5 - 9 Nulla Nulla Street and 4 – 6 Ku-ring-gai Avenue

Residential flat buildings with in-fill affordable housing—Aboriginal Due Diligence Assessment (SSD-94893958)

Final report

Prepared for SRG Construction Pty Ltd c/- CPDM

28 October 2025

Biosis offices

New South Wales

Albury
Phone: (02) 6069 9200
Email: albury@biosis.com.au

Gosford
Phone: (02) 9101 8700
Email: gosford@biosis.com.au

Newcastle
Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney
Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Western Sydney
Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Wollongong
Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

Victoria

Ballarat
Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Melbourne
Phone: (03) 8686 4800
Email: melbourne@biosis.com.au

Wangaratta
Phone: (03) 5718 6900
Email: wangaratta@biosis.com.au

Document information

Report to:	SRG Construction Pty Ltd c/- CPDM
Prepared by:	Luci Kumar Sharma Bronte Baonza
Biosis project no.:	43193
File name:	43193.5-9.Nulla.Nulla.and4-6.KuRingGai.ADDA.FIN01.20251028
Citation:	Biosis 2025. 5 - 9 Nulla Nulla Street and 4 – 6 Ku-ring-gai Avenue, Turramurra. Residential flat buildings with in-fill affordable housing—Aboriginal Due Diligence Assessment (SSD-94893958). Report for SRG Construction Pty Ltd c/- CPDM. Authors: Kumar Sharma, L., Baonza, B., Biosis Pty Ltd, Sydney, NSW. Project no. 43193

Document control

Version	Internal reviewer	Date issued
Draft version 01	Charlotte Allen	15/08/2025
Final version 01	Charlotte Allen	10/10/2025
Final version 02	Ashley Bridge	28/10/2025

Acknowledgements

Biosis acknowledges the contribution of the following people and organisations in undertaking this study:

- CPDM: Ross Norton.
- Gyde Consulting: Rebbecca Sladen and Georgia Sedgmen.
- Metropolitan Local Aboriginal Land Council: Raymond Weatherall.

Biosis staff involved in this project were:

- Megan Porter (assistance in the field).
- Charlotte Allen (quality assurance).
- Lauren Harley (mapping).

Biosis acknowledges the Aboriginal and Torres Strait Islander peoples as Traditional Custodians of the land on which we live and work.

We pay our respects to the Traditional Custodians and Elders past and present and honour their connection to Country and ongoing contribution to society.

Contents

Tables

Figures

Photographs

Summary

Biosis Pty Ltd (Biosis) has been commissioned by CPDM (the client) on behalf of SRG Construction Pty Ltd (the proponent) to undertake an Aboriginal Due Diligence Assessment (ADDA), for the proposed development at 5–9 Nulla Nulla Street and 4–6 Ku-ring-gai Avenue, Turramurra (Lots 2–4 DP17642 and Lots 422–423 DP556058), in New South Wales (NSW) (the study area).

This ADDA report accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in support of a State Significant Development application (SSDA) that seeks approval for the construction of residential flat buildings at 5–9 Nulla Nulla Street and 4–6 Ku-ring-gai Avenue, Turramurra. The reference number for the SSDA is SSD-94893958. This report has been prepared to determine if the proposed development is likely to have a significant effect on Aboriginal cultural heritage.

The purpose of this report does not relate to archaeological or built heritage concerns that have no association with Aboriginal cultural heritage. This report addresses the Secretary Environmental Assessment Requirements (SEARs) issued for the project, as per Table 1.

An assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a) (Due Diligence Code) has been undertaken for the study area in order to inform responsibilities with regards to Aboriginal cultural heritage in the area. In addition to the basic tasks required for a due diligence assessment, an extended background review, as well as an archaeological survey in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) (the Code) was conducted, to adequately map areas of high, moderate and low archaeological potential.

A desktop assessment of the study area identified that geologically, the study area is within the Ashfield Shale unit within the Wianamatta Group. The study area is situated within the Glenorie soil landscape, the erosional characteristics of which often results in the poor preservation of archaeological materials. A review of historical aerials shows that the study area has undergone extensive development indicating that any archaeological potential has since been destroyed.

Background research also included a search of the Aboriginal Heritage Information Management System (AHIMS) database and a review of relevant reports. The AHIMS search conducted on 30 July 2025 identified 101 Aboriginal archaeological sites within a 5-kilometre search area centred on the study area (Client service ID: 1028490). None of these sites were located in or within the study area. Previous assessments within the local and regional areas and their findings were also reviewed as part of this assessment. The results of the previous assessments along with a review of the historical aerial imagery, geology, hydrology and soil landscape characteristics of the study area have been examined to provide a series of predictive statements of the study area's archaeological potential. The predictive statements indicated that there was low potential for Aboriginal objects or sites to be present within the study area.

A review of historical aerials shows significant development of the study area, with large scale residential land use and development pre-dating the 1940s. Extensive landscape modification, vegetation clearance and installation of associated subsurface utilities has been undertaken. Previous assessments within the local area identified similarly heavy disturbances to the archaeological record within the broader, highly developed area of Turramurra.

An archaeological survey of the study area was undertaken on 5 August 2025 by Bronte Baonza (Biosis, Heritage Consultant), Megan Porter (Biosis, Graduate Heritage Consultant), and Raymond Weatherall

(Metropolitan Local Aboriginal Land Council (LALC)). The archaeological survey was hampered by low ground surface visibility (GSV) due to grass coverage and extensive existing disturbances, including buildings and residential landscaping. Taking into account the distance to reliable water sources, unfavourable topographical and geological landforms, the erosional soil profile, and extensive subsurface and surface disturbances, the study area is assessed to hold low potential for archaeological deposits or other Aboriginal sites.

The following management recommendations have been developed 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:
  - The Ethos of *The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance, 2013* (the Burra Charter) (Australia ICOMOS 1999).
  - 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 assessed as having low archaeological potential and there being no known Aboriginal heritage sites within the study area.

Recommendation 2: Discovery of Unanticipated Aboriginal Objects

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

Recommendation 3: Discovery of Aboriginal Ancestral Remains

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

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and 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.

Definitions

ACHA	Aboriginal Cultural Heritage Assessment
ADDA	Aboriginal Due Diligence Assessment
AHCP	Aboriginal History and Connections Program
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AMBS	Australian Museum Business Services
AR	Archaeological report
Biosis	Biosis Pty Ltd
BP	Before present
Burra Charter	*The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance, 2013*
Cth DCCEEW	Australian Commonwealth Department of Climate Change, Energy, the Environment and Water
DSCA	Dominic Steele Consulting Archaeology
DP	Deposited Plan
Due Diligence Code	*Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
GPS	Global Positioning System
GSV	Ground Surface Visibility
Heritage Act	*Heritage Act 1977*
Heritage NSW	Heritage NSW, NSW Department of Climate Change, Energy, the Environment and Water
ICOMOS	International Council on Monuments and Sites
JMCHM	Jo McDonald Cultural Heritage Management
KNC	Kelleher Nightingale Consulting
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LGA	Local Government Area
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
PAD	Potential Archaeological Deposit
SEARs	Secretary Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SGAC	Stephanie Garling Archaeological Consulting

SSD	State Significant Development
Study area	6 – 12 Nulla Nulla Street, Turramurra (Lot 100 DP1299873)
The Code	*The Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*

1 Introduction

1.1 Background

Biosis has been commissioned by CPDM on behalf of SRG Construction Pty Ltd to undertake an ADDA for the proposed development at 5–9 Nulla Nulla Street and 4–6 Ku-ring-gai Avenue, Turramurra (Lots 2–4 DP17642 and Lots 422–423 DP556058), NSW (the project). This ADDA report accompanies an EIS pursuant to Part 4 of the EP&A Act, in support of a SSDA that seeks approval for the construction of residential flat buildings at 5-9 Nulla Nulla Street and 4-6 Ku-ring-gai Avenue, Turramurra. The reference number for the SSDA is SSD-94893958.

This report addresses the SEARs issued for the project, as per Table 1.

The development is to comprise construction of a residential flat building, maximising the development potential of the study area under State Environmental Planning Policy (SEPP) (Housing) Chapters 2 and 5. The proponent seeks to achieve the maximum Affordable Housing Bonus and submit an application through the SSD pathway.

The proposed works consist of a residential development within the study area. This will necessitate demolition of all current structures within the study area and will include activities such as bulk excavation, installation of associated utilities, and landscaping. The development will destroy previously built structures and disturb the ground thus inducing a risk to potential Aboriginal heritage.

