BaptistCare Macquarie Park Concept Master Plan

Appendix D: Archaeological Report

State Significant Development Application (SSDA)

23 November 2022

Prepared for BaptistCare

FINAL REPORT

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- BaptistCare: Lisa Petro.
- Ethos Urban: Gareth Bird, Colin Finn, and Jessica Kotselas.
- Registered Aboriginal Parties.

Biosis staff involved in this project were:

- Jenny Beckius (mapping).

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Contents

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Tables

Figures

Photos

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Glossary

ACHA	Aboriginal Cultural Heritage Assessment
AHCP	Aboriginal History and Connections Program
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AR	Archaeological Report
BP	Before present
Biosis	Biosis Pty Ltd
Consultation requirements	*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*
DA	Development Application
DCP	Development Control Plan
DECCW	Department of Environment, Climate Change and Water (now Heritage NSW)
DP	Deposited Plan
ESD	Ecologically Sustainable Development
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
FCAD	Fellingham Consultancy and Design
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
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW	New South Wales
PAD	Potential Archaeological Deposit
RAP	Registered Aboriginal Party
SEARs	Secretary's Environmental Assessment Requirements
SSDA	State Significant Development Application
Study area	157 Balaclava Road, Macquarie Park (Lot 60 DP1107965)

the Code	*Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*

Summary

Biosis Pty Ltd (Biosis) was commissioned by BaptistCare to undertake an Aboriginal Cultural Heritage Assessment (ACHA) for the development of a master plan at 157 Balaclava Road, Macquarie Park, New South Wales (NSW) (the study area). This Archaeological Report (AR) documents the findings of the archaeological investigations conducted as part of the ACHA. As required under Section 2.3 of The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a) (the Code), the AR provides evidence about the material traces of Aboriginal land use to support the conclusions and management recommendations in the ACHA.

This report has been prepared to accompany a State Significant Development Application (SSDA) for a Concept Master Plan for the site located at 157 Balaclava Road, Macquarie Park.

Specifically, consent is sought for the following in this Concept SSDA:

- A mixed use development comprising a maximum GFA of 190,000m2 dedicated to a range of land uses including:
  - Student Housing.
  - Seniors Housing.
  - Build to Rent.
  - Retail.
  - Residential.
  - Mixed uses including commercial and allied health.
  - A school.
- Maximum building heights and GFA for each development block.
- Public domain landscape concept, including parks, streets and pedestrian connections.
- Vehicular and intersection upgrades.

The Site

The site is located at 157 Balaclava Road, Macquarie Park, NSW and is legally identified as Lot 60 DP 1107965. The site is located near the corner of Herring Road and Epping Road within the City of Ryde Local Government Area (LGA). It is directly south of Macquarie University and in close proximity to Macquarie Shopping Centre. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings.

The site comprises a significant land holding with street frontages to Balaclava Road and Epping Road. It currently accommodates several low-medium density buildings that are connected via internal footpaths and lower order road networks. The total site area of the BaptistCare landholding is 63,871m^2 (Photo 1).

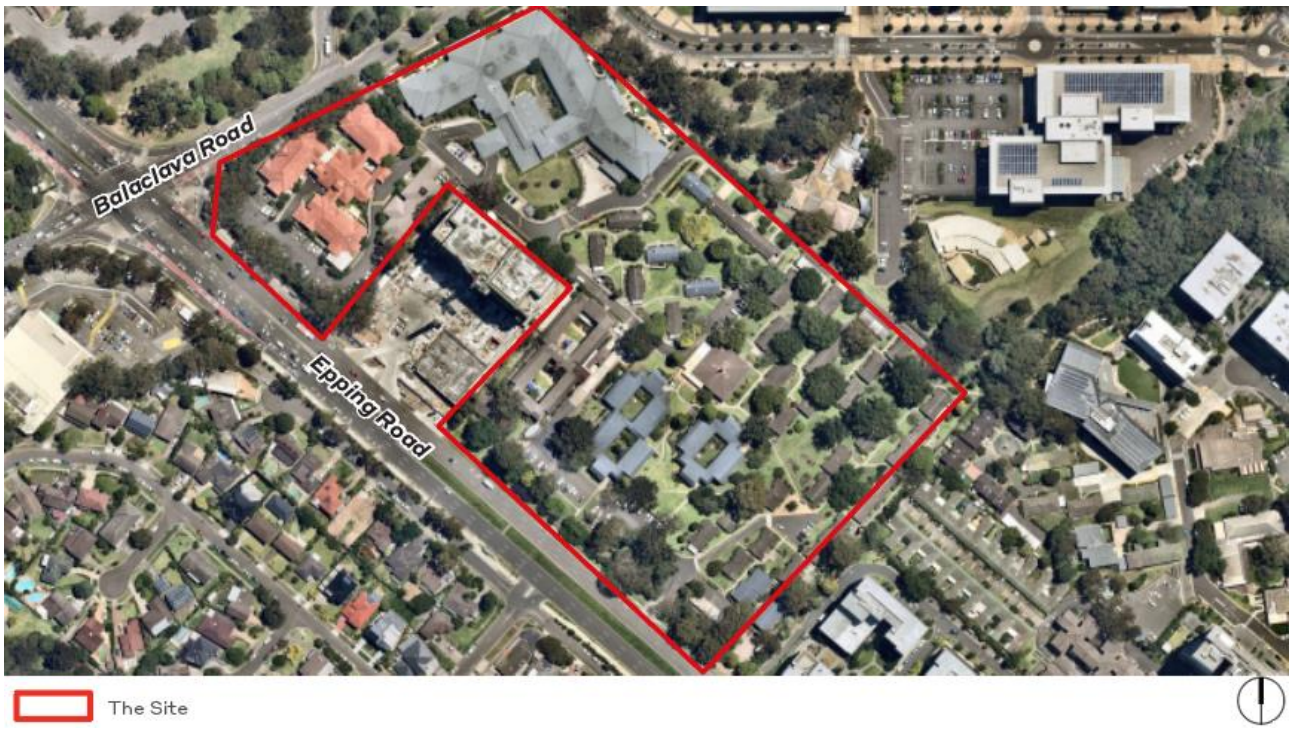

Photo 1 Location Plan

This report has been prepared in response to the Secretary's Environmental Assessment Requirements (SEARS) dated 17 August 2022 for SSD-46561712. Specifically, this report has been prepared to respond to those SEARS summarised in Table 1.

Table 1 SEARs requirements

Item	Description of Requirement	Section Reference
17. Aboriginal Cultural Heritage	Provide an Aboriginal Cultural Heritage Assessment Report (ACHAR), prepared in accordance with relevant guidelines, identifying, describing and assessing any impacts to Aboriginal cultural heritage sites or values associated with the site.	This has been addressed in Section 3, 4, 5, 6, 7 and in the ACHA.

Results

A search of the Aboriginal Heritage Information Management System (AHIMS) register conducted on 13 July 2022 (Client Service ID: 699970), identified 111 Aboriginal sites within a 4 by 4 kilometre search area centred over the study area. There are no Aboriginal cultural heritage sites registered with the AHIMS register, within the study area or in the vicinity.

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 2010b) (consultation requirements).

An archaeological survey was conducted on 21 July 2022 on foot with a field team of one team member including Crystal Garabedian (Biosis, Archaeologist); with Mathew Fellingham and James Carroll (Fellingham Consultancy and Design (FCAD)) joining part of the survey. A second archaeological survey on 20 September 2022 was conducted on foot with a field team of three team members including Anthea Vella (Biosis

Consultant Archaeologist), Belinda Jackson (Cultural Heritage Officer, Kamilaroi-Yankuntjatjara Working Group) and Joshua Marr (Cultural Heritage Officer, Metropolitan Local Aboriginal Land Council (LALC)).

The surveys were hampered by low visibility due to the extensive disturbances from the BaptistCare aged care facility obscuring the ground surface. No previously unrecorded Aboriginal cultural heritage sites were identified during the archaeological survey and no areas of archaeological potential were identified. A number of sandstone boulders were noted as part of the landscaping of the BaptistCare aged care facility. These boulders are not naturally occurring and have been brought in to the study area. The sandstone boulders were inspected however no engravings were observed. This assessment has determined that the study area has low archaeological potential due to extensive disturbances present across the entire study area.

Comments made by Registered Aboriginal Parties (RAPs) during the second archaeological survey included the following:

- The study area has been heavily disturbed.
- Signage should be included that acknowledges the Wallumedegal or Wallumattagal as traditional owners of the land.
- Monitoring by a RAP should be undertaken where sandstone (in the landscaping) is to be removed. This will allow the RAP to assess the sandstone to see if there are any engravings on them.

Management recommendations

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.

The recommendations that resulted from the consultation process are provided below.

Prior to any development impacts occurring within the study area, the following is recommended:

Recommendation 1: No further archaeological assessment is required

No further archaeological work is required in the study area due to the entire study area being assessed as having low archaeological potential. This recommendation is conditional upon Recommendation 2 to 8.

Recommendation 2: Monitoring of sandstone removal

Consultation with Metropolitan LALC and Kamilaroi-Yankuntjatjara Working Group have identified the need for monitoring when sandstone rocks are to be removed from the site. Whilst no engravings were identified during the field investigation, the sandstone should be checked over by a RAP prior to removal Prior to any construction commencing on site, BaptistCare is to consult with the RAPs to arrange this.

Recommendation 3: Continued consultation with the registered Aboriginal parties

As per the consultation requirements, it is recommended that the proponent provides a copy of this report to the RAPs and considers all comments received. The proponent should continue to inform these groups about the management of Aboriginal cultural heritage sites within the study area throughout the life of the project.

Recommendation 4: Acknowledgement signage

Consultation with Metropolitian LALC and Kamilaroi Yankuntjatjara Working Group has also recommended that signage including an acknowledgement of the Wallumedegal or Wallumattagal as traditional owners of the land implemented for the project. This can also include native landscaping, Aboriginal art, digital displays, signage, edible and medicinal gardens, and apps educating about the history and use of the land by Aboriginal people. The Project Team are to consult with the RAPs for this.

Development of a Public Art Strategy including guidance for future signage is already underway for this project. In addition to this, future DA's for construction will need to take into account the 'Connecting with Country' framework (Government Architect NSW n.d.).

Recommendation 5: Heritage induction

Heritage inductions for all site workers and contractors should be undertaken in order to prevent any unintentional harm to any unexpected Aboriginal objects. The heritage induction should include the following items:

- Relevant legislation.
- Location of identified Aboriginal heritage sites, areas of archaeological potential, and areas of archaeological sensitivity within proximity to the study area.
- Basic identification skills for Aboriginal and non-Aboriginal artefacts and human remains.
- Procedure to follow in the event of an unexpected heritage item find during construction works.
- Procedure to follow in the event of discovery of human remains during construction works.
- Penalties and non-compliance.

Recommendation 6: 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 disturb an Aboriginal site without a consent permit issued by Heritage NSW, Department of Planning and Environment (Heritage NSW). Should any unanticipated 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 Heritage NSW and Aboriginal stakeholders.

Recommendation 7: 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* (Heritage Act). Relics cannot be disturbed except with a permit or exception 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.

Recommendation 8: Discovery of human remains

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 Heritage NSW Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by Heritage NSW.

1 Introduction

1.1 Project background

Biosis was commissioned by BaptistCare to undertake an ACHA for the development of the master plan at 157 Balaclava Road (Lot 60 DP1107965), Macquarie Park, NSW (the study area) (Figure 1 and Figure 2). The proposed development involves the subdivision of the study area into the proposed BaptistCare Macquarie Park (Figure 3) (see section 2 for further details of the proposed development).

This AR documents the findings of the archaeological investigations conducted as part of the ACHA. The AR provides evidence about the material traces of Aboriginal land use to support the conclusions and management recommendations in the ACHA.

The purpose of the ACHA is to support an Environmental Impact Statement (EIS) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for a SSDA.

This investigation has been carried out under Part 6 of the NPW Act. It has been undertaken in accordance with 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.

It is stated in section 1.2 of the Code that where the ACHA report concludes that the proposed activity will result in harm to Aboriginal objects or declared Aboriginal Places, an application for an Aboriginal Heritage Impact Permit (AHIP) will be required. As per Section 4.41 of the EP&A Act an AHIP under the NPW Act is not required for SSD projects authorised by a development consent. This project is classified as SSD and as such an AHIP will not be required. This is due the overall assessment of State significant projects that addresses all heritage issues.

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.

1.2 Study area

The study area is located within Lot 60 DP1107965 and is approximately 18 kilometres north-west of the Sydney CBD (Figure 1). It encompasses approximately 6.4 hectares of public land.

The study area is within the:

- Ryde LGA.
- Parish of Hunters Hill.
- County of Cumberland.

The study area is bounded by Epping Road to the south, Balaclava Road to the west, the Macquarie University campus to the north, and other public buildings to the east (Figure 2).

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1.3 Planning approvals

The proposed development will be assessed against Part 4 of the EP&A Act. Other relevant legislation and planning instruments that will inform this assessment include:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- NPW Act.
- *National Parks and Wildlife Amendment Act 2010.*
- *Ryde Local Environmental Plan 2014* (LEP).
- *Ryde Development Control Plan 2014* (DCP).

1.4 Objectives of the investigation

The objectives of the investigation can be summarised as follows:

- To identify and consult with any RAPs and the Metropolitan LALC.
- To conduct additional background research in order to recognise any identifiable 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 and associated land use and the identification and integrity/preservation of Aboriginal sites.
- To summarise past Aboriginal occupation in the locality of the study area using ethnohistory and the archaeological record.
- 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 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 AR are described below in Table 2.

