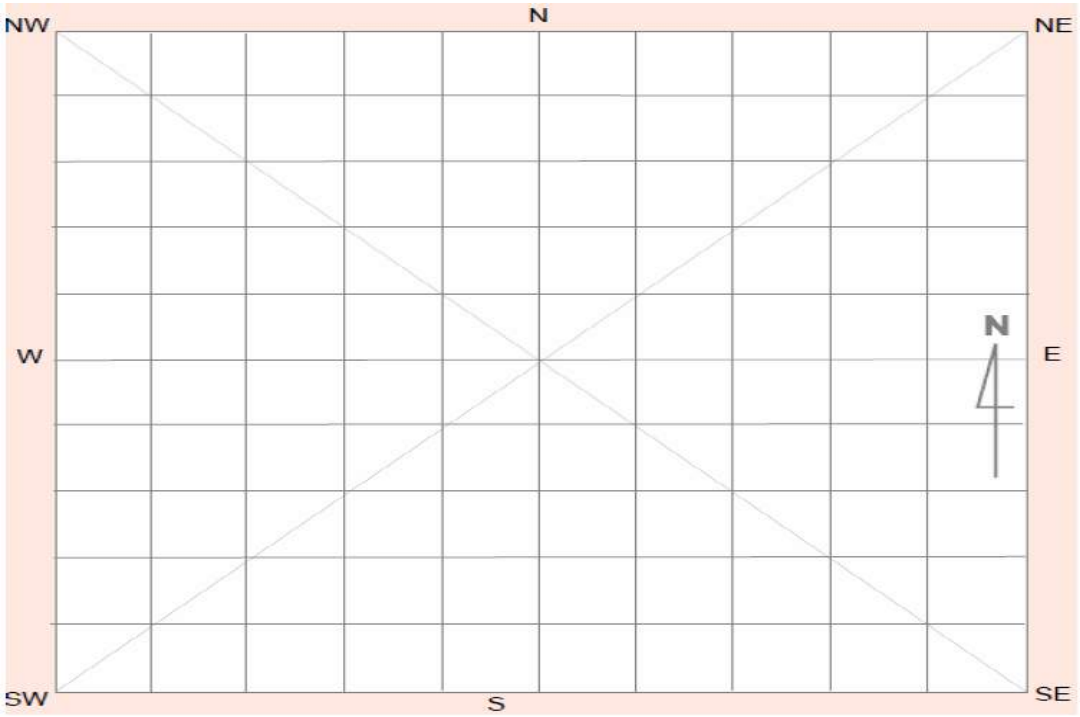
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

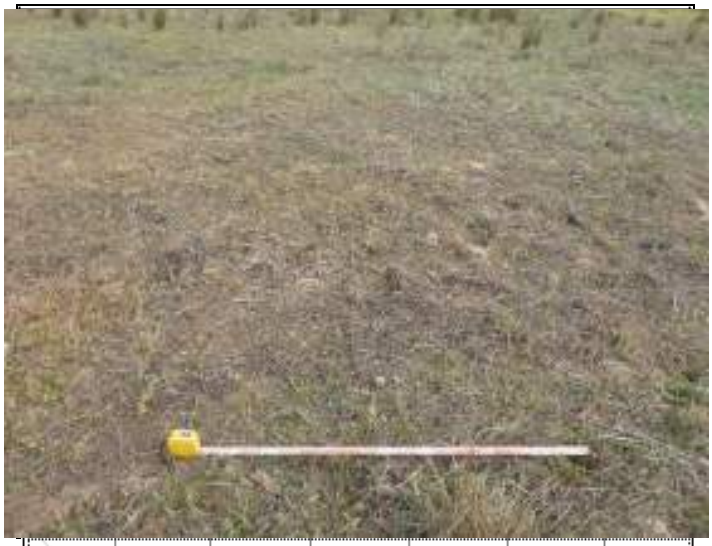
Description:

Other Site Info: The site consists of two silcrete complete flakes. The nearest natural water source is South Creek, located approximately 75 metres to the west of the site. In addition to this, there is a second order ephemeral tributary of South Creek located approximately 90 metres south of the site.

Site plan



Site photographs



Description: Location of site MSP-02, view north

Description: Silcrete complete flake identified at site MSP-02

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 45-5-5189 **Date recorded:** 18-02-2019

Site Location Information

Site name: MSP-03

Easting: 293501 **Northing:** 6253805 **Coordinates must be in GDA (MGA)**

Horizontal Accuracy (m): 5

Zone: 56 **Location method:** Non-Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mrs.	Keats	Samantha

Organisation: Biosis Pty Ltd

Address: 8 Tate Street, Wollongong NSW 2500

Phone: 0242011061 **E-mail:** ahims@biosis.com.au

Site Context Information

Land Form Pattern: Plain **Land Use:** Pastoral/Grazing

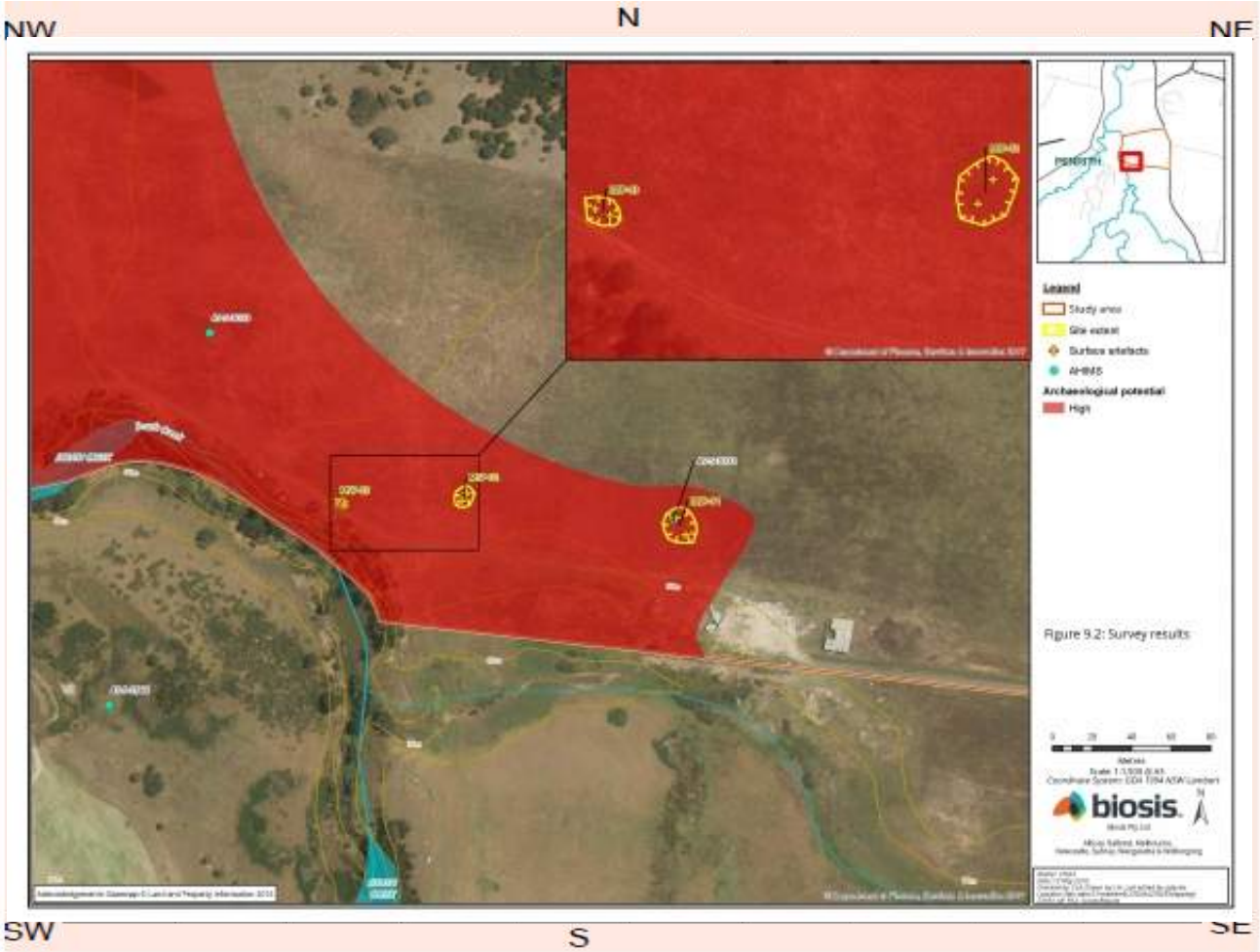
Land Form Unit: Flat **Vegetation:** Cleared

Distance to Water (m): 20 **Primary Report:** Biosis 2018. 27033 Mamre South SSD Application Survey Report.

How to get to the site: The site is located within Lot 22 DP 258414, and is located approximately 1.1 kilometers west of Mamre Road, Kemps Creek.

Other site information: The site consists of one silcrete complete flake and one broken quartzite hammerstone. The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

Site location map



Site contents information

open/closed site: Open

Site condition: Disturbed

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	2	5	5				

Description:

MSP-03 consists of an artefact scatter located across a flat within Lot 22 DP 258414. The site is located approximately 100 metres west of the recorded location of EPTA10. Based on the surrounding context, the site is considered to be present within a disturbed context.

Features:

		Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

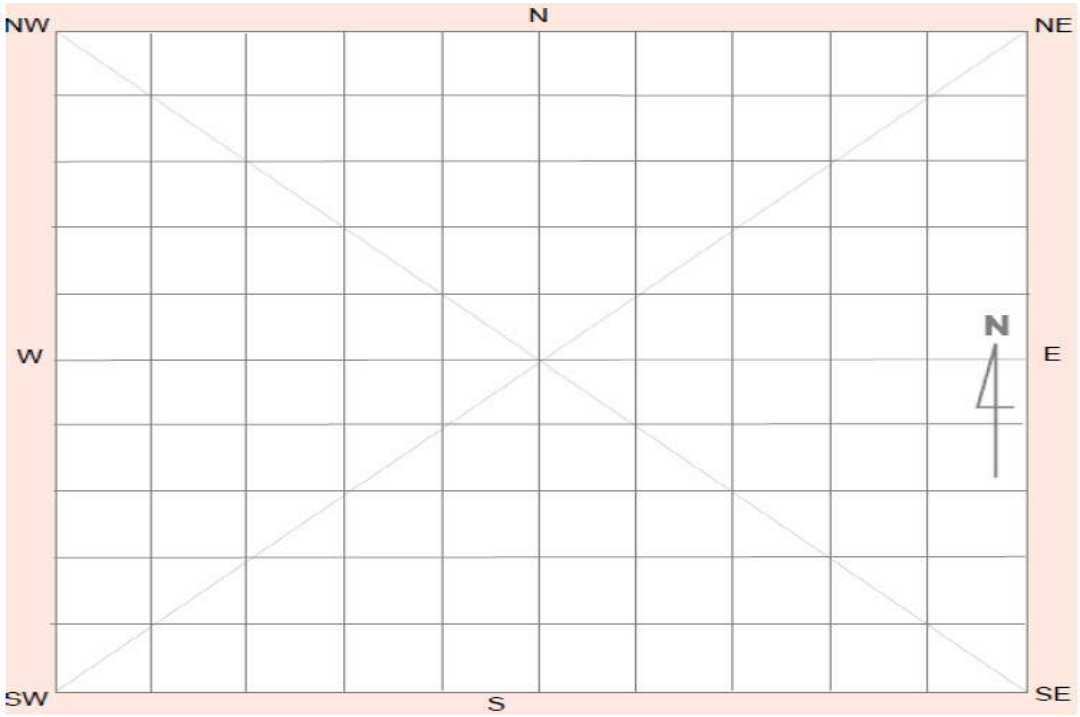
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info: The site consists of one silcrete complete flake and one broken quartzite hammerstone. The nearest natural water source is South Creek, located approximately 20 metres south-west of the site.

Site plan



Site photographs

Description: Location of MSP-03, view south-west

Description: Broken quartzite hammerstone identified at site MSP-03

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title **Surname** **First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☒ Additional information ☐

SITE IDENTIFICATION			
Site name	EPTA3	**NPWS Site #**	45-5-3028
Owner/manager	CSR Limited		
Owner Address	9 Help Street, Chatswood NSW 2067		

LOCATION					
Location	Lenore Lane, Erskine Park				
How to get to the site	See attached map				
1:250,000 map name	Prospect			**NPWS map code**	
AMG Zone		**AMG Easting**		**AMG Northing**	
Method for grid reference	1:25000 map	**Map scale (if method = map)**	1:25,000	**Map name**	Prospect 3rd Edition L&PI 2001.
NPWS District Name (see map)				**NPWS Zone (see map)**	
Portion no.				**Parish**	

SITE DESCRIPTION			
Site type(s)	Artefact Scatter	**Site type code (NPWS use only)**	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet,/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	**Attach photographs and sketches, eg. plan & section of shelter.** **Do NOT dig, disturb or damage site or contents.**		

SITE ENVIRONMENT					
Land form	low gradient ridge slope	**Aspect**	open	**Slope**	ridge

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

Mark position of the site				
Local rock type	Wianamatta Shale quartz, shale, laminate, kaolinite, carbonaceous claystone, sandstone		**Land use/effect**	grazing
Distance from drinking water	2 km 100 m		**Source**	Ropes Creek unnamed tributary
Resource zone (eg. estuarine, river, forest)	woodland		**Vegetation**	pasture grasses, eucalypts, exotic trees, shrubs, weeds
Edible plants			**Faunal resources** (include shellfish)	
Other exploitable resources (eg. ochre)	silcrete, rhyolitic tuff, quartz, quartzite, tuff, chert, milky quartz, chalcedony			
Are there other sites in the locality	yes	**Are they in the Sites Register** some	**Other site types include**	artefact scatters, rock shelter sites, hearths, isolated finds
SITE MANAGEMENT				
Site condition	See Report			
Management recommendations	See Report No further archaeological assessment Application of Section 90 for separate developments and untested areas Consultation with Aboriginal groups regarding cultural values of archaeological deposits and regarding Section 90 applications for each development			
Have artefacts been removed from site	yes		**When**	January – February 2005
By whom	Navin Officer Heritage Consultants		**Deposited at**	
Consent applied for	☒		**Consent issued**	
Date of issue			**Consent number**	
SITE INSPECTION AND RECORDING				
Reason for investigation	Subsurface Testing; development for various industrial purposes			
Were local Aborigines contacted or present for the recording	☐Not contacted ☒Contacted and present ☐Contacted but not present	**Names and addresses**	Mr Phil Khan Sites Officer Deerubin Local Aboriginal Land Council PO Box V 3184 MOUNT DRUITT VILLAGE NSW 2770 Ms Celestine Everingham Darug Tribal Aboriginal Corporation PO Box 441 BLACKTOWN NSW 2148 Ms Leanne Wright Darug Custodians Aboriginal Corporation PO Box 36 KELLYVILLE NSW 2153	
Is the site important to local Aborigines				
Verbal/written reference sources	1. . Navin Officer Heritage Consultants (March) 2005 *CSR Lands at Erskine Park Archaeological Subsurface Testing* A Report to CGP Management Pty Ltd		**ASR report number(s) (or title)**	C- C-

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

	on behalf of CSR Limited		
Photographs taken	Yes	**No. of Photos attached**	nil
Site recorded by	Navin Officer Heritage Consultants Pty Ltd	**Date of recording**	March 2005
Address/institution	4/71 Leichhardt Street, KINGSTON, ACT 2604		

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☒ Additional information ☐

SITE IDENTIFICATION			
Site name	EPTA4	**NPWS Site #**	
Owner/manager	CSR Limited		
Owner Address	9 Help Street, Chatswood NSW 2067		

LOCATION					
Location	Lenore Lane, Erskine Park				
How to get to the site	See attached map				
1:250,000 map name	Prospect			**NPWS map code**	
AMG Zone		**AMG Easting**		**AMG Northing**	
Method for grid reference	1:25000 map	**Map scale (if method = map)**	1:25,000	**Map name**	Prospect 3rd Edition L&PI 2001.
NPWS District Name (see map)				**NPWS Zone (see map)**	
Portion no.				**Parish**	

SITE DESCRIPTION			
Site type(s)	Artefact Scatter	**Site type code (NPWS use only)**	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet,/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	**Attach photographs and sketches, eg. plan & section of shelter.** **Do NOT dig, disturb or damage site or contents.**		

SITE ENVIRONMENT					
Land form	spurline crest	**Aspect**	open	**Slope**	gentle

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

Mark position of the site				
Local rock type	Wianamatta Shale quartz, shale, laminate, kaolinite, carbonaceous claystone, sandstone		**Land use/effect**	grazing
Distance from drinking water	2 km 100 m		**Source**	Ropes Creek unnamed tributary
Resource zone (eg. estuarine, river, forest)	woodland		**Vegetation**	pasture grasses, eucalypts, exotic trees, shrubs, weeds
Edible plants			**Faunal resources** (include shellfish)	
Other exploitable resources (eg. ochre)	silcrete, rhyolitic tuff, quartz, quartzite, tuff, chert, milky quartz, chalcedony			
Are there other sites in the locality	yes	**Are they in the Sites Register** some	**Other site types include**	artefact scatters, rock shelter sites, hearths, isolated finds
SITE MANAGEMENT				
Site condition	See Report			
Management recommendations	See Report No further archaeological assessment Application of Section 90 for separate developments and untested areas Consultation with Aboriginal groups regarding cultural values of archaeological deposits and regarding Section 90 applications for each development			
Have artefacts been removed from site	yes		**When**	January – February 2005
By whom	Navin Officer Heritage Consultants		**Deposited at**	
Consent applied for	☒		**Consent issued**	
Date of issue			**Consent number**	
SITE INSPECTION AND RECORDING				
Reason for investigation	Subsurface Testing; development for various industrial purposes			
Were local Aborigines contacted or present for the recording	☐Not contacted ☒Contacted and present ☐Contacted but not present	**Names and addresses**	Mr Phil Khan Sites Officer Deerubin Local Aboriginal Land Council PO Box V 3184 MOUNT DRUITT VILLAGE NSW 2770 Ms Celestine Everingham Darug Tribal Aboriginal Corporation PO Box 441 BLACKTOWN NSW 2148 Ms Leanne Wright Darug Custodians Aboriginal Corporation PO Box 36 KELLYVILLE NSW 2153	
Is the site important to local Aborigines				
Verbal/written reference sources	1. . Navin Officer Heritage Consultants (March) 2005 *CSR Lands at Erskine Park Archaeological Subsurface Testing* A Report to CGP Management Pty Ltd		**ASR report number(s) (or title)**	C- C-

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

	on behalf of CSR Limited		
Photographs taken	Yes	**No. of Photos attached**	nil
Site recorded by	Navin Officer Heritage Consultants Pty Ltd	**Date of recording**	March 2005
Address/institution	4/71 Leichhardt Street, KINGSTON, ACT 2604		

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☒ Additional information ☐

SITE IDENTIFICATION			
Site name	EPTA5	**NPWS Site #**	
Owner/manager	CSR Limited		
Owner Address	9 Help Street, Chatswood NSW 2067		

LOCATION					
Location	Lenore Lane, Erskine Park				
How to get to the site	See attached map				
1:250,000 map name	Prospect			**NPWS map code**	
AMG Zone		**AMG Easting**		**AMG Northing**	
Method for grid reference	1:25000 map	**Map scale (if method = map)**	1:25,000	**Map name**	Prospect 3rd Edition L&PI 2001.
NPWS District Name (see map)				**NPWS Zone (see map)**	
Portion no.				**Parish**	

SITE DESCRIPTION			
Site type(s)		**Site type code (NPWS use only)**	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents- shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet,/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	**Attach photographs and sketches, eg. plan & section of shelter.** **Do NOT dig, disturb or damage site or contents.**		

SITE ENVIRONMENT					
Land form	low gradient ridge slope	**Aspect**	open	**Slope**	ridge

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

Mark position of the site					
Local rock type	Wianamatta Shale quartz, shale, laminate, kaolinite, carbonaceous claystone, sandstone			**Land use/effect**	grazing
Distance from drinking water	2 km 100 m			**Source**	Ropes Creek unnamed tributary
Resource zone (eg. estuarine, river, forest)	woodland			**Vegetation**	pasture grasses, eucalypts, exotic trees, shrubs, weeds
Edible plants				**Faunal resources** (include shellfish)	
Other exploitable resources (eg. ochre)	silcrete, rhyolitic tuff, quartz, quartzite, tuff, chert, milky quartz, chalcedony				
Are there other sites in the locality	yes	**Are they in the Sites Register**	some	**Other site types include**	artefact scatters, rock shelter sites, hearths, isolated finds
SITE MANAGEMENT					
Site condition	See Report				
Management recommendations	See Report No further archaeological assessment Application of Section 90 for separate developments and untested areas Consultation with Aboriginal groups regarding cultural values of archaeological deposits and regarding Section 90 applications for each development				
Have artefacts been removed from site	yes			**When**	January – February 2005
By whom	Navin Officer Heritage Consultants			**Deposited at**	
Consent applied for	☒			**Consent issued**	
Date of issue				**Consent number**	
SITE INSPECTION AND RECORDING					
Reason for investigation	Subsurface Testing; development for various industrial purposes				
Were local Aborigines contacted or present for the recording	☐Not contacted ☒Contacted and present ☐Contacted but not present	**Names and addresses**	Mr Phil Khan Sites Officer Deerubin Local Aboriginal Land Council PO Box V 3184 MOUNT DRUITT VILLAGE NSW 2770 Ms Celestine Everingham Darug Tribal Aboriginal Corporation PO Box 441 BLACKTOWN NSW 2148 Ms Leanne Wright Darug Custodians Aboriginal Corporation PO Box 36 KELLYVILLE NSW 2153		
Is the site important to local Aborigines					
Verbal/written reference sources	1. .Navin Officer Heritage Consultants (March) 2005 *CSR Lands at Erskine Park Archaeological Subsurface Testing* A Report to CGP Management Pty Ltd			**ASR report number(s) (or title)**	C- C-

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

	on behalf of CSR Limited		
Photographs taken	Yes	**No. of Photos attached**	nil
Site recorded by	Navin Officer Heritage Consultants Pty Ltd	**Date of recording**	March 2005
Address/institution	4/71 Leichhardt Street, KINGSTON, ACT 2604		

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☒ Additional information ☐

SITE IDENTIFICATION			
Site name	EPTA6	**NPWS Site #**	
Owner/manager	CSR Limited		
Owner Address	9 Help Street, Chatswood NSW 2067		

LOCATION					
Location	Lenore Lane, Erskine Park				
How to get to the site	See attached map				
1:250,000 map name	Prospect			**NPWS map code**	
AMG Zone		**AMG Easting**		**AMG Northing**	
Method for grid reference	1:25000 map	**Map scale (if method = map)**	1:25,000	**Map name**	Prospect 3rd Edition L&PI 2001.
NPWS District Name (see map)				**NPWS Zone (see map)**	
Portion no.				**Parish**	

SITE DESCRIPTION			
Site type(s)		**Site type code (NPWS use only)**	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents- shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet,/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	**Attach photographs and sketches, eg. plan & section of shelter.** **Do NOT dig, disturb or damage site or contents.**		

SITE ENVIRONMENT					
Land form	spurline crest	**Aspect**	open	**Slope**	gentle

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

Mark position of the site				
Local rock type	Wianamatta Shale quartz, shale, laminate, kaolinite, carbonaceous claystone, sandstone		**Land use/effect**	grazing
Distance from drinking water	2 km 100 m		**Source**	Ropes Creek unnamed tributary
Resource zone (eg. estuarine, river, forest)	woodland		**Vegetation**	pasture grasses, eucalypts, exotic trees, shrubs, weeds
Edible plants			**Faunal resources** (include shellfish)	
Other exploitable resources (eg. ochre)	silcrete, rhyolitic tuff, quartz, quartzite, tuff, chert, milky quartz, chalcedony			
Are there other sites in the locality	yes	**Are they in the Sites Register** some	**Other site types include**	artefact scatters, rock shelter sites, hearths, isolated finds
SITE MANAGEMENT				
Site condition	See Report			
Management recommendations	See Report No further archaeological assessment Application of Section 90 for separate developments and untested areas Consultation with Aboriginal groups regarding cultural values of archaeological deposits and regarding Section 90 applications for each development			
Have artefacts been removed from site	yes		**When**	January – February 2005
By whom	Navin Officer Heritage Consultants		**Deposited at**	
Consent applied for	☒		**Consent issued**	
Date of issue			**Consent number**	
SITE INSPECTION AND RECORDING				
Reason for investigation	Subsurface Testing; development for various industrial purposes			
Were local Aborigines contacted or present for the recording	☐Not contacted ☒Contacted and present ☐Contacted but not present	**Names and addresses**	Mr Phil Khan Sites Officer Deerubin Local Aboriginal Land Council PO Box V 3184 MOUNT DRUITT VILLAGE NSW 2770 Ms Celestine Everingham Darug Tribal Aboriginal Corporation PO Box 441 BLACKTOWN NSW 2148 Ms Leanne Wright Darug Custodians Aboriginal Corporation PO Box 36 KELLYVILLE NSW 2153	
Is the site important to local Aborigines				
Verbal/written reference sources	1. . Navin Officer Heritage Consultants (March) 2005 *CSR Lands at Erskine Park Archaeological Subsurface Testing* A Report to CGP Management Pty Ltd		**ASR report number(s) (or title)**	C- C-