An ADDA assessment in accordance with the Due Diligence Code has been undertaken for the study area to inform responsibilities regarding Aboriginal cultural heritage in the area. In addition to the basic tasks required for a due diligence assessment, an extended background review, as well as an archaeological survey in accordance with the Code was conducted, in order to adequately map areas of high, moderate and low archaeological sensitivity.

1.2 Location of the study area

The study area is located within the Ku-ring-gai Local Government Area (LGA), Parish of Gordon, County of Cumberland, as shown in Figure 1. The study area incorporates Lots 2–4 DP 17642 and Lots 422–423 DP 556058 and is bounded by Nulla Nulla Street to the north, private dwellings to the east (Lot 1 DP 396518, Lot 3 DP 228879, Lot 2 DP 541876, and Lot 1 DP 918766) and west (SP 101411, Lot 9 DP 17642, and Lot 4-21 DP 556058), and Ku-ring-gai Avenue to the south (Figure 2).

1.3 Approval pathway

The proposed development will be assessed as an SSD (SSD-94893958) against Part 4 of the EP&A Act. This ADDA has been undertaken to address Condition 21 of the Housing Industry Specific SEARs (Table 1).

Table 1 Housing Industry Specific SEARs

SEARs Requirement	Description	Section of report where response is provided
21	**Aboriginal Cultural Heritage** Where there is known, or reasonably likely, to be Aboriginal cultural	This whole report

SEARs Requirement	Description	Section of report where response is provided
	heritage on or near the site demonstrate that impacts have been adequately investigated and assessed by: • Identifying that an appropriate prior planning process has already considered these impacts, e.g. a rezoning or development application, or • Providing an initial assessment of the potential impacts. If potential impacts are significant, provide an ACHAR which: • Identifies, describes and assesses any impacts to Aboriginal cultural heritage sites or values associated with the site. • Is prepared in accordance with relevant guidelines	

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

- NPW Act.
- *National Parks and Wildlife Amendment Act 2010 (NSW)*.
- SEPP (Housing) 2021.
- *Ku-ring-gai Local Environment Plan 2015*.
- *Ku-ring-gai Development Control Plan 2021*.

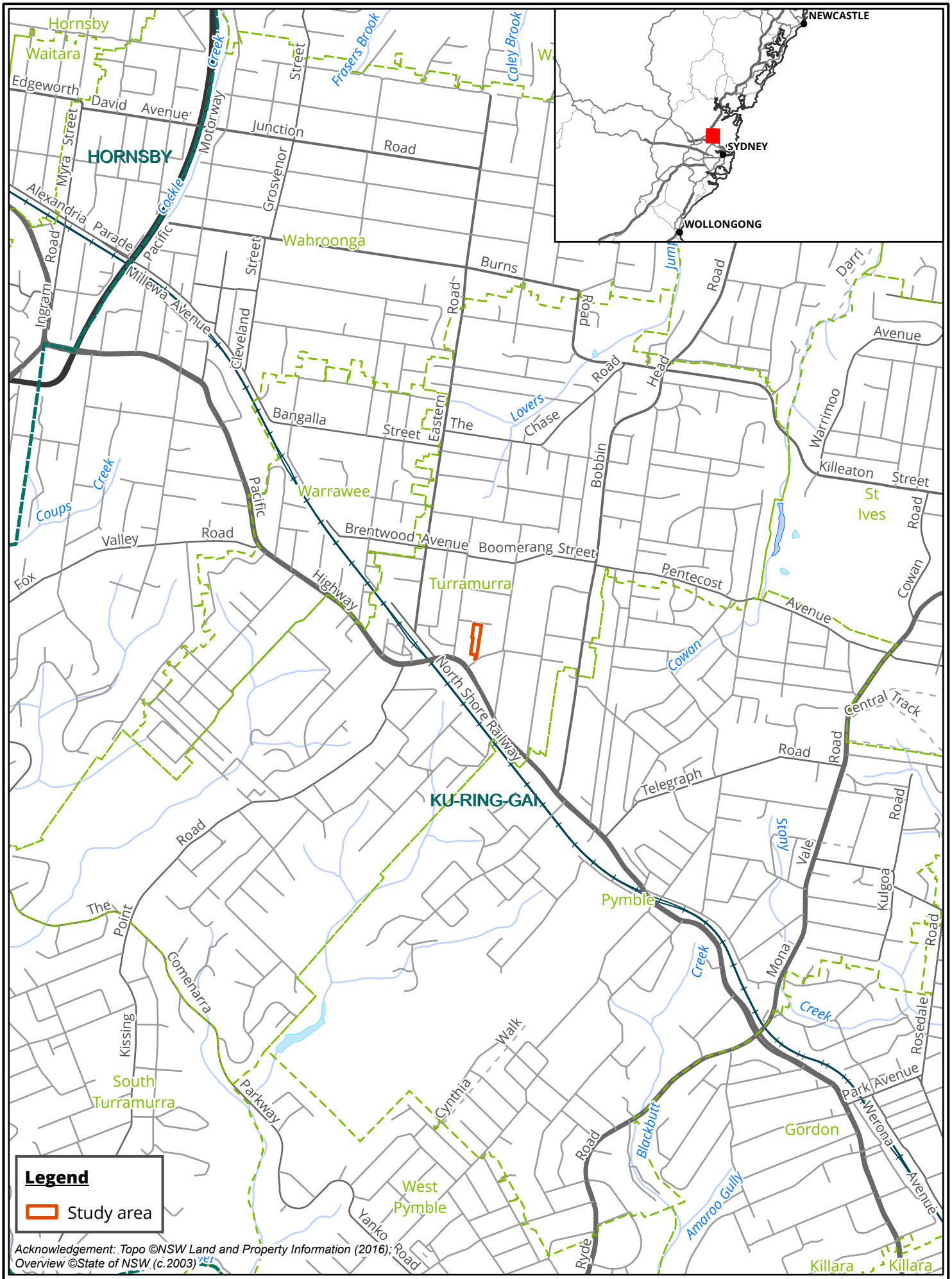
1.4 Scope of the assessment

The following is a summary of the major objectives of the assessment:

- Conduct background research in order to recognise any identifiable trends in site distribution and location, including a search of the AHIMS.
- Undertake archaeological survey as per Requirement 5 of the Code, with particular focus on landforms with high potential for Aboriginal heritage within the study area, as identified through background research.
- Record and assess sites identified during the survey in compliance with the guidelines endorsed by Heritage NSW.
- Determine levels of archaeological significance of the study area.
- Make recommendations to mitigate and manage any cultural heritage values identified within the study area.

1.5 Aboriginal consultation

Raymond Weatherall from the Metropolitan LALC attended the archaeological survey on 5 August 2025. He commented via email (12 August 2025) on the heavily disturbed landscapes and that there was no sign of lived or living Aboriginal people available in the study area, with the sandstone outcrops present displaying no markings. He noted that the Darramuragal people maintained a physical and spiritual connection to the land and water of the area for thousands of years.

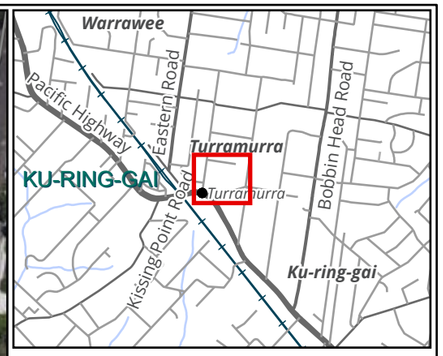


biosis
APEM Group

Figure 1 Location of the study area

Matter: 43193, Date: 11 August 2025,
Prepared for: LKS, Prepared by: LH, Last edited by: hliswoyo
Location: P:\43100s\43193\Mapping\43193_NullaNullaSt_KuRingGaiAve_ADDA
Layout: 43193_ADDA_F1_Locality

Scale 1:25,000@ A4, GDA2020 MGA Zone 56



Legend

- Study area
- Lot

Figure 2 Study area detail

0 10 20 30 40

Metres
Scale: 1:1,000@ A3
Coordinate System:
GDA2020 MGA Zone 56

N

biosis
APEM Group

Matter: 43193, Date: 12 August 2025,
Prepared for: LKS, Prepared by: LH, Last edited by: hliswoyo
Location: P:\43100s\43193\Mapping\
43193_NullaNullaSt_KuRingGaiAve_ADDA,
Layout: 43193_ADDA_F2_StudyArea

2 Desktop assessment

A brief desktop assessment has been undertaken to review existing archaeological studies for the study area and surrounding region. This information has been synthesised to develop some Aboriginal site predictive statements for the study area and 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.