Table 2 Investigators and contributors

Name and qualifications	Experience summary	Project role
Claire Nunez **B. Cultural Heritage Studies,** **Dip. Project Management,** **Grad. Cert. City Planning**	Claire is a heritage consultant with over 16 years' experience in the public and private sector, which blends heritage management, materials conservation, government policy, strategic advice and regulation. She enjoys collaborating with multi-disciplinary teams and solving complex challenges with new perspectives, a positive outlook and creative solutions. Claire has led teams who have delivered complex and multifaceted projects, including services such as heritage assessment, impact assessment, archaeological investigations and ACHAs. She has advanced skills in stakeholder engagement and project management and has represented the Australian Government and the private sector in forums and high-level meetings, both domestic and international, including as part of a World Heritage Committee delegation. Claire is currently on the Heritage Advisory Panel to the Heritage Council of NSW and the Australia ICOMOS Intangible Cultural Heritage Scientific Committee.	• Project Director
Maggie Butcher **BSc/BA (Hons)**	Maggie is a Senior Archaeologist and artefact specialist who has been practicing full time since 2015. Maggie has had experience working as an archaeologist on a number of European and Aboriginal heritage projects across NSW and report writing.	• Project Manager
Anthea Vella **B.Arch M.AHM**	Anthea is a Consultant Archaeologist with over four years' experience. Anthea has experience in conducting Aboriginal and historical heritage assessments, surveys and archaeological test excavations for a variety of projects throughout NSW. Anthea has experience in undertaking desktop assessments, project management, and reporting.	• Field investigation • Reporting
Hannah Mills **BA, MA Cultural Heritage Studies**	Hannah is a Research Assistant with over one year of fieldwork experience. She completed her Masters in Cultural Heritage Studies in 2020 and undertaken fieldwork across the south coast of NSW primarily with Biosis, Casey & Lowe, and AMBS Ecology & Heritage. She has also carried out voluntary fieldwork in England as a student. As a Research Assistant Hannah has participated in a variety of projects, developing her skills in report writing, community consultation, and background research.	• Background research
Crystal Garabedian **BA Archaeology (Hons) BSc Geology and Geophysics**	Crystal joined Biosis in the Sydney office in 2021 as a Heritage Research Assistant. She has experience in conducting archaeological surveys, test excavations, Aboriginal consultation and desktop assessments for a variety of projects throughout NSW. Crystal possesses specialist skills in the identification of marine zooarchaeological analysis, whilst also having experience in processing historical artefacts, including ceramics, building materials and glass.	• Field investigation • Reporting • Community consultation

Name and qualifications	Experience summary	Project role
Jenny Beckius **BEnvScMgmt (Sustainability)**	Jenny has been working with the Biosis GIS Team since November 2021. In that time she has consistently generated high quality outputs, maps and spatial analyses through using a variety of technical skills including georeferencing, spatial data management, data conversion, area calculations and cartographic design whilst working on various ecology and heritage projects. After completing a 12 month contract working for NSW National Parks and Wildlife Services (NPWS), Jenny continues to dedicate her time to environmental conservation through volunteering for NPWS and with community restoration groups.	• Mapping

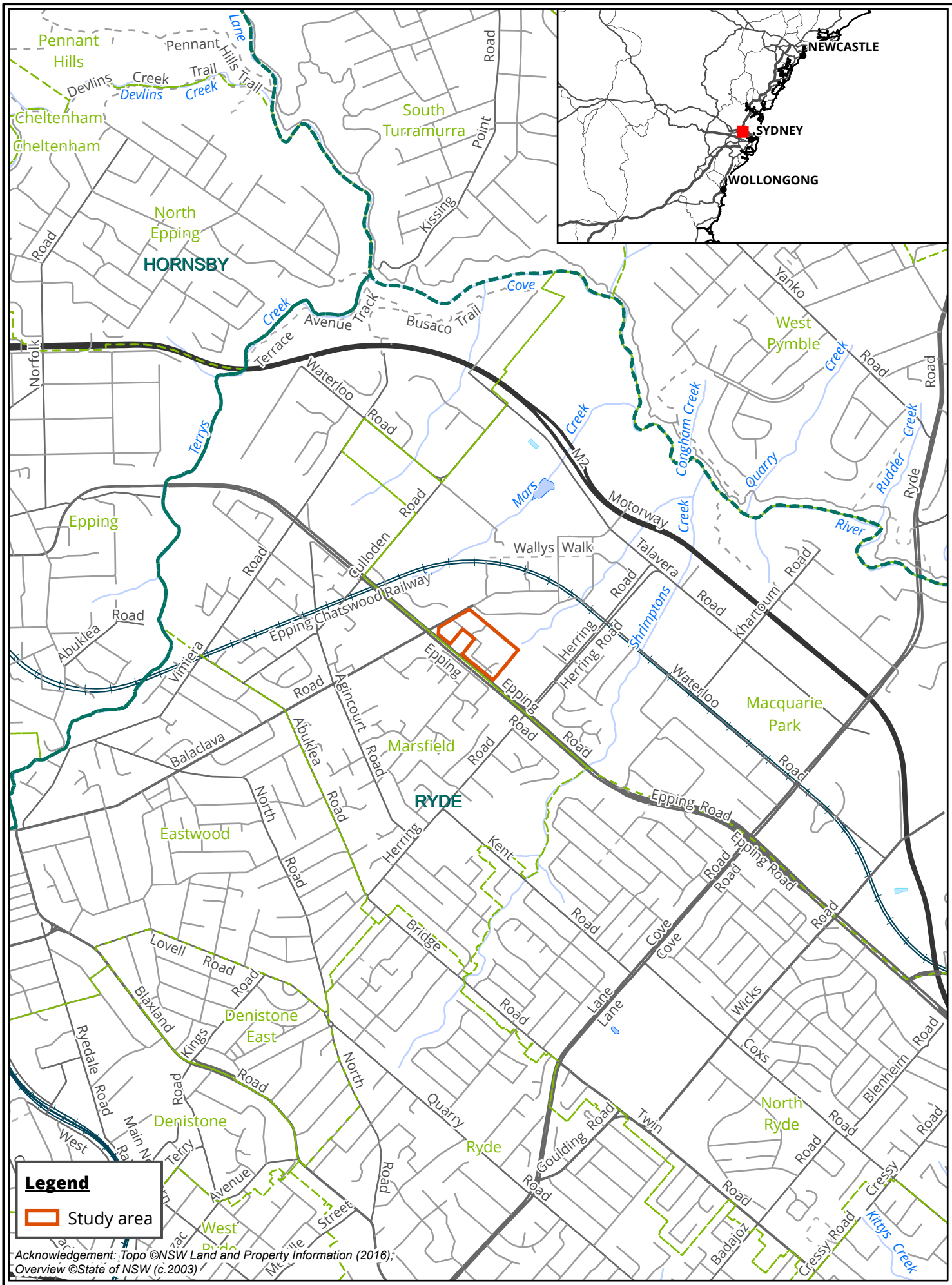


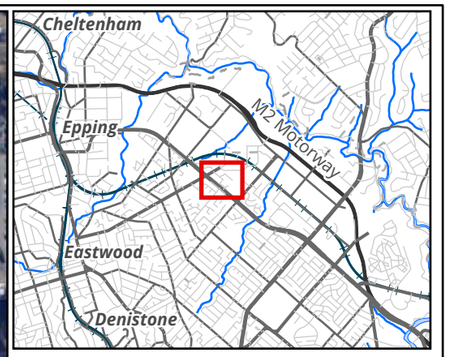
Figure 1 Location of the study area

Matter: 37323,
Date: 15 July 2022,
Drawn by: JB, Checked by: MB, Last edited by: jbeckius
Location:P:\37300s\37323\Mapping\
37323_MacquariePk_ACHA, Layout: 37323_F1_Locality

0 200 400 600 800 1,000
Metres
Scale 1:25,000@ A4, GDA 1994 MGA Zone 56

N

Acknowledgements: Basemap © Land and Property Information 2016; public/NSW_Imagery: © Department of Customer Service 2020



Legend

- Study area
- Lot

Figure 2 Study area detail

0 10 20 30 40 50

Metres

Scale: 1:2,000@ A3

Coordinate System: GDA 1994 MGA Zone 56

N

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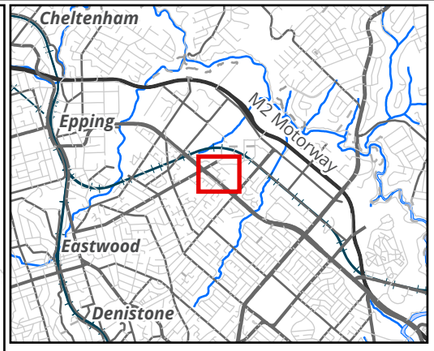
Matter: 37323, Date: 14 September 2022,
Drawn by: JB, Checked by: MB, Last edited by: jbeckius
Location: P:\37300s\37323\Mapping\
37323_MacquariePk_ACHA, Layout: 37323_F2_StudyArea

2 Proposed development

The proposed development involves the development of a master plan for the proposed BaptistCare Macquarie Park (Figure 3). The master plan will include provision for:

- Student Housing.
- Seniors Housing.
- Build to Rent.
- Retail.
- Residential.
- Mixed uses including commercial and allied health.
- A school.

As the development at this stage only involves the master plan proposal, no physical works will be undertaken, subsequent stages will be undertaking physical works.



Legend

Study area

Figure 3 Proposed development

0 10 20 30 40 50

Metres

Scale: 1:2,000@ A3

Coordinate System: GDA 1994 MGA Zone 56

N

biosis

Matter: 37323, Date: 22 November 2022,
Drawn by: JB, Checked by: MB, Last edited by: jtownsend
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37323_MacquariePk_ACHA, Layout: 37323_F3_PropDevelopment

Acknowledgements: Proposed development masterplan supplied by Ethos Urban Pty Ltd 2022

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 for 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 Geology, topography and hydrology

The study area lies within the broader Sydney Basin, contained by the Ashfield Shale unit within the Wianamatta Group (Figure 4). This geological landscape consists of middle Triassic black to light grey shale and laminite. Topographically, the study area lies in an undulating landscape with an overall downwards gentle slope from the north-west to the east.

Stream order is recognised as a factor which aids in the development of predictive modelling in Aboriginal archaeology. Predictive models which have been developed have a tendency to favour permanent water courses as the locations of complex sites that have been continuously occupied, 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 (JMCHM 2000, 2005, 2005, 2006, 2008). The stream order system used for this assessment was originally developed by Strahler (1952). As stream order increases, so does the likelihood that the stream would be a perennial source of water (Photo 2).

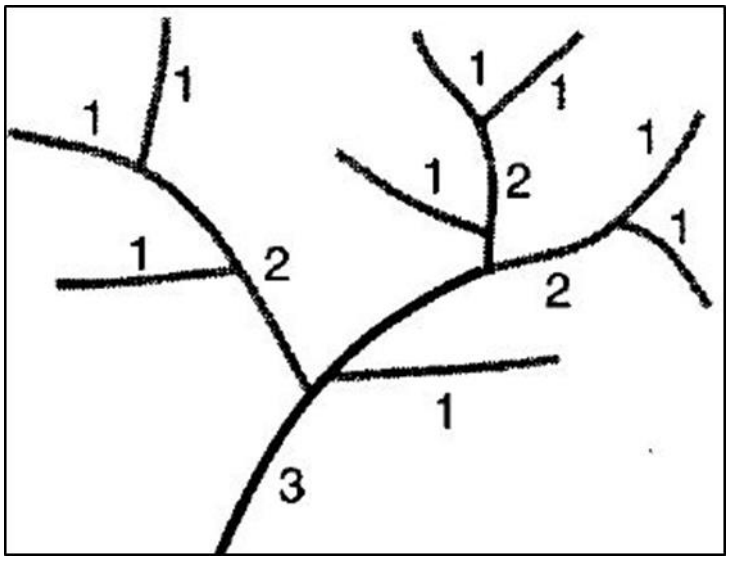


Photo 2 Diagram showing Strahler stream order (Ritter et al. 1995, p.151)

There are no water sources within the study area (Figure 5). The closest water source is an unnamed, first-order, non-perennial creek located approximately 38 metres from the north-eastern boundary of the study area. Mars Creek, a first-order non-perennial watercourse, is located approximately 260 metres from the study area.

3.1.2 Soil landscapes

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. 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.