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

	on behalf of CSR Limited		
Photographs taken	Yes	**No. of Photos attached**	nil
Site recorded by	Navin Officer Heritage Consultants Pty Ltd	**Date of recording**	March 2005
Address/institution	4/71 Leichhardt Street, KINGSTON, ACT 2604		

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☒ Additional information ☐

SITE IDENTIFICATION			
Site name	EPTA10	**NPWS Site #**	
Owner/manager	CSR Limited		
Owner Address	9 Help Street, Chatswood NSW 2067		

LOCATION					
Location	Lenore Lane, Erskine Park				
How to get to the site	See attached map				
1:250,000 map name	Prospect			**NPWS map code**	
AMG Zone		**AMG Easting**		**AMG Northing**	
Method for grid reference	1:25000 map	**Map scale (if method = map)**	1:25,000	**Map name**	Prospect 3rd Edition L&PI 2001.
NPWS District Name (see map)				**NPWS Zone (see map)**	
Portion no.				**Parish**	

SITE DESCRIPTION			
Site type(s)		**Site type code (NPWS use only)**	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet,/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	**Attach photographs and sketches, eg. plan & section of shelter.** **Do NOT dig, disturb or damage site or contents.**		

SITE ENVIRONMENT					
Land form	low gradient ridge slope	**Aspect**	open	**Slope**	ridge

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

Mark position of the site				
Local rock type	Wianamatta Shale quartz, shale, laminate, kaolinite, carbonaceous claystone, sandstone		**Land use/effect**	grazing
Distance from drinking water	2 km 100 m		**Source**	Ropes Creek unnamed tributary
Resource zone (eg. estuarine, river, forest)	woodland		**Vegetation**	pasture grasses, eucalypts, exotic trees, shrubs, weeds
Edible plants			**Faunal resources** (include shellfish)	
Other exploitable resources (eg. ochre)	silcrete, rhyolitic tuff, quartz, quartzite, tuff, chert, milky quartz, chalcedony			
Are there other sites in the locality	yes	**Are they in the Sites Register** some	**Other site types include**	artefact scatters, rock shelter sites, hearths, isolated finds
SITE MANAGEMENT				
Site condition	See Report			
Management recommendations	See Report No further archaeological assessment Application of Section 90 for separate developments and untested areas Consultation with Aboriginal groups regarding cultural values of archaeological deposits and regarding Section 90 applications for each development			
Have artefacts been removed from site	yes		**When**	January – February 2005
By whom	Navin Officer Heritage Consultants		**Deposited at**	
Consent applied for	☒		**Consent issued**	
Date of issue			**Consent number**	
SITE INSPECTION AND RECORDING				
Reason for investigation	Subsurface Testing; development for various industrial purposes			
Were local Aborigines contacted or present for the recording	☐Not contacted ☒Contacted and present ☐Contacted but not present	**Names and addresses**	Mr Phil Khan Sites Officer Deerubin Local Aboriginal Land Council PO Box V 3184 MOUNT DRUITT VILLAGE NSW 2770 Ms Celestine Everingham Darug Tribal Aboriginal Corporation PO Box 441 BLACKTOWN NSW 2148 Ms Leanne Wright Darug Custodians Aboriginal Corporation PO Box 36 KELLYVILLE NSW 2153	
Is the site important to local Aborigines				
Verbal/written reference sources	1. . Navin Officer Heritage Consultants (March) 2005 *CSR Lands at Erskine Park Archaeological Subsurface Testing* A Report to CGP Management Pty Ltd		**ASR report number(s) (or title)**	C- C-

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

	on behalf of CSR Limited		
Photographs taken	Yes	**No. of Photos attached**	nil
Site recorded by	Navin Officer Heritage Consultants Pty Ltd	**Date of recording**	March 2005
Address/institution	4/71 Leichhardt Street, KINGSTON, ACT 2604		

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☒ Additional information ☐

SITE IDENTIFICATION			
Site name	EPTA11	**NPWS Site #**	
Owner/manager	CSR Limited		
Owner Address	9 Help Street, Chatswood NSW 2067		

LOCATION					
Location	Lenore Lane, Erskine Park				
How to get to the site	See attached map				
1:250,000 map name	Prospect			**NPWS map code**	
AMG Zone		**AMG Easting**		**AMG Northing**	
Method for grid reference	1:25000 map	**Map scale (if method = map)**	1:25,000	**Map name**	Prospect 3rd Edition L&PI 2001.
NPWS District Name (see map)				**NPWS Zone (see map)**	
Portion no.				**Parish**	

SITE DESCRIPTION			
Site type(s)		**Site type code (NPWS use only)**	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet,/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	**Attach photographs and sketches, eg. plan & section of shelter.** **Do NOT dig, disturb or damage site or contents.**		

SITE ENVIRONMENT					
Land form	spurline crest	**Aspect**	open	**Slope**	gentle

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

Mark position of the site				
Local rock type	Wianamatta Shale quartz, shale, laminate, kaolinite, carbonaceous claystone, sandstone		**Land use/effect**	grazing
Distance from drinking water	2 km 100 m		**Source**	Ropes Creek unnamed tributary
Resource zone (eg. estuarine, river, forest)	woodland		**Vegetation**	pasture grasses, eucalypts, exotic trees, shrubs, weeds
Edible plants			**Faunal resources** (include shellfish)	
Other exploitable resources (eg. ochre)	silcrete, rhyolitic tuff, quartz, quartzite, tuff, chert, milky quartz, chalcedony			
Are there other sites in the locality	yes	**Are they in the Sites Register** some	**Other site types include**	artefact scatters, rock shelter sites, hearths, isolated finds
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By whom	Navin Officer Heritage Consultants		**Deposited at**	
Consent applied for	☒		**Consent issued**	
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Verbal/written reference sources	1. . Navin Officer Heritage Consultants (March) 2005 *CSR Lands at Erskine Park Archaeological Subsurface Testing* A Report to CGP Management Pty Ltd		**ASR report number(s) (or title)**	C- C-

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Site recorded by	Navin Officer Heritage Consultants Pty Ltd	**Date of recording**	March 2005
Address/institution	4/71 Leichhardt Street, KINGSTON, ACT 2604		

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☒ Additional information ☐

SITE IDENTIFICATION			
Site name	EPTA10	**NPWS Site #**	
Owner/manager	CSR Limited		
Owner Address	9 Help Street, Chatswood NSW 2067		

LOCATION					
Location	Lenore Lane, Erskine Park				
How to get to the site	See attached map				
1:250,000 map name	Prospect			**NPWS map code**	
AMG Zone		**AMG Easting**		**AMG Northing**	
Method for grid reference	1:25000 map	**Map scale (if method = map)**	1:25,000	**Map name**	Prospect 3rd Edition L&PI 2001.
NPWS District Name (see map)				**NPWS Zone (see map)**	
Portion no.				**Parish**	

SITE DESCRIPTION			
Site type(s)		**Site type code (NPWS use only)**	
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SITE ENVIRONMENT					
Land form	low gradient ridge slope	**Aspect**	open	**Slope**	ridge

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

Mark position of the site				
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Resource zone (eg. estuarine, river, forest)	woodland		**Vegetation**	pasture grasses, eucalypts, exotic trees, shrubs, weeds
Edible plants			**Faunal resources** (include shellfish)	
Other exploitable resources (eg. ochre)	silcrete, rhyolitic tuff, quartz, quartzite, tuff, chert, milky quartz, chalcedony			
Are there other sites in the locality	yes	**Are they in the Sites Register** some	**Other site types include**	artefact scatters, rock shelter sites, hearths, isolated finds
SITE MANAGEMENT				
Site condition	See Report			
Management recommendations	See Report No further archaeological assessment Application of Section 90 for separate developments and untested areas Consultation with Aboriginal groups regarding cultural values of archaeological deposits and regarding Section 90 applications for each development			
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Site recorded by	Navin Officer Heritage Consultants Pty Ltd	**Date of recording**	March 2005
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SITE IDENTIFICATION			
Site name	EPTA11	**NPWS Site #**	
Owner/manager	CSR Limited		
Owner Address	9 Help Street, Chatswood NSW 2067		

LOCATION					
Location	Lenore Lane, Erskine Park				
How to get to the site	See attached map				
1:250,000 map name	Prospect			**NPWS map code**	
AMG Zone		**AMG Easting**		**AMG Northing**	
Method for grid reference	1:25000 map	**Map scale (if method = map)**	1:25,000	**Map name**	Prospect 3rd Edition L&PI 2001.
NPWS District Name (see map)				**NPWS Zone (see map)**	
Portion no.				**Parish**	

SITE DESCRIPTION			
Site type(s)		**Site type code (NPWS use only)**	
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SITE ENVIRONMENT					
Land form	spurline crest	**Aspect**	open	**Slope**	gentle

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

Mark position of the site				
Local rock type	Wianamatta Shale quartz, shale, laminate, kaolinite, carbonaceous claystone, sandstone		**Land use/effect**	grazing
Distance from drinking water	2 km 100 m		**Source**	Ropes Creek unnamed tributary
Resource zone (eg. estuarine, river, forest)	woodland		**Vegetation**	pasture grasses, eucalypts, exotic trees, shrubs, weeds
Edible plants			**Faunal resources** (include shellfish)	
Other exploitable resources (eg. ochre)	silcrete, rhyolitic tuff, quartz, quartzite, tuff, chert, milky quartz, chalcedony			
Are there other sites in the locality	yes	**Are they in the Sites Register** some	**Other site types include**	artefact scatters, rock shelter sites, hearths, isolated finds
SITE MANAGEMENT				
Site condition	See Report			
Management recommendations	See Report No further archaeological assessment Application of Section 90 for separate developments and untested areas Consultation with Aboriginal groups regarding cultural values of archaeological deposits and regarding Section 90 applications for each development			
Have artefacts been removed from site	yes		**When**	January – February 2005
By whom	Navin Officer Heritage Consultants		**Deposited at**	
Consent applied for	☒		**Consent issued**	
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SITE INSPECTION AND RECORDING				
Reason for investigation	Subsurface Testing; development for various industrial purposes			
Were local Aborigines contacted or present for the recording	☐Not contacted ☒Contacted and present ☐Contacted but not present	**Names and addresses**	Mr Phil Khan Sites Officer Deerubin Local Aboriginal Land Council PO Box V 3184 MOUNT DRUITT VILLAGE NSW 2770 Ms Celestine Everingham Darug Tribal Aboriginal Corporation PO Box 441 BLACKTOWN NSW 2148 Ms Leanne Wright Darug Custodians Aboriginal Corporation PO Box 36 KELLYVILLE NSW 2153	
Is the site important to local Aborigines				
Verbal/written reference sources	1. . Navin Officer Heritage Consultants (March) 2005 *CSR Lands at Erskine Park Archaeological Subsurface Testing* A Report to CGP Management Pty Ltd		**ASR report number(s) (or title)**	C- C-

Version: June 1998	Data entered by:	Date entered:

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

	on behalf of CSR Limited		
Photographs taken	Yes	**No. of Photos attached**	nil
Site recorded by	Navin Officer Heritage Consultants Pty Ltd	**Date of recording**	March 2005
Address/institution	4/71 Leichhardt Street, KINGSTON, ACT 2604		

Appendix 2 Test excavation results

Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	A1	1	1	0	100	7.5YR3/2	High	Loam	Grass roots	Dark brown silty clay, with orange and red clay inclusion ranging from 2-10mm	10%	5
3	A1	1	2	100	200	7.5YR3/2	High	Silty Clay		Dark brown silty clay, with orange and red clay inclusion ranging from 2-60mm	30%	5
3	A1	1	3	200	300	10YR4/6	High	Silty Clay	glass, brick, grass roots, plastic	Strong brown silty clay, with orange and red clay inclusion ranging from 2-60mm, with small iron stone nodules, finishing on red Brown clay	40%	5
3	A1	2	1	0	100	7.5YR3/2	High	Silty Clay	redeposited, likely ploughed	Dark brown silty clay, with orange and red clay inclusion ranging from 2-10mm	10%	8
3	A1	2	2	100	200	7.5YR3/2	High	Silty Clay		Dark brown silty clay, with orange and red clay inclusion ranging from 2-60mm	30%	7.5
3	A1	2	3	200	300	10YR4/6	High	Clay		Brown clay, with orange and red clay inclusion ranging from 2-60mm, with small iron stone nodules, finishing on red Brown clay	40%	7
3	A1	3	1	0	100	7.5YR3/2	High	Silty Clay	Grass roots	Dark brown silty clay, with orange and red clay and charcoal inclusions ranging from 2-10mm	10%	8
3	A1	3	2	100	200	7.5YR3/2	High	Clay	Grass roots	redeposited clay with large inclusions (10-50mm)	30%	7.5
3	A1	3	3	200	300	7.5YR3/2	High	Silty Clay		Dark brown silty clay, with orange and red clay and charcoal inclusions ranging from 2-10mm	30%	7.5
3	A1	3	4	300	400	10YR6/2	High	Silty Clay		silty clay, with orange and red clay and charcoal inclusions ranging from 2-20mm	40%	7.5
3	A1	3	5	400	500	10YR4/6	High	Clay		Brown clay, ending test pit at 500mm.	40%	7
3	1	1	1	0	50	7.5YR3/2	High	Silty Clay	Glass, brick, possible fill soils, grass roots	Dark brown silty clay, with orange and red clay and charcoal inclusions ranging from 2-10mm	10%	5
3	1	1	2	50	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass roots	Dark brown silty clay, with orange and red clay and charcoal inclusions ranging from 2-10mm	10%	5
3	1	1	3	100	150	7.5YR3/2	High	Silty Clay	Glass, brick, grass roots	Dark brown silty clay, with orange and red clay and charcoal inclusions ranging from 2-10mm	30%	5
3	1	1	4	150	200	7.5YR3/2	High	Silty Clay	Glass, brick, grass roots	Dark brown silty clay, with orange and red clay and charcoal inclusions ranging from 2-20mm	40%	5
3	1	1	5	250	300	10YR4/6	High	Clay	Glass, brick, grass roots, highly disturbed	Strong brown silty clay, to bright red Brown clays with orange and red clay inclusion ranging from 2-60mm, with small iron stone nodules, and charcoal inclusions.	40%	5
3	1	1	6	300	350	10YR4/6	High	Clay	Glass, brick, grass roots, highly disturbed	Bright red Brown clays with orange and red clay inclusion ranging from 2-60mm, with small iron stone nodules, and charcoal inclusions.	30%	5
3	1	1	7	350	400	10YR4/6	High	Clay	Glass, brick, grass roots, highly disturbed	Bright red Brown clays with orange and red clay inclusion ranging from 2-20mm, with small iron stone nodules, and charcoal inclusions.	20%	5
3	1	2	1	0	100	7.5YR3/2	High	Silty Clay	Gass, brick, possible fill soils, grass roots	Dark brown silty clay, with orange and red clay inclusion ranging from 2-10mm	10%	5
3	1	2	2	100	200	7.5YR3/2	High	Silty Clay	Glass,brick,plastic, grass roots	Dark brown silty clay, with orange and red clay inclusion ranging from 2-60mm	30%	5
3	1	2	3	200	300	10YR4/6	High	Silty Clay	Glass, brick, grass roots, plastic	Strong brown silty clay, with orange and red clay inclusion ranging from 2-60mm, with small iron stone nodules, finishing on red Brown clay	40%	5
3	1	2	4	200	250	10YR4/6	High	Silty Clay	Glass, brick, grass roots, highly disturbed	Strong brown silty clay, with orange and red clay inclusion ranging from 2-60mm, with small iron stone nodules, and charcoal inclusions.	40%	5
3	1	3	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark brown silty clay, with orange and red clay inclusion ranging from 2-5mm	30%	5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	1	3	2	100	200	7.5YR3/2	High	Silty Clay	Glass, brick, grass roots, plastic	Dark brown silty clay to strong Brown red clays, with orange and red clay inclusion ranging from 2-20mm	40%	5
3	1	3	3	200	290	10YR4/6	High	Silty Clay	Glass, brick, grass roots, plastic	Strong brown clay, to red Brown clay with orange and red clay inclusion ranging from 2-20mm, with small iron stone nodules, finishing on red Brown clay	40%	5
3	2	1	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-10mm	5%	5
3	2	1	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, grass roots, plastic	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-10mm, with small iron stone nodules	5%	5
3	2	1	3	200	220	10YR4/4	High	Clay	Glass, brick, grass roots, plastic	Orange Brown clay with orange and red clay inclusion ranging from 2-10mm, with small iron stone nodules	5%	5
3	2	2	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark brown silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	30%	5
3	2	2	2	100	200	10YR4/6	High	Silty Clay	Glass, brick, grass roots, plastic	Strong brown silty clay to red Brown clay with orange and red clay inclusion ranging from 2-10mm, with small iron stone nodules	30%	5
3	2	2	3	200	270	10YR4/6	High	Clay	Glass, brick, grass roots, plastic	Red Brown clay with orange and red clay inclusion ranging from 2-10mm, with small iron stone nodules	30%	5
3	2	3	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown silty clay, with orange and red clay and charcoal inclusions ranging from 2-20mm	30%	5
3	2	3	2	100	200	7.5YR3/2	High	Silty Clay	Glass, brick, grass roots, plastic	Dark brown silty clay, with orange and red clay and charcoal inclusion ranging from 2-20mm	40%	5
3	2	3	3	200	300	10YR4/6	High	Silty Clay	Glass, brick, grass roots, plastic	Strong brown clay, to red Brown clay with orange and red clay inclusion ranging from 2-20mm, with small iron stone nodules	40%	5
3	2	3	4	308	340	10YR4/6	High	Clay	Glass, brick, grass roots, plastic	Red Brown clay with orange and red clay inclusion ranging from 2mm, with small iron stone nodules	40%	5
3	3	1	1	0	100	7.5YR3/2	High	Clayey Loam	Glass, brick, grass root, cow plugged topsoil	Dark brown clayey loam, with orange and red clay and charcoal inclusions ranging from 2-10mm	10%	5
3	3	1	2	100	200	10YR4/6	High	Loamy Clay	Glass, brick, grass roots, plastic	Strong brown loamy clay to red Brown clay with orange and red clay inclusion ranging from 2-40mm	40%	5
3	3	1	3	200	240	10YR4/6	High	Silty Clay	Glass, brick, grass roots, plastic	Red Brown clay with orange and red clay inclusion ranging from 2-40mm	40%	5
3	3	2	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	5%	5
3	3	2	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, grass roots, plastic	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules	10%	5
3	3	2	3	200	270	10YR4/4	High	Clay	Glass, brick, grass roots, plastic	Yellowish brown silty clay finishing on orange Brown clay with orange and red clay inclusion ranging from 2-10mm, with small iron stone nodules	5%	5
3	3	3	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass roots, cow plugged topsoil, and a 10 cm in diameter poly pipe	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	20%	5
3	3	3	2	100	200	10YR4/6	High	Silty Clay	Glass, brick, grass roots, plastic and a 10 cm in diameter poly pipe.	Strong brown silty clay with orange and red clay inclusion ranging from 2-10mm	30%	5
3	3	3	3	200	260	10YR4/6	High	Silty Clay	Glass, brick, grass roots, plastic	Strong Brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-10mm	40%	5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	3	4	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	10%	5
3	3	4	2	100	200	10YR4/6	High	Silty Clay	Glass, brick, grass roots, plastic	Strong brown silty clay with orange and red clay inclusion ranging from 2-5mm, plastic in southern wall	10%	5
3	3	4	3	200	250	10YR4/6	High	Silty Clay	Previously ploughed to 300mm	Strong Brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-10mm.	5%	5
3	3	5	1	0	80	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	3	5	2	80	230	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	3	6	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing.	25%	5
3	3	6	2	100	200	10YR4/6	High	Silty Clay	Glass, brick, plastic, grass roots	Strong brown silty clay with orange and red clay inclusion ranging from 2-5mm, highly disturbed from ploughing.	20%	5
3	3	6	3	200	300	10YR4/6	High	Silty Clay	Previously ploughed to 300mm	Strong Brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-10mm.	25%	5
3	3	6	4	300	400	10YR4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown silty clay with orange and red clay inclusion ranging from 2-10mm, change from disturbed ploughed soils to natural.	10%	5
3	3	6	5	400	500	10YR4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown silty clay with orange and red clay inclusion ranging from 2-5mm.	10%	5
3	3	6	6	500	550	10YR4/2	High	Silty Clay	Tree root, previously ploughed to 300mm	Dark greyish brown silty clay with orange and red clay inclusion ranging from 2-5mm, ending on clay with tree root at base of test pit.	10%	5
3	3	8	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass roots, cement, cow plugged topsoil	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing.	15%	5
3	3	8	2	100	200	10YR4/6	High	Silty Clay	Glass, brick, plastic, grass roots	Strong brown silty clay with orange and red clay inclusion ranging from 2-5mm, highly disturbed from ploughing.	10%	5
3	3	8	3	200	300	10YR4/6	High	Silty Clay	Previously ploughed to 300mm	Strong Brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, disturbed from ploughing.	15%	5
3	3	8	4	300	400	10YR4/6	High	Silty Clay	Previously ploughed to 300mm	Strong Brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, disturbed from ploughing, wood in western wall at base of spit 4 towards south western corner, ending on clay with orange clay and charcoal inclusions.	15%	5
3	3	10	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass roots, cow plugged topsoil	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing.	15%	5
3	3	10	2	100	200	10YR 5/3	High	Silty Clay	Glass, brick, plastic, grass roots	Brown silty clay with orange and red clay inclusion ranging from 1-2mm.	2%	5
3	3	10	3	200	300	10YR 5/3	High	Silty Clay	Grass roots	Brown silty clay with orange and red clay, and charcoal inclusion ranging from 1-2mm.	2%	5
3	3	10	4	300	400	10YR 5/3	High	Silty Clay		Brown silty clay with orange and red clay, and charcoal inclusion ranging from 1-2mm, ending on clay with dark yellow and orange mottles.	2%	5
3	4	2	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	5%	5
3	4	2	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, plastic, grass roots	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules.	10%	5

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3	4	2	3	200	270	10YR4/6	High	Silty Clay	Glass, brick, plastic, grass roots	Brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-10mm, finishing on orange brown clay	15%	5
3	4	3	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	5%	5
3	4	3	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, plastic, grass roots	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules.	10%	5
3	4	3	3	200	280	10YR4/6	High	Silty Clay	Glass, brick, plastic, grass roots	Brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-10mm, finishing on orange brown clay	15%	5
3	4	4	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	5%	5
3	4	4	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, plastic, grass roots	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules.	10%	5
3	4	4	3	200	280	10YR4/6	High	Silty Clay	Glass, brick, plastic, grass roots	Brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-10mm, finishing on orange brown clay	15%	5
3	4	5	1	0	120	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	4	5	2	120	210	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	4	5	3	210	320	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	4	6	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing.	20%	5
3	4	6	2	100	200	7.5YR 3/2	High	Silty Clay	Glass, brick, plastic, grass roots	Dark brown silty clay with orange and red clay inclusion ranging from 2-5mm, highly disturbed from ploughing, clear definition between disturbed layers and natural.	20%	5
3	4	6	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, top 50mm of spit 3 is disturbed like spit 1 and 2.	15%	5
3	4	6	4	300	380	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay, very uneven clay base.	5%	5
3	4	8	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing, very clear distinction from disturbed layer to natural.	20%	5
3	4	8	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	10%	5
3	4	8	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	10%	5
3	4	8	4	300	360	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay, uneven clay base.	5%	5
3	4	9	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay inclusions ranging from 2-5mm, disturbed from ploughing.	20%	5

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3	4	9	2	100	200	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay inclusions ranging from 2-5mm, disturbed from ploughing, very clear distinction from disturbed layer to spit underneath.	20%	5
3	4	9	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	4	9	4	300	400	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay.	5%	5
3	4	10	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing.	20%	5
3	4	10	2	100	200	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing, very clear distinction from disturbed layer to spit underneath.	20%	5
3	4	10	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	4	10	4	300	400	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay.	5%	5
3	5	2	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	5%	5
3	5	2	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, plastic, grass roots	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules, ending on clay.	10%	5
3	5	3	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	2%	5
3	5	3	2	100	170	10YR4/4	High	Silty Clay	Glass, brick, plastic, grass roots	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules.	5%	5
3	5	4	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, plastic, grass roots	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm	5%	5
3	5	4	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, plastic, grass roots	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules.	10%	5
3	5	4	3	200	250	10YR4/6	High	Silty Clay	Glass, brick, plastic, grass roots	Brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-10mm, finishing on orange brown clay	15%	5
3	5	5	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing.	20%	5
3	5	5	2	100	200	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing.	20%	5
3	5	5	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	5	5	4	300	350	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay with yellow mottles, very uneven clay base.	5%	5
3	5	6	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5