2.1 Landscape context

It is important to consider the local environment of the study area any heritage assessment. The local environmental characteristics can influence human occupation and associated land use and consequently the distribution and character of cultural material. Environmental characteristics and geomorphological processes can affect the preservation of cultural heritage materials to varying degrees or even destroy them completely. Lastly, landscape features can contribute to the cultural significance that places can have for people.

2.2 Geology, landforms, hydrology and soils

Geology, landforms, hydrology and soils provide useful information for determining the potential for Aboriginal sites and objects. Geology can aid in determining if there were useful raw material resources that could be exploited. Soils can be used to determine the likelihood of preservation of archaeological materials. Hydrology is often an indicator of the potential for sites to be present depending on the perenniality and size of the water sources.

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. As sandstone outcrops are therefore less likely to occur in this geological landscape, artefact sites are more commonly identified. Topographically, the study area is situated predominantly on a shoulder landform transitioning to a flat landform descending to the north (Figure 4).

Stream order is recognised as a factor which helps the development of predictive modelling in Aboriginal archaeology in NSW. Predictive models which have been developed for the region have a tendency to favour permanent water courses as the locations of short- or long-term occupation and use. The reason being that 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. Occupation places are more likely to be found upon well drained topographies associated with permanent watercourses (creek banks, flats, terraces) (Dyall 1979, Dean-Jones 1990, Biosis 2017).

The stream order system used for this assessment was originally developed by Strahler (1952). It functions by adding two streams of equal order at their confluence to form a higher order stream, as shown in Photo 1. As stream order increases, so does the likelihood that the stream would be a perennial source of water. Hydrological features identified within the study area would have most likely been associated with temporary land use due to their non-perennial nature, and Aboriginal sites within the study area are more likely to be identified within well-drained topographies such as foot slopes and gentle slopes within proximity to these water sources.

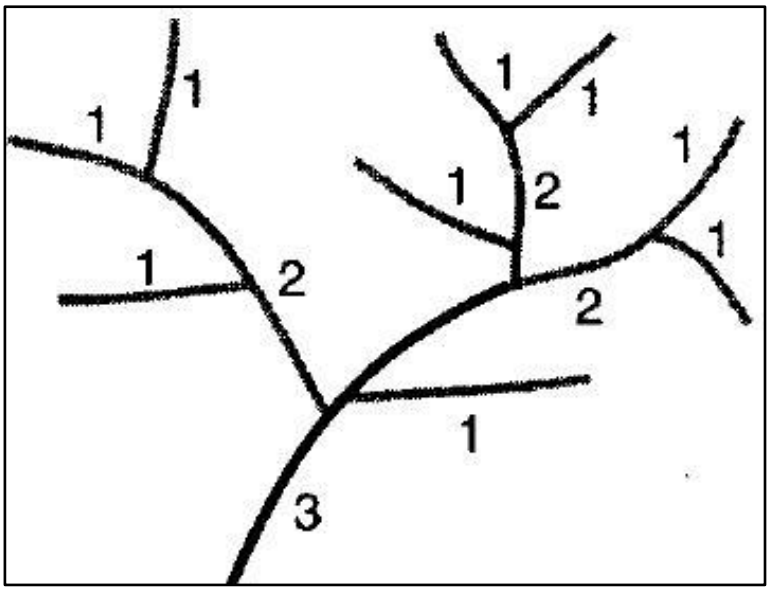


Photo 1 Diagram showing Strahler stream order (Ritter, Kochel, & Miller 1995, p. 151)

There are no water sources within the study area. The nearest water source to the study area is a first order nonperennial waterway located approximately 478 meters south of the study area. Other nearby watercourses include Cowan Creek approximately 1 kilometre to the east and Lovers Jump Creek approximately 1 kilometre to the north. The closest permanent water source is Middle Harbour Creek a fourth-order, nonperennial waterway located approximately 5.6 kilometres south-east of the study area (Figure 4). The absence of reliable water sources in proximity to the study area suggests the land within which the study area is located was less likely to be used as a site of intensive occupation.

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 (Figure 5). This landscape is composed of undulating to rolling rises and low hills with local reliefs of 50–0 metres, with 5–20% slopes. Glenorie soils are shallow to moderately deep (under 100 centimetres) on crests, moderately deep (70–150 centimetres) on upper slopes and deep (up to 200 centimetres) along drainage lines. The shallow, highly permeable soils within erosional landscapes are generally subject to movements that can result in poor preservation of the archaeological record. When the land is cleared of vegetation, the soils can be subjected to more extensive levels of erosion. This would result in the poor preservation of archaeological material at shallow depths but may also potentially lead to the exposure of any deeper archaeological deposits where topsoil has eroded away (Chapman et al. 1989, pp. 64–7, McInnes 1997, p.45, cited by Umwelt (Australia) Pty Limited 2016, p. 13).

Table 2 Glenorie soil landscape characteristics (Chapman et al. 2009, pp. 70–4)

Soil material	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-

Soil material	Description
	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.
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.