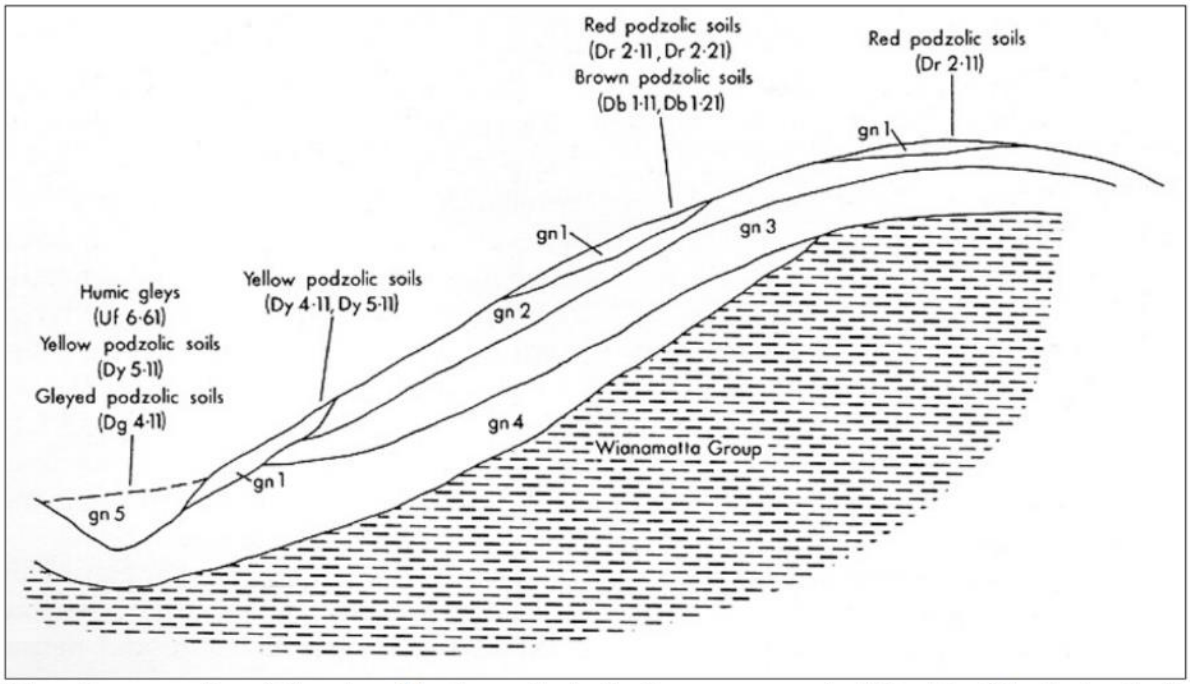
The study area is contained within the erosional Glenorie soil landscape (Department of Planning, Industry and Environment 2020, p.70) (Figure 6). Erosional landscapes comprise of soils that are generally subject to movement of shallow soils, which can result in poor preservation of the archaeological record. Additionally, when the land is cleared of vegetation, the soils can be subjected to more extensive levels of erosion. As this soil type is characterised as highly erosional, the soils can be shallow, highly permeable, and have low levels of soil fertility. This would suggest that Aboriginal sites and objects are unlikely be present where erosion has occurred (Chapman et al. 1989, pp.64–67, McInnes 1997, p.45, cited by Umwelt (Australia) Pty Limited 2016, p.13).

These landscapes typically feature undulating to rolling low hills on Wianamatta Group shales, with local relief of 50–80 metres and slopes of 5–20%. Narrow ridges, hillcrests and valleys are present, and formerly standing tall open-forest (wet sclerophyll forests) have been extensively cleared. Soils contained within this landscape are typically shallow to moderately deep (<100 centimetres) red podzolic soils on crests; moderately deep (70–150 centimetres) red and brown podzolic soils on upper slopes; and deep (>200 centimetres) yellow podzolic soils and gleyed podzolic soils along drainage lines (see Table 3, Photo 3).

Table 3 Glenorie soil landscape characteristics (Department of Planning, Industry and Environment 2020, pp.71–72)

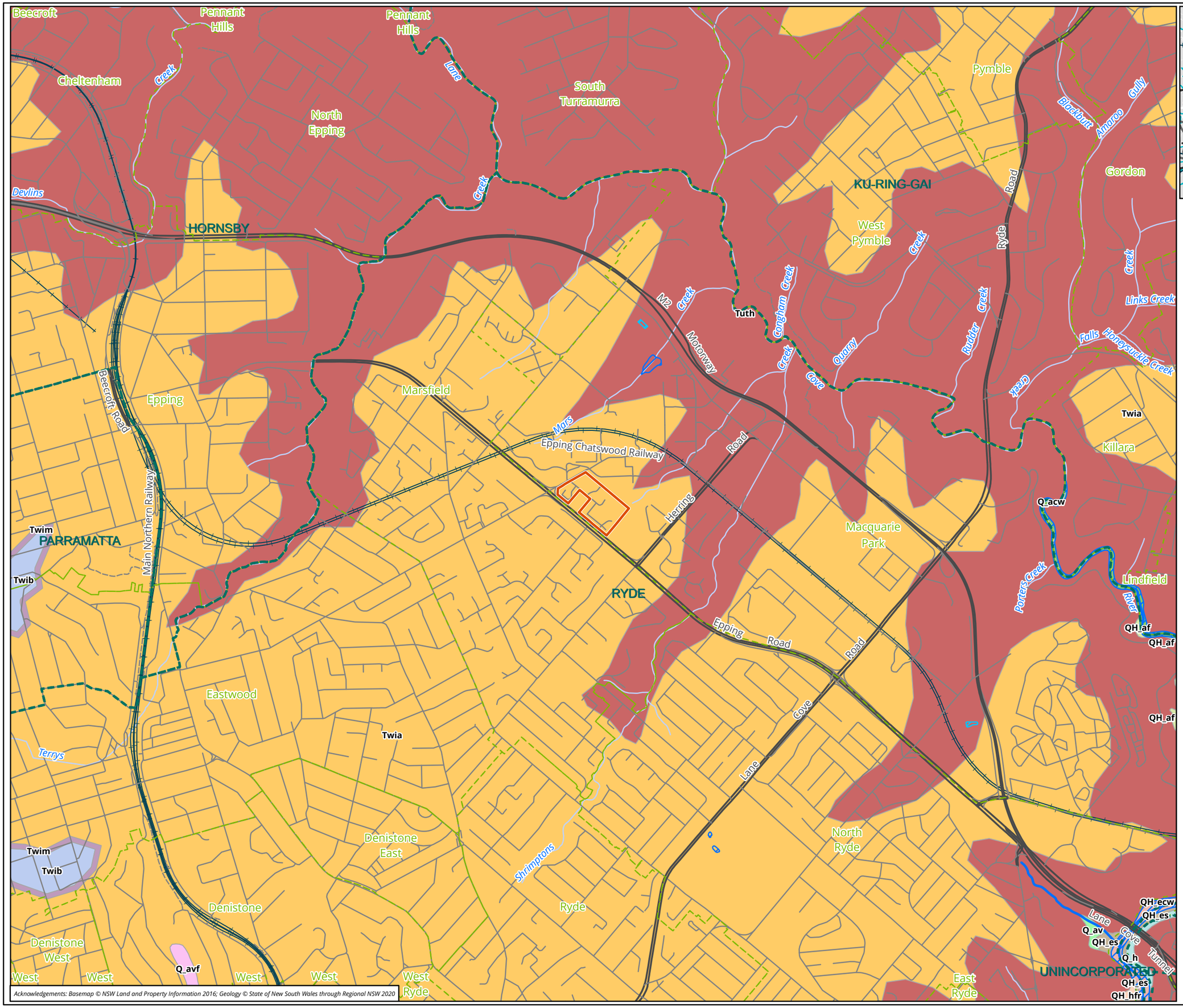
Soil landscape	Description
***gn1*: Friable dark brown loam**	This is generally a dark brown, friable loam, silt loam or silty clay loam with moderately to strongly pedal structure and porous rough-faced ped fabric. This material occurs as topsoil (A1 horizon). Peds are commonly sub-angular blocky to polyhedral, 2–10 mm in size and are rough faced and porous. In uncompacted soils these peds break down readily to very small crumbs. Surface condition is distinctly friable but may become hardsetting when compacted and dry. Colour is generally dark brown (10YR 3/3, 7.5YR 3/3) and may range from brownish-black (7.5YR 2/2) to brown (10YR 4/4). This material is occasionally water repellent. The pH ranges from moderately acid (pH 5.0) to slightly acid (pH 6.0). Shale fragments occur and charcoal is occasionally present whilst roots are common.
***gn2*: Hardsetting brown clay loam**	This is commonly a clay loam to fine sandy clay loam with an apedal massive or weakly pedal structure and an earthy or porous, rough-faced ped fabric. This material occurs as an A2 horizon and is occasionally hardsetting when exposed at the surface. Peds, when present, are sub-angular blocky, 10–50 mm in size, and are rough faced and porous. Otherwise this material has apedal massive structure with an earthy porous fabric. Colour is commonly brown (7.5YR 4/4) but may range between dull yellowish-brown (10YR 5/4) and reddish-brown (5YR 4/6). The pH ranges between strongly acid (pH 4.0) and moderately acid (pH 6.0). Shale rock fragments, charcoal fragments and roots are present.

Soil landscape	Description
***gn3*: Whole-coloured, reddish-brown, strongly pedal clay**	This is medium clay with strongly pedal structure and smooth-faced, dense, ped fabric. It generally occurs as subsoil (B horizon). Texture is generally medium clay but may range from silty clay to heavy clay. The peds are usually sub-angular blocky or polyhedral. They range in size from 5–20 mm and are smooth-faced and porous. Cutans are also present. Colour is generally reddish-brown (5YR 4/6-8) and can range from bright reddish-brown (2.5YR 4/8) to dull yellowish-brown (10YR 5/4). The pH ranges from strongly acid (pH 4.0) to moderately acid (pH 5.5). Shale rock fragments are common. Roots are rare and charcoal fragments are absent.
***gn4*: Mottled grey plastic clay**	This is a grey, mottled, medium to heavy clay with strongly pedal structure and dense, smooth ped fabric. It commonly occurs as deep subsoil. The peds are usually sub-angular blocky, 10–20 mm in size, and are smooth-faced and dense. These can be broken down easily to smaller (2–5 mm) polyhedral peds. Colour is usually pale grey (5YR 7/1), but ranges from light reddish-grey (2.5YR 7/1) to brownish-grey (7.5YR 6/1). Yellow and red mottles are common. It is usually moist and is very plastic. The pH ranges from strongly acid (pH 4.0) to moderately acid (pH 5.0). Shale rock fragments and gravels are common. Roots are rare and charcoal is absent.
***gn5*: Brownish-grey plastic silty clay**	This is commonly brownish-grey, plastic silty clay which is often saturated and exhibits apedal massive structure. It usually occurs as subsoil (B horizon). Colour is dark brown (10YR 3/3) often becoming brownish-grey (10YR 4/1) with dark brown mottles at depth. This material is moderately sticky and very plastic when moist. The pH ranges from moderately acid (pH 5.0) to slightly acid (pH 6.5). Rock and charcoal fragments are absent and roots are rare.



Schematic cross-section of Glenorie soil landscape illustrating the occurrence and relationship of the dominant soil materials.

Photo 3 Schematic cross section of the Glenorie soil landscape (Department of Planning, Industry and Environment 2020, p.74)



Legend

Study area

Geological units

- QH_af,Alluvial floodplain deposits
- QH_ecw,Estuarine channel deposits (subaqueous)
- QH_es,Estuarine swamp
- QH_hfr,Anthropogenic deposits - fill on Quaternary deposits
- Q_acw,Alluvial channel deposits - subaqueous
- Q_av,Alluvial valley deposits
- Q_avf,Alluvial fan deposits
- Q_h,Anthropogenic deposits
- Tuth,Hawkesbury Sandstone
- Twia,Ashfield Shale
- Twib,Bringelly Shale
- Twim,Minchinbury Sandstone

Figure 4 Geological units in the vicinity of the study area

0 200 400 600 800

Metres

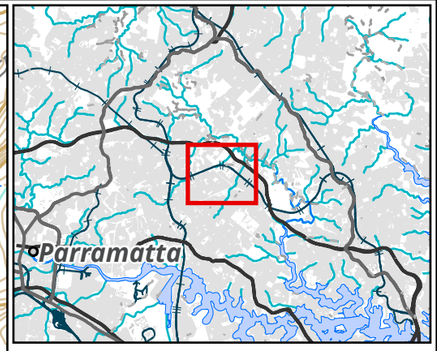
Scale: 1:20,000@ A3

Coordinate System: GDA 1994 MGA Zone 56

biosis

Matter: 37323, Date: 15 July 2022,
Drawn by: JB, Checked by: MB, Last edited by: jbeckius
Location: P:\37300s\37323\Mapping\37323_MacquariePk_AR, Layout: 37323_AR_F4_Geology

Acknowledgements: Basemap © NSW Land and Property Information 2016; Geology © State of New South Wales through Regional NSW 2020



Legend

- Study area
- Contour (2m)