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3	5	6	4	300	380	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay with red mottles, very uneven clay base.	5%	5
3	5	6	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing.	20%	5
3	5	6	2	100	200	7.5YR 3/2	High	Silty Clay	Glass, brick, plastic, grass roots	Dark brown silty clay with orange and red clay inclusion ranging from 2-5mm, highly disturbed from ploughing, clear definition between disturbed layers and natural.	20%	5
3	5	8	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	5	8	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	10%	5
3	5	8	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay with dark yellow mottles.	5%	5
3	5	9	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay inclusions ranging from 2-5mm, disturbed from ploughing.	20%	5
3	5	9	2	100	200	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay inclusions ranging from 2-5mm, disturbed from ploughing, very clear distinction from this layer to spit underneath.	20%	5
3	5	9	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	5	9	4	300	400	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay at base, uneven base.	5%	5
3	5	10	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, disturbed from ploughing, very clear distinction from disturbed layer to spit underneath.	20%	5
3	5	10	2	100	200	10YR 6/4	Medium	Silty sand	Glass, brick, grass root, cow plugged topsoil	Light yellowish brown, silty sand, medium compaction, with orange and red clay and charcoal inclusions ranging from 1-2mm, glass and brick.	10%	5
3	5	10	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	5	10	4	300	400	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	5	10	5	400	480	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay, uneven base.	5%	5
3	6	2	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, clay content increase towards base of spit.	5%	5
3	6	2	2	100	190	10YR4/4	High	Silty Clay	Glass, grass roots	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules, increse in clay content through out spit to end on clay with orange mottles.	10%	5

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3	6	3	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, piece of plastic tubing/irrigation in northern wall.	5%	5
3	6	3	2	100	170	10YR4/4	High	Silty Clay	Glass, grass roots	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules, ending on clay with orange mottles.	10%	5
3	6	4	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm.	5%	5
3	6	4	2	100	200	10YR4/4	High	Silty Clay	Glass, grass roots	Yellowish brown silty clay to orange Brown clay with orange and red clay inclusion ranging from 2-5mm, with small iron stone nodules, ending on clay with orange mottles.	10%	5
3	6	5	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm.	15%	5
3	6	5	2	100	200	10YR4/4	High	Silty Clay	Glass, grass roots	Dark yellowish brown silty clay to orange Brown clay with dried orange and red clay inclusions ranging from 2-5mm.	5%	5
3	6	5	3	300	330	10YR4/4	High	Silty Clay	Glass, grass roots	Dark yellowish brown silty clay to orange Brown clay with dried orange and red clay inclusions ranging from 2-5mm, ending on clay with dark yellow mottles.	5%	5
3	6	6	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm,.	15%	5
3	6	6	2	100	230	10YR4/4	High	Silty Clay	Glass, grass roots	Dark yellowish brown silty clay to orange Brown clay with dried orange and red clay inclusions ranging from 2-5mm, ending on clay with dark yellow mottles.	5%	5
3	6	8	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 2-5mm, plant root in northern wall in spit 1.	5%	5
3	6	8	2	100	200	10YR4/4	High	Silty Clay	glass, grass roots	Yellowish brown silty clay to orange Brown clay with dried orange and red clay inclusions ranging from 2-5mm, ending on clay with red and orange mottles.	5%	5
3	6	9	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay inclusions ranging from 2-5mm, disturbed from ploughing, very clear distinction from disturbed layer to spit underneath.	20%	5
3	6	9	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	6	9	3	200	280	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay, uneven base.	5%	5
3	6	10	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark brown clayey silt to silty clay, with orange and red clay inclusions ranging from 2-5mm, disturbed from ploughing, very clear distinction from disturbed layer to spit underneath.	20%	5
3	6	10	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	6	10	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil, cement	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay, uneven base.	5%	5
3	6A	1	1	0	70	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	6A	1	2	70	200	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	7	5.1	1	0	100	10YR 4/2	High	Loamy Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silty loam, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	7	5.1	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	10%	6
3	7	5.1	3	200	260	10YR 4/2	High	Silty Clay		Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	2%	6
3	7	3	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silt to silty clay, with orange clay and charcoal inclusions of 2mm	5%	5
3	7	3	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Yellowish brown silty clay with orange clay and charcoal inclusion ranging from 2-5mm	20%	5
3	7	3	3	200	250	10YR4/6	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Yellow brown silty clay to orange Brown clay with orange clay inclusions ranging from 2-5mm, finishing on orange brown clay	15%	5
3	7	4	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silt to silty clay, with orange clay and charcoal inclusions of 2mm	5%	5
3	7	4	2	100	200	10YR4/4	High	Silty Clay	Grass roots	Yellowish brown silty clay with orange clay and charcoal inclusion ranging from 2-5mm, finishing on yellow Brown clay.	30%	5
3	7	5	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silt with orange clay and charcoal inclusions of 2mm	2%	5
3	7	5	2	100	200	10YR4/4	High	Silty Clay	Glass, grass roots	Yellowish brown silty clay with orange clay and charcoal inclusion ranging from 2-5mm, finishing on uneven yellow Brown clay.	30%	5
3	7	5	3	200	300	10YR4/6	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Uneven yellow brown silty clay to with orange clay and charcoal fleck inclusions measuring 2mm, finishing on orange brown clay	2%	5
3	7A	1	1	0	90	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	7A	1	2	90	220	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	8	1	1	0	100	7.5YR3/2	High	Silty Clay Loam	Plastic, grass root,s cement mix	Dark brown silty clay loam, with charcoal inclusions ranging from 2-10mm	2%	5
3	8	1	2	100	200	10YR4/6	High	Loamy Clay	Glass, brick, grass root, cow plugged topsoil	Strong brown loamy clay to dark orange Brown clay with 2mm charcoal clay inclusions	10%	5
3	8	2	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silt to silty clay, with orange clay and charcoal inclusions of 2mm	5%	5
3	8	3	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silt to silty clay, with orange clay and charcoal inclusions of 2mm	10%	5
3	8	3	2	100	200	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Yellowish brown silty clay with orange clay and charcoal inclusions measuring 2mm, finishing on orange brown clay	20%	5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	8	4	1	0	100	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silt to silty clay, with orange clay and charcoal inclusions of 2mm	5%	5
3	8	4	2	100	160	10YR4/4	High	Silty Clay	Grass roots, plastic	Yellowish brown silty clay with orange clay and charcoal inclusions measuring 2-5mm, finishing on orange brown clay	20%	5
3	8	6	1	0	100	10YR 4/2	High	Loamy Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silty loam, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	5.5
3	8	6	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	10%	6
3	8	6	3	200	300	10YR 4/2	High	Silty Clay		Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 2mm-5mm.	10%	6
3	8	6	4	300	380	10YR 4/2	High	Silty Clay	Wooden post	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 2mm-5mm. Wooden post/beam located in north east corner at base in wall, measuring 90 by 100mm, and continues into eastern wall. Ending on clay with dark yellow mottles.	10%	6
3	8	6A	1	0	100	10YR 4/2	High	Loamy Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silty loam, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	5.5
3	8	6A	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	10%	6
3	8	6A	3	200	300	10YR 4/2	High	Silty Clay		Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 2mm-5mm.	10%	6
3	8	6A	4	300	400	10YR 4/2	High	Silty Clay		Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 2mm-5mm.	10%	6
3	8	6A	5	400	500	10YR 4/2	High	Silty Clay		Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 2mm-5mm, ending on clay.	10%	6
3	8	8	1	0	100	10YR 4/2	High	Loamy Silt	Grass roots, plastic, previously ploughed to 300mm.	Dark greyish brown silty loam, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm, plastic in western wall.	5%	5.5
3	8	8	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	10%	6
3	8	8	3	200	300	10YR 4/2	High	Silty Clay		Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 2mm-5mm, ending on clay with orange mottles.	10%	6
3	8	10	1	0	100	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark brown clayey silt to silty clay, with orange and red clay inclusions ranging from 2-5mm, disturbed from ploughing.	20%	5
3	8	10	2	100	200	7.5YR3/2	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark brown clayey silt to silty clay, with orange and red clay inclusions ranging from 2-5mm, disturbed from ploughing, very clear distinction from disturbed layer to spit underneath.	20%	5
3	8	10	3	200	300	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm.	5%	5
3	8	10	4	300	400	10YR4/4	High	Silty Clay	Glass, brick, grass root, cow plugged topsoil	Dark yellow brown loamy silty to silty clay, with orange and red clay and charcoal inclusions ranging from 1-2mm, ending on clay, uneven base.	5%	5
3	9	1	1	0	100	10YR 4/2	High	Silty Loam	Grass roots, previously ploughed to 300mm.	Dark greyish brown silty loam, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5

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3	9	1	2	100	160	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	5%	6
3	9	2	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silty loam, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm, few ironstone nodules.	2%	5.5
3	9	2	2	100	210	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	5%	6
3	9	3	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	9	3	2	100	210	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	9	3A	1	0	140	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	9	3A	2	140	240	10YR 4/2	Medium	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	9	3A	3	230	320	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	9	4	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	9	4	2	100	200	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	9	4	3	200	300	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	5%	6
3	9	5	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	9	5	2	100	200	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	9	5	3	200	300	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	9	5	4	300	400	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules measuring 2-5mm.	5%	6
3	9	5	5	400	500	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown, moderatly to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, e.nding on clay with dark yellow mottles.	5%	6
3	9	6	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	10%	5.5
3	9	6	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	9	6	3	200	300	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	9	6	4	300	400	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	9	6	5	400	520	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on dark yellow clay, uneven base.	5%	6
3	9A	1	1	0	170	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	9A	1	2	170	230	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	10	1	1	0	100	10YR 4/2	High	Silty Loam	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	10%	5.5
3	10	1	2	100	180	10YR 4/2	High	Silty Clay	Tree root, previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, tree root at base of spit 2 along southern wall, uneven base, ending on clay with dark yellow mottles.	20%	6
3	10	2	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	10%	5.5
3	10	2	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules.	20%	6
3	10	2	3	200	230	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, uneven base, ending on clay with dark yellow mottles.	10%	6
3	10	3	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	10%	5.5
3	10	3	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	10	3	3	200	320	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on dark yellow clay with orange mottles.	5%	6
3	10	4	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	10%	5.5
3	10	4	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	10	4	3	200	320	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with orange mottles, uneven base.	5%	6
3	10	5	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	10%	5.5
3	10	5	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	10	5	3	200	300	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	10	5	4	300	400	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	5%	6

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3	10	6	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	10%	5.5
3	10	6	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	10	6	3	200	300	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	10	6	4	300	400	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	10	6	5	400	500	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, increase in clay content towards base of spit, ending on dark yellow clay, uneven base.	5%	6
3	11	1	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	11	1	2	100	200	10YR 4/2	High	Silty Clay	Previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	11	1	3	200	250	10YR 4/2	High	Silty Clay	Tree root, previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, tree root at base of test pit, uneven base, ending on clay with dark yellow mottles.	10%	6
3	11	2	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	11	2	3	200	240	10YR 4/2	High	Silty Clay	Peviously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	10%	6
3	11	4	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	11	4	2	100	200	10YR 4/2	Medium	Silty Clay	Plastic, artefact, previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, artefacts was located in center of northern wall of spit 2, and became dislodged after recording.	10%	6
3	11	4	3	200	300	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on dark yellow clay with charcoal inclusions and ironstone nodules in base of test pit.	10%	6
3	11	5	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with small amount of dried orange clay inclusions 1-2mm.	2%	5.5
3	11	5	2	100	200	10YR 4/2	Medium	Silty Clay	Plastic, previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	10%	6
3	11	5	3	200	300	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on dark yellow clay with charcoal inclusions in base of test pit.	10%	6
3	11	6	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with small amount of dried orange clay inclusions 1-2mm.	2%	5.5
3	11	6	2	100	200	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6

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3	11	6	3	200	300	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	5%	6
3	12	2	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	5.5
3	12	2	2	100	200	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	12	2	3	200	240	10YR 4/2	High	Silty Clay	Grass root, previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	10%	6
3	12	3	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	12	3	2	100	200	10YR 5/3	High	Silty Clay	Grass roots, previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	12	3	3	200	300	10YR 5/3	High	Silty Clay	Grass root, previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, some ironstone nodules.	10%	6
3	12	3	4	300	320	10YR 5/3	High	Silty Clay	Grass root, previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	10%	6
3	12	4	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	12	4	2	100	200	10YR 5/3	High	Silty Clay	Grass roots, previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	10%	6
3	12	4	3	200	300	10YR 5/3	High	Silty Clay	Grass root, previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 2mm-5mm, some ironstone nodules.	10%	6
3	12	4	4	300	400	10YR 5/3	High	Silty Clay	Grass root, previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	5%	6
3	12	5	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	12	5	2	100	200	10YR 5/3	High	Silty Clay	Grass roots, previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	15%	6
3	12	5	3	200	280	10YR 5/3	High	Silty Clay	Grass root, previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 2mm-5mm, some ironstone nodules, plastic in north eastern corner of northern wall, uneven base, ending on clay with dark yellow mottles	20%	6
3	12	6	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	5.5
3	12	6	2	100	200	10YR 4/2	Medium	Silty Clay	Plastic, previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules 2-5mm, plastic rope in eastern wall.	10%	6
3	12	6	3	200	250	10YR 4/2	Medium	Silty Clay	Previously ploughed to 300mm	Dark greyish brown moderately compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules 2-5mm, ending on clay with ironstone nodules in base of test pit.	10%	6

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	12	7	1	0	140	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	12	7	2	140	310	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	6
3	13	1	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	13	1	2	100	200	10YR 4/2	High	Silty Clay	Grass roots, tree root previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange, yellow, and red clay inclusions of 5mm-10mm, and charcoal of 1-5mm. Tree root in northern wall.	5%	6
3	13	1	3	200	300	10YR 5/4	High	Silty sand	Previously ploughed to 300mm	Yellowish brown highly compacted silty sand with dried orange clay and charcoal inclusions of 1mm-2mm	2%	6
3	13	1	4	300	400	10YR 5/4	High	Silty sand	Previously ploughed to 300mm	Yellowish brown highly compacted silty sand with dried orange clay and charcoal inclusions of 1mm-2mm. Occasional ironstonenldule of 2-5mm.	2%	6
3	13	1	5	400	500	10YR 5/4	High	Silty sand	Previously ploughed to 300mm	Yellowish brown highly compacted silty sand with dried orange clay and charcoal inclusions of 1mm-2mm. Occasional ironstone nodule of 2-5mm.	2%	6
3	13	1	6	500	600	10YR 5/8	High	Silty sand	Previously ploughed to 300mm	Yellowish brown highly compacted silty sand with dried orange clay and charcoal inclusions of 1mm-2mm. Cluster of ironstone nodules along southern wall in south eastern corner of 5-10mm.	2%	6
3	13	1	7	600	700	10YR 5/8	High	Silty Sandy Clay	Previously ploughed to 300mm	Yellowish brown highly compacted silty sand with dried orange clay and charcoal inclusions of 1mm-2mm. Increase in clay content towards base of spit.	2%	6
3	13	1	8	700	760	10YR 5/8	High	Silty Sandy Clay	Previously ploughed to 300mm	Yellowish brown highly compacted silty sandy clay with dried orange clay and charcoal inclusions of 1mm-2mm, uneven base, ending on dark yellow clay with orange mottles.	2%	6
3	13	2	1	0	100	10YR 4/2	High	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	5.5
3	13	2	2	100	200	10YR 4/2	High	Silty Clay	Grass roots, previously ploughed to 300mm	Dark greyish brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	13	2	3	200	300	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules	10%	6
3	13	2	4	300	400	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	13	2	5	400	500	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ending on clay with dark yellow mottles.	5%	6
3	13	3	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	13	3	2	100	200	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm	Dark greyish brown moderately compacted silt with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules towards base of spit.	5%	6
3	13	3	3	200	300	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, increase in ironstone nodules	10%	6
3	13	3	4	300	400	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, ironstone nodules 2-	5%	6

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
										5mm, ending on clay with dark yellow mottles with few ironstone nodules in base of test pit.		
3	13	4	1	0	100	10YR 4/2	High	Silt	Grass roots, plastic, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm, plastic in northern wall.	2%	5.5
3	13	4	2	100	200	10YR 5/3	High	Silty Clay	Grass roots, previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules.	5%	6
3	13	4	3	200	300	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules, ending on clay with dark yellow mottles and ironstone nodules in base measuring 1-2mm.	5%	6
3	13	5	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	13	5	2	100	210	10YR 5/3	High	Silty Clay	Grass roots, previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules, plastic in western wall, ending on clay with dark yellow mottles and ironstone nodules in base measuring 2-5mm.	10%	6
3	14	3	1	0	100	10YR 4/2	Medium	Silt	Grass roots, plastic, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	14	3	2	100	200	10YR 5/3	High	Silty Clay	Grass roots, plastic, previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, plastic in northern wall.	5%	6
3	14	3	3	200	300	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules.	15%	6
3	14	3	4	300	340	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, few ironstone nodules, uneven base, ending on clay with dark yellow mottles.	5%	6
3	14	5	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium to high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	14	5	2	100	200	10YR 5/3	Medium	Silty Clay	Grass roots, plastic, previously ploughed to 300mm	Brown medium compacted clayey silt to silty clay with increase in dried orange clay and charcoal inclusions of 1mm-2mm towards base of spit.	5%	6
3	14	5	3	200	260	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with ironstone nodules measuring 2-5mm, ending on dark yellow clay with ironstone nodules and orange mottles.	15%	6
3	16	1	1	0	100	10YR 4/2	High	Silt	Grass roots, plastic, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm, plastic in southern wall.	2%	5.5
3	16	1	2	100	200	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with increase in dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	16	1	3	200	300	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions measuring 2-5mm.	10%	6
3	16	1	4	300	400	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal measuring 1-5mm, ending on dark yellow clay.	15%	6
3	16	3	1	0	100	10YR 4/2	High	Silt	Grass roots, cement, plastic, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm, plastic in western wall, cement located in north western corner.	2%	5.5
3	16	3	2	100	200	10YR 5/3	High	Clayey Silt	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with increase in dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6

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3	16	3	3	200	300	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with ironstone nodules measuring 2-5mm. Clay reached in north western corner at 250.	15%	6
3	16	3	4	300	400	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with ironstone nodules measuring 2-5mm. Clay reached from south western corner to north eastern corner at 300 to 350mm.	15%	6
3	16	3	5	400	500	10YR 4/6	High	Silty Clay	Animal burrow, previously ploughed to 300mm	Dark yellowish brown, highly compacted clayey silt to silty clay, clay not reached in eastern half of test pit.	15%	6
3	16	3	6	500	600	10YR 4/6	High	Silty Clay	Animal burrow, previously ploughed to 300mm	Dark yellowish brown, highly compacted clayey silt to silty clay, clay not reached in eastern half of test pit.	15%	6
3	16	3	7	600	680	10YR 4/6	High	Silty Clay	Animal burrow, previously ploughed to 300mm	Dark yellowish brown, highly compacted clayey silt to silty contending on clay at 680mm in eastern half of test pit. Animal burrow has removed existing clay and has been infilled with silty soil.	15%	6
3	16	5	1	0	100	10YR 4/2	High	Silt	Grass roots, ants, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm, plastic in eastern wall.	2%	5.5
3	16	5	2	100	200	10YR 5/3	Medium		Grass roots, ants, plastic, previously ploughed to 300mm	Brown medium compacted clayey silt to silty clay with increase in dried orange clay and charcoal inclusions of 1mm-2mm, plastic in northern wall of	5%	6
3	16	5	3	200	300	10YR 5/3	High	Silty Clay	Ants, previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with ironstone nodules measuring 2-5mm.	15%	6
3	16	5	4	300	330	10YR 5/3	High	Silty Clay	Ants, previously ploughed to 300mm	Brown medium to highly compacted clayey silt to silty clay with ironstone nodules measuring 2-5mm, ending on dark yellow clay with ironstone nodules and orange mottles.	15%	6
3	16	7	1	0	100	10YR 4/2	High	Silt	Grass roots, ants, previously ploughed to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	16	7	2	100	200	10YR 5/3	Medium	Silty Clay	Grass roots, ants, plastic, previously ploughed to 300mm	Brown medium compacted clayey silt to silty clay with increase in dried orange clay and charcoal inclusions of 1mm-2mm.	5%	6
3	16	7	3	200	230	10YR 5/3	High	Silty Clay	Ants, previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with ironstone nodules measuring 2-5mm, some ironstone nodules towards base of spit, ants burrow at base of test pit in north western corner, ending on dark yellow clay.	15%	6
3	17	8	1	0	100	10YR 4/3	High	Silt	Grass roots, ants, previously ploughedl to 300mm.	Dark greyish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	17	8	3	200	300	10YR 3/6	High	Silty Clay	Ants, previously ploughed to 300mm	Yellowish brown highly compacted silty clay with ironstone nodules measuring 2-5mm	15%	6
3	17	8	4	300	400	10YR 3/6	High	Clay		Test pit ends on clay at 400mm.	15%	6
3	17	10	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silty sand	0%	6
3	17	10	2	100	200	7.5YR 4/4	High	Silty sand		Silty sandy spit with high compaction	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	17	10	3	200	300	7.5YR 4/4	Medium	Silty sand		Transitions to silty clay	10% some small charcoal and	6.5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
											ironstone fragments 1-5 mm	
3	17	10	4	300	400	7.5YR 4/6	Medium	Silty Clay		Silty clay with medium compaction	0%	6.5
3	17	10	5	400	500	5YR 4/6	High	Silty Clay		Silty clay with high compaction	0%	6.5
3	17	10	6	500	600	5YR 4/6	High	Clay		Test pit ends on clay at 600mm.	0%	6.5
3	17	12	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silt	0%	6
3	17	12	2	100	200	7.5YR 4/4	High	Silt		Silt spit with high compaction	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	17	12	3	200	300	7.5YR 4/4	Medium	Silty sand		Transitions to silty clay	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	17	12	4	300	400	7.5YR 4/6	Medium	Silty Clay		Test pit ends on silty clay with medium compaction at 400mm	0%	6.5
3	17	14	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silt	0%	6
3	17	14	2	100	200	7.5YR 4/4	High	Silt		Highly compacted silt	0%	6
3	17	14	3	200	300	7.5YR 4/4	Medium	Silt		Transitions to silty clay	15% some small charcoal and ironstone fragments 1-5 mm	6
3	17	14	4	300	400	10YR 3/6	Medium	Silty Clay		Silty clay transitions clay at base	0%	6
3	17	16	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silt	0%	6
3	17	16	2	100	200	7.5YR 4/4	High	Silt		Highly compacted silt	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	17	16	3	200	300	7.5YR 4/4	Medium	Silt		Transitions to silty clay	15% some small charcoal and ironstone fragments 1-5 mm	6
3	17	16	4	300	400	10YR 5/4	Medium	Silty Clay		Silty clay transitions to clay at base	5% decomposing ironstone fragments	6
3	17	18	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silt	0%	6

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	17	18	2	100	200	7.5YR 6/2	High	Silt		Highly compacted silt	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	17	18	3	200	300	7.5YR 4/4	Medium	Silt		Transitions to silty clay	15% some small charcoal and ironstone fragments 1-5 mm	6
3	17	18	4	300	400	10YR 5/4	Medium	Silty Clay		Silty clay	5% decomposing ironstone fragments	6
3	17	20	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silt	0%	6
3	17	20	2	100	200	7.5YR 6/2	High	Silt		Highly compacted silt	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	17	20	3	200	300	7.5YR 4/4	Medium	Silty Clay		Silt transitions to silty clay	15% some small charcoal and ironstone fragments 1-5 mm	6
3	17	22	1	0	100	7.5YR 4/3	Medium	Silt	Grass roots	Moderatly compacted silt	0%	5.5
3	17	22	2	100	200	7.5YR 4/3	High	Silt		Dark yellowish brown highly compacted silt	5%	6
3	17	22	3	200	300	7.5YR 4/3	High	Silt		Dark yellowish brown highly compacted silt	10% ironstone inclusions 1-2 5mm increasing size with depth	6
3	17	22	4	300	400	7.5YR 4/3	High	Silt		Dark yellowish brown highly compacted silt	15% ironstone inclusions	6
3	17	22	5	400	500	7.5YR 4/3	High	Silt		Dark yellowish brown highly compacted silt	15% ironstone inclusions increasing in size 2-5 mm	6
3	17	22	6	500	600	10YR 5/6	High	Silty Clay		Dark yellowish brown highly compacted silt	10% iron stone fragments 1-5 mm	6
3	17	22	7	600	700	10YR 5/6	High	Silty Clay		Dark yellowish brown highly compacted silt	10% iron stone	6