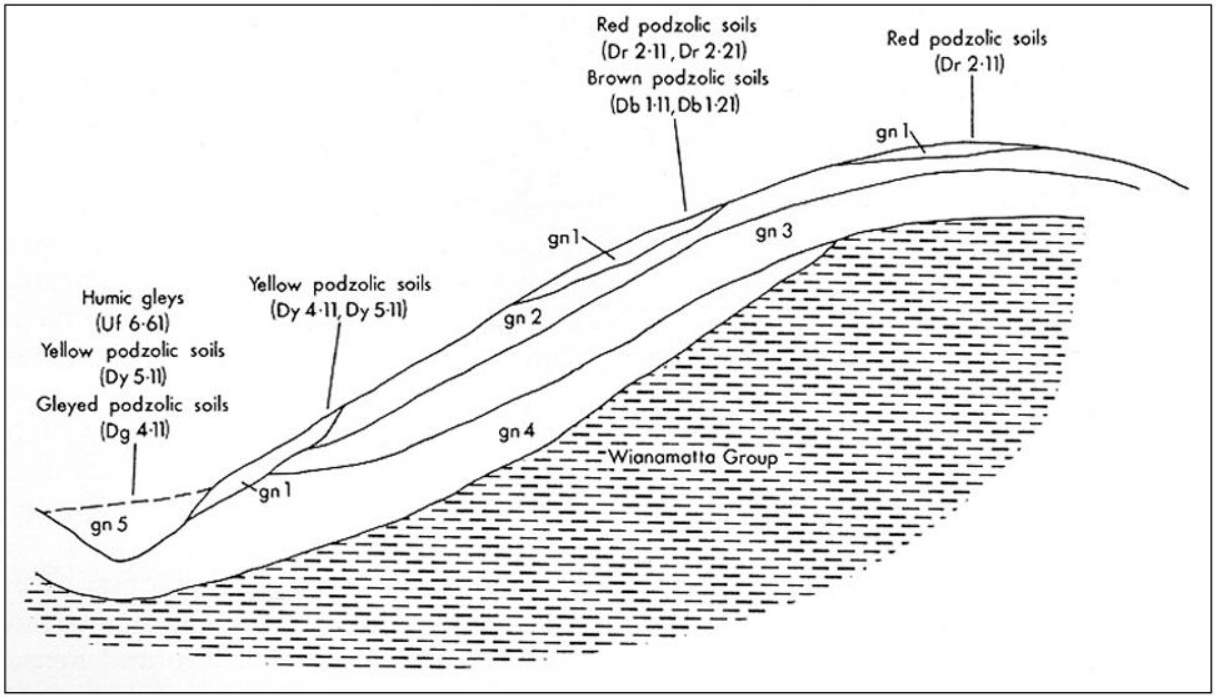
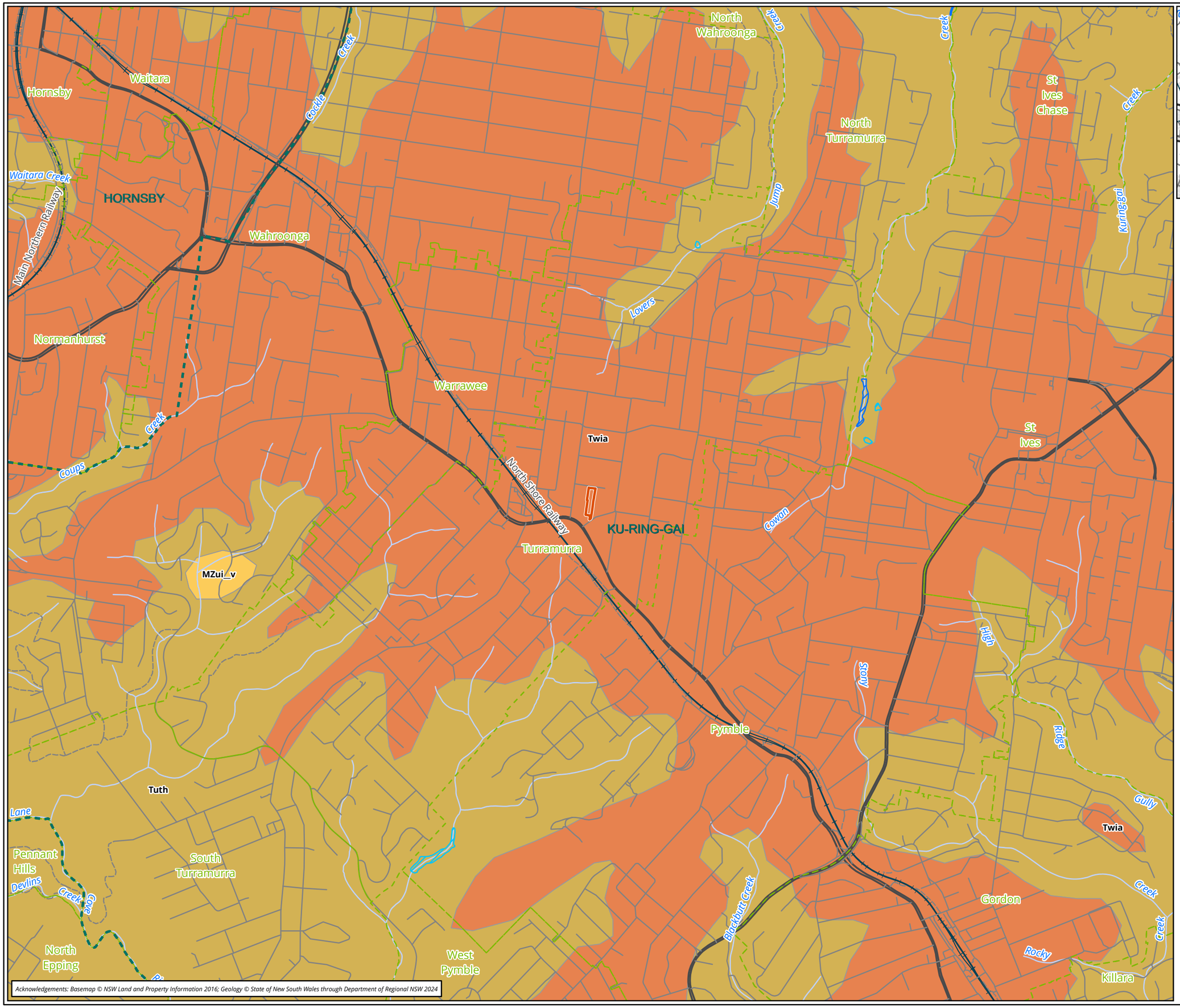


Photo 2 **Schematic cross-section of Glenorie soil landscape illustrating the occurrence and relationship of the dominant soil materials (Chapman et al. 2009, pp. 70–4)**



Legend

- Study area

Geological units

- MZui_v - Ungrouped Mesozoic igneous units - breccia
- Tuth - Hawkesbury Sandstone
- Twia - Ashfield Shale

Figure 3 Geological units in the vicinity of the study area

0 200 400 600 800

Metres

Scale: 1:20,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

N

biosis

APEM Group

Matter: 43193, Date: 12 August 2025,
Prepared for: LKS, Prepared by: LH, Last edited by: hliswoyo
Location: P:\43100s\43193\Mapping\
43193_NullaNullaSt_KuRingGaiAve_ADDA,
Layout: 43193_ADDA_F3_Geology

Legend

- Study area
- Contour (10m)

Strahler Order

- 1
- 2
- 3

Figure 4 Hydrology and topography in the vicinity of the study area

0 100 200 300 400

Metres

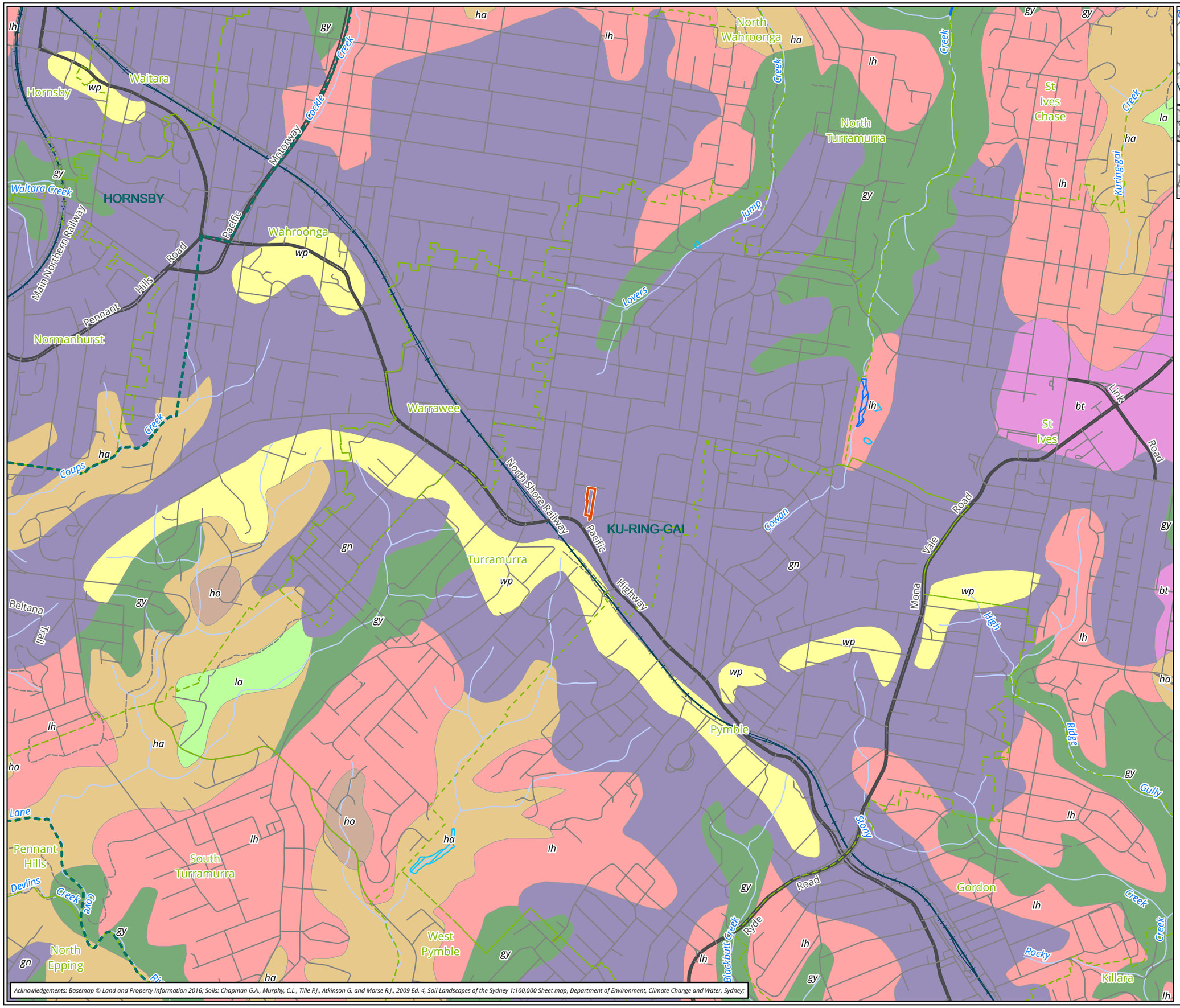
Scale: 1:10,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

N

biosis APEMGroup

Matter: 43193, Date: 12 August 2025,
Prepared for: LKS, Prepared by: LH, Last edited by: hliswoyo
Location: P:\43100s\43193\Mapping\,
43193_NullaNullaSt_KuRingGaiAve_ADDA,
Layout: 43193_ADDA_F4_Hydrology