Strahler Order

- 1
- 2
- 5

Figure 5 Hydrology and topography in the vicinity of the study area

0 100 200 300 400

Metres

Scale: 1:10,000@ A3

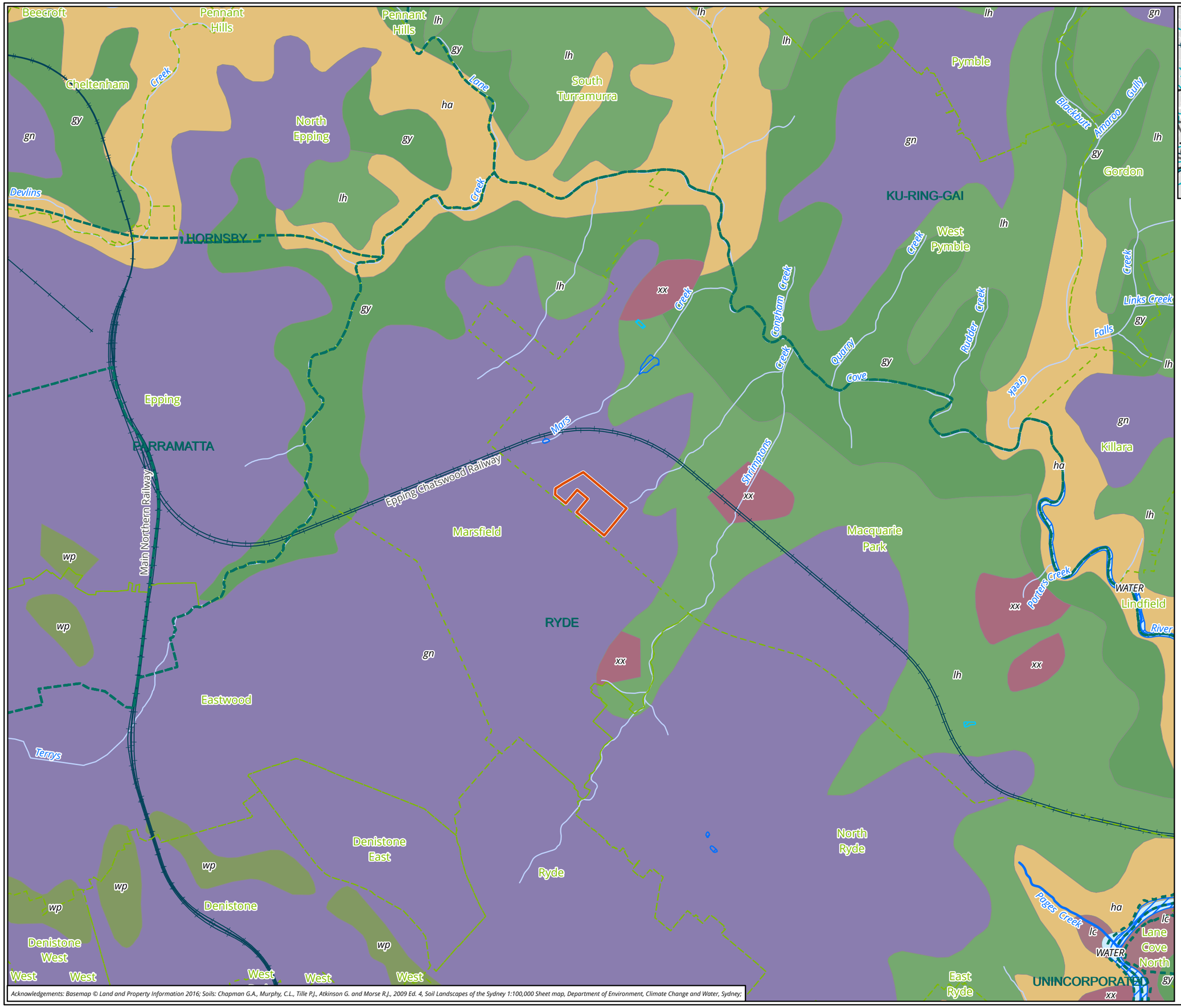
Coordinate System:
GDA 1994 MGA Zone 56

N

biosis

Matter: 37323, Date: 15 July 2022,
Drawn by: JB, Checked by: MB, Last edited by: jbeckius
Location: P:\37300s\37323\Mapping\,
37323_MacquariePk_AR, Layout:37323_AR_F5_Hydrology

Acknowledgements: Basemap © Land and Property Information 2016



Legend

Study area

Soil landscape units

- gn - GLENORIE
- gy - GYMEA
- ha - HAWKESBURY
- lc - LANE COVE
- lh - LUCAS HEIGHTS
- WATER - WATER
- wp - WEST PENNANT HILLS
- xx - DISTURBED TERRAIN

Figure 6 Soil landscapes in the vicinity of the study area

0 200 400 600 800

Metres

Scale: 1:20,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

biosis

Matter: 37323 Date: 15 July 2022,
Drawn by: JB, Checked by: MB, Last edited by: jbeckius
Location: P:\37300s\37323\Mapping\
37323_MacquariePk_AR, Layout: 37323_AR_F6_Soils

Acknowledgements: Basemap © Land and Property Information 2016; Soils: Chapman G.A., Murphy, C.L., Tille P.J., Atkinson G. and Morse R.J., 2009 Ed. 4, Soil Landscapes of the Sydney 1:100,000 Sheet map, Department of Environment, Climate Change and Water, Sydney;

3.1.3 Landscape resources

The wider region includes distinct ecological zones, including open forest and open woodland, with riparian vegetation extending along many of the watercourses. Each ecological zone hosts a different array of floral and faunal species, many of which would have been utilised according to seasonal availability. Aboriginal inhabitants of the region would have had access to a wide range of avian, terrestrial and aquatic fauna and repeated firing of the vegetation would have opened up the foliage allowing ease of access through and between different resource zones.

Plant resources were used in a variety of ways. 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).

While the current study area has been extensively cleared of vegetation, plant species supported by the Glenorie soil landscape include tall open-forest (wet sclerophyll forest), with dominant tree species including Sydney Blue Gum *Eucalyptus saligna* and Blackbutt *E. pilularis* (Department of Planning, Industry and Environment 2020, p.71). Other species include Turpentine *Syncarpia glomulifera*, Grey Ironbark *E. paniculata*, White Stringybark *E. globoidea* and Rough-Barked Apple *Angophora floribunda*. Pittosporum *Pittosporum undulatum* and Coffee Bush *Breynia oblongifolia* are common understorey species.

As well as being important food sources, 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. Animals such as Brush-tailed Possums were highly prized for their fur, with possum skin cloaks worn fastened over one shoulder and under the other. Kangaroo teeth were incorporated into decorative items, such as head bands (Attenbrow 2002).

Animal species that may have been present within vicinity of the study area include mammal species such as the Common Ringtail Possum *Pseudocheirus peregrinus*, Common Brushtail Possum *Trichosurus vulpecula*, Grey-headed Flying-fox *Pteropus poliocephalus*, Short-beaked Echidna *Tachyglossus aculeatus*, and Swamp Wallaby *Wallabia bicolor* (Atlas of Living Australia 2022). The bird species Sulphur-crested Cockatoo *Cacatua (Cacatua) galerita*, Kookaburra *Dacelo (Dacelo) novaeguineae* and Australian Magpie *Gymnorhina tibicen* have been recorded in the area. The Eastern Blue-tongue *Tiliqua scincoides* and Red-bellied Black Snake *Pseudechis porphyriacus* are reptile species that may have been present.

3.1.4 Land use history

Historical aerial imagery can be used to identify modern developments that have occurred within the study area. An aerial photograph dated to 1943 shows evidence of extensive vegetation clearance and agricultural land use (Photo 4). A creekline in the south-eastern portion of the study area is also visible, and had likely been modified for agricultural uses. The study area is split into numerous properties, with several residential and agricultural structures developed throughout. From the southern boundary (Epping Road) a road has been created to provide access to properties in the north. While the eastern portion of the study area has been less disturbed by European land use, property development and extensive vegetation clearance is visible. As noted in Section 3.1.2, vegetation clearance increases the likelihood of soil erosion likely resulting in movement of soil and artefact deposits throughout the landscape and impacting Aboriginal site preservation.

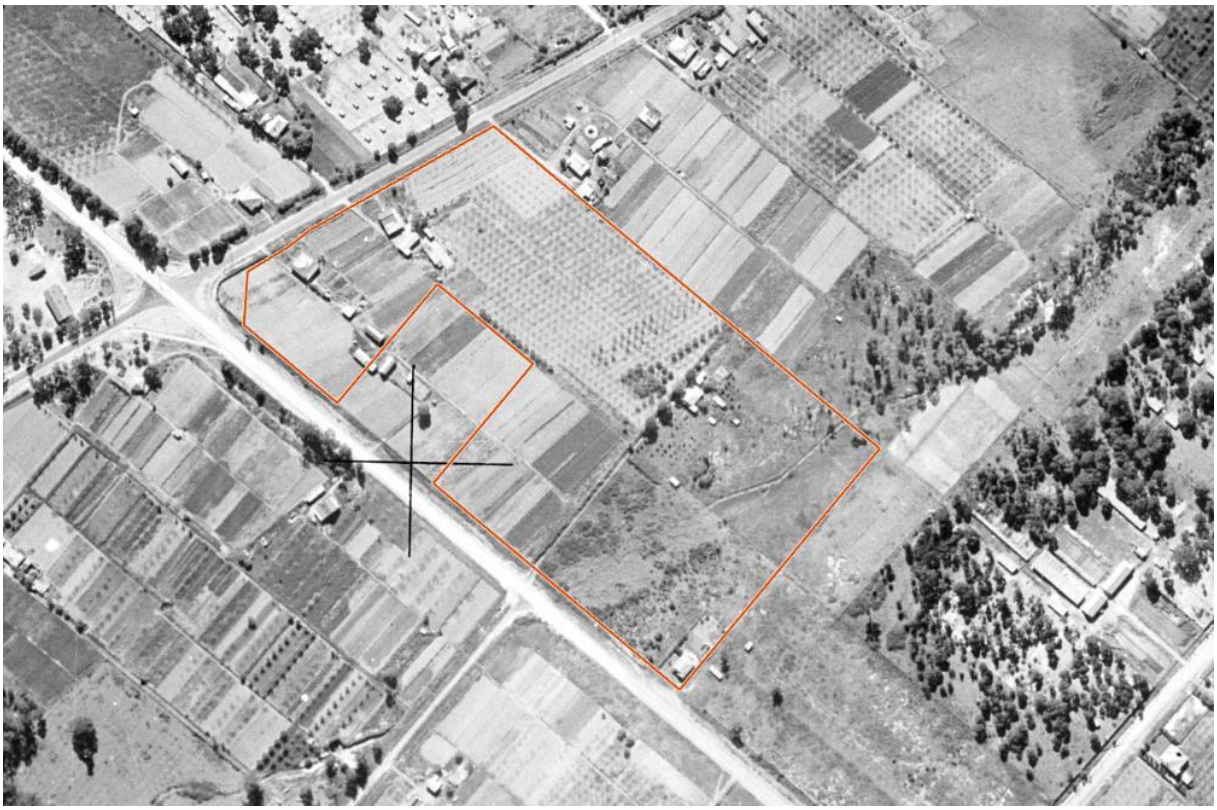


Photo 4 1943 aerial photograph with the study area outlined in red (Source: NSW Spatial Services)

By 1971 major changes have occurred throughout the study area (Photo 5). Agricultural land use has generally fallen out of practice, with many of the former structures within the study area removed. The creekline has been destroyed and appears to have been filled in and the area levelled. A new complex of buildings has been developed in the north and east, and further vegetation clearance has occurred in the previously less-disturbed eastern area. Development associated complex, including paving, new road access, tree plantings lining access paths and driveways are also visible in the image.

Photo 5 1971 aerial photograph with the study area outlined in red (Source: NSW Spatial Services)

Aerial imagery from 1991 shows the expansion of the building complex into the south-western portion of the study area (Photo 6). There is a visible increase in vegetation within the study area as a result of the trees planted prior to 1971 maturing – there are few or no surviving mature native trees. Earthworks and landscaping are visible in the south-west, parallel to Epping Road, and an additional driveway and car park has been constructed. More recent aerial imagery from 2005 shows the continued expansion of the building complexes within the study area, resulting in disturbance across the extent of the site due to European land use and development (Photo 7).

Photo 6 **1991 aerial photograph with the study area outlined in red (Source: NSW Spatial Services)**

Photo 7 **2005 aerial photograph with the study area outlined in red (Source: NSW Spatial Services)**

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.

3.2.1 Regional overview

A number of Aboriginal cultural heritage investigations have been conducted for the wider region. Models for predicting the location and type of Aboriginal sites with a general applicability to the area 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.

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). This evidence comes from radiocarbon dates retrieved from excavated sites such as Shaw's Creek K2 (14,700 years before present [BP]) (Attenbrow 2002, p.18), and George & Charles Street Parramatta (~25,000-30,000 BP) (JMCHM 2005b).

Attenbrow (1990) undertook an investigation titled "The Port Jackson Archaeological Project" for the Australian Museum. The purpose of this report was to improve upon the existing literature about Aboriginal life as previous work had focused on historical accounts and not utilised the archaeological record. The report was broken into two stages; stage 1 involved site recording and survey, and stage 2 utilised excavation of selected sites. The project found that many middens and deposits were still able to be located within the Port Jackson landscape despite the development and expansion of Sydney and its surrounding suburbs. The survey relocated and recorded 112 sites with middens and deposits. The report concludes that there are more unregistered sites that had not been reported.

Irish (2004) undertook an assessment of Aboriginal scarred trees at Sydney Olympic Park as part of the Aboriginal History and Connections Program (AHCP), established by the Parklands Unit at Sydney Olympic Park. The purpose of the AHCP was to explore Aboriginal connections to the Homebush Bay area of Sydney from the earliest occupation until the present day. The ACHP found that the Sydney Olympic Park landscape had been heavily disturbed by historical land use practices such as land reclamation and industrial activities. The ACHP found that the only area within Sydney Olympic Park that had any potential to contain evidence of Aboriginal occupation and cultural activity was the relict Cumberland Woodland known as the Wanngal (Newington) Woodland, within the Newington Nature Reserve (Irish, P. 2004, p.59). A survey of the Woodland was conducted as part of this assessment in order to relocate a number of scarred trees recorded in the area. This assessment determined that none of the previously recorded scarred trees were Aboriginal in origin, as the characteristics associated with cultural scarring were not present and the trees were much too young to have been scarred by Aboriginal people. A number of previously unrecorded artefact scatters were however identified during the survey.

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 Jo McDonald Cultural Heritage Management. 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:

- Stream Order: 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 first, second, and fourth order streams).

- Distance from water: the results showed that an assumption that sites would be clustered within 50 metres of water sources was not entirely correct from the data available. In first order stream landscapes, there was no significant correlation between artefact distribution and distance to water. In second order stream landscapes, artefact density was highest within 50 metres of water, and then declined with increasing distance. In fourth order landscapes, density was highest between 51 to 100 metres from water.
- Landform: 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 erosion they caused.
- Distance to silcrete sources: the results of the study showed no significant difference between sites located closer to or further away from silcrete sources. However, 6 kilometres was the maximum tested distance from silcrete sources, so the sample is only representative of a limited area.
- Aspect: This only appeared to have an influence on sites in the lower parts of valleys. This may have been sited to take advantage of steady factors such as the rising/setting sun and wind direction, with sites in higher parts of valleys having a stronger influence by weather and other factors.

The study concluded that landform and distance from water had an impact on site distribution, with the preference being for slightly elevated, well-drained areas in the lower parts of valleys.