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
											fragments 1-5 mm	
3	17	22	8	700	800	10YR 4/6	High	Silty Clay		Test pit ends on highly compacted silty clay	1% ironstone	6
3	18	1	1	0	100	7.5YR 3/3	Medium	Loamy Silt	Grass roots, previously ploughed to 300mm.	Dark brown loamy silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5
3	18	1	2	100	200	10YR 3/6	High	Silty sand	Previously ploughed to 300mm	Dark yellowish brown highly compacted silty sand with dried orange and red clay and charcoal inclusions of 1mm-2mm.	5%	6
3	18	1	3	200	300	7.5YR 4/6	High	Silty sand	Previously ploughed to 300mm	Strong brown highly compacted silty sand with dried orange and red clay and charcoal inclusions of 1mm-2mm.	5%	6
3	18	1	4	300	400	7.5YR 4/6	High	Silty sand	Previously ploughed to 300mm	Strong brown highly compacted silty sand with dried orange and red clay and charcoal inclusions of 1mm-2mm.	5%	6
3	18	1	5	400	500	7.5YR 4/6	High	Silty sand	Previously ploughed to 300mm	Strong brown highly compacted silty sand with dried orange and red clay and charcoal inclusions of 1mm-2mm.	5%	6
3	18	1	6	500	600	5YR 4/6	High	Silty Clay	Previously ploughed to 300mm	Yellowish red highly compacted silty sand with dried orange and red clay and charcoal inclusions of 1mm-2mm, ending on red clay.	2%	6
3	18	3	1	0	100	10YR 4/4	High	Silt	Grass roots, plastic, previously ploughed to 300mm.	Dark yellowish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	18	3	2	100	200	10YR 4/4	High	Silt	Previously ploughed to 300mm.	Dark yellowish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	18	3	3	200	300	10YR 4/4	High	Silt	Previously ploughed to 300mm.	Dark yellowish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	18	3	4	300	400	10YR 4/4	High	Silt	Previously ploughed to 300mm.	Dark yellowish brown silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	18	3	5	400	500	7.5YR 4/6	High	Sandy Silt	Previously ploughed to 300mm.	Strong brown sandy silt, high compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	18	3	6	500	600	7.5YR 4/6	Medium	Sandy Silt	Previously ploughed to 300mm.	Strong brown sandy silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	18	3	7	600	700	7.5YR 4/6	High	Sandy Silt	Previously ploughed to 300mm.	Strong brown sandy silt, increase in sand content, band of charcoal inclusions at 700mm across eastern wall that extends to half way, and north eastern corner, medium to low compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	30%	5.5
3	18	3	8	700	800	7.5YR 4/6	Medium	Sandy Silt	Previously ploughed to 300mm.	Strong brown sandy silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	5.5
3	18	3	9	800	900	7.5YR 4/6	Medium	Sandy Silt	Previously ploughed to 300mm.	Strong brown sandy silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm.	5%	5.5
3	18	3	10	900	970	7.5YR 4/6	Medium	Sandy Silt	Previously ploughed to 300mm.	Strong brown sandy silt, medium compaction, with small amount of dried orange clay and charcoal inclusions 1-2mm, test pit finished at 970mm as no artefacts were recovered after spit 7.	5%	5.5
3	18	5	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with dried orange clay and charcoal inclusions 1-2mm.	15%	5.5
3	18	5	2	100	200	10YR 5/3	High	Silt	Previously ploughed to 300mm	Brown highly compacted silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm, charcoal in eastern wall at corner of southern wall measuring 5-10mm in width.	15%	6
3	18	5	3	200	300	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with ironstone nodules, dried orange clay and charcoal inclusions of 2-5mm.	25%	6
3	18	5	4	300	400	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions measuring 1-2mm, some ironstone nodules of 2-5mm.	15%	6
3	18	5	5	400	500	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions measuring 1-2mm.	15%	6

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	18	5	6	500	600	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions measuring 1-2mm, ending on dark yellow clay.	10%	6
3	18	8	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with dried orange clay and charcoal inclusions 1-2mm.	15%	5.5
3	18	8	2	100	200	10YR 5/3	High	Silt	Previously ploughed to 300mm	Brown highly compacted silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	15%	6
3	18	8	3	200	300	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with ironstone nodules, dried orange clay and charcoal inclusions of 2-5mm.	15%	6
3	18	8	4	300	400	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions measuring 1-2mm, some ironstone nodules of 2-5mm.	5%	6
3	18	8	5	400	450	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with dried orange clay and charcoal inclusions measuring 1-2mm, ending on dark yellow clay, with some ironstone nodules in base of test pit.	2%	6
3	18	9	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction, with dried orange clay and charcoal inclusions 1-2mm.	15%	5.5
3	18	9	2	100	200	10YR 5/3	High	Silt	Previously ploughed to 300mm	Brown highly compacted silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	15%	6
3	18	9	3	200	300	10YR 5/3	High	Silty Clay	Previously ploughed to 300mm	Brown highly compacted clayey silt to silty clay with ironstone nodules, dried orange clay and charcoal inclusions of 2-5mm.	15%	6
3	18	9	4	300	400	10YR 4/4	High	Silty Clay		Highly compacted silty clay	5%	6
3	18	9	5	400	500	10YR 4/4	High	Clay		Silty clay transitions to light clay	2%	6
3	18	11	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silty sand	0%	6
3	18	11	2	100	200	7.5YR 4/4	High	Silty sand		Highly compacted silty sand	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	18	11	3	200	300	7.5YR 4/4	Medium	Silty sand		Transitions to silty clay	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	18	11	4	300	400	7.5YR 4/6	Medium	Silty Clay		Moderately compacted silty clay	0%	6.5
3	18	11	5	400	500	5YR 4/6	High	Clay		Test pit ends on highly compacted clay at 500mm	0%	6.5
3	19	10	1	0	100	10YR 4/2	Medium	Silt	Grass roots, previously ploughed to 300mm.	Dark greyish brown silt, medium compaction	5	5.5
3	19	10	2	100	200	10YR 5/3	High	Silt	Previously ploughed to 300mm	Brown highly compacted silt to silty clay with dried orange clay and charcoal inclusions of 1mm-2mm.	15%	6
3	19	12	3	200	300	5YR 4/6	High	Silty Clay		compacted silty clay	0%	5.5
3	19	10	4	300	400	10YR 4/4	High	Clay		Test pit ends on highly compacted clay at 400mm	5%	6
3	19	14	1	0	100	7.5YR 4/4	Low	Sand	Fill layer	Brown sand	0	6
3	19	14	2	100	200	10YR 5/6	Low	Sand	Fill layer	Yellow brown sand	0%	6
3	19	14	3	200	300	10YR 3/6	High	Sand		Yellow brown clay with ironstone mottles	10% ironstone	6

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
											nodules 1-2 mm	
3	19	16	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silt	0%	6
3	19	16	2	100	200	7.5YR 4/4	High	Silt		Highly compacted silt	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	19	16	3	200	300	10YR 3/6	High	Sand		Yellow brown clay with ironstone mottles on top	5% ironstone nodules 1-2 mm	6
3	19	18	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silt	0%	6
3	19	18	2	100	200	7.5YR 6/2	High	Silt		Highly compacted silt	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	19	18	3	200	300	10YR 3/6	High	Clay		Yellow brown clay	0%	6
3	19	20	1	0	100	7.5YR 3/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silt	0%	6
3	19	20	2	100	200	7.5YR 6/3	High	Silt		Highly compacted silt	10% some small charcoal and ironstone fragments 1-5 mm	6.5
3	19	20	3	200	300	10YR 3/6	High	Clay		Yellow brown clay	0%	6
3	19	24	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction	0%	5.5
3	19	24	2	100	200	10YR 4/4	High	Silt		Dark yellowish brown highly compacted silt	5%	6
3	19	24	3	200	300	10YR 4/4	High	Silt		Dark yellowish brown highly compacted silt	0%	6.6
3	19	24	4	300	400	10YR 4/4	High	Silt		Dark yellowish brown highly compacted silt	5%	6.5
3	19	24	5	400	500	5YR 4/6	High	Silty sand		Yellowish red silty sand	0%	6.5
3	19	24	6	500	600	5YR 4/6	High	Silty sand		Yellowish red silty sand	0%	6.5
3	19	24	7	600	700	5YR 4/6	High	Silty Clay		Yellowish red silty clay	0%	7
3	19	24	8	700	800	5YR 4/6	High	Clay		Yellowish red silty clay	0%	7
3	19	26	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, dried orange clay and charcoal inclusions 1-2mm.	1%	5.5
3	19	26	2	100	200	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt, few charcoal inclusions 1-2mm.	2%	5.5
3	19	26	3	200	300	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt, few dried orange clay and charcoal inclusions 1-2mm, and few ironstone inclusions 1-2mm.	2%	5.5
3	19	26	4	300	400	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt, few dried orange clay and charcoal inclusions 1-2mm, and few ironstone inclusions 2-5mm.	5%	5.5
3	19	26	5	400	500	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt, few dried orange clay and charcoal inclusions 1-2mm, and few ironstone inclusions 2-5mm.	10%	5.5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	19	26	6	500	600	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt, few dried orange clay and charcoal inclusions 1-2mm, and ironstone nodules 2-5mm.	15%	5.5
3	19	26	7	600	700	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt to silty clay, few dried orange clay and charcoal inclusions 1-2mm, and ironstone nodules 2-5mm, ending on clay with ironstone nodules in base of test pit.	20%	5.5
3	19	28	1	0	100	7.5YR 5/4	Medium	Silt	Mulberry/blackberry roots	Brown, medium to high compaction.	0%	5.5
3	19	28	2	100	200	7.5YR 5/4	High	Silt	Mulberry/blackberry roots	Brown, highly compacted silt.	2%	5.5
3	19	28	3	200	300	7.5YR 5/4	High	Silt		Brown, highly compacted silt, dried orange clay and charcoal inclusions 1-2mm.	15%	5.5
3	19	28	4	300	400	7.5YR 5/8	Medium	Silty sand		Strong brown, moderately compacted silty sand, few dried orange clay and charcoal inclusions 1-2mm, and few ironstone inclusions 1-2mm.	2%	5.5
3	19	28	5	400	500	7.5YR 5/8	Medium	Silty sand		Strong brown, moderately compacted silty sand, few dried orange clay and charcoal inclusions 1-2mm, and few ironstone inclusions 1-2mm.	2%	5.5
3	19	28	6	500	600	7.5YR 5/8	Medium	Silty sand		Strong brown, moderately compacted silty sand, few dried orange clay and charcoal inclusions 1-2mm, and few ironstone inclusions 1-2mm.	2%	5.5
3	19	28	7	600	700	7.5YR 5/8	Medium	Silty sand		Strong brown, moderately compacted silty sand to silty clay, few dried orange clay and charcoal inclusions 1-2mm, and few ironstone inclusions 1-2mm, ending on clay.	2%	5.5
3	19	30	1	0	100	7.5YR 5/4	Medium	Silt	Mulberry/blackberry roots	Brown, medium to high compaction.	0%	5.5
3	19	30	2	100	200	7.5YR 5/4	High	Silt	Mulberry/blackberry roots	Brown, highly compacted silt, mulberry/blackberry roots, some dried orange clay inclusions 1-2mm.	2%	5.5
3	19	30	3	200	300	7.5YR 5/4	High	Silt		Brown, highly compacted silt, dried orange clay and charcoal inclusions 1-2mm.	5%	5.5
3	19	30	4	300	400	7.5YR 5/4	High	Silt		Brown, highly compacted silt, few dried orange clay and charcoal inclusions 1-2mm, and few ironstone inclusions 2-5mm.	5%	5.5
3	19	30	5	400	500	7.5YR 5/4	High	Silt		Brown, highly compacted silt, few dried orange clay and charcoal inclusions 1-2mm, and few ironstone inclusions 2-5mm.	15%	5.5
3	19	30	6	500	600	10YR 5/6	High	Silt		Yellowish brown, highly compacted silt, few dried orange clay and charcoal inclusions 1-2mm, and ironstone nodules 2-5mm, ending on clay with ironstone nodules in base of test pit.	15%	5.5
3	20	2	1	0	100	10YR 4/4	Medium	Silty Loam	Grass roots, soil mixing from ploughing	Dark yellowish brown silty loam transitions to silty sand	2%	7
3	20	2	2	100	200	10YR 5/3	High	Silty sand	Soil mixed	Brown highly compacted silty sand	5%	7
3	20	1	3	200	300	7.5YR 4/6	High	Silty sand		Strong brown highly compacted	5%	6.5
3	20	2	4	300	400	7.5YR 4/6	High	Silty sand		Strong brown highly compacted silty sand transitioning to silty clay	5%	6.5
3	20	2	5	400	500	7.5YR 4/6	High	Clay		Test pit ends on highly compacted clay at 500mm	2%	6.5
3	20	4	1	0	100	10YR 4/4	Medium	Loamy Clay	Grass roots, soil mixing from ploughing	Loamy clay topsoil, lots of grass roots	2%	7
3	20	4	2	100	200	7.5YR 4/6	Medium	Clay	Ploughed	Redeposited clay from ploughing, white and red mottling of clay	2%	6.5
3	20	4	3	200	300	7.5YR 4/6	High	Silty sand		Clay transitions to silty sand	5%	6.5

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3	20	4	4	300	400	7.5YR 4/6	High	Silty sand		Strong brown highly compacted silty sand transitioning to silty clay	5%	6.5
3	20	4	5	400	500	7.5YR 4/6	High	Silty Clay		Silty sand transitions to silty clay	2%	6.5
3	20	4	6	500	600	7.5YR 4/3	High	Clay		Test pit ends on highly compacted clay at 600mm	0%	6.5
3	20	6	1	0	100	10YR 4/4	Medium	Loamy Clay	Grass roots, clay contains road base and gravel	Loamy clay topsoil transitioms to redeposited clay at 20 mm	2%	6
3	20	6	2	100	200	7.5YR 4/6	Medium	Clay	Redeposited red clay with ironstome and building rubble present	Moderatly compacted loamy clay to clay with disturbances of building rubble	30%, ironstone rocks 2-100 mm, road base	6
3	20	6	3	200	300	7.5YR 4/6	High	Silty sand		Clay transitions to silty sand	5%	6.5
3	20	6	4	300	400	7.5YR 4/6	High	Clay		Highly compacted clay	5%	6.5
3	20	6	6	500	600	7.5YR 4/3	High	Clay		Highly compacted clay	0%	6.5
3	20	6	7	600	700	7.5YR 4/3	High	Clay	Wire, sandstone rocks at base	Piece of wire in spit, fill layer	0%	6.5
3	20	8	1	0	100	7.5YR 4/3	Medium	Clay	Grass roots	Moderately compacted clay with roots	mottled white and orange clays	6
3	20	8	2	100	200	5YR 3/4	High	Clay	Redeposited clay with some road base gravel	Highly compacted clay with disturbance of roadbase gravel	5% gravel	6
3	20	8	3	200	300	7.5YR 4/6	High	Silty Clay		Clay transitions to silty clay	0%	6.5
3	20	8	4	300	400	7.5YR 4/6	High	Silty Clay		Highly compacted silty clay	0%	6.5
3	20	8	5	500	600	7.5YR 4/3	High	Clay		Test pit ends on highly compacted silty clay	0%	6.5
3	20	10	1	0	100	7.5YR 4/4	Low	Silty Loam	Grass roots	Brown silty loam transitions to silty sand	0%	6.5
3	20	10	2	100	200	7.5R 4/4	High	Silty sand		Brown highly compacted silty sand	0%	6.5
3	20	10	4	300	400	7.5YR 4/4	High	Silty sand		Brown very compacted silty sand	0%	6
3	20	10	5	400	500	7.5YR 4/4	High	Silty sand		Highly compacted silty sand	0%	6
3	20	10	6	500	600	7.5YR 4/3	High	Silty sand		Brown silty sand with high compaction	0%	6
3	20	10	7	600	700	7.5YR 5/6	High	Silty Clay		Silty sand transitions to silty clay, ending on clay at 700mm	0%	6
3	20	12	1	0	100	7.5YR 5/3	Low	Silty Loam	Grass roots	Brown silty loam transitions to silty sand, with grass roots	0%	6
3	20	12	2	100	200	10YR 5/3	High	Silt		Highly compacted silt	0%	6.5
3	20	12	3	200	300	7.5YR 4/4	High	Silty Clay		Silt transitions to silty clay	0%	6.5
3	21	1	1	0	100	7.5YR 4/4	Medium	Loamy Silt	Grass roots	Dark brown loamy silt, medium compaction	2%	7
3	21	1	2	100	200	7.R 4/4	High	Silty sand		Dark yellowish brown highly compacted silty sand	5%	6.5
3	21	1	3	200	300	7.5YR 4/4	High	Silty sand		Strong brown highly compacted silty sand	5%	6.5
3	21	2	1	0	100	10YR 4/4	Medium	Silty Loam	Grass roots	Dark yellowish brown silty loam transitions to silty sand	2%	7
3	21	2	8	700	800	10YR 5/3	High	Clay	Grass roots	Silty clay with ironstone inclusions, ending on clay at 800mm	10%	7

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	21	11	1	0	100	7.5YR 4/4	Medium	Silty Loam	Grass roots	Silty loam that transitions to silt with medium compaction	0%	5
3	21	11	2	100	200	7.5YR 4/4	High	Silt		Highly compacted silt	0%	6
3	21	11	3	200	300	7.5YR 4/4	High	Silt		Highly compacted brown silt	0%	6.5
3	21	11	4	300	400	5YR 3/4	High	Silty Clay		Dark reddish brown silty clay with high compaction	0%	6.5
3	21	11	5	400	500	5YR 4/4	High	Silty Clay		Brown reddish, highly compacted silty clay	0%	6
3	21	11	6	500	600	7.5YR 4/3	High	Silty Clay		Reddish brown silty clay, high compaction	0%	6
3	21	11	7	600	700	5YR 4/4	High	Silty Clay		Highly compacted silty sand transitions to silty clay, with test pit ending on clay at 700mm	0%	6
3	21	13	2	100	200	7.5YR 4/4	High	Silt		Highly compacted silt	0%	6.5
3	21	13	3	200	300	7.5YR 4/4	High	Silt		Brown silt, with high compaction	0%	6.5
3	21	13	4	300	400	5YR 4/6	High	Silt		Brown silt transitions to silty clay, with test pit ending on clay at 400mm	0%	6.5
3	21	15	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction, with disturbance from grass roots	0%	6.5
3	21	15	2	100	200	7.5R 4/3	High	Silt		Dark yellowish brown highly compacted silty sand	5%	6.5
3	21	15	3	200	300	7.5YR 4/4	High	Silt		Highly compacted brown silt	0%	6.5
3	21	15	4	300	400	5YR 3/4	High	Silty Clay		Dark reddish brown silty clay transitions to clay, ending on clay at 400mm	0%	6.5
3	21	18	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction, with disturbance from grass roots	0%	6.5
3	21	18	2	100	200	7.5R 4/3	High	Silt		Dark yellowish brown highly compacted silty sand	5%	6.5
3	21	18	3	200	300	7.5YR 4/4	High	Silt		Highly compacted brown silt	0%	6.5
3	21	18	4	300	400	5YR 3/4	High	Silty Clay		Dark reddish brown silty clay transitions to clay	0%	6.5
3	21	20	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction	0%	6.5
3	21	20	2	100	200	7.5R 6/2	High	Silt		Dark yellowish brown highly compacted silty sand	5%	6.5
3	21	20	3	200	300	5YR 3/4	High	Silty Clay		Dark reddish brown silty clay transitions to clay	0%	6.5
3	21	22	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Moderately compacted silt	0%	5.5
3	21	22	2	100	200	7.5YR 5/4	High	Silt	Grass roots	1% iron stone nodules 1-2 mm	0%	5.5
3	21	22	3	200	300	7.5YR 5/4	High	Silt		1% iron stone nodules 1-2 mm	0%	5.5
3	21	22	4	300	400	5YR 4/6	High	Silty sand		1% iron stone nodules and charcoal 1-2 mm	0%	6
3	21	22	5	400	500	5YR 4/6	High	Silty Clay		Highly compacted silty clay	0%	6
3	21	22	6	500	600	5YR 4/6	High	Silty Clay		Highly compacted silty clay, ending on clay at 600mm	0%	6.5
3	21	24	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	21	24	2	100	200	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt, few charcoal inclusions 1-2mm.	2%	5.5
3	21	24	3	200	300	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt, few charcoal inclusions 1-2mm.	2%	5.5
3	21	24	4	300	400	5YR 4/6	Medium	Silty sand		Reddish brown, silty sand, medium compaction, no inclusions.	0%	6
3	21	24	5	400	500	5YR 4/6	High	Silty Clay		Reddish brown, medium compaction, silty sand, no inclusions	0%	6
3	21	24	6	500	540	5YR 4/6	High	Silty Clay		Reddish brown, silty sand to silty clay, medium to high compaction, no inclusions, finishing on clay.	0%	6.5
3	21	26	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, dried orange clay and charcoal inclusions 1-2mm.	2%	5.5
3	21	26	2	100	200	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt, few charcoal inclusions 1-2mm.	2%	5.5
3	21	26	3	200	300	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt, few charcoal inclusions 1-2mm.	2%	5.5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	21	26	4	300	400	5YR 4/6	Medium	Silty sand		Reddish brown, silty sand, medium to highly compaction, no inclusions.	0%	6
3	21	26	5	400	500	5YR 4/6	Medium	Silty Clay		Reddish brown, medium compaction, silty sand, no inclusions	0%	6
3	21	26	6	500	600	5YR 4/6	Medium	Silty sand		Reddish brown, silty sand to silty clay, medium compaction, no inclusions.	0%	6.5
3	21	26	7	600	640	5YR 4/6	Medium	Silty Clay		Reddish brown, silty sand to silty clay, medium compaction, no inclusions, finishing on red clay.	0%	6.5
3	21	28	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	21	28	2	100	200	7.5YR 5/4	Medium	Silt		Brown, medium compaction, silt, few charcoal inclusions 1-2mm.	2%	5.5
3	21	28	3	200	300	7.5YR 5/4	High	Silt	Grass roots	Brown, highly compacted silt, few charcoal inclusions 1-2mm.	2%	5.5
3	21	28	4	300	400	5YR 4/6	Medium	Silty sand		Reddish brown, silty sand, medium compaction, no inclusions.	0%	6
3	21	28	5	400	500	5YR 4/6	Medium	Silty sand		Reddish brown, medium compaction, silty sand, no inclusions	0%	6
3	21	28	6	500	600	5YR 4/6	Medium	Silty sand		Reddish brown, silty sand to silty clay, medium compaction, no inclusions, ending on clay.	0%	6.5
3	21	30	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	21	30	2	100	200	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium to high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 2-5mm.	5%	5.5
3	21	30	3	200	300	7.5YR 5/4	Medium	Silt		Brown, medium to high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 2-5mm.	10%	5.5
3	21	30	4	300	400	7.5YR 5/4	High	Silt		Brown, high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 2-5mm.	10%	5.5
3	21	30	5	400	500	7.5YR 5/4	High	Silt		Brown, high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 2-5mm, ending on clay with ironstone nodules at base of test pit.	10%	5.5
3	22	1	1	0	100	7.5YR 2.5/3	Low	Silty Loam	Grass roots	Very dark brown silty loam transitions to silty clay	0%	6.5
3	22	1	2	100	200	7.5R 4/3	High	Silty sand		Dark yellowish brown highly compacted silty sand	5%	6.5
3	22	1	3	200	300	7.5YR 4/3	High	Silty Clay		Strong brown highly compacted silty sand	5%	6.5
3	22	1	4	300	400	7.5YR 4/4	High	Silty Clay		Highly compacted silty clay	0%	6
3	22	1	5	400	500	7.5YR 4/3	High	Silty Clay		Highly compacted silty clay	0%	6.5
3	22	1	6	500	600	7.5YR 4/3	High	Silty Clay		Highly compacted silty clay	0%	6.5
3	22	1	7	600	700	7.5YR 4/3	High	Silty Clay		Test pit ends on highly compacted silty clay at 700mm	0%	6.5
3	22	3	1	0	100	7.5YR 4/3	Low	Silty Clay	Grass roots	Very dark brown silty loam transitions to silty clay	0%	7
3	22	1	2	100	200	7.5R 4/3	High	Silty sand		Highly compacted silty sand	5% small rocks 2-5 mm	6.5
3	22	3	3	200	300	7.5YR 4/3	High	Silty Clay		Strong brown highly compacted silty sand	5% small rocks 2-5 mm	6.5
3	22	3	4	300	400	7.5YR 4/4	High	Silty Clay		Test pit ends on highly compacted silty clay	0%	6
3	22	5	1	0	100	7.5YR 4/3	Medium	Loamy Clay	Grass roots	Loamy clay with moderate compaction	0%	6
3	22	5	2	100	200	5YR 3/4	High	Clay	Redeposited clay with some road base gravel	Highly compacted redeposited clay with some road base gravel	10% gravel	6
3	22	5	3	200	300	5YR 3/4	High	Clay	Redeposited clay with some road base gravel	Highly compacted redeposited clay with some road base gravel	10% gravel	6