Legend

Study area

Soil landscape units

- bt - BLACKTOWN
- gn - GLENORIE
- gy - GYMEA
- ha - HAWKESBURY
- ho - HORNSBY
- la - LAMBERT
- lh - LUCAS HEIGHTS
- wp - WEST PENNANT HILLS

Figure 5 Soil landscapes in the vicinity of the study area

0 200 400 600 800

Metres

Scale: 1:20,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

N

biosis APEM Group

Matter: 43193, Date: 12 August 2025,
Prepared for: LKS, Prepared by: LH, Last edited by: hliswoyo
Location: P:\43100s\43193\Mapping\43193_NullaNullaSt_KuRingGaiAve_ADDA,
Layout: 43193_ADDA_F5_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;

2.3 Flora and fauna

While the diverse natural environment would have provided vast and plentiful floral and faunal resources and the temperate climate would have made the area suitable for year-round occupation, the distance of the study area from permanent water sources would have detracted from its appeal as a long-term occupation site. Although extensively cleared today, the Glenorie Soil Landscape typically supports predominant species of eucalypt, including Sydney Blue Gum *Eucalyptus saligna* Blackbutt *E. Pilularis,* Grey Gum *E. paniculata and* White Stringybark *E. globoidea*. Turpentine *Syncarpia glomulifera,* Rough-barked apple *Angophora floribunda,* Sweet Pittosporum *Pittosporum undulatum* and Coffee Bush *Breynia oblongifolia* were also present (DECCW 2008).

Within the Cumberland subregion of the Sydney Basin Bioregion there are a variety of vegetation types present, with Forest Red Gum *E. tereticornic*, Narrow-leaved Ironbark *E. Creba* woodland and Spotted Gum *Corymbia maculata* present on shale hills. Hard-leaved Scribbly Gum *E. sclerophylla* and Old Man Banksia *Banksia serrata* are identified on alluvial sands and gravels. Broad-leaved Apple *A. subvelutina*, Cabbage Gum *E. amplifolia*, Forest Red Gum *E. tereticornic*, and Swamp Oak *Casuarina galuca* are present on river flats. Tall Spike Rush *Eleocharis spachelata*, and Juncus with Parramatta Red Gum *E. parramattaensis* are noted around lagoons and swamps (NSW National Parks and Wildlife Service 2003, p. 193).

Plant resources can be used in a variety of ways. Fibres can be twisted into string which can be used for many purposes including the weaving of nets, baskets and fishing lines. String was also used for personal adornment. Bark from eucalypts is useful in the provision of shelter, such as a large sheet of bark being propped against a stick to form a gunyah (Attenbrow 2002). Swamp Oak bark can be used for the making of canoes, and smooth-barked apple for the making of baskets and bowls.

Native fauna that would have been present in the vicinity of the study area include Australian Wood Duck *Chenonetta jubata*, White-faced Heron *Egretta novaehollandiae*, Welcome Swallow *Hirundo neoxena*, Purple Swamphen *Porphyrio porphyrio*, Eastern Long-necked Tortoise *Chelodina longicollis*, Eastern Water Skink *Eulamprus quoyii*, Garden Skink *Lampropholis delicata*, as well as arboreal fauna including owls *Strigiformes*, Ring- and Brush-tailed Possums *Pseudocheirus peregrinus* and *Trichosurus vulpecula*, and gliders *Petauridae*.

As well as being important food sources, animal products are also used for tool making and fashioning a myriad of utilitarian and ceremonial items. For example, tail sinews are known to be used to make fastening cord, while 'bone points', which function as awls or piercers, are often a part of the archaeological record. Animals such as Brush-tailed Possums are highly prized for their fur, with possum skin cloaks worn fastened over one shoulder and under the other. Kangaroo teeth are incorporated into decorative items, such as head bands (Attenbrow 2002).

2.4 Land use history

Historical aerial imagery allows for modern developments and land use patterns to be identified within the study area. Aerial imagery of the study area dated to 1943 displays considerable developments by this time (Photo 3). Land division has taken place, and two dwellings have been constructed. Furthermore, the land within the study area has been cleared and heavily landscaped. Any archaeological material which may have been present is likely to have been impacted by these existing developments. By 1970, two more dwellings have been constructed, with further landscaping and earthworks taking place (Photo 4). Aerial imagery for 1994 (Photo 5) shows that the three Nulla Nulla Road-facing dwellings have since been demolished and replaced with three new dwellings of greater square metrage and with more extensive landscaping, including two swimming pools. A fifth dwelling and associated infrasturcture has also been constructed in the south of

the study area. Figure 2 show the study area has not undergone any extensive changes aside from upgrades and renovations to these existing houses.

Photo 3 1943 aerial imagery with the study area outlined in orange (Source: NSW Spatial Services, 2025)

Photo 4 **1970 aerial imagery with the study area outlined in orange (Source: NSW Spatial Services, 2025)**

Photo 5 **1994 aerial imagery with the study area outlined in orange (Source: NSW Spatial Services, 2025)**

3 Aboriginal context

3.1 Ethnohistory and contact history

It is generally accepted that people have inhabited the Australian landmass for the last 65,000 years (Clarkson et al. 2017). Dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken. The timing for the human occupation of the Sydney Basin is still uncertain. While there is some possible evidence for occupation of the region around 40,000 years ago, the earliest known radiocarbon date for the Aboriginal occupation of the Sydney Basin is associated with a cultural / archaeological deposit at Parramatta, which was dated to 30,735 ± 407 Before Present (BP) (JMCHM 2005a, JMCHM 2005b, JMCHM 2006).

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 BP) (Attenbrow 2002, p. 18), and George & Charles Street, Parramatta (25,000-30,000 BP) (JMCHM 2005c). Our knowledge of Aboriginal people and their land-use patterns and lifestyles prior to European contact is mainly reliant on documents written by non-Aboriginal people. These documents are affected by the inherent bias of the class and cultures of their authors, who were also often describing a culture that they did not fully understand—a culture that was in a heightened state of disruption given the arrival of settlers and disease. Early written records can, however, be used in conjunction with archaeological information and surviving oral histories from members of the Aboriginal community in order to gain a picture of Aboriginal life in the region.

According to the Australian Institute of Aboriginal and Torres Strait Island Studies Map of Indigenous Australia, the current study area is located on Kurin-gai (Guringai) country (Photo 6). It is worth recognising that the boundaries of Aboriginal groups were highly mobile and subject to change, and data available today may not totally reflect these fluctuations.

Photo 6 AIATSIS map of Indigenous Australia, with the approximate location of the study area indicated by the orange arrow (Source: Horton 1996)

There is also some confusion relating to group names that can be explained by the use of differing terminologies in early historical references. Language groups were not the main political or social units in

Aboriginal life. Instead, land custodianship and ownership centred on the smaller named groups that comprised the broader language grouping (Attenbrow 2002). There is some variation in the terminology used to categorise these smaller groups; the terms used by Attenbrow (2010) will be used here.

The broader Sydney region is the home of a number of language groups. Owing to the displacement of Aboriginal people caused by the arrival of Europeans, there is still much debate around the exact nature of different language groups and their boundaries; however, they are characterised by Attenbrow (2010, p. 34) as:

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

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

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

3.2 Regional context

Several Aboriginal cultural heritage investigations have been conducted for the region around the study area. Models for predicting the location and type of Aboriginal sites with a general applicability to the region and thus relevant to the study area have also been formulated, some as a part of these investigations and others from cultural heritage investigations for relatively large developments.

Stephanie Garling Archaeological Consulting (SGAC) (2000) completed test excavations in two areas of potential (AHIMS 45-5-2573/RHAC2 and AHIMS 45-5-2574/RHAC3) in advance of the construction of the Rouse Hill Anglican College, 21.2 kilometres northwest of the study area. The program of testing was completed following an archaeological survey which identified one stone artefact and two potential archaeological deposits (PADs). These areas were assessed as having moderate to high potential based on:

- Close proximity to food and water sources in the form of Second Ponds Creek.
- Gentle hillslopes in the area, which formed a potentially suitable camping location.

- The presence of previously excavated sites in the vicinity, which had contained significant deposits.
- Predictive modelling, which suggested that higher densities of artefactual material may be present within the assessment area.
- A lack of disturbance identified within the assessment area.
- The presence of the assessment area on Shale Lowlands, which had previously been assessed as a threatened landscape on the Cumberland Plain in terms of disturbance.