(Biosis 2019) was commissioned by Ecove Group to conduct an Aboriginal archaeological assessment to support an EIS for a proposed development in Sydney Olympic Park. An archaeological survey of the area identified no Aboriginal sites, objects or areas of sensitivity. Due to the highly disturbed nature of the landscape, it was determined that low archaeological potential would be present throughout the entire site.

3.2.2 Local overview

A number of Aboriginal cultural heritage investigations have been conducted within the local area (within approximately 10 kilometres of the study area). Most of these investigations were undertaken as part of development applications and included surface and sub-surface investigations. These investigations are summarised below.

The NPWS (1990) carried out an assessment of the Lane Cove River State Recreation Area. This assessment consisted of background research and survey carried out to record the 'Aboriginal carvings and areas' in the park (National Parks and Wildlife Service 1990, p.1). The predictive modelling undertaken for this study identified the coastal margins of the area as the likely location of shell midden deposits, occurring in both open contexts and rock shelters. Areas where the underlying geology consists of shales were considered the locations where campsites, Potential Archaeological Deposits (PADs), quarries and scarred trees would occur, with it being noted that due to extensive vegetation clearance scarred trees are unlikely to be identified. Areas overlying the Hawkesbury Sandstone were the likely locations of rock shelters, art sites, rock engravings, and grinding grooves (National Parks and Wildlife Service 1990, pp.30–34).

The survey relocated three previously recorded sites, identified seven new sites, and noted five potential habitation sites. The three relocated sites were all rock engravings. Two newly recorded sites were rock engravings, and five were middens. The five potential habitation sites were all rock shelters with PADs. It was recommended that all sites be managed appropriately, and in some cases be subject to further investigation. These sites are located outside of the study area and the area of disturbance associated with the project.

Oakely (2000) completed a survey for a proposed sewerage upgrade within Lane Cove National Park. Two new Aboriginal sites were located in the southern portion of the National Park. Both new sites (LCRM1 and LCRM2) are shell midden scatters and associated areas of PAD. It was recommended that the sewer line

should be redirected to avoid these sites, or if this was not possible that further archaeological work, such as a test excavation, should be conducted.

HLA Envirosciences (2003) completed a subsurface testing program at Eden Gardens PAD RYDE 007, Macquarie Park (AHIMS 45-6-2653), located approximately 3 kilometers east of the study area. The testing program consisted of nine test pits excavated along two transects, each pit measuring 50 by 50 centimetres. The purpose of the excavation was twofold: to establish the nature of soil profiles across the study area, and to clear sandstone outcropping in a controlled manner to identify potential engravings.

Test excavations encountered disturbance across all test pits. In one pit, a quartz artefact was identified along with one potential artefact. There was European material present at a greater depth in this pit however, suggesting that the artefact was in a disturbed context. No other artefacts were identified, and no engravings were identified on the sandstone outcrop. It was recommended that a Consent to Destroy for the area be sought, with no requirement for further investigation. These sites are located outside of the study area and the area of disturbance associated with the project.

The Aboriginal Heritage Office (2011) carried out a broad planning study for Aboriginal heritage in the City of Ryde LGA. The purpose of the study was to identify, access, and re-record all Aboriginal sites located in the City of Ryde, to provide a planning document for conserving cultural values, and to provide a schedule for conservation works.

An initial search undertaken of the AHIMS register identified a total of 118 sites in the LGA. The Aboriginal Heritage Office discounted any sites which had been recorded twice, or site cards which did not provide enough information to be relocated. After this revision, they listed 56 sites in the City of Ryde, most of which were rock shelters and middens. The LGA was divided into three Sections: Area 1- Lane Cove River (containing the majority of the study area), Area 2 – Central Plateau (containing a small portion of the study area), and Area 3 – Parramatta River. Area 1 was dominated by rock shelters, engravings, and grinding grooves. Area 2 contained only a single artefact scatter. The report recommended a program of staff education take place to enable workers to identify and avoid Aboriginal sites, and regular monitoring of sites in the LGA to ensure that they are appropriately managed. The study area is located entirely within this planning study, with the northern portion of the study area being located within Area 1 and the southern portion within Area 2.

Artefact Heritage (2011) conducted a survey of an area along the northern edge of Stringybark Creek in Lane Cove Wes, located approximately 7.9 kilometres south-east of the study area. A previously recorded rock shelter with a charcoal drawing of two fish was relocated. Although the shelter had been disturbed by construction of a sewer pipe, the art remained in good condition. No new Aboriginal sites were located during the study.

Artefact Heritage (2017) was commissioned by Ausgrid to conduct a due diligence assessment for a cable replacement between Pittwater Road and Rene Street, East Ryde, located approximately 7.9 kilometres south-east of the study area. A pedestrian survey of the study area was undertaken and no previously unrecorded Aboriginal sites or areas of archaeological sensitivity were identified within the study area. This was most likely due to the lack of archaeologically sensitive landforms, disturbance from road construction impacts and removal of vegetation.

Biosis Pty Ltd (2019) was commissioned by Greenbox Architecture to undertake an Aboriginal archaeological survey report for the construction of a data centre at 1 Sirius Avenue, Lane Cove, approximately 16 kilometres east of the study area. Archaeological investigations at the site identified a low potential for Aboriginal sites. This was due to heavy disturbance of the landscape in addition to the landform types within the area.

Biosis (2020) carried out an ACHA for the Macquarie University Station Bus Interchange, commissioned by GHD. Desktop research indicated that no previously identified Aboriginal sites are present within the study area. A review of previous assessments in the local area predicted a moderate potential for artefact scatters

and PAD to be located within the study area. Following the field investigation, impacted by poor visibility due to vegetation and grass coverage, heavy disturbance due to residential and commercial development, and access issues, the site was assessed to contain low potential for intact Aboriginal sites or objects.

3.2.3 AHIMS site analysis

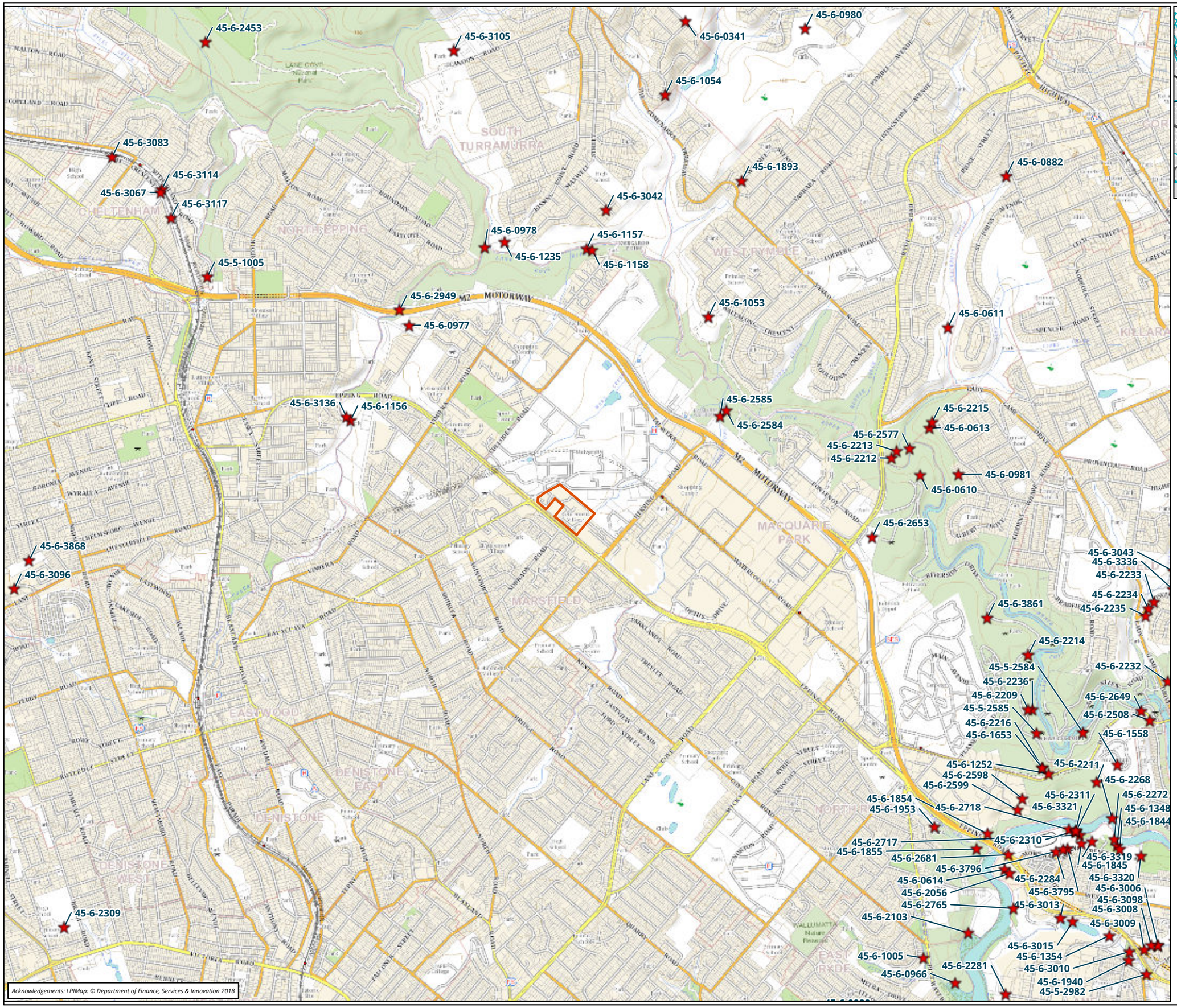
A search of the AHIMS database carried out on 13 July 2022 (Client Service ID: 699970) identified 111 Aboriginal archaeological sites within a 4 by 4 kilometre search area, centred on the study area (Figure 7). None of these registered sites are located within the study area. AHIMS search results are provided in Appendix 1. Table 4 provides the frequencies of Aboriginal site types in the vicinity of the study area. The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available.

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 a modified tree, 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 143 results presented here, compared to the 111 sites identified in AHIMS.

Table 4 AHIMS site type frequency

Site type	Number of occurrences	Frequency (%)
Artefact	51	35.66
Art (Pigment or Engraved)	31	21.68
Shell	26	18.18
PAD	19	13.29
Grinding Groove	13	9.09
Habitation Structure	2	1.40
Water Hole	1	0.70
Total	**143**	**100.00%**

A simple analysis of the Aboriginal cultural heritage sites registered within the 4 by 4 kilometre buffer of the study area indicates that the dominant site type is artefact, representing 35.66% (n=31), followed by art sites at 21.68% (n=31). PAD sites and grinding grooves represented 13.29% and 9.09% of site types within vicinity (n=19 and n=13 respectively). The least represented site types are habitation structures and water holes, representing only 1.40% and 0.70% (n=2 and n=1 respectively).



Legend

- Study area
- AHIMS

NOT TO BE MADE PUBLIC

Figure 7 AHIMS within the vicinity of the study area

0 200 400 600 800 1,000

Metres

Scale: 1:25,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

biosis

Matter: 37323, Date: 15 July 2022,
Drawn by: JB, Checked by: MB, Last edited by: jbeckius
Location: P:\37300s\37323\Mapping\
37323_MacquariePk_AR, Layout: 37323_AR_F7_AHIMS

3.3 Discussion

Background research has indicated that the erosional Glenorie soil landscape, featuring undulating to rolling low hills on Wianamatta Group shales, is composed of soils subject to movement which can result in poor preservation of the archaeological record. Additionally, when the land is cleared of vegetation, the soils can be subjected to more extensive levels of erosion, suggesting that Aboriginal sites and objects are unlikely be present where erosion has occurred (Chapman et al. 1989, pp.64–67, McInnes 1997, p.45, cited by Umwelt (Australia) Pty Limited 2016, p.13). A review of historical aerial imagery has confirmed previous extensive vegetation clearance and development of the site.

Previous predictive models have a tendency to favour permanent water courses as the locations of complex sites that have been continuously occupied, 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. No such watercourses are present *within* the study area (JMCHM 2000, 2005, 2005, 2006, 2008). Historically, the closest water source was the first-order creekline that was located within the south-east of the study area. This creekline was destroyed by the development. The closest existing water source is an unnamed, first-order non-perennial tributary located approximately 38 metres from the north-eastern boundary of the study area. Mars Creek, a first order non-perennial watercourse, is located approximately 260 metres from the study area. This suggests that the study area is unlikely to have been used by Aboriginal people as an occupation or resource gathering site. The high levels of disturbance and previous land clearance also suggests any Aboriginal sites that may have been present prior to European development are unlikely to remain within the study area.

3.3.1 Predictive statements

A series of statements have been formulated to broadly predict the type and character of Aboriginal cultural heritage sites likely to have existed throughout the study area and where they are more likely to be located.

These statements are 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.

Table 5 indicates the site types most likely to be encountered across the present study area. The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

Table 5 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.	Low: The study area has been extensively developed.

Site type	Site description	Potential
PADs	Potential sub surface deposits of cultural material.	Low: Due to the development of the study area and landform present there is low potential for PADs to be present.
Shell middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Low: Shell midden sites have not been recorded within the study area. There is some potential for shell middens to be located in vicinity of permanent water sources, which are not present within the study area.
Modified trees	Trees with cultural modifications	Low: No mature native trees have survived within the study area, due to extensive vegetation clearing from the 1800's onwards.
Axe grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	Low: 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 art / engraving	Rock art includes paintings and drawings that generally occur in rock overhangs, caves and shelters. Engravings commonly occur on open, flat surfaces of rock such as on sandstone outcrops, although some are found on vertical rock faces and in rock shelters.	Low: The geology of the study area lacks suitable horizontal sandstone rock outcrops for rock art/ engraving. Therefore there is low potential for rock art/ engravings to occur in 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.