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	22	5	4	300	400	5YR 3/4	High	Clay	Redeposited clay with some road base gravel	Highly compacted redeposited clay with some road base gravel	10% gravel	6
3	22	5	5	400	500	5YR 3/4	High	Clay	Fibro tile at base, redeposited clay with some road base gravel	Highly compacted redeposited clay with some road base gravel, test pit ends on clay at 500mm	10% gravel	6
3	22	7	1	0	100	7.5YR 4/3	Medium	Loamy Clay	Grass roots	Transitions to clay fill layer	0%	6
3	22	7	2	100	200	7.5YR 5/3	Medium	Clay	Redeposited clay with some road base gravel	Moderately compacted redeposited clay with some road base gravel	10% gravel	6
3	22	7	3	200	300	5YR 3/4	High	Clay	Redeposited clay transitions to brown red heavy clay	Highly compacted clay with orange and white mottles ending on clay at 300mm	10% gravel	6
3	22	9	1	0	100	7.5YR 4/4	Medium	Silty Loam	Grass roots	Transitions to silt	0%	5
3	22	9	2	100	200	7.5YR 4/4	High	Silt		Highly compacted silt	0%	6
3	22	9	3	200	300	7.5YR 4/4	High	Silt		Brown silt transitions to silty clay	0%	6.5
3	22	9	4	300	400	5YR 3/4	High	Silty Clay		Dark reddish brown silty clay transitions to clay	0%	6.5
3	22	9	5	400	500	2.5YR 4/6	High	Clay		Highly compacted red clay, test pit ends on clay at 500mm	0%	6.5
3	22	11	1	0	100	7.5YR 4/4	Medium	Silty Loam		Transitions to silt	0%	7
3	22	11	2	100	200	7.5YR 4/4	High	Silt		Highly compacted silt	0%	6.5
3	22	11	4	300	400	7.5YR 4/4	High	Silty Clay		Silt transitions to clay	0%	6.5
3	22	11	5	400	500	5YR 3/4	High	Silty Clay		Dark reddish brown silty clay transitions to end on clay at 500mm	0%	6.5
3	22	17A	1	0	100	7.5YR 4/3	Medium	Silt	Grass roots	Brown, moderately to highly compacted silt, grass roots.	0%	6.5
3	22	17A	2	100	200	7.5YR 4/3	High	Silt		Brown highly compacted silt, no inclusions	0%	6.5
3	22	17A	3	200	300	7.5YR 4/4	High	Silt		Brown, highly compacted silt, no inclusions	0%	6.5
3	22	17A	4	300	320	7.5YR 4/4	High	Silt		Brown, highly compacted silt, some dried orange and yellow clay and charcoal inclusions 1-2mm, ending on clay with yellow mottles.	2%	6.5
3	23	9	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction, with grass roots disturbance	0%	6.5
3	23	9	2	100	200	7.5R 4/3	High	Silt		Dark yellowish brown highly compacted silty sand	5%	6.5
3	23	9	3	200	300	7.5YR 4/4	High	Silt		Highly compacted brown silt	0%	6.5
3	23	9	4	300	400	5YR 3/4	High	Silty Clay		highly compacted dark reddish brown silty clay transitions to clay	0%	6.5
3	23	9	5	400	500	5YR 4/6	High	Silt		Reddish brown silt	0%	6.5
3	23	9	6	500	600	5YR 4/6	High	Silty Clay		Highly compacted reddish brown silty clay, ending on clay at 600mm	0%	6.5
3	23	10	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction	0%	6.5
3	23	10	2	100	200	7.5R 4/3	High	Silt		Dark yellowish brown highly compacted silty sand	5%	6.5
3	23	10	3	200	300	7.5YR 4/4	High	Silt		Highly compacted brown silt	0%	6.5
3	23	10	4	300	400	5YR 3/4	High	Silty Clay		Reddish brown silty clay	0%	6.5
3	23	10	5	400	500	5YR 4/6	High	Silty Clay		Reddish brown silty clay	0%	6.5
3	23	10	6	500	600	5YR 4/6	High	Silty Clay		Highly compacted reddish brown silty clay, ending on clay at 600mm	0%	6.5
3	23	12	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction	0%	6.5
3	23	12	2	100	200	7.5R 4/3	High	Silt		Dark yellowish brown highly compacted silty sand	5%	6.5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	23	12	3	200	300	7.5YR 4/4	High	Silt		Highly compacted brown silt	0%	6.5
3	23	12	4	300	400	5YR 3/4	High	Silty Clay		Reddish brown silty clay	0%	6.5
3	23	12	5	400	500	5YR 4/6	High	Silt		Highly compacted reddish brown silt	0%	6.5
3	23	12	6	500	600	5YR 4/6	High	Silty Clay		Highly compacted reddish brown silty clay, ending on clay at 600mm	0%	6.5
3	23	13	1	0	100	7.5YR 4/3	Medium	Silt	Grass roots	Brown, moderately to highly compacted silt	0%	6.5
3	23	13	2	100	200	7.5YR 4/3	High	Silt		Brown highly compacted silt, no inclusions	0%	6.5
3	23	13	3	200	300	7.5YR 4/4	High	Silt		Brown, highly compacted silt, no inclusions	0%	6.5
3	23	13	4	300	400	7.5YR 4/4	High	Silt		Brown, highly compacted silt, no inclusions	0%	6.5
3	23	13	5	400	500	7.5YR 4/4	High	Silt		Brown, highly compacted silt, no inclusions	0%	6.5
3	23	13	6	500	600	5YR 4/6	Medium	Silt		Reddish brown, moderately compacted silty sand, some charcoal and dried orange clay inclusions 1-2mm.	5%	6.5
3	23	13	7	600	700	5YR 4/6	Medium	Silty Clay		Reddish brown, moderately compacted silty sand to silty clay, some charcoal and dried orange clay inclusions 1-2mm.	5%	6.5
3	23	13	8	700	800	5YR 4/6	Medium	Silty Clay		Reddish brown, moderately compacted silty sand to silty clay, ending on clay.	0%	6.5
3	23	14	1	0	100	7.5YR 4/3	Medium	Silt	Grass roots	Brown, moderately to highly compacted silt, grass roots.	2%	6.5
3	23	14	2	100	200	7.5YR 4/3	High	Silt		Brown highly compacted silt, no inclusions	0%	6.5
3	23	14	3	200	300	7.5YR 4/4	High	Silt		Brown, highly compacted silt, no inclusions	0%	6.5
3	23	14	4	300	400	7.5YR 4/4	High	Silt		Brown, highly compacted silt, no inclusions	0%	6.5
3	23	14	5	400	500	7.5YR 4/4	High	Silt		Brown, highly compacted silt, no inclusions	0%	6.5
3	23	14	6	500	600	5YR 4/6	Medium	Silt		Reddish brown, moderately compacted silty sand, some charcoal and dried orange clay inclusions 1-2mm.	5%	6.5
3	23	14	7	600	660	5YR 4/6	Medium	Silty Clay		Reddish brown, moderately compacted silty sand to silty clay, some charcoal and dried orange clay inclusions 1-2mm.	5%	6.5
3	23	15	1	0	100	7.5YR 4/3	Medium	Silt	Grass roots	Brown, moderately to highly compacted silt, grass roots.	0%	6.5
3	23	15	2	100	200	7.5YR 4/3	High	Silt		Brown highly compacted silt, no inclusions	0%	6.5
3	23	15	3	200	300	7.5YR 4/4	High	Silt		Brown, highly compacted silt, no inclusions	0%	6.5
3	23	15	4	300	400	7.5YR 4/4	High	Silt		Brown, highly compacted silt, no inclusions	0%	6.5
3	23	15	5	400	500	7.5YR 4/4	Medium	Silt		Brown, moderately compacted silt, no inclusions, ending on clay with charcoal inclusions at base.	0%	6.5
3	23	16	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	23	16	2	100	200	7.5YR 5/4	Medium	Silt		Brown, medium to high compaction, silt.	0%	5.5
3	23	16	3	200	300	7.5YR 5/4	Medium	Silt		Brown, medium to high compaction, silt, dried orange and yellow clay 1-2mm, few ironstone nodules 1-2mm.	5%	5.5
3	23	16	4	300	400	7.5YR 5/4	High	Silt		Brown, high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 1-2mm.	10%	5.5
3	23	16	5	400	450	7.5YR 5/4	High	Silt		Brown, high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 1-2mm, ending on clay, and charcoal inclusions in base of test pit.	5%	5.5
3	23	18	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	23	18	2	100	200	7.5YR 5/4	Medium	Silt		Brown, medium to high compaction, silt.	0%	5.5
3	23	18	3	200	300	7.5YR 5/4	Medium	Silt		Brown, medium to high compaction, silt, dried orange and yellow clay 1-2mm.	5%	5.5
3	23	18	4	300	400	7.5YR 5/4	High	Silt		Brown, high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 1-2mm.	10%	5.5
3	23	18	5	400	500	7.5YR 5/4	High	Silt		Brown, high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 1-2mm, ending on clay with yellow mottles, and ironstone nodules in base of test pit.	5%	5.5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	23	20	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	23	20	2	100	200	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	23	20	3	200	300	7.5YR 5/4	Medium	Silt		Brown, medium to high compaction, silt, dried orange and yellow clay 1-2mm.	2%	5.5
3	23	20	4	300	400	7.5YR 5/4	Medium	Silt		Brown, medium to high compaction, silt, dried orange and yellow clay 1-2mm.	2%	5.5
3	23	20	5	400	500	5YR 4/6	Medium	Silty Clay		Reddish brown, moderately compacted silty sand to silty clay, ending on reddish clay.	0%	6.5
3	23	22	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	23	22	2	100	200	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	23	22	3	200	300	7.5YR 5/4	Medium	Silt		Grey, medium to high compaction, silt.	0%	5.5
3	23	22	4	300	400	7.5YR 5/4	Medium	Silt		Grey, medium to high compaction, silt.	0%	5.5
3	23	22	5	400	500	5YR 4/6	Medium	Silty sand		Reddish brown, silty sand, medium compaction.	0%	6
3	23	22	6	500	600	5YR 4/6	Medium	Silty sand		Reddish brown, silty sand, medium compaction, ending on reddish clay.	0%	6
3	23	23	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	23	23	2	100	200	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	23	23	3	200	300	7.5YR 6/1	Medium	Silt		Grey, medium to high compaction, silt, dried orange and yellow clay 1-2mm.	5%	5.5
3	23	23	4	300	400	7.5YR 6/1	High	Silt		Grey, high compaction, silt, dried orange and yellow clay 1-2mm.	5%	5.5
3	23	23	5	400	500	10YR 4/4	High	Silt		Dark yellowish brown, high compaction, silt, dried orange and yellow clay 1-2mm, ending on clay with yellow mottles.	5%	5.5
3	23	25	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	23	25	2	100	200	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium to high compaction, silt.	0%	5.5
3	23	25	3	200	300	7.5YR 5/4	Medium	Silt		Brown, medium to high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 2-5mm.	10%	5.5
3	23	25	4	300	400	7.5YR 5/4	High	Silt		Brown, high compaction, silt, dried orange and yellow clay 1-2mm, and ironstone inclusions of 2-5mm, increase in gravel content, ending on clay with yellow mottles.	20%	5.5
3	24	1	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction, disturbance of grass roots	0%	6.5
3	24	1	2	100	200	7.5R 4/3	High	Silty sand		Dark yellowish brown highly compacted silty sand	5%	6.5
3	24	1	3	200	300	7.5YR 4/3	High	Silty Clay		Strong brown highly compacted silty sand	5%	6.5
3	24	1	5	400	500	7.5YR 4/3	High	Silty Clay		Highly compacted silty clay	0%	6.5
3	24	3	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction	0%	6.5
3	24	3	2	100	200	7.5R 4/3	High	Silt		Dark yellowish brown highly compacted silty sand	5%	6.5
3	24	3	3	200	300	7.5YR 4/3	High	Silt		Strong brown highly compacted silty sand	5%	6.5
3	24	3	4	300	400	7.5YR 4/4	High	Silt		Highly compacted silty sand	0%	6
3	24	3	5	400	500	7.5YR 4/3	High	Silty Clay		Highly compacted silty clay, ending on clay at 500mm	0%	6.5
3	24	4	1	0	100	7.5YR 4/3	Low	Silty Loam	Grass roots	Silty loam with low compaction, and disturbance of grass roots	0%	6.5
3	24	4	2	100	200	7.5R 4/3	High	Silt		Dark yellowish brown highly compacted silty sand	5%	6.5
3	24	4	3	200	300	7.5YR 4/3	High	Silt		Strong brown highly compacted silty sand	5%	6.5
3	24	4	4	300	400	7.5YR 4/3	High	Silt		Strong brown highly compacted silt	5%	6.5
3	24	4	5	400	500	7.5YR 4/3	High	Silty Clay		Highly compacted silty clay, ending on clay at 500mm	0%	6.5

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Area	Transect	Test Pit Number	Spit	StartDepth_mm	EndDepth_mm	Colour (Munsell Code)	Compaction	Texture	Disturbance	Notes	Inclusions	PH
3	24	6	2	100	200	7.5R 4/3	High	Silt		Dark yellowish brown highly compacted silt	5%	6.5
3	24	6	3	200	300	7.5YR 4/3	High	Silt		Strong brown highly compacted silt	5%	6.5
3	24	6	4	300	400	7.5YR 4/3	High	Silt		Strong brown highly compacted silt	5%	6.5
3	24	6	5	400	500	7.5YR 4/3	High	Silt		Strong brown highly compacted silt	5%	6.5
3	24	6	6	500	600	7.5YR 3/4	High	Silt		Strong brown highly compacted silt	5%	5.5
3	24	6	7	600	700	7.5YR 3/4	High	Silty Clay		Highly compacted silty clay, ending on clay at 700mm	0%	5
3	25	2	1	0	100	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium compaction, silt.	0%	5.5
3	25	2	2	100	200	7.5YR 5/4	Medium	Silt	Grass roots	Brown, medium to high compaction, silt.	0%	5.5
3	25	2	3	200	300	7.5YR 5/4	Medium	Silt		Brown, medium to high compaction, silt.	0%	5.5
3	25	2	4	300	400	5YR 4/6	Medium	Silty sand		Reddish brown, silty sand, medium compaction, no inclusions.	0%	6
3	25	2	5	400	500	5YR 4/6	Medium	Silty sand	Tree root	Reddish brown, silty sand, medium compaction, tree root in northern wall.	0%	6
3	25	2	6	500	600	5YR 4/6	Medium	Silty sand	Tree root	Reddish brown, silty sand, medium compaction.	0%	6
3	25	2	7	600	700	5YR 4/6	Medium	Silty sand	Tree root	Reddish brown, silty sand, medium compaction, ending on reddish clay.	0%	6

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Appendix 3 Artefact data

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-09	**OA 1**	4	11	1	distal flake	silcrete	0				hinge			15.49	9.51	2.64	2		0.44	
MSP-09	**OA 1**	4	11	1	proximal flake	silcrete	0	flaked	9.44	2.65				15.92	12.94	4.22	2		1.18	
MSP-09	**OA 1**	4	9	1	angular fragment	silcrete	0							14.49	14.03	4.79	1		0.93	
MSP-09	**OA 1**	3	9	2	angular fragment	silcrete	0							8.64	6.61	2.38	0		0.15	
MSP-09	**OA 1**	3	9	2	angular fragment	silcrete	0							21.62	15.79	7.39	0		1.76	potliding on both faces, heat shatter
MSP-09	**OA 1**	4	11	2	complete flake	silcrete	0	flaked	10.78	5..02	feather			33.44	21.3	7.25	3		5.49	
MSP-10	**OA 1**	3	4	2	angular fragment	silcrete	0							8.47	5.39	4.16	0		0.14	
MSP-10	**OA 1**	3	4	2	angular fragment	silcrete	0							23.15	14.39	7.54	0		1.94	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-10	**OA 1**	3	4	2	angular fragment	silcrete	0							27.47	20.8	18.05	0		12.25	
MSP-10	**OA 1**	3	4	2	angular fragment	silcrete	0							14.21	14.38	8.66	0		2.21	
MSP-10	**OA 1**	3	4	2	angular fragment	silcrete	0							19.93	13.1	12.15	0		3.16	
MSP-09	**OA 1**	2	10	1	tool	silcrete	0					backing retouch	proximal and lateral margin	17.22	8.72	4.46	5	broken bondi point	0.81	missing tip
MSP-10	**OA 1**	2	5	1	angular fragment	silcrete	40							17.26	13.11	3.4	1		0.63	
MSP-10	**OA 1**	2	5	1	complete flake	IMT	0	flaked - dihedral	21.22	6.18	hinge			30.09	19.31	6.35	2		3.63	
MSP-10	**OA 1**	2	4	2	distal flake	silcrete	0				hinge			11.56	13.7	2.67	3		0.46	
MSP-10	**OA 1**	2	3	2	proximal flake	silcrete	0	flaked	9.33	3.6				12.75	12.55	4.32	1		0.72	
MSP-05	**OA 2**	4	15	3	longitudinal flake	silcrete	0	flaked	`10.18	3.27	feather			20.13	10.43	5.39	0		1.36	
MSP-05	**OA 2**	5	9	2	complete flake	quartz	40	flaked - dihedral	20.56	7.98	plunge			30.35	23.99	8.08	2		7.74	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-05	**OA 2**	4	12	2	angular fragment	silcrete	0							35.22	26.43	13.62	0		12.25	2 potlid scars, heat shatter
MSP-05	**OA 2**	3	15	2	angular fragment	IMT	0							22.54	7.61	4.64	0		0.7	1 potlid scar, heat shatter
MSP-06	**OA 2**	1	9	1	angular fragment	silcrete	0							23.28	15.36	7.08	0		2.54	
MSP-08	**OA 2**	4	2	2	complete flake	quartz	0	crushed			axial			11.77	7.48	2.9	3		0.26	bipolar flake
MSP-06	**OA 2**	2	10	2	proximal flake	silcrete	0	flaked	8.54	4.42				12.23	8.24	3.23	2		0.49	
MSP-07	**OA 2**	3	5	1	angular fragment	IMT	0							17.69	11.84	2.67	0		0.52	
MSP-05	**OA 2**	3	14	1	angular fragment	silcrete	0							25.56	15.2	17.24	0		6.64	
MSP-03	**OA 3**	11	1	1	proximal flake	IMT	0	flaked	7.03	2.41				5.13	8.99	2.81	0		0.22	Bending iniaition
MSP-03	**OA 3**	11	1	1	complete flake	chert	0	crushed			hinge			9.16	11.07	2.95	2		0.36	
MSP-03	**OA 3**	11	1	1	complete flake	silcrete	0	flaked	18.15	5.01	hinge			14.83	23.95	5.63	1		2.56	
MSP-03	**OA 3**	21	11	2	angular fragment	silcrete	0							26.08	14.11	10.36	0		4.19	
MSP-03	**OA 3**	21	11	1	proximal flake	silcrete	0	flaked	16.64	5.59				17.05	20.27	5.7	1		2.72	Bending iniaition