Test excavations at both sites identified subsurface deposits, with the results summarised in Table 3.

Table 3 Results of test excavations conducted by Stephanie Garling Archaeological Consulting (2000)

Site	Extent of excavations	Number of artefacts recovered	Density (artefacts / metres squared)
AHIMS 45-5-2573/RHAC2	32 m squared Six 1 x 1 m test pits Two open areas	942	29.44
AHIMS 45-5-2574/RHAC3	15 m squared Fifteen 1 x 1 m test pits	7	0.47

Within AHIMS 45-5-2573/RHAC2, localised knapping floors were identified, with the largest containing 812 artefacts. Excavations in this area identified a relatively intact knapping floor with a central area of high density and a lower density peripheral area. It was noted that a high number of backed artefacts (47) were identified in the assemblage, and that the primary raw material was silcrete. The site was assessed as having moderate significance, as while a large number of artefacts were recovered, it was considered that the deposit was relatively unstratified, and as such as unable to provide a chronology for Aboriginal occupation in the area (SGAC 2000, p. 80). The low density of artefacts identified at AHIMS 45-5-2574/RHAC3 led to it being classed as 'background scatter' with it being considered unlikely that camping or knapping took place at this site. It was suggested that local Aboriginal groups may have favoured the lower hillslope closer to Second Ponds Creek. This site was classed as having low significance.

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, located approximately 11.3 kilometres south of the study area. 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 the assessment in order to relocate a number of scarred trees recorded in the area. The 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 & McDonald (2010) undertook a review of previous work in the Rouse Hill development area, located 13.7 kilometres west of the study area at its closest boundary. This review discussed lithic artefact distribution in previous excavations carried out by Jo McDonald Cultural Heritage Management (JMCHM) in 2008. 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 landscapes, artefact density was highest within 50 metres of water, and then declined with increasing distance. In fourth order landscapes, density was highest between 51-100 metres from water
- Landform: Artefact density was lowest on upper slopes and ridgetops, and increased 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 the 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: only appeared to have an influence on sites in the lower parts of valleys may have been sited to take advantage of steady factors such as the rising/setting sun and wind direction. Sites in higher parts of valleys may have been influenced by weather and other factors.

The study concluded that landform and distance from water had an impact on site distribution, with artefacts becoming more numerous closer to creeks, and along higher order creeks. It also found that although artefacts are found on all landforms, landform type influences artefact distribution, with the preference being for slightly elevated, well-drained areas in the lower parts of valleys.

Kelleher Nightingale Consulting (KNC) (2010) undertook an Aboriginal heritage assessment of the Area 20 Precinct of the North West Growth Centre for the NSW Department of Planning approximately 27 kilometres west of the current study area. The project involved broad assessment and survey of the area to inform precinct planning, zoning, and layout. Based on the results of previous assessments in the vicinity of the project area, a predictive model was developed which stated the following (KNC 2010, p. 18):

- Stone artefacts are likely to occur across the entire assessment area.
- The highest artefact numbers and densities will be associated with the margins of Second Ponds Creek.
- Artefact densities are likely to be quite low on the higher upper slope and crest landforms within Area 20. Although artefacts may not be observed on the surface during field survey they are likely to be present in a subsurface context.
- The subsurface archaeological context across Area 20 would not necessarily have been heavily disturbed by ploughing and/or vegetation clearance.

This model was based on the findings of Australian Museum Business Services (1998, 2000), Jo McDonald Cultural Heritage Management (JMCHM) (2002), and a number of other surface and subsurface investigations that have taken place in the vicinity of Area 20. It noted that the results of multiple excavations had indicated that low artefact densities were consistently recorded on upper slopes and crests in the area (KNC 2010, p. 17). It was also noted by KNC that previous predictive models had placed significant emphasis on the idea that more complex sites would be identified in close proximity to streams, but potential had been

demonstrated by the results of excavations carried out by Therin (2004) (as cited by Kelleher Nightingale Consulting 2010), which had identified artefacts in a range of landforms, but that the highest artefact densities were located in the margins of Second Ponds Creek. The majority of sites identified in the survey were located on lower and mid slopes, with some being present on upper slopes and crests as well as one on a creek flat. A total of 19 artefact sites and seven PADs were identified during the survey. The results of the survey largely confirm the predictive statements made in the predictive model. Stone artefacts formed the majority of identified sites, and were located across a variety of landforms, as well as being well distributed throughout the assessment area. The majority of sites were located away from upper slopes and crests, and those that were located on these landforms were low density scatters and isolated finds (although it is noted that all scatters were of low density). The sites with the largest artefact counts were located within 150 metres of Second Ponds Creek. As the assessment did not involve subsurface investigations, it is not possible to judge the accuracy of that portion of the predictive model.

Biosis (2011) undertook an ADDA for the proposed construction of a vehicle access track along existing 11kV powerline from the end of Addison Road to the Active Tree Hire yard on McCowen Road, Ingleside, located approximately 13 kilometres north-east of the current study area. The assessment area was dominated by the Hawkesbury Sandstone geological formation. It was situated on the Lambert soil landscape, characterised by very high soil erosion, rock outcrop, shallow and very low fertile soils. The desktop assessment also found that water courses in the area were abundant, and this would have provided substantial fish and shellfish resources for Aboriginal people. The AHIMS search for the project revealed there were two rock engraving sites within a 700 by 700 metre search area. It was noted that the majority of these sites were distributed along major creeks and waterways such as Narrabeen Lake and its tributaries. However, it was also identified that the project area had undergone serious urban and industrial development including the construction of infrastructure such as roads, access tracks, utility services and transmission lines. Although the project area was located in a region that is rich in Aboriginal archaeological heritage, it was determined that further investigation of the project area was not required due to previous disturbances. No Aboriginal objects or Places were identified within the project area and it was recommended that vegetation and stone clearance works were monitored in the case that rock engravings were encountered during development.

Biosis (2012) undertook an ADDA for the proposed civil works to an Ausgrid access track along an inaccessible section of the McCallums Avenue Fire Trail, Berrilee, to Calabash Bay, approximately 16 kilometres north of the current study area. An AHIMS search was undertaken during the desktop assessment, and it identified 61 sites with a 2 by 2-kilometre search area. The predominant site types identified within the locality were rock engravings, followed by shelters with art and shelters with middens. The project area was situated entirely within the Hawkesbury Sandstone geological formation which supported the findings of the AHIMS search as such sites were compatible with that unit. The soils within the area were the Hawkesbury colluvial and Lambert erosional landscapes, and Berowra Creek, a natural perennial water course, was only 55 metres from the project area boundary. During the survey, one Aboriginal site was encountered: McCallums Ave Fire Trail RE 1-5 (AHIMS number not included). This site consisted of five rock engravings displaying animals and animal tracks. It was recommended that these sites undergo further assessment and avoidance of the area be undertaken.

Dominic Steele Consulting Archaeology (DSCA) (2012) completed an Aboriginal archaeological and cultural heritage impact assessment for a proposed subdivision at 100 South Creek Road, Cromer, located approximately 14 kilometres east of the study area. The assessment included background research and a field inspection. DSCA noted sandstone outcropping outside of the project area. AHIMS 45-6-1760/South Creek 1 and AHIMS 45-6-1851/South Creek were unable to be located in DSCA's assessment due to weathering of the sandstone. The following was noted in the predictive modelling:

- A considerable number of engraving sites are known to occur in the local Warringah landscape. Engravings can occur in groups with numerous depictions of animals, human figures, possible

spiritual motifs, and other images of equipment such as shields, or single depictions that generally are found to occur on extensive level sandstone platforms along with smaller ledges and rock exposures.

- Axe grinding grooves may be found where suitable sandstone is exposed in, or adjacent to, creeks or on elevated platforms where wet-grinding techniques are possible adjacent to natural rock holes and shallow 'basins'. Axe/hatchet grinding grooves may occur in large 'clusters' that serves to facilitate their ready recognition or may conversely comprise isolated items that are often difficult to detect within certain light conditions.
- Open camp sites are likely to occur on dry and relatively flat landforms along or adjacent to both major and minor watercourses, along with foreshore zones. However, repeatedly or continuously occupied sites are more likely to be located on elevated ground situated at principal creek confluences in the local landscape.
- Surface scatters of flaked stone artefacts (or potentially durable food remains such as animal and fish bone or shell) are often buried in alluvial or colluvial deposits and only become visible when subsurface sediments are exposed by erosion or disturbance.
- Isolated artefacts occur without any associated evidence for prehistoric activity or occupation anywhere in the landscape and may represent the random loss, deliberate discard or abandonment of artefacts, or the remains of dispersed artefact scatters.
- Manuports are items consisting of raw materials of stone that do not naturally occur within the soil profiles of a given region.