Site type	Site description	Potential
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.
Quarries	Raw stone material procurement sites.	Low: There is no record of any quarries being within or surrounding the study area.
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 are not commonly associated with burials.
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 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.	Nil: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not present in the study area.

4 Archaeological survey

A field investigation consisting of an archaeological survey of the study area was undertaken on 21 July 2022, and a supplementary survey on 20 September 2022 with RAPs in attendance. The survey sampling strategy, methodology and a discussion of results are provided below.

4.1 Archaeological survey objectives

The objectives of the surveys 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 proximity to the study area.
- 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 Aboriginal archaeological and cultural sensitivity.

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 all landforms that will potentially be impacted by the development. It focused on areas with disturbances to assess the extent and impact of these on the ground surface, as well as on areas with increased ground surface visibility (GSV) and exposure, as this enables Aboriginal objects to be identified on the ground surface.

4.2.2 Survey methods

The archaeological survey on 21 July 2022 was conducted on foot by Crystal Garabedian (Biosis, Archaeologist); with Mathew Fellingham and James Carroll (FCAD) joining part of the survey. A second archaeological survey on 20 September 2022 was conducted on foot with a field team of three team members including Anthea Vella (Biosis Consultant Archaeologist), Belinda Jackson (Cultural Heritage Officer, Kamilaroi-Yankuntjatjara Working Group) and Joshua Marr (Cultural Heritage Officer, Metropolitan LALC). Recording during the surveys followed the archaeological survey requirements of the Code and industry best practice methodology. Information that recorded during the surveys included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may 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, GSV 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 (GPS) and the Map Grid of Australia (MGA) (94) coordinate system.

4.3 Archaeological survey results

A total of two meandering transects were walked across the accessible extent of the study area (Figure 8). The study area was situated within a single landform, a simple slope, therefore one survey unit was established. No Aboriginal objects were identified in the study area and no areas of archaeological potential were identified. The results from the archaeological survey have been summarised in Table 6 and Table 7 below.

Table 6 Survey coverage

Survey unit	Landform	Survey unit area (m²)	Visibility (%)	Exposure (%)	Effective coverage area (m²)	Effective coverage (%)
1	Simple slope	1,345	10	5	1,345	2.10

Table 7 Landform summary

Landform	Landform area (m²)	Area effectively surveyed (m²)	Landform effectively surveyed (%)	No. of Aboriginal sites	No. of artefacts or features
Simple slope	63,985	1,345	2.10	0	0

4.3.1 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 was the lack of GSV and exposures due to the significant disturbances from the aged care facility that exists currently within the study area.

4.3.2 Visibility

In most archaeological reports and guidelines, visibility refers to GSV, 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 2010a). GSV across the study area was generally low (0–15%), with the average being approximately 10% and was seen to increase in areas under trees and in landscaped areas (Photo 8 and Photo 9). Low levels of visibility were the result of grass coverage, leaf litter, aged care facility and associated residential, office and maintenance buildings, bitumen roads, footpaths, gardens, and carparks, obscuring the view of the ground surface (Photo 10 to Photo 12).

Photo 8 **Low GSV in south-eastern portion of the study area, showing increased GSV around tree roots facing south-east**

Photo 9 **Low GSV in northern portion of the study area, facing south-east**

Photo 10 **Low GSV in north-western portion of the study area, facing south-west**

Photo 11 **Low GSV in north-western portion of the study area, facing south-east**

Photo 12 **Low GSV in central portion of the study area, facing north-west**

4.3.3 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 2010a).

Overall, the study area displayed low levels of exposure, ranging between 0–10% and averaging 5%. Higher levels of exposure were seen predominantly in areas underneath trees, near fence lines and signage and in some areas within landscaped portions of the study area (Photo 13 and Photo 14). Areas with low exposure were primarily the result of buildings and infrastructure obscuring the ground surface from view.

Photo 13 **Increased area of exposure in southern portion of the study area, facing south-east**

Photo 14 **Increased area of exposure in north-western portion of the study area, facing south-east**

4.3.4 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. Examples of human agents can 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; and agricultural practices.

Disturbance levels within the study area were assessed during the visual inspection. Levels of disturbance were categorised through an inspection of the ground surface, landforms, and aerial imagery. Disturbance levels within the study area have been categorised according to the following criteria:

- High disturbance – the landform has been heavily disturbed and all natural soil horizons have been displaced or removed, these areas are unlikely to contain Aboriginal cultural material.

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- Moderate disturbance – the landform has undergone disturbances to a certain degree, but the extent and nature of these disturbances cannot be fully quantified. Aboriginal cultural material may be present within these locations but is unlikely to be *in situ*.
- Low disturbance – the landform has not been significantly disturbed and is highly likely to contain intact soil horizons. Aboriginal cultural material if present is likely to be *in situ*.

As evidenced by the historic aerials (Photo 4 to Photo 7) and the archaeological survey, the entire study area has been subjected to high levels of disturbance. Previous clearing of large vegetation in the central and western portions for use as market gardens and paddocks for pastoral grazing can be observed in the historical aerial imagery. There has been multiple phases of development associated with residential infrastructure and the BaptistCare aged care facility. The modern BaptistCare aged care facility resulted in significant disturbances throughout the entire study area. This was evident with the residential, office and maintenance buildings, sub-surface services, bitumen roads, footpaths, gardens, and carparks located throughout (Photo 10 to Photo 16).

Photo 15 **Stormwater drain, gardens and residential buildings in south-eastern portion of the study area, facing north-west**

Photo 16 **Stormwater drain in southern portion of the study area, facing north-west**

4.4 Discussion of archaeological survey results

The archaeological survey consisted of two meandering transects throughout the extent of the study area, focusing on determining whether any archaeological material from Aboriginal occupation or land use exists within the study area. The entire study area has been highly modified due modern developments associated with agricultural practices and later, the BaptistCare aged care facility. No Aboriginal sites were identified within the study area and no areas of archaeological potential were identified due to landforms and disturbances present. The results of the archaeological survey have been summarised below and in Figure 8 and Figure 9.

Background research identified that the study area is located in the Ashfield Shale geological unit. The study area is also underlain by the erosional Glenorie soil landscape. Erosional landscapes comprise of soils that are generally subject to movement of shallow soils, which can result in poor preservation of the archaeological record. Additionally, when the land is cleared of vegetation, the soils can be subjected to more extensive levels of erosion. The study area lies in an undulating landscape with an overall downwards slope from the north-west to the east. There are no water sources within the study area and the nearest water sources are an unnamed, first-order, non-perennial creek and Mars Creek, a first-order non-perennial watercourse, located approximately 38 metres and 260 metres from the study area respectively. Therefore the study area was unlikely to have been used due to the distance from permanent water sources.

A review of historical sources and aerials show that the study area was used for agricultural purposes prior to being developed into the BaptistCare facility. Historical disturbances include vegetation clearance, the construction of houses and subsurface infrastructure, market gardening, and use of the study area for agricultural purposes. The BaptistCare aged care facility has resulted in significant disturbances throughout the entire study area. This was evident through the multiple phases of development seen in historical imagery, with modern residential, office and maintenance buildings, sub-surface services, bitumen roads, footpaths, gardens, and carparks identified during the archaeological survey.

The disturbances associated with previous agricultural activities and with the construction of the aged care facility would have included the stripping and grading of topsoil, large-scale excavation, cutting and benching of the landscape, importing of material for fill, installation of services, construction of underground carparks, installation of roadways, and landscaping of the grounds. All these activities would have resulted in the mass movement of soils and the removal off any intact sub-surface deposits or surface artefacts. This conclusion is supported by previous assessments conducted throughout the local region. These assessments identified that where extensive historical and modern disturbances had occurred, there was low potential for archaeological deposits to be present (Artefact Heritage 2017, Biosis Pty Ltd 2019, Biosis 2020).

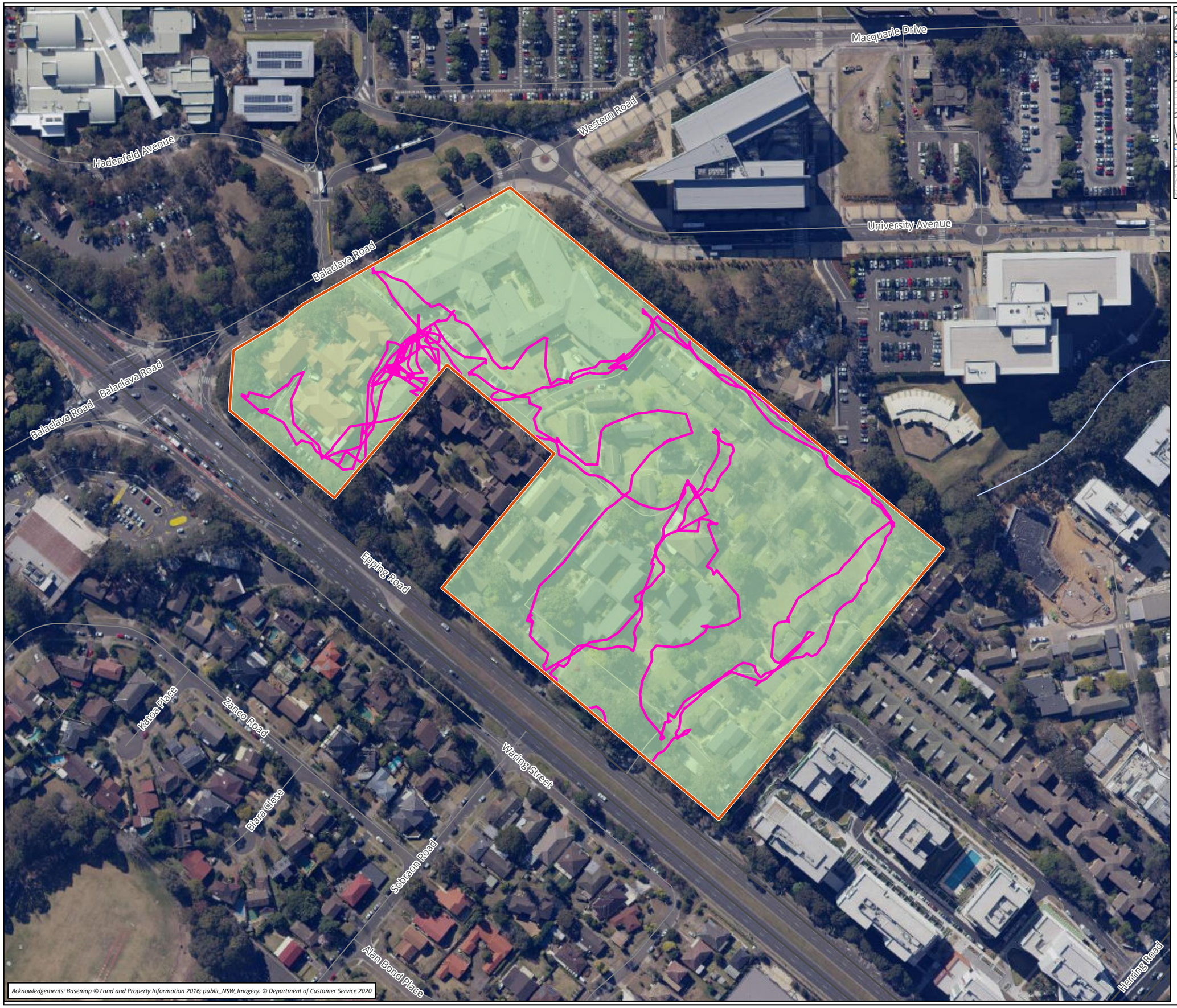
The archaeological survey of the study area conducted on 21 July 2022 and 20 September 2022 confirmed the extensive disturbance throughout the study area previously reported and no Aboriginal sites were identified. A number of sandstone boulders were noted as part of the landscaping of the BaptistCare aged care facility, and have been brought into the study area. The sandstone boulders were inspected however no engravings were observed. Due to the likelihood that limited to no intact soil deposits remain, and no sites or areas of archaeological potential have been identified, the study has been determined to contain low archaeological potential (Figure 8).

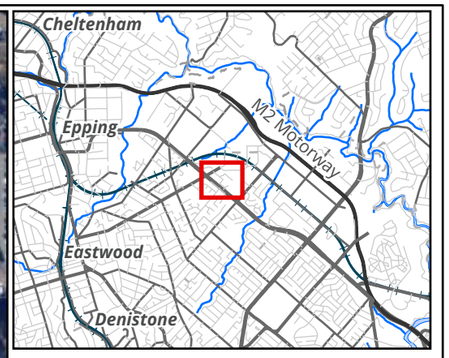
4.5 Aboriginal consultation

Belinda Jackson (Cultural Heritage Officer, Kamilaroi-Yankuntjatjara Working Group) and Joshua Marr (Cultural Heritage Officer, Metropolitan LALC) attended the field investigation on 20 September 2022. The areas containing the proposed works were noted to have been disturbed by the construction of several buildings, roads and footpaths, carparks, landscaping, and associated subsurface infrastructure. A number of

sandstone boulders were noted as part of the landscaping of the BaptistCare aged care facility, and have been brought into the study area, as noted above. During the field investigation several comments were made and are noted below:

- The study area has been heavily disturbed.
- Signage should be included that acknowledges the Wallumedegal or Wallumattagal as traditional owners of the land.
- Monitoring by a RAP should be undertaken where sandstone (in the landscaping) is to be removed. This will allow the RAP to assess the sandstone to see if there are any engravings on them.