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	21	11	3	distal flake	silcrete	0				feather			22.16	15.38	8.41	1		3.66	
MSP-03	**OA 3**	23	10	4	angular fragment	silcrete	0							17.18	13	13.18	1		3.09	
MSP-03	**OA 3**	21	20	2	angular fragment	silcrete	0							17.03	11.45	11.29	0		2.9	
MSP-03	**OA 3**	21	20	3	medial	silcrete	0							6.48	13.73	2.9	0		0.27	
MSP-03	**OA 3**	24	3	3	proximal flake	silcrete	0	flaked - dihedral	8.72	2.78				11.84	12.08	2.86	2		0.59	conjoins to 11 (broken during excavations)
MSP-03	**OA 3**	24	3	3	medial flake	silcrete	0							5.77	13.58	1.92	2		0.23	
MSP-03	**OA 3**	20	10	3	proximal flake	silcrete	0	flaked	6.32	4.13				20.76	12.63	4.35	3		1.49	
MSP-03	**OA 3**	1	2	1	angular fragment	silcrete	0							10.08	7.46	4.73	0		0.37	
MSP-03	**OA 3**	1	2	1	single platform core	silcrete	0							11.67	15.56	11.44	2		2.93	exhausted, microblade core
MSP-03	**OA 3**	1	1	4	angular fragment	silcrete	0							18.57	10.7	5.21	1		1.05	
MSP-03	**OA 3**	1	1	4	angular fragment	silcrete	0							15.94	10.96	9.01	0		1.7	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	1	1	4	angular fragment	silcrete	0							9.14	3.39	2.34	0		0.1	
MSP-03	**OA3**	1	1	4	medial flake	silcrete	0							6.18	6.54	2.58	2		0.14	
MSP-03	**OA3**	1	3	3	distal flake	silcrete	0				feather			18.47	12.2	3.44	2		1.01	
MSP-03	**OA3**	2	2	1	angular fragment	silcrete	0							15.86	8.4	7.11	0		0.86	
MSP-03	**OA3**	2	2	2	angular fragment	silcrete	0							25.75	9.27	8.33	0		2.7	
MSP-03	**OA3**	2	2	2	angular fragment	silcrete	0							14.63	12.34	7.49	0		2.32	
MSP-03	**OA3**	2	2	2	angular fragment	silcrete	0							12.28	9.31	6.09	0		1.25	
MSP-03	**OA3**	2	2	2	angular fragment	silcrete	0							9.87	8.23	6.41	0		0.71	
MSP-03	**OA3**	2	1	1	complete flake	silcrete	0	flaked - dihedral	15.5	3.58	feather			15.73	14.51	3.78	3		1.12	
MSP-03	**OA3**	2	2	3	heat shatter	IMT	0							23.72	8.86	4.54	0		1.2	
MSP-03	**OA3**	2	2	3	complete flake	silcrete	0	flaked	10.74	2.79	feather			16.03	11.01	2.93	2		0.81	
MSP-03	**OA3**	2	2	3	complete flake	silcrete	0	flaked	10.74	2.79	axial			14.28	10.12	5.89	2		1.13	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	2	2	3	longitudinal flake	silcrete	0	flaked	`6.56	2.31	feather			15.38	6.68	3	2		0.53	
MSP-03	**OA 3**	2	2	3	distal flake	silcrete	0				feather			13.52	8.66	3.57	2		0.33	
MSP-03	**OA 3**	2	2	3	distal flake	silcrete	0				step			8.66	6.23	1.48	2		0.11	
MSP-03	**OA 3**	1	1	5	distal flake	IMT	0				feather			14.33	10.33	4.77	2		0.98	bending fracture
MSP-03	**OA 3**	1	1	5	distal flake	quartz	0				axial			7.41	8.19	2.86	0		0.25	bipolar flake
MSP-03	**OA 3**	10	1	1	complete flake	IMT	10	flaked-focal	7.86	4.29	axial			28.16	28.24	7.45	2		6.25	bipolar flake
MSP-03	**OA 3**	10	1	1	tool	silcrete	0					backing retouch	right lateral margin	25.37	12.56	5.09	8	bondi point	1.64	bondi point, tip has snapped off
MSP-03	**OA 3**	10	1	1	angular fragment	silcrete	0							14.33	10.47	5.2	0		0.98	
MSP-03	**OA 3**	10	1	1	proximal flake	silcrete	0	flaked	7.43	4.71				13.87	9.7	6.09	1		0.77	
MSP-03	**OA 3**	10	1	1	single platform core	silcrete	0							12.35	10.24	6.99	2		0.94	LFS: 9.91mm L, 4.57mm W
MSP-03	**OA 3**	10	1	1	angular fragment	silcrete	0							9.5	5.87	3.76	0		0.36	
MSP-03	**OA 3**	10	1	1	angular fragment	silcrete	0							14.68	10.95	4.26	0		0.99	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	10	1	1	angular fragment	silcrete	0							31.81	16.06	7.7	1		4.07	
MSP-03	**OA3**	10	1	1	angular fragment	silcrete	0							18.22	13.32	9.87	0		1.81	2 x potlid scars
MSP-03	**OA3**	11	1	2	distal flake	silcrete	0				hinge			11.75	10.38	2.35	2		0.26	finial
MSP-03	**OA3**	11	1	2	proximal flake	silcrete	0	crushed						8.35	12.28	4.3	1		0.52	
MSP-03	**OA3**	11	1	2	distal flake	IMT	80				feather			18.36	11.78	3.76	0		0.83	cortical flake
MSP-03	**OA3**	11	1	2	angular fragment	silcrete	0							9.4	9.29	6.88	1		0.48	
MSP-03	**OA3**	11	1	2	angular fragment	silcrete	0							17.04	12.19	5.86	0		1.27	
MSP-03	**OA3**	11	1	2	tool	silcrete	0					bakcing retouch	2 margins	18.46	14.32	7.53	3	geometric microlith	1.36	triangular
MSP-03	**OA3**	10	2	1	angular fragment	chert	0							19.86	13.55	7.75	0		2.01	2 x potlids
MSP-03	**OA3**	10	2	1	distal flake	silcrete	0				feather	edge damage	quadrant 3	17.23	11.71	4.07	3		1.22	
MSP-03	**OA3**	10	2	1	proximal flake	chert	0	flaked	9.5	9.95				13.86	12.99	5.16	4		1.09	
MSP-03	**OA3**	12	2	2	complete flake	silcrete	0	flaked	23.85	6.65	feather			32.73	19.12	8.37	2		7.57	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	12	2	2	angular fragment	silcrete	0							18.04	17.79	9.84	0		3	
MSP-03	**OA3**	12	2	2	tool	silcrete	0					backing	lateral	13.82	12.84	3.02	7	bondi point	0.86	tip snapped off
MSP-03	**OA3**	12	2	2	complete flake	silcrete	0	flaked	9.44	4.46	feather			11.37	10.61	3.32	2		0.57	Bending iniation
MSP-03	**OA3**	12	2	2	angular fragment	chert	0							8.01	7.11	1.25	0		0.1	potlid scar
MSP-03	**OA3**	12	2	2	complete flake	silcrete	0	flaked	4.83	1.19	feather			6.9	7.85	1.65	1		0.1	
MSP-03	**OA3**	12	2	2	angular fragment	silcrete	0							22.13	12.14	5.12	1		1.38	
MSP-03	**OA3**	12	2	2	angular fragment	silcrete	0							20.47	16.65	5.89	0		2.46	
MSP-03	**OA3**	12	2	2	complete flake	silcrete	0	crushed			feather			13.9	12.39	2.1	1		0.6	
MSP-03	**OA3**	10	1	2	complete flake	silcrete	0	flaked	7.78	1.77	feather			20.39	12.97	5.74	2		1.49	
MSP-03	**OA3**	10	1	2	angular fragment	silcrete	0							15.06	10.57	6.59	2		1.01	
MSP-03	**OA3**	10	1	2	angular fragment	silcrete	0							6.24	5.75	3.44	0		0.17	
MSP-03	**OA3**	10	2	2	distal flake	silcrete	0				feather			6.36	8.98	1.77	2		0.12	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	10	2	2	angular fragment	silcrete	40							19.28	10.19	5.88	1		1.35	
MSP-03	**OA3**	10	2	2	angular fragment	silcrete	0							13.99	8.93	4.4	1		0.48	
MSP-03	**OA3**	10	2	2	complete flake	quartz	0	flaked	6.78	2.41	axial			12.24	8.76	3.11	2		0.38	
MSP-03	**OA3**	9	2	2	tool	silcrete	0					backing	2 margins	12.43	10	2.67	8		0.37	triangular
MSP-03	**OA3**	9	2	2	angular fragment	silcrete	0							19.97	16.55	11.65	0		5.28	
MSP-03	**OA3**	9	2	2	angular fragment	silcrete	0							25.31	12.35	7.7	1		2.93	
MSP-03	**OA3**	9	2	2	angular fragment	silcrete	0							16.18	10.87	5.62	1		1.27	
MSP-03	**OA3**	9	2	2	medial flake	petrified wood	0							24.32	10.47	5.33	0		1.79	
MSP-03	**OA3**	9	2	2	complete flake	silcrete	0	flaked focal	3.88	1.71	hinge			17.5	14.04	4.5	2		1.2	
MSP-03	**OA3**	9	2	2	complete flake	silcrete	0	flaked	8.55	1.93	feather			10.17	10.48	2.59	1		0.29	
MSP-03	**OA3**	9	2	2	distal flake	IMT	0				hinge			10.15	12.72	1.96	1		0.25	
MSP-03	**OA3**	9	2	2	distal flake	IMT	0				feather			15.46	10.76	3.34	2		0.43	
MSP-03	**OA3**	9	2	2	distal flake	quartz	0				feather			9.74	11.38	4.55	1		0.51	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	9	2	2	angular fragment	silcrete	0							12.24	7.49	6.81	1		0.89	
MSP-03	**OA3**	9	2	2	angular fragment	silcrete	0							11.99	8.84	3.68	0		0.46	
MSP-03	**OA3**	9	2	2	angular fragment	silcrete	0							14.42	12.93	6.02	0		0.87	
MSP-03	**OA3**	9	2	2	angular fragment	silcrete	0							11.46	5.87	3.92	0		0.48	
MSP-03	**OA3**	9	2	2	angular fragment	silcrete	0							14.68	9.77	5.87	1		0.71	
MSP-03	**OA3**	9	2	2	medial flake	silcrete	0							12.22	6.57	2.01	1		0.23	
MSP-03	**OA3**	9	2	2	distal flake	silcrete	0				feather			7.23	6.36	2.94	1		0.14	
MSP-03	**OA3**	9	2	2	angular fragment	IMT	0							13.52	8.82	1.54	0		0.22	
MSP-03	**OA3**	4	1	3	angular fragment	silcrete	0							13.85	7.37	3.62	0		0.46	
MSP-03	**OA3**	5	2	2	angular fragment	silcrete	0							9.8	7.83	3.12	1		0.24	
MSP-03	**OA3**	5	2	2	angular fragment	silcrete	0							15.44	7.29	6.04	0		0.61	
MSP-03	**OA3**	5	2	2	angular fragment	silcrete	0							18.66	11.55	5.98	0		1.34	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	3	3	1	medial flake	chert	0							17.79	16.44	6.35	2		2.16	
MSP-03	**OA3**	3	3	1	glass fragment	glass	0							42.61	24.88	8.54	3		14.55	non artefactual
MSP-03	**OA3**	3	4	1	angular fragment	silcrete	0							9.33	9.51	3.02	1		0.36	
MSP-03	**OA3**	4	3	1	proximal flake	silcrete	0	crushed						9.57	14.91	4.31	2		0.71	
MSP-03	**OA3**	4	3	1	complete flake	IMT	0	flaked	9.69	3.71	plunge			15.91	10.57	9.62	2		1.5	
MSP-03	**OA3**	4	3	1	manuport	silcrete	100							38.25	25.61	20.41	0		23.39	small silcrete cobble
MSP-03	**OA3**	3	3	2	multiplatform core	silcrete	0							27.93	23.86	12.28	4		9.95	LFS: 7.96 L, 9.92 W
MSP-03	**OA3**	3	3	2	distal flake	silcrete	30				feather			11.73	9.88	3.94	1		0.53	
MSP-03	**OA3**	1	1	8	angular fragment	silcrete	0							10.89	7.2	5.28	0		0.39	
MSP-03	**OA3**	2	1	2	distal flake	silcrete	0				feather			11.4	8.86	2.79	1		0.37	
MSP-03	**OA3**	2	1	2	angular fragment	silcrete	40							13.32	8.9	4.32	0		0.67	
MSP-03	**OA3**	2	3	3	proximal flake	chert	0	flaked	9..08	3.66				6.22	10.51	4.59	2		0.49	
MSP-03	**OA3**	2	3	3	angular fragment	silcrete	0							10.34	6.82	5.91	1		0.5	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	4	2	1	tool	silcrete	0					scalar	lateral margin	20.32	21.38	6.94	6	steep edged scraper	3.52	
MSP-03	**OA3**	2	3	2	angular fragment	silcrete	0							16.83	11.54	3.47	0		0.66	
MSP-03	**OA3**	2	3	2	angular fragment	silcrete	0							11.02	6.96	3.85	1		0.4	
MSP-03	**OA3**	4	3	2	distal flake	silcrete	0				feather			11.79	11.97	3.24	2		0.45	
MSP-03	**OA3**	4	3	2	angular fragment	silcrete	0							8.39	7.54	2.47	0		0.19	
MSP-03	**OA3**	4	3	2	proximal flake	silcrete	0	crushed						8.49	9.55	2.87	1		0.25	
MSP-03	**OA3**	4	3	2	angular fragment	silcrete	0							7.95	5.75	4.52	0		0.26	
MSP-03	**OA3**	7	5	4	angular fragment	silcrete	0							21.09	11.08	4.69	0		1.03	
MSP-03	**OA3**	7	5	4	distal flake	silcrete	0							13.72	7.9	1.87	1		0.2	
MSP-03	**OA3**	7	5	2	angular fragment	silcrete	0							15.87	16.64	12.81	0		3.36	
MSP-03	**OA3**	7	5	1	complete flake	IMT	0	flaked	6.52	4.22	feather			8.15	13.28	4.58	1		0.48	
MSP-03	**OA3**	7	5	1	angular fragment	silcrete	0							25.81	21.99	15.22	0		8.88	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	7	5	1	angular fragment	silcrete	0							17.6	7.28	3.83	0		0.53	
MSP-03	**OA3**	7	5	1	angular fragment	silcrete	0							15.3	10.35	5.18	0		0.68	
MSP-03	**OA3**	7	5	1	angular fragment	IMT	0							14.09	7.57	3.51	0		0.42	potlid
MSP-03	**OA3**	7	5	1	angular fragment	silcrete	0							12.34	5.55	1.93	0		0.25	
MSP-03	**OA3**	7	5	1	angular fragment	silcrete	0							14.73	8.84	4.42	0		0.63	
MSP-03	**OA3**	7	5	1	angular fragment	silcrete	0							13.4	6.26	3.45	0		0.73	
MSP-03	**OA3**	7	5	1	tool	silcrete	0							8.49	6.43	2.96	2	burin	0.26	tip of a burin, transversly snapped
MSP-03	**OA3**	6	4	3	angular fragment	silcrete	0							9.58	9.08	3.44	1		0.28	2 x potlid scars
MSP-03	**OA3**	6	5	3	complete flake	silcrete	0	flaked	9.59	9.2	feather			8.96	10.42	4.4	2		0.65	
MSP-03	**OA3**	7	3	3	angular fragment	silcrete	0							11.81	9.54	5.06	0		0.71	
MSP-03	**OA3**	7	3	3	proximal flake	silcrete	0	crushed						10.58	11.11	3.07	2		0.27	
MSP-03	**OA3**	7	5	3	proxipmal flake	silcrete	0	flaked	3.94	1.56				16.45	9.83	3.75	1		0.54	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	7	5	3	longitudinal flake	silcrete	0	flaked	`6.82	4.12	axial			19.05	8.5	6.64	1		1.33	2x potlids
MSP-03	**OA 3**	8	1	1	complete flake	silcrete	0	flaked	5.25	1.04	step			7.39	7.08	1.64	1		0.11	
MSP-03	**OA 3**	8	1	1	angular fragment	silcrete	0							10.41	8.19	3.87	0		0.39	
MSP-03	**OA 3**	8	1	1	angular fragment	silcrete	0							17.18	12.13	4.43	0		0.74	
MSP-03	**OA 3**	8	1	1	angular fragment	silcrete	0							20.79	16.06	7.41	1		1.69	
MSP-03	**OA 3**	7	3	2	distal flake	silcrete	0				hinge			10.5	11.02	3.55	2		0.52	
MSP-03	**OA 3**	7	3	2	complete flake	silcrete	0	flaked	14.49	6.22	feather			15.41	18.59	6.75	2		2.27	
MSP-03	**OA 3**	7	3	2	proximal flake	silcrete	0	flaked	10.92	4.87				10.79	11.89	4.51	1		0.54	
MSP-03	**OA 3**	7	3	2	complete flake	silcrete	0	crushed			feather			12.48	5.52	3.29	1		0.19	
MSP-03	**OA 3**	7	3	2	distal flake	silcrete	0				feather			10.08	8.78	2.11	0		0.24	
MSP-03	**OA 3**	7	3	2	angular fragment	silcrete	0							27.62	23.08	10.43	0		7.99	
MSP-03	**OA 3**	7	3	2	angular fragment	silcrete	0							23.05	13.62	8.24	0		2.31	
MSP-03	**OA 3**	7	3	2	angular fragment	silcrete	0							21.26	14.53	11.01	0		2.26	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	7	3	2	angular fragment	silcrete	0							13.5	9.2	8.31	0		1.14	
MSP-03	**OA3**	7	3	2	angular fragment	silcrete	0							15.27	9.41	7.74	0		1.12	
MSP-03	**OA3**	7	3	2	proximal flake	quartz	0	bipolar	10.45	2.72				11.73	10.97	3.06	0		0.54	
MSP-03	**OA3**	7	3	2	angular fragment	silcrete	0							12.63	8.01	2.93	1		0.25	
MSP-03	**OA3**	7	3	2	angular fragment	IMT	0							15.18	11.74	5.19	0		0.96	
MSP-03	**OA3**	6	5	2	mulitplatform core	silcrete	30							59.53	53.66	25.68	8		88.31	LFS: 23.65 L 14.77 W
MSP-03	**OA3**	6	5	2	angular fragment	silcrete	0							25.63	13.57	5.18	1		2.38	
MSP-03	**OA3**	6	5	2	angular fragment	silcrete	0							14.6	10.71	5.71	0		0.74	
MSP-03	**OA3**	6	5	2	angular fragment	silcrete	0							13.33	7.61	2.73	0		0.27	
MSP-03	**OA3**	6	5	2	angular fragment	silcrete	0							9.93	9.3	2.94	0		0.37	
MSP-03	**OA3**	6	5	2	angular fragment	silcrete	0							13.92	7.42	2.36	1		0.26	
MSP-03	**OA3**	6	5	2	angular fragment	silcrete	0							12.12	11	5.85	1		0.75	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							10.14	8.35	3.24	2		0.36	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							12.56	10.11	4.27	2		0.66	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							18.57	10.18	5.16	2		1.19	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							15.54	10.2	6.05	1		0.96	
MSP-03	**OA3**	6	4	2	tool	silcrete	0					backing	left lateral margin	15.58	7.52	4.17	3	bondi point	0.56	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							28.19	26.6	8.19	4		8.53	
MSP-03	**OA3**	6	4	2	medial flake	silcrete	0							9.64	9.27	2.63	1		0.36	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							10.77	4.93	4.37	0		0.38	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							7.98	7.26	4.78	2		0.38	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							9.19	7.38	4.61	1		0.29	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							11.4	5.22	4.19	0		0.37	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							10.44	7.06	2.71	0		0.27	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							11.13	5.01	2.25	0		0.18	
MSP-03	**OA3**	6	4	2	angular fragment	silcrete	0							8.33	7.5	1.83	0		0.17	
MSP-03	**OA3**	7	1	2	distal flake	silcrete	0				hinge			16.01	8.44	4.5	1		0.86	
MSP-03	**OA3**	7	1	2	rejuvenation flake	silcrete	0							19.11	6.59	3.79	3		0.38	
MSP-03	**OA3**	8	2	1	complete flake	IMT	0	flaked-focal	3.84	1.18	plunge			16.94	18.86	5.6	3		1.36	
MSP-03	**OA3**	8	2	1	complete flake	silcrete	0	flaked	10.01	5.21				20.5	13.02	4.23	3		1.82	
MSP-03	**OA3**	8	2	1	complete flake	silcrete	0	flaked focal	3.07	2.06	step			14.29	5.9	2.92	2		0.31	
MSP-03	**OA3**	8	2	1	distal flake	quartz	0				axial			14.68	10.82	3.38	1		0.74	bipolar flake
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							10.33	8.34	3.96	0		0.26	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							8.52	7.15	6.9	0		0.4	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							10.09	10.43	4.91	1		0.58	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							10.06	10.08	5.39	0		0.56	
MSP-03	**OA3**	8	2	1	distal flake	silcrete	0				feather			11.41	8.26	2.7	3		0.23	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							24.88	17.95	8.35	0		4.04	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							16.79	8.8	2.68	0		0.45	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							40.56	30.39	9.38	0		11.38	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							8.2	7.34	1.56	0		0.1	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							7.94	7.15	2.27	0		0.2	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							15.32	9.89	6.98	3		1.78	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							12.13	9.55	5.25	1		0.75	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							16.04	12.61	4.47	0		1.13	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							8.79	6.84	4.49	0		0.29	
MSP-03	**OA3**	8	2	1	angular fragment	silcrete	0							9.9	8.36	1.62	0		0.14	
MSP-03	**OA3**	8	2	1	complete flake	quartz	0	bipolar	4.76	3.81	feather			18.32	10.89	8.44	2		1.45	
MSP-03	**OA3**	8	3	2	mulitplatform core	silcrete	0							29.82	14.42	14.17	7	microblade core	9.28	LFS: 18.5 L, 6.35 W