No additional sites were identified by the visual inspection and DSCA postulated that there were potential engravings that were covered by vegetation or may be buried. DSCA recommended that Metropolitan LALC and Northern Beaches Council be involved in developing management measures for AHIMS 45-6-1760/South Creek 1 (Site A), and that an Aboriginal Heritage Impact Permit (AHIP) be submitted for AHIMS 45-6-1851/South Creek.; (Site B). DSCA also recommended that an additional site (Area C) be investigated to determine if there were any Aboriginal heritage values related to Site A. Area C was noted to have sandstone outcrops outside of the project area.

Archaeological & Heritage Management Solutions (2015) were commissioned to prepare a preliminary Aboriginal heritage assessment for 14 Schofields Road, Schofields, approximately 23 kilometres west of the study area. The survey identified three small artefact scatters (AHIMS 45-5-4629/14SchRd-AS1, AHIMS 45-5-4628/14SchRd-AS2, AHIMS 45-5-4627/14SchRd-AS3,and one isolated find (AHIMS 45-5-4626/14SchRd_IF1), located within 200 metres of the third order stream to the south; one of these scatters (AHIMS 45-5-4628/14SchRd-AS2) consists of silcrete artefacts and is located south of the assessment area. These artefacts were identified in open exposures featuring shallow topsoils that had been heavily impacted and eroded. It was suggested that the artefacts had likely been originally located higher on the slope near the ridgeline, and redeposited either by natural soil erosion or earthworks. It was assessed that no areas of PAD were associated with the finds due to their locations and historical disturbances within the assessment area.

Biosis (2016) conducted an ACHA including test excavations for Blacktown City Council in advance of the proposed Rouse Road Upgrade, located approximately 20 kilometres north west of the current study area. Predictive modelling undertake for the assessment concluded that there was a very high likelihood that the assessment would identify stone artefacts, and a high likelihood that areas of potential would be identified during the survey, with the rationale behind this presented in Table 4.

Table 4 Aboriginal site prediction statements ((Biosis Pty Ltd 2016, p. 43)

Site type	Potential
Flaked Stone Artefact Scatters and Isolated Artefacts	**High**: This site type has been recorded in all locally noted soil landscapes and landforms, as well as being the most common site type in relation to both geological formations underlying the assessment area. When looking at the AHIMS data this site type is the most dominant within the local region. This site type will be recorded on average 158m and 208m from permanent and ephemeral water sources respectively. Artefacts scatters in this area appear to be located closer to permanent creeks. Artefact scatters are also very common in close proximity to Second Ponds Creek, a third order stream which flows through the assessment area. This site type has also been recorded at various heights throughout the landscape ranging from 27 metres to 72 metres above sea level, and is located primarily on hillslopes, however it is present across all landforms, being less common on crests.
PADs	**High**: This site type has been recorded locally within the Blacktown soil landscape, which covers all of the assessment area. They have also been identified locally in the Ashfield and Bringelly shale formations, which cover the assessment area. This site type represents the second highest recorded site type within the wider area, after artefact scatters. The majority of previously recorded PADs occur within 100 metres of water sources and are located most commonly on hillslopes, but also in alluvial plains and creek banks at the edges of watercourses. The assessment area contains Second Ponds Creek, a permanent water source which has previously had PADs identified in close proximity to it, increasing the likelihood of identifying this site type.

The results of Biosis' predictive modelling suggested that sites were most likely to be identified in association with first and third order creek lines, with sites occurring in relatively large numbers up to 400 metres from both permanent and ephemeral water courses.

The survey did not identify any new Aboriginal sites, with the lack of stone artefacts being identified mostly attributed to the grass cover over the area, as well as large areas of disturbance associated with Rouse Road. Based on the results of the assessment, the assessment area was classed into areas of high, moderate, and low archaeological potential, and further investigation undertaken in the form to test excavation. Areas of low potential were associated with areas of disturbance, typically those which had already been developed, areas of moderate potential with lesser disturbed areas considered to have the potential to contain intact subsurface deposits, and areas of high potential typically associated with the margins of Second Ponds Creek.

Comber Consultants (2016) completed an Aboriginal archaeological assessment for 56 Cudgegong Road, Rouse Hill, approximately 21 kilometres west of the study area, in advance of a proposed residential subdivision and development at the site. The assessment included background research, survey, and the formulation of management recommendations relating to the site. Background research for the project indicated that there was a high potential for artefact sites and subsurface archaeological deposits to be present, particularly given the close proximity of the site to Second Ponds Creek. The site survey did not identify any Aboriginal sites, as the ground surface was largely obscured by grass. Based on the results of the assessment, Comber Consultants recommended that the site be subject to archaeological testing to determining if an AHIP would be required under the NPW Act, as the site had the potential to contain subsurface archaeological deposits.

Extent (2017) were commissioned by Guntawong Estate Pty Ltd to undertaken an ADDA at 172 Guntawong Road, Riverstone, located approximately 19 kilometres west of the study area. The assessment was undertaken for a proposed residential redevelopment of the site. The site inspection revealed that majority of the subject area had been previously disturbed and/or cleared. It was noted that a first order drainage line was once present but had been subject to modification by heavy machinery to construct a dam. No Aboriginal objects were observed around the watercourse or within the area.

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.

Biosis (2020a) completed an Aboriginal archaeological assessment for the same project area as the DSCA (2012) report listed above at 100 South Creek Road, Cromer. The assessment was required in order to determine if further investigation in the form of testing would be required for the project. The assessment included background research and a field investigation, which identified two areas of moderate archaeological potential. These areas of potential were determined due to the presence of existing AHIMS sites within and in close proximity to the project area, the undisturbed nature of these locations, the topography, geology and soil landscapes present, and previous assessment results of DSCA (2012). Biosis recommended that the proposed works avoid the AHIMS sites inside and outside the project area and avoid the areas of moderate potential. If those areas were unable to be avoided as part of future development of the project area, further assessment would be required.

Biosis (2021) undertook an ADDA for the proposed residential development at 94 Hopetoun Avenue, Vaucluse, approximately 19 kilometres south-east of the study area. Background research illustrated that an abundance of engravings had been previously recorded throughout the Vaucluse area and the wider Sydney region, attributed to proximity to fresh water and coastal resources. It is likely Aboriginal people utilised the study area for both occupation and resource gathering. However, the erosional patterns present in the Hawkesbury soil landscape and the extensive residential development visible throughout the majority of the assessment area suggests that there is a low potential for intact Aboriginal deposits to exist as the disturbances will have removed any Aboriginal sites.

Biosis (2023) completed an ACHA for the proposed development located at 50-88 Parraween Street and 59-67 Gerard Street, Cremorne, approximately 14 kilometres south-east of the study area. While the assessment area was surrounded by rock shelters and rock engraving sites as the closest Aboriginal sites, the relatively flat platform indicates that vertical sandstone exposures were not expected. This suggested that further possible rock shelters would be unlikely. Furthermore, the area's proximity to other sites of Aboriginal heritage and its position on an elevated outlook over the bay may indicate a landscape feature considered of cultural significance. The background researched completed with the archaeological survey confirmed the assessment area as low potential due to the extensive disturbances, land clearance and heavily modified through multiple phases of residential development.

3.3 Local context

Several 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.

Conyers (1990) carried out an Aboriginal Sites Planning Study of the Lane Cove River State Recreation Area, approximately 4.1 kilometres south of the study area. Given the scale of the subject area, the study targeted impact areas with the aim of identifying Aboriginal sites and areas of potential present. Twelve new sites were identified by the study, including five PADs. The riverbank associated with the Riverside Walking Track was assessed to hold low archaeological potential due to landscape modification associated with flooding events and levelling for the picnic areas. Flooding events following the construction of the weir were also assessed to have likely impacted shell middens upstream of Fullers Bridge. Ridgetops and upper slopes were assessed to have the highest potential for Aboriginal sites to be present.