Legend

- Study area
- Survey tracks

Archaeological potential

- Low

Figure 8 Survey effort and results

0 10 20 30 40 50

Metres

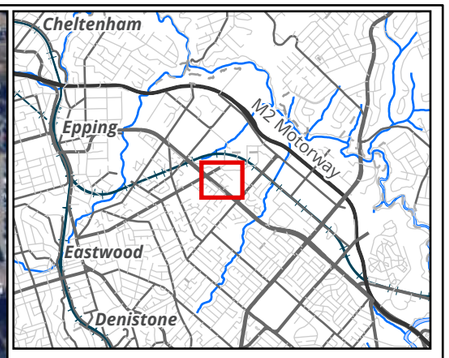
Scale: 1:2,000@ A3

Coordinate System: GDA 1994 MGA Zone 56

N

biosis

Matter: 37323, Date: 26 September 2022,
Drawn by: JB, Checked by: MB, Last edited by: jbeckius
Location: P:\37300s\37323\Mapping\
37323_MacquariePk_AR, Layout: 37323_AR_F8_SurveyEffortResult



Legend

Study area

Landform

Simple slope

Figure 9 Landforms

0 10 20 30 40 50

Metres

Scale: 1:2,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

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Matter: 37323, Date: 26 September 2022,
Drawn by: JB, Checked by: MB, Last edited by: jbeckius
Location: P:\37300s\37323\Mapping\
37323_MacquariePk_AR, Layout: 37323_AR_F9_Landforms

5 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.

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 (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, Heritage NSW, NSW Department of Planning, Industry 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 Heritage NSW 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.

5.2 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 & Smith 2004, p.249, NPWS 1997). 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 1997, 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 8 and Table 9 outline the site content and site condition rating used for archaeological sites.

Table 8 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

Rating	Description
	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 9 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 10 outlines the site representativeness ratings used for archaeological sites.

Table 10 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 11.

Table 11 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 sub-surface testing.

5.2.1 Statements of archaeological significance

No Aboriginal sites, objects or areas of archaeological potential were identified as part of this assessment. The study area has been heavily disturbed by previous land uses which has resulted in the entire study area being assessed as having low archaeological potential. The study area therefore does not have any research potential or representativeness associated with it. This assessment has therefore determined that study area does not contain any archaeological significance.

6 Impact assessment

The proposed future development will consist of several buildings with intended use for accommodation and retail. The potential impacts of these works on Aboriginal heritage is presented below.

6.1 Proposal details

The proposed development involves the development of a master plan for the proposed BaptistCare Macquarie Park (Figure 3). The master plan will include provision for:

- Student Housing.
- Seniors Housing.
- Build to Rent.
- Retail.
- Residential.
- Mixed uses including commercial and allied health.
- A school.

As the development at this stage only involves the master plan proposal, no physical works will be undertaken, subsequent stages will be undertaking physical works.

6.2 Ecologically Sustainable Development

One of the primary aims of the NPW Act is the 'conservation of objects places and features … of cultural value within the landscape, including … places, objects and features of significance to Aboriginal people …' ((s.2A(1)(b)(i)). The *Operational Policy: Protecting Aboriginal Cultural Heritage (Version 2)* (State of NSW and Office of Environment and Heritage NSW 2011) provides guidance to proponents in term of Ecologically Sustainable Development (ESD).

ESD has been defined in Part 3, 6. (2) Objective of the Authority of the *Protection of the Environment Administration* Act 1991 (NSW). This outlines that the ESD requires the integration of economic and environmental considerations (including cultural heritage) in the decision-making process. In regard to Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle.

> ***"Intergenerational equity***
>
> *The principle of intergenerational equity states that the present generation should make every effort to ensure the health, diversity and productivity of the environment – which includes cultural heritage – for the benefit of future generations.*
>
> *In terms of Aboriginal cultural heritage, intergenerational equity can be considered in terms of the 'cumulative impacts' of any proposal to Aboriginal objects and places. For example, if few Aboriginal objects and places remain in a region (because of harm authorised under previous AHIPs), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.*

Information about the significance of Aboriginal cultural heritage values associated with the Aboriginal objects and places proposed to be harmed will be relevant to the consideration of intergenerational equity and an understanding of the cumulative impacts of a proposal.

Where there is uncertainty, the precautionary principle should also be followed (see below).

The precautionary principle

The precautionary principle states that the lack of full scientific certainty about the threat of harm should not be used as a reason for not taking measures to prevent harm from occurring.

In applying the precautionary principle, decisions should be guided by:

- *a careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment (which includes cultural heritage)*
- *an assessment of the risk-weighted consequences of various options.*

The precautionary principle is relevant to Heritage NSW consideration of potential harm to Aboriginal cultural heritage where:

- *the proposal involves a risk of serious or irreversible harm to Aboriginal objects or places or to the value of those objects or places, and*
- *there is a lot of uncertainty about the significance of Aboriginal cultural heritage values of the Aboriginal objects or places proposed to be harmed.*

Where this is the case, a precautionary approach should be taken and all cost-effective measures implemented to prevent or reduce harm to the Aboriginal objects/place (State of NSW and Office of Environment and Heritage NSW 2011, p.26)."

The results of this assessment have identified that the land within the study area represents part of a complex Aboriginal cultural landscape. As identified in the background research and through Aboriginal community consultation, the region surrounding the study area, particularly to the south-east, contains several sites, landforms and landscapes that are significant to local Aboriginal groups. Therefore, this assessment has been able to further our knowledge of Aboriginal archaeology in the area, by highlighting the environmental and cultural significance of the surrounding landscape and how this may have been intertwined with the current study area.

6.3 Assessment of impacts to the study area

The study area does not contain any recorded Aboriginal sites and has been assessed as having low archaeological potential due to existing disturbances within the study area. The proposed works will therefore not impact on any Aboriginal heritage values (Figure 10).

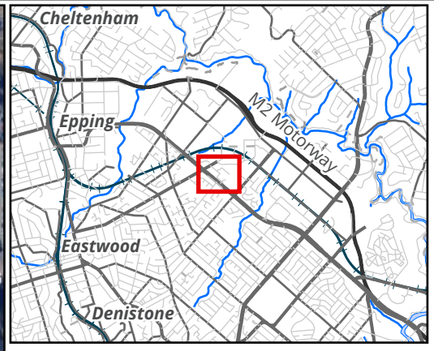
A summary of the impacts of the proposed works to the study area is presented in Table 12 and Table 13 below.

Table 12 Summary of sub-surface impacts of proposed works

Proposed works	Impacts to potential archaeological deposits (Yes/No)
• Development of the master plan	No – there will be no physical works at this stage. Should the concept design be approved, future development may result in physical disturbances across the study area; however, no Aboriginal cultural values are present across the site. The works will therefore not impact on Aboriginal cultural values.

Table 13 Summary of potential archaeological impacts to the study area

Study area potential	Significance	Type of harm	Degree of harm	Consequence of harm
Low	Nil	None	None	No consequence; the study area does not contain any Aboriginal sites, objects or areas of archaeological potential. A heritage induction for all site workers and contractors should be undertaken in order to prevent any unintentional harm to Aboriginal sites located within the study area and its surrounds. Monitoring by a RAP should be undertaken when sandstone is to be removed and signage should also be incorporated into the project.



Legend

Study area

Lot

Archaeological potential

Low

Figure 10 Impact assessment

0 10 20 30 40 50

Metres

Scale: 1:2,000@ A3

Coordinate System: GDA 1994 MGA Zone 56

N

biosis

Matter: 37323, Date: 22 November 2022,
Drawn by: JB, Checked by: MB, Last edited by: jtownsend
Location: P:\37300s\37323\Mapping\
37323_MacquariePk_AR, Layout: 37323_AR_F10_IA

Acknowledgements: Basemap © Land and Property Information 2016; public_NSW_Imagery: © Department of Customer Service 2020; Proposed development masterplan supplied by Ethos Urban Pty Ltd 2022

7 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.

Prior to any impacts occurring within the study area, the following is recommended:

Recommendation 1: No further archaeological assessment is required

No further archaeological work is required in the study area due to the entire study area being assessed as having low archaeological potential. This recommendation is conditional upon Recommendation 2 to 8.

Recommendation 2: Monitoring of sandstone removal

Consultation with Metropolitan LALC and Kamilaroi-Yankuntjatjara Working Group have identified the need for monitoring when sandstone rocks are to be removed from the site. Whilst no engravings were identified during the field investigation, the sandstone should be checked over by a RAP prior to removal. . Prior to any construction commencing on site, BaptistCare is to consult with the RAPs to arrange this .

Recommendation 3: Continued consultation with the registered Aboriginal parties

As per the consultation requirements, it is recommended that the proponent provides a copy of this report to the RAPs and considers all comments received. The proponent should continue to inform these groups about the management of Aboriginal cultural heritage sites within the study area throughout the life of the project.

Recommendation 4: Acknowledgement signage

Consultation with Metropolitian LALC and Kamilaroi Yankuntjatjara Working Group has also recommended that signage including an acknowledgement of the Wallumedegal or Wallumattagal as traditional owners of the land implemented for the project. This can also include native landscaping, Aboriginal art, digital displays, signage, edible and medicinal gardens, and apps educating about the history and use of the land by Aboriginal people. The Project Team are to consult with the RAPs for this.

Development of a Public Art Strategy including guidance for future signage is already underway for this project. In addition to this, future DA's for construction will need to take into account the 'Connecting with Country' framework (Government Architect NSW n.d.)

Recommendation 5: Heritage induction

Heritage inductions for all site workers and contractors should be undertaken in order to prevent any unintentional harm to any unexpected Aboriginal objects. The heritage induction should include the following items:

- Relevant legislation.

- Location of identified Aboriginal heritage sites, areas of archaeological potential, and areas of archaeological sensitivity within proximity to the study area.
- Basic identification skills for Aboriginal and non-Aboriginal artefacts and human remains.
- Procedure to follow in the event of an unexpected heritage item find during construction works.
- Procedure to follow in the event of discovery of human remains during construction works.
- Penalties and non-compliance.

Recommendation 6: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to disturb an Aboriginal site without a consent permit issued by Heritage NSW. Should any unanticipated 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 Heritage NSW and Aboriginal stakeholders.

Recommendation 7: Discovery of unanticipated historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the Heritage Act. Relics cannot be disturbed except with a permit or exception 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.

Recommendation 8: Discovery of human remains

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 Heritage NSW Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by Heritage NSW.

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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 : 37323 HM

Client Service ID : 699970

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-3868	86 Chelmsford Avenue	GDA	56	321244	6260447	Open site	Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Comber Consultants Pty Limited,Comber Consultants Pty Limited,Apex Archaeolog					**Permits**		
45-6-1054	Lane Cove;Man Goanna Cave;	AGD	56	325690	6263590	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	ASRSYS					**Permits**	580	
45-6-1053	Lane Cove River;	AGD	56	326000	6262000	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	98744
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-1893	KP.1.;	AGD	56	326239	6262975	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Margrit Koettig					**Permits**		
45-6-0980	Pennant Hills;Pymble;	AGD	56	326694	6264065	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-0990	Gladesville; The Boulders Cave, RYDE 023	GDA	56	327134	6256730	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-6-0613	Max Allen Track Kangaroo ENG (KUR069)	GDA	56	327687	6261396	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Ms.Bronwyn Conyers,Mr.Oliver Descoeudres					**Permits**		
45-6-2215	Terrace Road #2	GDA	56	327708	6261438	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Ms.Bronwyn Conyers,DPIE - Armidale,Ms.Elise McCarthy					**Permits**		
45-6-0981	Lane Cove River	AGD	56	327792	6260874	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	1899,98744
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-1855	L C/1 Lanecove 1	AGD	56	327920	6258190	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Ms.Laila Haglund					**Permits**		
45-6-1854	L C/2 Lanecove 2 Epping Road Bridge RYDE 012	GDA	56	328104	6258490	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	2383,102489
	Contact	**Recorders**	Val Attenbrow,Alice Gorman,K Cutmore,Ms.Laila Haglund,Aboriginal Heritage Offic					**Permits**		
45-6-3741	Sugarloaf Point Trail Midden	GDA	56	328206	6256686	Open site	Valid	Shell : -		
	Contact	**Recorders**	AECOM George Street Sydney ,Ms.Julia Atkinson					**Permits**		
45-6-2598	CSIRO 3 (CSIRO North Ryde) RYDE 010	GDA	56	328354	6258740	Open site	Valid	Artefact : -	Open Camp Site	4157,102489
	Contact	**Recorders**	Aboriginal Heritage Office,Ms.Tessa Corkill					**Permits**		
45-6-2277	Blackman Park 3;	AGD	56	328450	6256560	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	

Report generated by AHIMS Web Service on 13/07/2022 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 320881.804 - 329290.741, Northings : 6256627.596 - 6264992.43 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 111

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 37323 HM

Client Service ID : 699970

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2276	Blackman Park 2;	AGD	56	328560	6256780	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2718	Will-145 - Mowbray Park	AGD	56	328580	6258330	Open site	Valid	Shell : -		
	Contact	**Recorders**	David Watts					**Permits**		
45-6-2268	Big River Cave;	AGD	56	328890	6258410	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-1348	Mowbray Park;Lane Cove West;Mowbray Park 1.;Chatswood West;	GDA	56	329030	6258405	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	1497
	Contact	**Recorders**	Val Attenbrow,Michael Guider					**Permits**		
45-6-1940	Stringy Bark Creek Cave 1;	AGD	56	329010	6257390	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2649	Lane Cove River PAD 1	AGD	56	329100	6259180	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mr.Neville Baker					**Permits**	1470	
45-6-2949	M2A1	GDA	56	323895	6262241	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	Mr.Rick Bullers					**Permits**		
45-6-3042	Eden Ave Groove 1 KUR 052	GDA	56	325374	6262955	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3041	Rofe Park Shelter KUR 032	GDA	56	326184	6264540	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-0931	Boronia Park, Ryde 019	GDA	56	327234	6257010	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	102489
	Contact	**Recorders**	Charles.D Power,Aboriginal Heritage Office					**Permits**		
45-6-2212	Blue Hole	AGD	56	327310	6260990	Closed site	Valid	Artefact : -	Shelter with Deposit	1899,98744
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-3861	Riverside Drive Charcoal Art	GDA	56	328101	6260036	Open site	Valid	Art (Pigment or Engraved) : -		
	Contact	**Recorders**	DPIE - Armidale,Ms.Elise McCarthy					**Permits**		
45-5-2585	LCNPM 2	AGD	56	328350	6259020	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Bobbie Oakley					**Permits**		
45-6-2216	Lane_Cove_#1	GDA	56	328497	6258962	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899