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	8	3	2	single platform core	silcrete	0							23.74	14.63	13.47	4		5.6	LFS: 12.7 L, 6.18 W
MSP-03	**OA3**	8	3	2	angular fragment	silcrete	0							14.79	12.17	6.18	0		1.38	
MSP-03	**OA3**	8	3	2	angular fragment	silcrete	0							10.16	7.14	2.13	0		0.17	
MSP-03	**OA3**	8	3	2	angular fragment	silcrete	0							16.5	12.7	4.47	0		1.13	
MSP-03	**OA3**	8	3	2	angular fragment	silcrete	0							16.19	6.49	5.4	2		0.73	
MSP-03	**OA3**	8	3	2	angular fragment	silcrete	0							13.67	8.69	6.4	0		0.97	
MSP-03	**OA3**	8	3	2	angular fragment	silcrete	0							10.19	7.53	2.35	0		0.24	
MSP-03	**OA3**	8	3	2	angular fragment	silcrete	0							25.07	10.76	5.4	1		1.8	
MSP-03	**OA3**	8	2	2	angular fragment	silcrete	0							31.02	16.19	8.37	1		4.03	
MSP-03	**OA3**	8	2	2	angular fragment	silcrete	0							21.85	16.27	10.33	1		4.74	
MSP-03	**OA3**	8	2	2	angular fragment	silcrete	0							30.63	16.68	9.44	0		3.47	
MSP-03	**OA3**	8	2	2	distal flake	silcrete	0							15.77	7	4.17	3		0.46	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	8	2	2	angular fragment	silcrete	0							9.93	7.19	3.3	2		0.19	
MSP-03	**OA3**	8	2	2	angular fragment	silcrete	0							9.75	8.11	5.14	2		0.37	
MSP-03	**OA3**	8	2	2	complete flake	silcrete	0	crushed			feather			8.87	10.72	3.11	2		0.28	
MSP-03	**OA3**	8	2	2	angular fragment	silcrete	0							11.19	14.44	2.72	0		0.56	
MSP-03	**OA3**	8	2	2	complete flake	silcrete	0	flaked	9.62	3.09	plunge			30.68	9.32	4.78	2		1.95	
MSP-03	**OA3**	8	2	2	medial flake	silcrete	0							8.76	5.87	2.47	2		0.16	
MSP-03	**OA3**	8	2	2	tool	silcrete	0					backing retouch	2 backing flake scars, one edge	8.8	5.27	2.69	2	backed artefact fragment	0.16	backed artefact tip
MSP-03	**OA3**	8	2	2	angular fragment	silcrete	0							8.82	7.63	2.7	0		0.18	
MSP-03	**OA3**	8	2	2	angular fragment	silcrete	0							20.32	11.36	4.47	1		0.98	
MSP-03	**OA3**	19	24	1	angular fragment	silcrete	0							18.46	14.12	5.48	1		1.78	
MSP-03	**OA3**	19	24	3	angular fragment	chert	20							25.95	11.86	7.05	0		3.56	heat shatter
MSP-03	**OA3**	5	4	2	angular fragment	IMT	0							14.21	12.18	5.19	1		0.93	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	5	4	2	angular fragment	silcrete	0							20.54	14.15	8.28	0		3.03	
MSP-03	**OA3**	5	4	2	angular fragment	silcrete	0							16.33	9.78	3.92	0		0.66	
MSP-03	**OA3**	6	4	2	tool	silcrete	0					backing retouch	proximal and entire left lateral	25.21	6.17	3.65	7		0.73	
MSP-03	**OA3**	4	4	3	complete flake	silcrete	0	flaked	11.63	3.19	plunge			16.33	13.27	3.5	2		1.17	
MSP-03	**OA3**	4	4	3	angular fragment	silcrete	0							17.66	11.07	9.42	1		3.14	
MSP-03	**OA3**	4	4	3	angular fragment	silcrete	0							12.82	8.05	6.55	1		0.59	
MSP-03	**OA3**	4	4	3	medial flake	silcrete	0							9.52	7.58	3.58	2		0.32	
MSP-03	**OA3**	5	4	1	tool	silcrete	0					backing retouch, scalar retouch	backing on one lateral margin, scalar on opposite margin, at tip	11.54	7.91	4.72	6	backed artefact fragment	0.48	possible bondi tip
MSP-03	**OA3**	5	4	1	complete flake	silcrete	0	flaked	4.48	2.69	plunge			27.26	10.18	6.08	4		2.02	
MSP-03	**OA3**	5	4	1	angular fragment	silcrete	0							15.24	11.9	12.1	0		3.38	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	5	4	1	angular fragment	silcrete	0							10.76	6.28	2.19	2		0.22	
MSP-03	**OA3**	5	3	1	distal flake	silcrete	5				feather			15.38	7.76	2.38	1		0.41	
MSP-03	**OA3**	5	3	1	angular fragment	silcrete	0							19.1	11.28	4.76	0		1.32	
MSP-03	**OA3**	5	2	3	angular fragment	silcrete	0							11.29	7.61	6.44	0		0.66	
MSP-03	**OA3**	5	2	3	angular fragment	silcrete	0							17.39	9.13	6.86	0		0.85	
MSP-03	**OA3**	6	3	1	complete flake	silcrete	0	flaked	2.3	2.83	feather			19.94	8.45	3.47	3		0.87	
MSP-03	**OA3**	6	3	1	angular fragment	silcrete	0							24.06	20.08	10.73	0		7.39	
MSP-03	**OA3**	6	3	1	angular fragment	silcrete	0							15.94	7.55	3.31	0		0.49	
MSP-03	**OA3**	6	3	1	angular fragment	silcrete	0							12.7	7.63	3.35	0		0.29	potlid scars
MSP-03	**OA3**	21	18	1	angular fragment	silcrete	0							32.66	16.94	11.57	1		7.27	
MSP-03	**OA3**	18	3	7	potlid	IMT	0							11.16	9.64	2.36	0		0.27	
MSP-03	**OA3**	3	6	2	angular fragment	silcrete	0							23.01	6.79	5.5	1		0.9	
MSP-03	**OA3**	14	5	1	angular fragment	silcrete	0							18.31	12.73	10.89	0		3.82	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	14	5	1	angular fragment	silcrete	0							10.8	9.52	9.73	0		1.25	
MSP-03	**OA3**	14	5	1	angular fragment	silcrete	0							14.64	6.23	6.88	0		0.61	
MSP-03	**OA3**	14	5	1	angular fragment	silcrete	0							19.12	11.46	7.24	0		1.37	
MSP-03	**OA3**	16	1	2	distal flake	silcrete	0				feather			8.61	8.57	1.75	2		0.18	
MSP-03	**OA3**	16	1	1	proximal flake	silcrete	0	flaked	6.18	1.89				11.46	8.92	2.47	2		0.4	
MSP-03	**OA3**	16	1	1	angular fragment	silcrete	0							14.65	5.81	4.32	3		0.61	
MSP-03	**OA3**	16	1	1	distal flake	silcrete	0				feather			12.78	8.05	1.94	2		0.26	
MSP-03	**OA3**	16	1	1	angular fragment	silcrete	0							29.64	25.41	15.22	0		17.23	
MSP-03	**OA3**	16	1	3	complete flake	IMT	0	crushed			hinge			7.13	8.33	1.09	1		0.09	
MSP-03	**OA3**	16	1	3	angular fragment	silcrete	0							15.65	11.38	4.55	0		1.03	
MSP-03	**OA3**	16	1	3	distal flake	silcrete	0				feather			19.5	7.24	5.46	1		0.8	
MSP-03	**OA3**	16	1	3	medial flake	quartzite	0							27.9	21.19	6.13	3		5.24	
MSP-03	**OA3**	16	1	4	proximal flake	silcrete	0	flaked	5.66	2.44				12.84	11.01	2.52	0		0.51	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	16	1	4	angular fragment	silcrete	0							20.42	6	5.24	1		0.76	
MSP-03	**OA3**	16	5	2	medial flake	silcrete	0							10.41	10.21	4.41	2		0.55	
MSP-03	**OA3**	16	5	2	angular fragment	silcrete	0							9.65	7.95	5.66	2		0.45	
MSP-03	**OA3**	16	5	2	proximal flake	silcrete	0	flaked	4.34	2.23				9.94	7.81	2.08	2		0.23	
MSP-03	**OA3**	16	5	2	distal flake	silcrete	0				feather			10.26	6.59	3.32	2		0.26	
MSP-03	**OA3**	16	5	3	angular fragment	silcrete	0							9.83	5.2	5.91	0		0.55	
MSP-03	**OA3**	16	5	3	angular fragment	IMT	0							17.09	14.41	4.14	0		1.04	
MSP-03	**OA3**	16	7	1	complete flake	quartz	0	flaked	2.67	1.55	feather			10.98	8	1.94	1		0.2	
MSP-03	**OA3**	16	7	1	angular fragment	silcrete	0							21.94	13.41	7.17	1		2.51	
MSP-03	**OA3**	16	7	1	angular fragment	chert	0							13.69	7.68	4.34	0		0.51	
MSP-03	**OA3**	16	7	2	longitudinal flake	silcrete	0	flaked	`5.23	2.67	feather			22.72	8.42	2.34	0		0.66	
MSP-03	**OA3**	16	5	1	angular fragment	silcrete	0							16.1	10.96	7.85	2		2.13	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	8	3	1	complete flake	IMT	0	flaked	3.57	1.52	plunge			12.78	12.77	3.82	3		0.53	
MSP-03	**OA3**	8	3	1	tool	silcrete	0					backing	one margin	18.72	9.31	4.61	9	bondi point	0.84	
MSP-03	**OA3**	8	3	1	angular fragment	silcrete	0							16.47	9.31	5.6	0		1.2	
MSP-03	**OA3**	8	3	1	proximal flake	silcrete	0	flaked	10.07	2.49				12.07	8.76	2.62	0		0.46	
MSP-03	**OA3**	8	3	1	distal flake	silcrete	0				feather			10.99	15.8	6.32	3		1.24	
MSP-03	**OA3**	8	3	1	angular fragment	silcrete	0							15.83	14.66	4.36	1		1.02	
MSP-03	**OA3**	8	3	1	angular fragment	silcrete	0							15.28	5.65	2.85	0		0.29	
MSP-03	**OA3**	8	3	1	angular fragment	silcrete	0							39.83	22.47	14.8	0		21.67	
MSP-03	**OA3**	8	3	1	angular fragment	silcrete	0							24.75	20.29	11.83	0		7.68	
MSP-03	**OA3**	8	3	1	angular fragment	silcrete	0							7.6	6.53	1.72	1		0.12	
MSP-03	**OA3**	8	3	1	angular fragment	silcrete	0							16.3	8.94	6.29	1		1.21	
MSP-03	**OA3**	8	4	2	proximal flake	silcrete	0	flaked	8.38	2.69				10.28	10.19	3.56	0		0.45	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	8	4	2	complete flake	IMT	0	flaked	26.16	13.25	hinge			24.54	24.45	10.07	3		8.45	
MSP-03	**OA 3**	8	4	2	distal flake	silcrete	0				feather			26.37	17.05	7.06	2		4	
MSP-03	**OA 3**	8	4	2	angular fragment	silcrete	0							14.36	8.13	7.74	0		1.1	
MSP-03	**OA 3**	8	4	2	angular fragment	silcrete	0							8.86	5.94	5.09	0		0.29	
MSP-03	**OA 3**	8	4	2	single platform core	silcrete	0							40.71	17.73	12.74	6		11.23	LFS 9.81 L, 12.75 W
MSP-03	**OA 3**	8	4	2	distal flake	quartz	0				feather			7.09	7.16	2	2		0.15	
MSP-03	**OA 3**	9	2	1	angular fragment	silcrete	0							9.51	6.65	3.75	1		0.26	
MSP-03	**OA 3**	9	2	1	angular fragment	silcrete	0							27.61	20.16	14.85	2		8.09	
MSP-03	**OA 3**	9	2	1	angular fragment	silcrete	0							24.08	20.08	11.82	0		7.57	
MSP-03	**OA 3**	9	2	1	angular fragment	silcrete	0							44.36	26	7.8	2		10.52	
MSP-03	**OA 3**	9	2	1	angular fragment	silcrete	0							7.99	6.85	2.82	0		0.2	
MSP-03	**OA 3**	9	2	1	angular fragment	silcrete	0							14.06	10.68	2.69	1		0.38	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	9	2	1	angular fragment	silcrete	0							12.81	8.2	2.38	0		0.25	
MSP-03	**OA3**	9	2	1	angular fragment	silcrete	0							8.19	5.34	1.43	0		0.12	
MSP-03	**OA3**	9	2	1	angular fragment	chert	0							10.27	7.64	2.45	1		0.21	
MSP-03	**OA3**	9	2	1	complete flake	silcrete	0	flaked	8.23	1.97	feather			11.88	14.66	2.1	1		0.35	
MSP-03	**OA3**	9	2	1	distal flake	silcrete	0				feather			13.73	7.7	2.98	3		0.27	
MSP-03	**OA3**	6	5	1	angular fragment	silcrete	0							12.26	5.39	4.83	2		0.32	
MSP-03	**OA3**	6	5	1	angular fragment	silcrete	0							12.43	8.15	2.46	2		0.28	
MSP-03	**OA3**	6	5	1	medial flake	silcrete	0							8.13	7.66	3.28	2		9.08	
MSP-03	**OA3**	6	5	1	angular fragment	silcrete	0							13.76	10.15	6.28	2		0.81	
MSP-03	**OA3**	6	5	1	angular fragment	silcrete	0							11.6	14.53	2.5	1		0.57	
MSP-03	**OA3**	7	5.1	1	complete flake	silcrete	0	flaked	5.73	2.58	feather			14.77	10.11	3.22	2		0.68	
MSP-03	**OA3**	7	5.1	1	distal flake	silcrete	0				feather			6.26	7.78	3.44	2		0.2	
MSP-03	**OA3**	7	5.1	1	medial flake	silcrete	0							10.25	6.53	2.45	2		0.27	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	7	5.1	1	angular fragment	silcrete	0							23.03	15.33	4.95	1		22.47	
MSP-03	**OA3**	7	5.1	1	angular fragment	silcrete	0							13.92	9.45	2.96	0		0.53	
MSP-03	**OA3**	7	5.1	1	angular fragment	silcrete	0							16.59	11.51	10.12	0		1.87	
MSP-03	**OA3**	7	5.1	1	angular fragment	silcrete	0							21.85	13.98	7.21	0		2.73	
MSP-03	**OA3**	7	5.1	1	proximal flake	silcrete	0	flaked	4.45	0.98				7.71	7.04	1.53	1		0.11	
MSP-03	**OA3**	7	5.1	1	angular fragment	silcrete	0							9.8	9.55	4.38	0		0.45	
MSP-03	**OA3**	7	5.1	1	angular fragment	silcrete	0							15.95	9.77	5.7	1		0.71	
MSP-03	**OA3**	7	5.1	1	angular fragment	silcrete	0							12.98	6.58	5.16	0		0.38	
MSP-03	**OA3**	7	5.1	1	angular fragment	silcrete	0							34.93	17.01	11.13	3		7.17	
MSP-03	**OA3**	7	5.1	2	medial flake	silcrete	0							13.91	11.41	4.26	1		0.76	
MSP-03	**OA3**	7	5.1	2	angular fragment	silcrete	0							18.32	12.75	4.43	0		1.34	
MSP-03	**OA3**	7	5.1	2	distal flake	silcrete	0				feather			19.18	13.48	4.58	1		1.54	
MSP-03	**OA3**	7	5.1	2	distal flake	silcrete	0				feather			13.81	10.55	4.02	2		0.61	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	7	5.1	2	angular fragment	IMT	0							10.88	14.64	6.35	1		0.9	
MSP-03	**OA3**	7	5.1	2	complete flake	silcrete	0	crushed			hinge			9.23	11.1	1.93	1		0.2	finial
MSP-03	**OA3**	7	5.1	2	distal flake	silcrete	0				feather			11.81	8.21	2.3	2		0.2	
MSP-03	**OA3**	7	5.1	2	angular fragment	silcrete	0							9.89	8.33	3.11	1		0.3	
MSP-03	**OA3**	7	5.1	2	distal flake	silcrete	0				plunge			14.03	6.82	4.82	2		0.52	
MSP-03	**OA3**	7	5.1	2	angular fragment	silcrete	0							13.28	7.97	1.71	0		0.17	
MSP-03	**OA3**	7	5.1	2	complete flake	silcrete	0	flaked	10.85	5.32	feather			11.18	11.22	5.59	1		0.97	
MSP-03	**OA3**	7	5.1	2	angular fragment	silcrete	0							9.25	7.11	2.99	0		0.28	
MSP-03	**OA3**	7	5.1	2	angular fragment	silcrete	0							8.82	8.4	3.84	1		0.41	
MSP-03	**OA3**	7	5.1	2	proximal flake	silcrete	0	facetted	10.49	3.5				13.02	12.23	2.84	1		0.6	
MSP-03	**OA3**	7	5.1	2	distal flake	silcrete	0				feather			9.66	6.75	2.64	2		0.2	
MSP-03	**OA3**	7	5.1	2	distal flake	chert	0				feather			8.8	8.53	2.03	1		0.18	
MSP-03	**OA3**	7	5.1	2	medial flake	silcrete	0							7.74	7.68	316	2		0.24	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	7	5.1	2	angular fragment	silcrete	0							19.71	15.52	5.31	0		3.24	
MSP-03	**OA3**	7	5.1	2	angular fragment	silcrete	0							13.15	11.94	10.29	0		2.04	
MSP-03	**OA3**	7	5.1	2	angular fragment	silcrete	0							34.54	18.63	13.41	0		11.8	
MSP-03	**OA3**	7	5.1	3	distal flake	silcrete	0				feather			12.14	8.26	4.36	2		0.47	
MSP-03	**OA3**	7	5.1	3	angular fragment	silcrete	0							12.18	10.54	3.73	1		0.45	
MSP-03	**OA3**	7	5.1	3	angular fragment	silcrete	0							16.02	15.8	3.7	2		1.06	
MSP-03	**OA3**	8	4	1	medial flake	silcrete	0							9.37	14.23	4.12	2		0.5	
MSP-03	**OA3**	8	4	1	medial flake	silcrete	0							12.54	13.15	4.24	2		0.85	
MSP-03	**OA3**	8	4	1	angular fragment	silcrete	0							31.21	29.57	19.12	0		22.43	
MSP-03	**OA3**	6	4	3	angular fragment	silcrete	0							18.7	8.25	6.61	0		1.24	
MSP-03	**OA3**	6	4	3	medial flake	silcrete	0							13.89	18.54	5.11	2		2	
MSP-03	**OA3**	6	4	3	angular fragment	silcrete	0							15.11	8.86	4.45	0		0.76	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	6	5	2	complete flake	silcrete	0	flaked	12.61	2.48	feather			17.62	12.6	2.65	2		0.63	
MSP-03	**OA3**	6	5	2	complete flake	silcrete	0	flaked	12.53	1.17	feather			10.41	10.66	1.52	1		0.19	
MSP-03	**OA3**	6	5	2	distal flake	silcrete	0				feather			17.21	16.75	6.01	1		1.63	
MSP-03	**OA3**	6	5	2	single platform core	silcrete	30							29.59	24.45	11.87	1		9.24	LFS 10.86 L, 15.52 W
MSP-03	**OA3**	6	5	2	angular fragment	silcrete	0							16.46	8.23	4.97	0		0.68	
MSP-03	**OA3**	7	5	3	angular fragment	silcrete	0							25.63	10.43	3.99	0		1.61	
MSP-03	**OA3**	5	5	3	angular fragment	silcrete	0							17.96	10.21	7.03	2		1.46	
MSP-03	**OA3**	6	5	1	complete flake	silcrete	0	flaked	17.05	6.46	feather			11.19	23.87	7.52	2		2.31	
MSP-03	**OA3**	6	5	1	angular fragment	silcrete	0							14.91	5	3.22	0		0.37	
MSP-03	**OA3**	6	5	1	angular fragment	silcrete	0							24.95	16.14	12.32	1		4.68	
MSP-03	**OA3**	6	5	1	distal flake	IMT	0				feather			16.25	13.68	5.4	1		1.19	
MSP-03	**OA3**	7	5	2	distal flake	silcrete	0				feather			20.59	18.8	6.7	3		2.52	
MSP-03	**OA3**	6	9	3	distal flake	silcrete	0				feather			16.67	11.34	2.65	1		0.65	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	6	9	2	angular fragment	silcrete	0							15.4	12.34	7.27	2		1.21	
MSP-03	**OA3**	9	4	3	angular fragment	IMT	0							15.57	11.64	3.48	0		0.53	
MSP-03	**OA3**	9	4	3	angular fragment	silcrete	0							8.78	5.67	4.85	2		0.37	
MSP-03	**OA3**	9	4	3	angular fragment	silcrete	0							11.94	7	5.15	0		0.46	
MSP-03	**OA3**	9	4	3	tool	silcrete	0					backing retouch	one margin	13.1	5.11	2.16	4	backed artefact fragment	0.25	bondi point tip
MSP-03	**OA3**	9	4	2	distal flake	silcrete	0				feather			11.61	8.94	3.15	3		0.39	
MSP-03	**OA3**	9	4	2	angular fragment	silcrete	0							14.71	11.2	5.65	2		0.95	
MSP-03	**OA3**	9	4	2	proximal flake	silcrete	0	flaked	3.89	1.85				14.85	10.75	4.15	2		0.85	
MSP-03	**OA3**	10	3	3	angular fragment	silcrete	0							7.16	5.51	5.47	0		0.26	
MSP-03	**OA3**	10	3	3	angular fragment	silcrete	0							8.37	5.83	4.55	0		0.3	
MSP-03	**OA3**	10	3	3	angular fragment	silcrete	0							15.88	10.5	2.85	0		0.46	2 potlid scars, heat shatter
MSP-03	**OA3**	10	3	2	angular fragment	silcrete	0							11.9	7.19	4.65	0		0.65	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	10	3	2	angular fragment	silcrete	0							15.13	9.75	3.06	0		0.52	
MSP-03	**OA 3**	10	3	2	angular fragment	silcrete	0							17.44	10.9	6.19	3		1.41	
MSP-03	**OA 3**	10	3	2	angular fragment	silcrete	0							11.82	5.84	3.75	0		0.38	
MSP-03	**OA 3**	10	3	2	medial flake	silcrete	0							5.28	6.63	1.31	1		0.05	
MSP-03	**OA 3**	10	3	1	proximal flake	silcrete	0	flaked	8.96	2.2				9.55	14.42	2.15	1		0.39	
MSP-03	**OA 3**	10	3	1	angular fragment	IMT	0							17.29	9.47	7.9	0		1.15	1 potlid scar
MSP-03	**OA 3**	10	3	1	medial flake	silcrete	0							11.24	7.11	5.84	1		0.51	
MSP-03	**OA 3**	10	4	2	angular fragment	silcrete	0							8.57	8.71	2.18	2		0.15	
MSP-03	**OA 3**	10	4	2	medial flake	silcrete	0							7.2	9.44	3.88	3		0.31	
MSP-03	**OA 3**	10	4	2	angular fragment	silcrete	0							18.72	14.87	10.39	0		2.76	
MSP-03	**OA 3**	10	4	3	complete flake	IMT	0	crushed			feather			13.06	18.97	3.45	1		0.81	
MSP-03	**OA 3**	10	4	1	angular fragment	IMT	0							9.25	7.87	3.95	0		0.26	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	4	9	3	proximal flake	silcrete	0	flaked	8.22	2.13				9.01	11.43	2.64	1		0.41	
MSP-03	**OA3**	4	9	2	complete flake	silcrete	0	flaked	3.61	1.39	plunge			8.07	9.39	2.19	2		0.2	
MSP-03	**OA3**	4	9	2	angular fragment	silcrete	0							8.77	6.61	4.65	0		0.21	
MSP-03	**OA3**	4	10	3	distal flake	silcrete	0				feather			10.57	7.81	1.94	1		0.23	
MSP-03	**OA3**	22	17A	2	angular fragment	silcrete	0							21	11.02	4.49	1		1.05	
MSP-03	**OA3**	22	17A	2	angular fragment	silcrete	0							18.89	11.13	6.04	0		1.21	
MSP-03	**OA3**	22	17A	1	angular fragment	silcrete	0							12.05	13.21	3.56	1		0.69	
MSP-03	**OA3**	22	17A	1	angular fragment	silcrete	0							12.74	11.04	3.02	2		0.68	
MSP-03	**OA3**	22	17A	1	complete	silcrete	0	flaked	20.22	9.36	feather			22.16	15.71	8.47	0		4.45	
MSP-03	**OA3**	23	22	2	distal flake	silcrete	0				feather			18.55	12.04	4.59	2		0.98	
MSP-03	**OA3**	23	14	1	single platform core	silcrete	0							45.31	23.78	9.42	1		13.92	LFS 15.55 L, 10.52 W
MSP-03	**OA3**	23	14	3	angular fragment	silcrete	0							11.73	11.94	3.88	1		0.69	
MSP-03	**OA3**	23	14	3	distal flake	silcrete	0				feather			12.85	8.43	5.44	1		0.51	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	23	14	3	angular fragment	silcrete	0							16.56	8.24	7.19	0		0.77	
MSP-03	**OA3**	23	14	3	distal flake	silcrete	0				feather			8.65	5.09	2.3	1		0.13	
MSP-03	**OA3**	23	15	4	complete flake	silcrete	0	flaked	4.58	2.23	feather			19.26	4.29	3.94	1		0.47	
MSP-03	**OA3**	23	13	2	angular fragment	silcrete	0							23.07	24.92	7.88	2		4	1 potlid scar
MSP-03	**OA3**	23	13	3	angular fragment	silcrete	0							7.96	5.98	3.02	0		0.29	
MSP-03	**OA3**	23	13	5	angular fragment	silcrete	0							10.87	11.17	8.96	0		1.18	
MSP-03	**OA3**	23	13	4	angular fragment	silcrete	0							11.05	11.17	9.34	0		1.17	
MSP-03	**OA3**	23	13	4	medial flake	silcrete	0							10.01	8.79	5.9	1		0.43	
MSP-03	**OA3**	7A	1	1	proximal flake	IMT	0	flaked	26.3	7.98				15.68	27.45	7.25	2		2.74	
MSP-03	**OA3**	7A	1	1	angular fragment	silcrete	30							26.06	20.25	14.27			5.81	
MSP-03	**OA3**	7A	1	1	grinding fragment	silcrete	0							27.33	22.22	10.74			6.14	
MSP-03	**OA3**	7A	1	1	complete flake	silcrete	20	flaked	10.54	3.77	feather			11.62	10.85	4.01	1		0.45	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	7A	1	1	complete flake	silcrete	0	crushed			feather			12.91	7.84	2.12			0.25	
MSP-03	**OA3**	12	7	2	angular fragment	chert	0							17.13	15.04	4.57			1.18	potlid scar
MSP-03	**OA3**	3	5	1	tool	silcrete	0					backing retouch	lateral	10.07	9.23	3.6	2	geometric microlith	0.3	broken geometric microlith fragment
MSP-03	**OA3**	3	5	1	angular fragment	silcrete	0							9.79	7.23	4.62			0.35	
MSP-03	**OA3**	3	5	1	complete flake	silcrete	0	flaked	7.81	2.54	plunge			13.01	12.36	3.49			0.55	
MSP-03	**OA3**	7A	1	2	tool	silcrete	0	flaked	16.9	7.31	plunge	backing retouch	lateral	27.69	18.66	6	6	notched	4.3	notched tool with backing on opposite lateral margin
MSP-03	**OA3**	7A	1	2	proximal flake	silcrete	0	flaked focal	5.03	3.15				13.91	11.46	6.28	1		0.72	
MSP-03	**OA3**	7A	1	2	tool	silcrete	0					backing retouch	lateral	23.4	10.34	9.03	5	eloura	2.47	Broken eloura
MSP-03	**OA3**	7A	1	2	angular fragment	silcrete	0							24.52	19.13	5.15	1		2.58	
MSP-03	**OA3**	7A	1	2	angular fragment	quartz	0							11.6	7.05	4.75			0.43	
MSP-03	**OA3**	7A	1	2	angular fragment	silcrete	0							12.92	6.09	2.45			0.23	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	7A	1	2	angular fragment	silcrete	0							16.91	9.25	4.8			0.85	
MSP-03	**OA3**	7A	1	2	angular fragment	silcrete	0							14.04	10.4	6.25			0.65	
MSP-03	**OA3**	7A	1	2	complete flake	silcrete	0	flaked	10.3	3.2	feather			9.86	11.06	3.2			0.39	
MSP-03	**OA3**	7A	1	2	proximal flake	silcrete	0	flaked	6.93	3.82				11.66	7.15	3.22	2		0.33	
MSP-03	**OA3**	7A	1	2	angular fragment	silcrete	0							10.05	7.82	2.75			0.23	
MSP-03	**OA3**	7A	1	2	tool	silcrete	0					backing retouch	lateral				5	bondi point	0.23	tip broken off
MSP-03	**OA3**	9	3	2	angular fragment	chert	0							19.42	14	5.63	0		1.25	potlid scar
MSP-03	**OA3**	9	3	2	angular fragment	silcrete	0							13.83	11.85	11.83			2.59	
MSP-03	**OA3**	9	3	2	angular fragment	IMT	0							7.64	7.37	1.75	2		0.14	
MSP-03	**OA3**	9	3	2	angular fragment	silcrete	0							12.51	9.08	3.17			0.3	
MSP-03	**OA3**	9	3	2	angular fragment	silcrete	0							8.95	8.8	7.26			0.51	
MSP-03	**OA3**	9	3	2	angular fragment	silcrete	0							13.19	9.51	2.82			0.44	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	9	3	2	angular fragment	silcrete	25							13.96	8.11	3.88			0.39	
MSP-03	**OA3**	9	3	2	angular fragment	silcrete	0							14.83	4.1	2.69			0.32	
MSP-03	**OA3**	9	3	2	angular fragment	IMT	0							10.57	8.62	2.35			0.14	
MSP-03	**OA3**	9	3	2	angular fragment	IMT	25							19.83	16.95	6.69			1.95	potlid scar
MSP-03	**OA3**	9	3	2	rejuvenation flake	silcrete	0	flaked focal	3.06	2.83				16.28	6.27	4.24	3		0.43	
MSP-03	**OA3**	9	3A	1	bi polar core	silcrete	0							33.05	29.33	15.9	2		18.26	
MSP-03	**OA3**	9	3A	1	complete flake	silcrete	0	crushed						13.15	10.01	2.04	2		0.35	
MSP-03	**OA3**	9	3A	2	angular fragment	silcrete	0							7.65	5.25	2.3			0.14	
MSP-03	**OA3**	9	3A	2	angular fragment	silcrete	0							15.07	14.35	6.36			1.03	
MSP-03	**OA3**	9	3A	2	complete flake	silcrete	0	crushed			feather			7.15	10.81	1.47			0.11	
MSP-03	**OA3**	9	3A	2	angular fragment	silcrete	0							18.93	8.9	5.84	2		1	
MSP-03	**OA3**	9	3A	2	angular fragment	chert	0							13.39	10.86	2.97	1		0.5	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	9	3A	2	angular fragment	silcrete	0							10.86	8.01	3.28			0.33	
MSP-03	**OA3**	9	3A	2	angular fragment	silcrete	0							10.65	6.56	2.99			0.27	
MSP-03	**OA3**	9	3A	2	tool	silcrete	0	flaked focal	3.57	2.2		backing retouch	lateral	13.19	7.43	4.37	4	bondi point	0.4	Broken bondi point
MSP-03	**OA3**	9	3A	2	medial flake	silcrete	0							9.71	15.4	2.44	3		0.64	
MSP-03	**OA3**	9	3A	2	angular fragment	silcrete	0							11.19	7.89	2.36	1		0.3	
MSP-03	**OA3**	9	3A	2	tool	silcrete	0							10.91	6.27	3.66		dihedral burin	0.28	snapped
MSP-03	**OA3**	9	3A	2	grinding stone base	siltstone	0							175	125	55		grinding stone	689	three conjoinable pieces
MSP-03	**OA3**	6A	1	2	proximal flake	IMT	0	flaked	11.2	7.04				13.16	12.74	8.37	2		1.59	
MSP-03	**OA3**	6A	1	2	angular fragment	quartz	0							12.21	11.24	8.8			1.45	
MSP-03	**OA3**	6A	1	2	angular fragment	quartz	0							8.8	9.58	5.18			0.43	
MSP-03	**OA3**	9	3	1	single platform core	silcrete	30							43.91	28.6	17.35	2		24.75	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	9	3	1	angular fragment	silcrete	0							16.94	16.46	6.63			2.12	
MSP-03	**OA 3**	9A	1	2	angular fragment	chert	0							13.62	8.27	4.31			0.48	
MSP-03	**OA 3**	9A	1	2	angular fragment	IMT	0							14.6	10.38	9.39			0.92	
MSP-03	**OA 3**	9A	1	2	angular fragment	quartz	0							13.16	5.97	3.62			0.39	
MSP-03	**OA 3**	9A	1	1	angular fragment	silcrete	0							13.89	5.73	4.18			0.29	
MSP-03	**OA 3**	9A	1	1	angular fragment	silcrete	0							11.95	8.89	3.74			0.38	
MSP-03	**OA 3**	9A	1	1	angular fragment	silcrete	0							12.05	7.88	5.43			0.49	
MSP-03	**OA 3**	9A	1	1	angular fragment	chert	0							13.55	9.67	2.13			0.24	potlid scar
MSP-03	**OA 3**	9A	1	1	angular fragment	silcrete	0							13.61	5.89	4.39			0.33	
MSP-03	**OA 3**	9A	1	1	angular fragment	chert	0							11.68	6.57	5.28			0.33	
MSP-03	**OA 3**	9A	1	1	angular fragment	silcrete	50							19.52	10.57	5.89			1.29	
MSP-03	**OA 3**	9A	1	1	angular fragment	silcrete	0							11.2	7.3	2.87			0.25	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	9A	1	1	proximal flake	silcrete	0	crushed						7.39	9.65	1.77			0.13	
MSP-03	**OA 3**	9A	1	1	proximal flake	silcrete	0	crushed						9.54	6.67	2.3			0.21	
MSP-03	**OA 3**	9A	1	1	proximal flake	silcrete	0	crushed						12.06	16	1			0.41	
MSP-03	**OA 3**	9A	1	1	angular fragment	chert	0							15.25	11.01	4.74			0.62	
MSP-03	**OA 3**	9A	1	1	rejuvenation flake	silcrete	0	flaked focal	3.35	2.31				`18.96	7.86	5.7	2		0.8	
MSP-03	**OA 3**	9A	1	1	complete flake	silcrete	0	flaked focal	5.36	2.45	feather			17.4	11.29	3.56	2		0.66	
MSP-03	**OA 3**	9A	1	1	proximal flake	silcrete	0	crushed						18.14	16.76	4.34	1		1.79	
MSP-03	**OA 3**	9A	1	1	proximal flake	silcrete	0	flaked	8.76	3.21				13.63	15	3.26	2		0.78	
MSP-03	**OA 3**	9	3A	3	angular fragment	silcrete	0							8.74	6.52	4.65			0.2	
MSP-03	**OA 3**	9	3A	3	angular fragment	silcrete	0							16.54	8.9	3.42			0.55	
MSP-03	**OA 3**	9	3A	3	longitudinal flake	silcrete	0	flaked						14.75	7.7	4.55			0.53	
MSP-03	**OA 3**	3	3	3	multiplatform core	tuff	0							23.08	18.02	10.53	2		3.16	LFS: 22.45mm L, 17.94 W