Report generated by AHIMS Web Service on 13/07/2022 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 320881.804 - 329290.741, Northings : 6256627.596 - 6264992.43 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 111

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 37323 HM

Client Service ID : 699970

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Ms.Bronwyn Conyers,DPIE - Armidale,Ms.Elise McCarthy					**Permits**		
45-6-3013	Stringybark Creek PAD Shelter 8 - LCC 086	GDA	56	328624	6257885	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-2717	Will-144 Mowbray Park	AGD	56	328660	6258290	Closed site	Valid	Habitation Structure : -		
	Contact	**Recorders**	David Watts					**Permits**		
45-6-2272	Mowbray Park 5;	GDA	56	329010	6258450	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-3096	Former Channel 7 site Mobbs Ln	GDA	56	321136	6260245	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Doctor.Alan Williams					**Permits**		
45-6-1156	Epping;Terrys Creek Cave; RYDE 002	GDA	56	323544	6261450	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-6-0978	Lane Cove River: KUR-050	GDA	56	324504	6262690	Open site	Valid	Grinding Groove : -, Water Hole : -	Axe Grinding Groove,Water Hole/Well	
	Contact	**Recorders**	Mr.Phil Hunt,Mr.R Taplin					**Permits**		
45-6-0608	Lane Cove River;Turramurra Public School	AGD	56	325351	6264430	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2585	Shrimpton's Creek 2;Macquarie Park (Lane Cove NP); RYDE 006	GDA	56	326189	6261480	Closed site	Valid	Artefact : -	Shelter with Deposit	98744,102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2574	Buffalo Creek; RYDE 022	GDA	56	327214	6256755	Closed site	Valid	Artefact : -	Shelter with Deposit	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2577	River Bend;	AGD	56	327440	6261060	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	98744
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-1005	Martins Creek;Lane Cove SRA; RYDE 015	GDA	56	327644	6257600	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	102489
	Contact	**Recorders**	Michael Guider,J.A Hatfield,Aboriginal Heritage Office					**Permits**		
45-6-2059	Sugarloaf 3	AGD	56	327950	6256610	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-0614	North Ryde;Delhi Rd;	AGD	56	328121	6258045	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	**Recorders**	ASRSYS					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 37323 HM

Client Service ID : 699970

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-2056	Footbridge Cave;	GDA	56	328261	6258205	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2765	LCC 077 Pumphouse Shelter	AGD	56	328185	6257765	Open site	Valid	Habitation Structure : 1		
	Contact S Scanlon	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-0882	Lane Cove River;Gordon;	AGD	56	328134	6263010	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Charles.D Power					**Permits**		
45-6-1252	LC#4 Chatswood	AGD	56	328435	6258730	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899
	Contact	**Recorders**	P Clark,Ms.Bronwyn Conyers					**Permits**		
45-6-2284	Athletics Fields;Lane Cove West;	AGD	56	328490	6258170	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2311	Rope Swing Cave;	GDA	56	328735	6258502	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-5-2584	LC NPM 1	GDA	56	328786	6259215	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Bobbie Oakley,Coast History & Heritage ,Miss.Gina Basile					**Permits**		
45-6-3319	Mowbray Park PAD4 WILL214	GDA	56	328850	6258435	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt,Aboriginal Heritage Office					**Permits**		
45-6-3010	Stringybark Creek PAD Shelter 7 - LCC085	GDA	56	329119	6257645	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-2309	Ermington PS; RYDE 101	GDA	56	321494	6257820	Open site	Valid	Artefact : -	Open Camp Site	102196,102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-3039	Meadowbank Park Tennis Courts RYDE 203	GDA	56	322539	6256690	Open site	Valid	Grinding Groove : 3		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3136	Terrys Creek Shelter PAD1	GDA	56	323515	6261475	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-1157	Brown;Cut Inside Cave; RYDE 003	GDA	56	325234	6262680	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-6-2057	Sugarloaf 1 RYDE 017	GDA	56	327959	6256850	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809,102489

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Extensive search - Site list report

Your Ref/PO Number : 37323 HM

Client Service ID : 699970

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2103	Magdala park; RYDE 014	GDA	56	327964	6257780	Open site	Valid	Shell : -, Artefact : -	Midden,Open Camp Site	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2275	Blackman Park 1;	AGD	56	328310	6256780	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2236	Blue Gum Cave;	AGD	56	328320	6259190	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2310	Hand Hold Cave;	GDA	56	328738	6258512	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-1845	Mowbray Park 3, Chatswood west.;	AGD	56	328670	6258230	Closed site	Valid	Artefact : -	Shelter with Deposit	1497
	Contact	**Recorders**	Val Attenbrow					**Permits**		
45-6-1558	Delhi Road;North Ryde; RYDE 009	GDA	56	329034	6258982	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	102489
	Contact	**Recorders**	Warren Bluff,Aboriginal Heritage Office					**Permits**		
45-6-3320	Mowbray Park PAD5 WILL215	GDA	56	329200	6258330	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt,Aboriginal Heritage Office					**Permits**		
45-5-2982	PAD 2 Stringbark Creek	GDA	56	329243	6257485	Open site	Valid	Potential Archaeological Deposit (PAD) : -		102196
	Contact	**Recorders**	Mrs.Robynne Mills					**Permits**	1985	
45-6-2234	LBG Creek 2;	AGD	56	329150	6259910	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-3083	Crescent 3	GDA	56	321838	6263337	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Kelleher Nightingale Consulting Pty Ltd,Mr.Josh Symons					**Permits**		
45-6-3117	Crescent 2 (C2)	GDA	56	322259	6262900	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Matthew Kelleher					**Permits**		
45-6-0977	Epping;Lane Cove River; Little bloodwood stump cave RYDE 001	GDA	56	323964	6262130	Closed site	Valid	Artefact : -	Shelter with Deposit	2047,102489
	Contact	**Recorders**	Val Attenbrow,Aboriginal Heritage Office,Mr.Rick Bullers					**Permits**		
45-6-1158	Brown Two Ceiling Domes Cave ENG (RYDE 004)	GDA	56	325274	6262670	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office,Mr.Oliver Descoeudres					**Permits**		
45-6-0991	Gladesville;Ryde 025	GDA	56	326304	6256780	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	102489

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Extensive search - Site list report

Your Ref/PO Number : 37323 HM

Client Service ID : 699970

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.R Taplin,Aboriginal Heritage Office					Permits		
45-6-2584	Shrimptons Creek 1;Macquarie Park (Lane Cove NP); RYDE 005	GDA	56	326234	6261520	Closed site	Valid	Artefact : -	Shelter with Deposit	98744,102489
	Contact	Recorders	Michael Guider,Aboriginal Heritage Office					Permits		
45-6-2575	Strangers Creek; RYDE 020	GDA	56	327239	6257010	Closed site	Valid	Artefact : -	Shelter with Deposit	102489
	Contact	Recorders	Michael Guider,Aboriginal Heritage Office					Permits		
45-6-2576	Field of Mars; RYDE 021	GDA	56	327314	6256880	Open site	Valid	Shell : -, Artefact : -	Midden	102489
	Contact	Recorders	Michael Guider,Aboriginal Heritage Office					Permits		
45-6-2653	Eden Gardens PAD RYDE 007	GDA	56	327279	6260615	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		102489
	Contact	Recorders	Aboriginal Heritage Office,Ms.Norma Richardson					Permits	1613,1685	
45-6-0610	Lane Cove River De Burgh's Bridge	AGD	56	327518	6260868	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	Recorders	Unknown Author					Permits		
45-6-0611	Lane Cove River West Pymble	AGD	56	327715	6261925	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	Recorders	Charles.D Power					Permits		
45-6-2238	Blackman Park 5;	AGD	56	328050	6256990	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	Recorders	Michael Guider					Permits		
45-6-2298	Lovetts Reserve 2;Lane Cove West;	GDA	56	328304	6256630	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	Recorders	Michael Guider					Permits		
45-6-2209	Carters creek.	AGD	56	328290	6259190	Closed site	Valid	Artefact : -	Shelter with Deposit	1899
	Contact	Recorders	Ms.Bronwyn Conyers,R Pallin					Permits		
45-6-2214	Commandment Rock(LC#2)	AGD	56	328290	6259580	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899
	Contact	Recorders	P Clark,Ms.Bronwyn Conyers,D Brown					Permits		
45-6-3795	Avian Cres PAD 1 WILL181	GDA	56	328675	6258385	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Mr.Phil Hunt					Permits		
45-6-3008	Stringybark Creek PAD Shelter 5	GDA	56	329274	6257690	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Aboriginal Heritage Office					Permits		
45-6-3114	Epping to Thornleigh Third Track Unexpected Find 1	GDA	56	322194	6263106	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Josh Symons					Permits		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-5-1005	IFCH1	AGD	56	322415	6262289	Open site	Not a Site	Artefact : -	Isolated Find	
	Contact	**Recorders**	Mr.Geordie Oakes,AECOM Australia Pty Ltd - Sydney,Ms.Tessa Corkill					**Permits**		
45-6-2453	HR6	AGD	56	322400	6263970	Closed site	Valid	Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Deposit	3484
	Contact	**Recorders**	Margrit Koettig					**Permits**		
45-6-0341	Pymble;Turramurra;	AGD	56	325839	6264120	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-3021	Field of Mars RYDE 026	GDA	56	327404	6257120	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-1953	Pages Creek Cave;	GDA	56	327724	6258540	Open site	Valid	Shell : -, Artefact : -	Midden	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2058	Sugarloaf 2	AGD	56	327890	6256670	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**	624	
45-6-2681	PAD B	AGD	56	328150	6258150	Open site	Not a Site	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mrs.Robynne Mills					**Permits**	1871	
45-6-3009	Stringybark Creek PAD Shelter 6 - LCC 084	GDA	56	329224	6257660	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-2508	Delhi Road; RYDE 008	GDA	56	329264	6259300	Closed site	Valid	Artefact : -	Shelter with Deposit	102489
	Contact	**Recorders**	W Walker,Mr.David Crew,Aboriginal Heritage Office					**Permits**		
45-6-3082	NWRL PAD1	GDA	56	320967	6262938	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	GML Heritage Pty Ltd - Surry Hills					**Permits**		
45-6-0304	Pennant Hills;	AGD	56	322503	6264795	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-3105	Canoon Rd Grooves 1 KUR143	GDA	56	324284	6264100	Open site	Valid	Grinding Groove : -		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-1235	Browns Waterhole Animal Tracks ENG	GDA	56	324646	6262727	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS,Mr.Oliver Descoeudres					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 37323 HM

Client Service ID : 699970

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-0989	Gladesville;Ryde 018	GDA	56	327224	6257020	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-6-2937	Tarban Creek 8	GDA	56	327300	6264600	Closed site	Valid	Art (Pigment or Engraved) : -		
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2213	DeBurghs Bridge	GDA	56	327454	6261230	Open site	Valid	Artefact : -, Habitation Structure : -	Shelter with Deposit	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers,DPIE - Armidale,Ms.Elise McCarthy					**Permits**		
45-6-0966	Kitty's Creek;Lane Cove SRA; RYDE 016	GDA	56	327874	6257420	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809,102489
	Contact	**Recorders**	Val Attenbrow,Alice Gorman,Aboriginal Heritage Office					**Permits**		
45-6-2237	Blackman Park 4;	AGD	56	328110	6256950	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2281	Mars Rd Cave;Lane Cove West;	AGD	56	328130	6257150	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-3321	Mowbray Park PAD3 WILL213	GDA	56	328735	6258510	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt,Aboriginal Heritage Office					**Permits**		
45-6-2211	Lane Cove 3	AGD	56	328780	6258670	Open site	Valid	Shell : -, Artefact : -	Midden	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-2235	LBG Creek 3;	AGD	56	329130	6259860	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-3067	Crescent 1	GDA	56	322187	6263082	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Kelleher Nightingale Consulting Pty Ltd					**Permits**		
45-6-2599	CSIRO 2 (CSIRO North Ryde) RYDE 011	GDA	56	328319	6258660	Closed site	Valid	Artefact : -	Shelter with Deposit	4157,102489
	Contact	**Recorders**	Aboriginal Heritage Office,Ms.Tessa Corkill					**Permits**		
45-6-1653	Ironbarks Man (duplicate of 45-6-2216)	GDA	56	328496	6258962	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	J Wyeth,Mr.Oliver Descoeudres					**Permits**		
45-6-3796	Avian Cres PAD 2 WILL182	GDA	56	328645	6258375	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 37323 HM

Client Service ID : 699970

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-3015	Stringybark Creek PAD Shelter 9 LCC 087	GDA	56	328714	6257860	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-1354	Sewer Pipe Cave;Stringybark Creek;	GDA	56	328974	6257760	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Ms.Tessa Corkill					**Permits**		
45-6-1844	Mowbray Park 2, Chatswood west.;Chatswood West;	GDA	56	329050	6258380	Closed site	Valid	Artefact : -, Shell : -	Shelter with Deposit,Shelter with Midden	1497
	Contact	**Recorders**	Val Attenbrow,Michael Guider					**Permits**		

**** Site Status**

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

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

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

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

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