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	3	3	3	angular fragment	silcrete	0							19	11.88	7.33	1		1.94	
MSP-03	**OA3**	4	2	1	complete flake	silcrete	0	flaked	6.99	2.1	feather			9.75	8.17	2.36			0.27	
MSP-03	**OA3**	4	3	2	distal flake	silcrete	0				feather			11.8	12.7	3.29	3		0.48	
MSP-03	**OA3**	4	3	2	angular fragment	silcrete	0							8.49	5.6	5.09			0.24	
MSP-03	**OA3**	4	3	2	proximal flake	silcrete	0	flaked	6.15	2.89				7.48	9.49	2.63			0.25	
MSP-03	**OA3**	4	3	2	complete flake	silcrete	0	flaked	9.4	2.41	feather			7.28	8.2	2.48			0.18	
MSP-03	**OA3**	4	3	2	proximal flake	silcrete	0	flaked	5.14	1.68				7.35	10.66	2.41			0.19	
MSP-03	**OA3**	3	2	1	complete flake	silcrete	0	flaked	7.73	4.17	feather			27.6	11.22	5.48	1		1.82	
MSP-03	**OA3**	3	2	1	angular fragment	silcrete	0							17.9	16.26	4.94	2		1.26	
MSP-03	**OA3**	3	2	1	angular fragment	silcrete	0							21.04	14.15	5.62			1.14	
MSP-03	**OA3**	3	2	1	proximal flake	silcrete	0	flaked focal	4.23	2.14				11.68	8.33	2.27	3		0.34	
MSP-03	**OA3**	3	2	1	angular fragment	silcrete	0							12.65	9.55	3.06			0.33	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	3	2	1	ceramic fragment	blue transfer ware														
MSP-03	**OA3**	3	4	3	glass fragment	glass														non-artefactual
MSP-03	**OA3**	3	4	3	angular fragment	silcrete	0							14.23	9.77	6.69			1.03	pot lids
MSP-03	**OA3**	3	4	3	angular fragment	silcrete	0							13.62	7.62	6.75			0.56	pot lids
MSP-03	**OA3**	3	4	3	angular fragment	silcrete	0							10.7	9.43	4.48			0.46	
MSP-03	**OA3**	17	20	2	angular fragment	silcrete	0							20.77	15.06	10.5			2.27	pot lids
MSP-03	**OA3**	17	10	4	angular fragment	silcrete	0							20.11	6.09	2.99			0.38	
MSP-03	**OA3**	17	10	1	angular fragment	silcrete	0							31.53	12.02	7.19			3.99	
MSP-03	**OA3**	3	6	6	complete flake	silcrete	0	flaked	6.46	2.83	feather			14.13	10.27	3.05			0.55	
MSP-03	**OA3**	3	6	4	angular fragment	silcrete	0							17.56	15.01	6.44			2.01	
MSP-03	**OA3**	A1	1	1	angular fragment	silcrete	0							12.64	11.19	5.53			1.04	
MSP-03	**OA3**	A1	1	1	angular fragment	silcrete	0							14.44	14.09	4.12			0.98	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	14	3	3	angular fragment	silcrete	0							19.28	13.07	5.33			1.62	
MSP-03	**OA 3**	14	3	3	angular fragment	IMT	0							12.16	5.68	2.46			0.14	
MSP-03	**OA 3**	19	12	1	angular fragment	quartz	0							10.45	5.19	3.33			0.18	
MSP-03	**OA 3**	A1	2	3	proximal flake	silcrete	0	flaked	12.69	4.68				8.51	17.57	4.56			0.72	
MSP-03	**OA 3**	18	5	4	angular fragment	silcrete	0							12.31	12.26	2.57			0.29	
MSP-03	**OA 3**	18	5	4	longitudinal flake	IMT	0	crushed						21.3	11.36	4.71			1.25	
MSP-03	**OA 3**	18	5	3	angular fragment	silcrete	0							12.74	11.29	6.05			0.76	
MSP-03	**OA 3**	18	5	3	angular fragment	silcrete	0							12.3	8.66	4.67			0.5	
MSP-03	**OA 3**	18	5	2	angular fragment	silcrete	0							13.59	10.75	7.22			0.72	
MSP-03	**OA 3**	3	6	5	angular fragment	silcrete	0							11.09	10.58	5.31			0.62	
MSP-03	**OA 3**	18	3	6	angular fragment	silcrete	0							18.17	9.61	7.13			0.65	
MSP-03	**OA 3**	3	6	4	angular fragment	silcrete	0							18.7	11.7	6.79			1.09	potlids

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	18	1	2	longitudinal flake	silcrete	0	flaked	6.97	2.86	feather			11.8	7.04	2.86			0.31	
MSP-03	**OA3**	18	1	1	angular fragment	silcrete	0							10.64	8.17	3.25			0.22	
MSP-03	**OA3**	18	3	1	grinding stone fragment	silcrete	0							23.74	12.74	12.51			4.25	
MSP-03	**OA3**	18	8	2	complete flake	chert	0	flaked	22.84	13.01	hinge			41.78	38.63	13.01			15.94	
MSP-03	**OA3**	18	5	6	angular fragment	silcrete	0							12.45	9.47	5.28			0.69	
MSP-03	**OA3**	3	6	3	angular fragment	IMT	0							22.68	10.4	9.86			1.17	potlids
MSP-03	**OA3**	3	6	3	tool	IMT	0					backing	lateral	18.69	5.36	4.19	5	bondi point	0.48	broken bondi point
MSP-03	**OA3**	A1	2	4	complete flake	silcrete	0	flaked	12.93	4.28	hinge			16.02	14.08	4.13			0.66	
MSP-03	**OA3**	A1	2	4	complete flake	silcrete	0	flaked	16.92	5.71	feather			9.27	17.67	5.11			0.87	
MSP-03	**OA3**	A1	2	4	angular fragment	silcrete	0							14.93	10.83	7.43			1.32	potlids
MSP-03	**OA3**	A1	2	4	complete flake	silcrete	0	flaked	13.51	4.04	feather			14.6	17.23	4.31			0.65	
MSP-03	**OA3**	A1	2	4	angular fragment	silcrete	0							21.42	14.38	5.78			1.35	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	A1	2	4	complete flake	silcrete	0	flaked	4.61	1.64	feather			8.18	5.81	1.62			0.05	
MSP-03	**OA3**	19	18	1	angular fragment	silcrete	0							18.07	5.83	2.54			0.27	
MSP-03	**OA3**	19	18	1	angular fragment	silcrete	0							23.53	19.61	7.3			3.79	
MSP-03	**OA3**	19	14	2	complete flake	silcrete	0	flaked	17.66	5.28	feather			7.84	17.66	5.28			0.55	
MSP-03	**OA3**	17	16	2	complete flake	silcrete	0	flaked	13.22	3.78	feather			10.61	13.22	3.78			0.52	
MSP-03	**OA3**	3	8	4	tool	silcrete	0	crushed				step/scalar	proximal/distal	18.32	21.06	8.87	see notes	steep edge scraper	3.64	4 negative flake scars on dorsal/3 proximal/6 distal
MSP-03	**OA3**	19	24	2	bipolar core	silcrete	0							19.02	15.68	14.22	1		4.7	LFS19.02x12.12
MSP-03	**OA3**	A1	3	5	bipolar core	silcrete	50	bipolar cortical						17.99	11.36	5.48			1.59	
MSP-03	**OA3**	A1	3	5	angular fragment	silcrete	0							19.42	11.97	9.15			2.73	
MSP-03	**OA3**	A1	3	3	angular fragment	silcrete	0							13.73	10.82	9.49			1.32	
MSP-03	**OA3**	7A	1	3	angular fragment	silcrete	0							16.08	14.1	4.28			1.16	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	7A	1	3	single platform core	silcrete	50	flaked						29.13	29.86	14.64	3 microblade, 1 larger	microblade	13.5	Micro blabe core LFS 15.66x9.09
MSP-03	**OA3**	17	12	2	angular fragment	silcrete	0							15.2	12.95	5.68			0.78	
MSP-03	**OA3**	18	11	3	complete flake	silcrete	0	flaked	9.23	4.09	hinge			24.7	13.86	6.33			2.26	
MSP-03	**OA3**	17	12	4	complete flake	silcrete	0	flaked	6.63	1.91	feather			7.74	9.72	2.12			0.2	
MSP-03	**OA3**	13	3	3	complete flake	chert	10	cortical	18.31	5.05	feather			9	21.43	5.14	2		1.19	
MSP-03	**OA3**	13	2	1	angular fragment	silcrete	0							17.68	9.02	4.72			0.79	
MSP-03	**OA3**	13	1	2	flake core	IMT	40							24.96	35.31	30.22	3		24.45	LFS 24.02x13.02
MSP-03	**OA3**	13	1	2	longitudinal flake	silcrete	0				feather			30.26	18.73	4.56	1		2.43	
MSP-03	**OA3**	13	1	2	single platform core	IMT	0							8.84	40	30.04	3		12.01	LFS 8.78x13.41
MSP-03	**OA3**	13	1	2	single platform core	silcrete	20	cortical						13.51	29.96	121.63	1		2.75	LFS 14.99x14.17
MSP-03	**OA3**	13	1	2	angular fragment	sil	0							18.44	6.7	3.47			0.36	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	13	1	2	angular fragment	silcrete	0							13.33	10.42	7.92			1.34	
MSP-03	**OA3**	13	1	2	complete flake	silcrete	0	flaked	10	2.57	feather			9.3	10.23	2.19			0.23	
MSP-03	**OA3**	13	1	2	angular fragment	silcrete	0							10.03	7.28	2.71			0.2	
MSP-03	**OA3**	13	1	2	tool	silcrete	0					backing	lateral	10.93	5.28	2.32	5	backed blade	0.16	broken at distal and proximal ends
MSP-03	**OA3**	13	1	2	tool	chert	0	flaked focal	3.36	1.98		chibling	lateral	19.97	6.64	2.81	chibling	bondi point	0.37	utilise flaked
MSP-03	**OA3**	13	1	2	tool	chert	0	flaked focal	3.69	1.71		backing	lateral	18.4	7.12	3.39	7	bondi point	0.41	complete
MSP-03	**OA3**	12	3	3	angular fragment	silcrete	0							11.73	8.95	3.15			0.29	
MSP-03	**OA3**	12	3	3	angular fragment	silcrete	0							23.85	17.82	15.72	2		2.22	
MSP-03	**OA3**	12	3	3	single platform core	silcrete	5							18.8	19.7	14.39	1		3.49	LFS 10.47x8.53
MSP-03	**OA3**	12	3	3	multiplatform core	silcrete	5							13.36	12.36	10.21	2		2.97	LFS 12.0x6.39
MSP-03	**OA3**	12	3	3	complete flake	silcrete	0	crushed			feather			14.43	16.27	2.6	1		0.46	
MSP-03	**OA3**	12	3	3	proximal flake	silcrete	0	crushed						11.93	7.77	3.32	2		0.28	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	13	3	2	multiplatform core	IMT	20							34.75	31.45	28.8	7		35.67	
MSP-03	**OA3**	13	3	2	distal flake	chert	0				hinge			12.31	16.99	5.46	1		1.42	
MSP-03	**OA3**	13	3	2	angular fragment	silcrete	0							13.67	9.68	2.51			0.34	
MSP-03	**OA3**	13	3	2	complete flake	silcrete	0	flaked	7.57	2.24	feather			10	10.01	2.9	2		0.24	
MSP-03	**OA3**	13	3	2	complete flake	silcrete	0	crushed			feather			16.43	6.91	2.13			0.19	
MSP-03	**OA3**	13	4	1	complete flake	chert	0	crushed			feather			11.04	7.37	1.11	2		0.09	
MSP-03	**OA3**	13	4	3	complete flake	siltstone	50	crushed			stepped			30.6	25.64	5.27			4.97	bending initiation
MSP-03	**OA3**	13	4	3	medial flake	siltstone	0							19.12	27.03	7.09	2		3.84	
MSP-03	**OA3**	13	4	3	longitudinal flake	mudstone	0	flaked	16.78	9.26				28.9	17.55	9.92	1		4.79	banded/plough damaged
MSP-03	**OA3**	13	1	1	single platform core	chert	0							12.25	28.87	12.7	1		2.78	LFS 12.25x16.64
MSP-03	**OA3**	13	1	1	angular fragment	silcrete	0							16.6	14.17	8.27			1.5	
MSP-03	**OA3**																			

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	13	1	1	complete flake	silcrete	0	flaked	12.12	6.94	feather			15.21	13.78	7.6	2		1.46	
MSP-03	**OA3**	13	1	1	angular fragment	silcrete	0							21.63	15.37	6.38			1.27	
MSP-03	**OA3**	13	1	1	distal flake	siltstone	0				feather			6.45	9.82	2.68			0.16	
MSP-03	**OA3**	13	1	1	distal flake	siltstone	0				feather			10.7	10.2	2.81	2		0.22	
MSP-03	**OA3**	12	2	2	angular fragment	silcrete	0							18.47	12.41	8.62			1.75	
MSP-03	**OA3**	12	2	2	angular fragment	silcrete	0							11.34	9.95	5.11			0.49	
MSP-03	**OA3**	12	2	2	angular fragment	silcrete	0							12.72	8.81	3.17			0.37	
MSP-03	**OA3**	12	2	1	complete flake	silcrete	0	flaked	20.32	6.04	feather			12.05	20.34	5.74			1.12	
MSP-03	**OA3**	12	3	3	complete flake	silcrete	10	crushed			axial			27.44	22.86	6.331			3.6	bending initiation
MSP-03	**OA3**	12	3	3	angular fragment	silcrete	0							19.19	14.68	5.86			1.09	
MSP-03	**OA3**	12	3	3	proximal flake	silcrete	0	flaked	15.19	5.86				6.96	16.06	6.24			0.93	
MSP-03	**OA3**	12	3	3	angular fragment	silcrete	0							16.74	11.41	5.08			0.62	
MSP-03	**OA3**	12	3	4	complete flake	silcrete	0	crushed			feather			17.47	13.31	5.68			1.06	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	13	1	2	longitudinal flake	silcrete	0	flaked	11.58	7.92	feather			23.23	11.49	6.26			2.3	
MSP-03	**OA3**	13	5	1	angular fragment	silcrete	0							14.23	10.67	3.85			0.41	
MSP-03	**OA3**	13	1	3	complete flake	silcrete	0	flaked	21.04	7.18	feather			7.96	20.35	7.21			0.82	
MSP-03	**OA3**	13	1	3	angular fragment	silcrete	0							20.14	14.58	7.71			1.59	
MSP-03	**OA3**	13	3	1	distal flake	silcrete	0				feather			10.58	10.81	3.1			0.37	
MSP-03	**OA3**	13	3	3	proximal flake	quartz	0	crushed						10.95	8.63	2.94			0.32	
MSP-03	**OA3**	13	3	3	longitudinal flake	mudstone	50	flaked	11.89	7.36	axial			19.39	14.14	7.26			1.62	
MSP-03	**OA3**	12	5	3	angular fragment	silcrete	0							18.67	14.34	6.73			1.68	
MSP-03	**OA3**	12	5	3	distal flake	mudstone	0				hinge			13.85	20.48	2.47			0.62	
MSP-03	**OA3**	12	5	2	angular fragment	silcrete	0							12.95	10.81	4.34			0.57	
MSP-03	**OA3**	12	5	2	longitudinal flake	siltstone	0	flaked	15.69	8.46	feather			34.27	20.46	8.85			6.02	
MSP-03	**OA3**	13	2	5	complete flake	silcrete	0	crushed			stepped			20.58	12.08	5.09			1.41	
MSP-03	**OA3**	9	1	1	angular fragment	silcrete	0							26.91	16.44	9.97			1.83	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	9	1	1	complete flake	silcrete	0	flaked	9.58	3.31	feather			15.74	17.04	6.06			1.51	
MSP-03	**OA3**	9	1	1	angular fragment	silcrete	0							18.85	10.1	5.78			1.08	
MSP-03	**OA3**	9	1	1	bipolar core	silcrete	0							44.22	25.02	19.67			15.46	
MSP-03	**OA3**	9	1	1	single platform core	silcrete	50							78.79	51.35	20.64			94.53	LFS 32.18x29.62
MSP-03	**OA3**	9	1	1	proximal flake	silcrete	0	flaked focal	8.73	3.14				27.83	24	8.27			4.54	
MSP-03	**OA3**	9	1	1	angular fragment	silcrete	0							18.91	16.72	4.8			1.62	
MSP-03	**OA3**	9	1	1	angular fragment	silcrete	10							19.83	14.81	7.66	2		2.7	
MSP-03	**OA3**	9	1	1	complete flake	mudstone	0	flaked	9.17	5.15	hinge			13.28	14.6	5.18			0.9	
MSP-03	**OA3**	9	1	1	complete flake	silcrete	10	flaked	7.99	4.54	feather			13.44	13.26	4.78			0.84	
MSP-03	**OA3**	9	1	1	angular fragment	silcrete	0							14.63	9.3	3.72			0.39	
MSP-03	**OA3**	9	1	1	angular fragment	silcrete	0							13.29	6.75	3.07			0.26	
MSP-03	**OA3**	9	1	1	distal flake	silcrete	0				feather			9.97	10.75	3.52			0.31	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	9	1	1	angular fragment	chert	0							12.29	9.64	2.58			0.24	
MSP-03	**OA3**	5	5	4	angular fragment	silcrete	0							8.93	8.15	3.95			0.27	
MSP-03	**OA3**	5	5	2	angular fragment	quartz	0							17.17	11.63	6.6			1.33	
MSP-03	**OA3**	5	5	2	angular fragment	quartz	0							12.45	7.36	4.25			0.3	
MSP-03	**OA3**	9	5	1	angular fragment	petrified wood	0							18.99	8.21	4.48			0.72	
MSP-03	**OA3**	8	8	2	medial flake	silcrete	0							14.44	14.4	4.08	3		0.92	
MSP-03	**OA3**	9	6	3	angular fragment	silcrete	0							21.81	16.25	9.01			4.29	
MSP-03	**OA3**	11	5	1	single platform core	silcrete	0							60.11	39.2	22.04	3		44.85	LFS 35.48x15.53
MSP-03	**OA3**	11	6	2	angular fragment	silcrete	0							16.53	11.06	8.69			1.51	
MSP-03	**OA3**	12	6	1	longitudinal flake	silcrete	0	crushed			feather			17.64	16.23	4.93			1.29	
MSP-03	**OA3**	11	5	2	complete flake	chert	0	crushed			feather			13.08	8.93	2.35			0.22	
MSP-03	**OA3**	11	5	2	angular fragment	chert	0							13.91	5.45	4.67			0.29	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	11	5	2	angular fragment	siltstone	0							29.87	25.38	4.13			2.98	
MSP-03	**OA3**	11	5	3	angular fragment	quartz	0							23.38	21.86	11.49			4.01	
MSP-03	**OA3**	11	6	3	longitudinal flake	siltstone	0	flaked	11.74	3.19	feather			16.53	16.07	3.23			0.89	
MSP-03	**OA3**	9	4	1	distal flake	silcrete	0				feather			5.87	11.09	2.47			0.18	
MSP-03	**OA3**	9	4	1	complete flake	silcrete	0	flaked	10.7	5.79	feather			24.95	14.57	6.17			2.5	
MSP-03	**OA3**	11	4	2	multiplatform core	silcrete	0							37.57	31.23	28.29	5		28.26	LFS 24.37x18.76
MSP-03	**OA3**	11	4	2	angular fragment	silcrete	0							11.28	9.64	2.95			0.28	
MSP-03	**OA3**	11	4	2	angular fragment	silcrete	0							10.16	8.9	3.02			0.24	
MSP-03	**OA3**	11	4	2	angular fragment	silcrete	0							11.12	8.76	4.21			0.49	
MSP-03	**OA3**	11	4	3	multiplatform core	silcrete	10							68.14	38.38	30.93	4		75.31	LFS 26.06x17.39
MSP-03	**OA3**	11	4	3	complete flake	silcrete	0	flaked	17.75	4.13	feather			12.85	18.34	4.36			1.02	
MSP-03	**OA3**	11	4	3	angular fragment	silcrete	0							14.75	7.25	4.62			0.5	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	11	4	3	angular fragment	mudstone	0							13.81	6.5	1.77			0.17	
MSP-03	**OA 3**	11	4	1	angular fragment	silcrete	0							7.18	4.44	1.79			0.03	
MSP-03	**OA 3**	11	4	1	medial flake	mudstone	0							11.39	6.65	3.45	3		0.35	
MSP-03	**OA 3**	11	4	1	angular fragment	silcrete	0							12.51	10.52	3.69			0.41	
MSP-03	**OA 3**	11	4	1	angular fragment	silcrete	0							10.92	10.9	4.52			0.69	
MSP-03	**OA 3**	11	4	1	angular fragment	silcrete	0							8.36	6.28	4.65			0.21	
MSP-03	**OA 3**	11	4	1	angular fragment	silcrete	0							14.82	10.54	10.4			1.37	
MSP-03	**OA 3**	11	4	1	complete flake	silcrete	20							32.7	18.43	10.85			5.82	
MSP-03	**OA 3**	10	5	1	angular fragment	silcrete	0							20.33	12.7	8.39			2.46	
MSP-03	**OA 3**	10	5	45	angular fragment	silcrete	0							11.41	8.69	2.2			0.2	
MSP-03	**OA 3**	8	6A	3	single platform core	quartzite	0							24.54	12.06	7.94			2.7	LFS 8.81x7.41
MSP-03	**OA 3**	8	6A	1	complete flake	mudstone	0	flaked focal	4.91	3.14	feather			19.68	12.55	5.96	1		1.61	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	8	6A	1	angular fragment	silcrete	0							19.21	9.59	5.19			0.62	
MSP-03	**OA3**	8	6A	2	complete flake	silcrete	20	flaked focal	8.49	3.87	axial			22.4	20.17	7.62	1		3.15	
MSP-03	**OA3**	8	6A	2	angular fragment	silcrete	0							10.36	6.47	3.79			0.26	
MSP-03	**OA3**	6	10	3	angular fragment	chert	0							12.68	10.09	4.9			0.55	
MSP-03	**OA3**	6	8	2	angular fragment	silcrete	0							9.91	9.03	3.52			0.32	
MSP-03	**OA3**	6	8	2	angular fragment	silcrete	0							8.77	8.08	3.3			0.3	
MSP-03	**OA3**	6	6	2	complete flake	siltstone	20	flaked focal	10.34	6.8	axial			33.52	38.54	17.73	1		19.3	potlids
MSP-03	**OA3**	6	6	2	complete flake	silcrete	0	flaked	15.61	4.49	feather			15.37	18.65	5.35			1.58	
MSP-03	**OA3**	6	6	2	angular fragment	silcrete	0							16.14	15.1	5.5			1.09	
MSP-03	**OA3**	6	6	2	angular fragment	silcrete	0							13.5	10.61	6.53			1	
MSP-03	**OA3**	6	6	2	angular fragment	silcrete	0							8.99	5.69	5.25			0.38	
MSP-03	**OA3**	6	6	2	angular fragment	silcrete	0							12.51	7.81	1.71			0.17	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA3**	5	9	3	angular fragment	mudstone	0							12.22	8.6	3.58			0.42	
MSP-03	**OA3**	5	8	1	complete flake	silcrete	0	flaked f	11.66	5.01	feather			17.73	13.52	5.41			1.53	
MSP-03	**OA3**	5	8	1	complete flake	siltstone	0	flaked focal	6.87	3.13	plunge			18.37	12.41	6.38			1.15	
MSP-03	**OA3**	5	6	4	longitudinal flake	silcrete	10	flaked focal	5.33	3.31	axial			22.27	22.31	9.72			3.98	
MSP-03	**OA3**	5	6	4	multiplatform core	siltstone	30							27.08	19.36	14.65			11.22	LFS 23.49x7.52
MSP-03	**OA3**	5	6	2	angular fragment	mudstone	50							17.02	15.91	8.44			2.4	
MSP-03	**OA3**	4	8	3	longitudinal flake	silcrete	0	flaked	18.24	11.9	feather			49.04	29.47	16.37			18.91	
MSP-03	**OA3**	4	8	3	angular fragment	silcrete	0							13.89	11.05	2.16			0.3	
MSP-03	**OA3**	4	8	3	angular fragment	siltstone	0							17.73	13.51	3.94			1.45	
MSP-03	**OA3**	4	8	3	angular fragment	silcrete	0							21.73	10.13	4.47			0.89	
MSP-03	**OA3**	4	8	3	angular fragment	silcrete	0							19.26	10.82	9.65			1.79	
MSP-03	**OA3**	4	8	2	angular fragment	chert	0							20.58	15.16	7.67	2		2.48	

Site Name	Site Area	Transect N.	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width (mm)	Platform depth (mm)	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight	Comments
MSP-03	**OA 3**	4	8	2	angular fragment	siltstone	0							9.61	6.93	3.78			0.32	
MSP-03	**OA 3**	4	8	2	angular fragment	silcrete	0							14.37	5.89	3.26			0.38	
MSP-03	**OA 3**	4	8	2	angular fragment	silcrete	0							12.2	6.78	3.34			0.29	
MSP-03	**OA 3**	23	13	4	angular fragment	silcrete	0							16.44	12.46	8.68			1.17	
MSP-03	**OA 3**	23	13	4	angular fragment	silcrete	0							10.07	8.81	5.75			0.42	
MSP-03	**OA 3**	21	24	3	complete flake	quartzite	0	flaked focal	3.42	2.06	feather			21.28	11.33	5.19			1.14	
MSP-03	**OA 3**	21	24	3	complete flake	silcrete	0	flaked	9.61	6.27	hinge			21.34	20.73	6.3	1		2.31	
MSP-03	**OA 3**	23	23	3	angular fragment	silcrete	0							15.51	8.81	8.79			1.24	
MSP-03	**OA 3**	4	6	4	angular fragment	quartz	0							10.78	8.67	6.01			0.61	
MSP-03	**OA 3**	4	6	4	angular fragment	silcrete	0							13.92	11.53	8.08			0.94	