Corkill (1991) undertook a heritage assessment for proposed upgrades at the CSIRO facility, Lindfield, located approximately 4.9 kilometres southeast of the study area. The survey targeted areas of remnant vegetation adjacent to Lane Cove River on a sandstone slope. Two sites were identified, including a shelter with midden and possible art, previously recorded by Haglund (AHIMS 45-6-1854/L C/2 Lanecove 2 Epping Road Bridge RYDE 012) and CSIRO PAD 1, a rock shelter with potential archaeological deposit (registered as AHIMS 45-6-2599/CSIRO 2 (CSIRO North Ryde) RYDE 011). Lane Cove River was highlighted for its significance in relation to Aboriginal occupation.

Test excavations were subsequently undertaken (Corkill 1997). Ten test pits were excavated, which contained a total of 14 artefacts. The assemblage consisted of silcrete, chert and indurated mudstone, and the site was registered as AHIMS 45-6-2599/CSIRO 2 (CSIRO North Ryde) RYDE 01. It was assessed that surface stripping may have occurred and impacted the preservation of archaeological materials.

Oakely (2000) completed a survey for a proposed sewerage upgrade within Lane Cove National Park approximately 5 kilometres southeast of the study area. Two new Aboriginal sites were located in the southern portion of the National Park. Both new sites (LCRM1 and LCRM2) were shell midden scatters and associated areas of PAD. It is noted that the AHIMS numbers were not present in the report. 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) undertook test excavations at Eden Gardens, Macquarie Park, approximately 4 kilometres south of the study area. The excavation program targeted AHIMS 45-6-2653/Eden Gardens PAD RYDE 007, consisting of nine, 50 by 50 centimetres test pits along two transects. The purpose of the excavation was twofold: to establish the nature of soil profiles across the assessment 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.

Aboriginal Heritage Office (2011) completed 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 of AHIMS sites, it was concluded that 56 sites were recorded 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 survey area), Area 2 – Central Plateau (containing a small portion of the survey area), and Area 3 – Parramatta River. Area 1 was dominated by rock shelters, engravings, and grinding grooves. Area 2 contained a single artefact scatter. Area 3 was dominated by midden sites, followed by shelter and midden sites, with low numbers of engravings, grinding grooves, open sites/isolated finds, and shelters with art or engravings. The report recommended a program for staff education take place to enable workers to identify and avoid Aboriginal sites, and regular monitoring of sites in the LGA was to be undertaken to ensure that Aboriginal sites were appropriately managed.

Artefact Heritage (2014) undertook an ADDA for the proposed Lindfield Substation, approximately 5.8 kilometres south-east of the study area, and ancillary electrical works between Killara Station and Clanville Road. The following predictive statement was generated:

> *The assessment area is located across a series of crest and gentle slopes extending from Killara Station to its southern extent. The assessment area is not in close proximity to major watercourses and is around two kilometres away from the Lane Cove River. No recorded Aboriginal sites have been identified within the assessment area. The most likely site type to occur within the assessment areas would be isolated artefacts or concentrations of artefacts in those areas, such as public reserves, where there is the possibility of surface exposure and a lesser degree of surface disturbance (Artefact Heritage 2014, pp. 17–8).*

A site survey found the subject area to be heavily disturbed, and no sites were identified. The assessment area was assessed to hold low potential for Aboriginal sites, with Artefact Heritage citing the distance from permanent water and lack of sensitive landform units as significantly informing this assessment (Artefact Heritage 2014, p. 19).

Artefact Heritage (2017) was commissioned by Ausgrid to conduct an ADDA for a cable replacement between Pittwater Road and Rene Street, East Ryde, located approximately 6.7 kilometres south-west of the study area. A pedestrian survey of the assessment area was undertaken, and no previously unrecorded Aboriginal sites or areas of archaeological sensitivity were identified within the assessment area. This was most likely due to the lack of archaeologically sensitive landforms, disturbance from road construction impacts and removal of vegetation.

Eco Logical (2019) undertook an ACHA for AJ + C Architects on behalf of Loreto Normanhurst for the proposed development of a boarding school located approximately 3.7 kilometres north-west of the study area. Desktop research indicated the assessment area had already been heavily disturbed. A pedestrian survey undertaken by Eco Logical and the Metropolitan LALC confirmed this. However, there was a portion of the southern woodlands area which was identified to have moderate archaeological potential. This area was not going to be impacted by the proposed development and therefore, no further archaeological works were undertaken.

Biosis (2020b) carried out an ACHA for the Macquarie University Station Bus Interchange, commissioned by GHD. The site is located approximately 4.4 kilometres to the south of the study area. Desktop research indicated that no previously identified Aboriginal sites were present within the assessment area. A review of previous assessments in the local area predicted a moderate potential for artefact scatters and PAD to be located within the assessment 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.

Artefact Heritage (2021) undertook an ACHA for the Pymble Ladies College for a redevelopment within the Grey House Precinct; located approximately 1.7 kilometres south of the study area. Background research identified that there were no previously recorded Aboriginal sites or places within the study area. A pedestrian survey of the assessment area identified no new sites and where historic aerial images were compared to the area it was determined that there was nil to low potential for the retention of any intact archaeological deposits.

Biosis (2024) undertook an ACHA for the proposed rezoning of approximately 71 hectares of land for residential purposes along Morgan Road, Belrose, approximately 8 kilometres east of the current study area. The desktop assessment identified that the project area was underlain by the Hawkesbury Sandstone geological unit, in an area of minimally disturbed land. The underlying geology indicated an increased likelihood that grinding groove, shelter and engraving sites would be present, which was supported by predictive modelling established by Therin (2007, p. 11) and DSCA (2012). The project area also contained five distinct soil landscapes which included: the erosional Lambert and Gymea landscapes; the colluvial Hawkesbury; residual Hornsby; and transferral Oxford Falls landscapes. It was noted that such landscapes could impact that archaeological potential of different zones of the project area. Hydrology within the area

was abundant, as the project area was situated in close proximity to a number of water courses, with Snake Creek intersecting through the middle. It was understood that the availability of water and marine resources increased the likelihood that the area would have been more consistently utilised. During the desktop assessment it was also recognised that predictive modelling developed for the local region of the project area suggested that while many sites are identified close to water courses, areas further from the shoreline would have also been utilised by Aboriginal groups: 'Terrestrial flora and fauna were also important in the Aboriginal diet' (Therin 2007, p. 11). During the survey, no previously unrecorded Aboriginal sites were identified during the field investigation. It was determined that accessible areas had low potential to contain archaeological material, and areas which had not been accessed during the survey were to have a five metre buffer places around them. Three AHIMS sites within the area were to be avoided during development.

Biosis (2025) undertook an ADDA for the proposed school upgrades at Hornsby South Public School. Similarly to the study area, Ashfield Shale was located within the northern portion of the study area. However, the Hawkesbury Sandstone geological formation was also present in the southern half of the project area. Due to the level of modification within the study area, it was found that such features associated with these geological types are likely to have been destroyed, should they have been present. It was concluded that activities associated with prior development, including land clearing and large-scale soil displacement, would have likely resulted in poor preservation of archaeological material and displaced any *in situ* archaeological deposits which may have been within the study area. No Aboriginal objects or areas of archaeological potential were identified within the study area.

3.3.1 Identified Aboriginal archaeological sites

An extensive search of the AHIMS database was conducted on 30 July 2025 (Client service ID: 1028490). The search identified 101 Aboriginal archaeological sites within a 5-kilometre search area, centred on the study area (Table 5). None of the registered sites are located within the study area (Figure 6).

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 116 results presented here, compared to the 101 sites identified in AHIMS.

Table 5 AHIMS search results

Site type	Occurrences	Frequency (%)
Art (Pigment or Engraved)	51	43.97
Artefact	23	19.83
Grinding Groove	18	15.52
PAD	13	11.21
Modified Tree (Carved or Scarred)	4	3.45
Shell	2	1.72
Aboriginal Resource and Gathering	2	1.72
Habitation Structure	2	1.72
Water Hole	1	0.86

Site type	Occurrences	Frequency (%)
Total	116	100.00

Figure 6 AHIMS sites within the vicinity of the study area

This page contains sensitive information and has not been included in this report.

3.3.2 Predictive statements

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

These statements are based on:

- Local and regional site distribution in relation to landform features identified within the study area.
- Consideration of site type, raw material types and site densities likely to be present within the study area.
- Findings of the ethnohistorical research on the potential for material traces to present within the study area.
- Potential Aboriginal use of natural resources present or once present within the study area.
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Based on this information, a series of predictive statements has been developed, indicating the site types most likely to be encountered during the survey and subsequent sub-surface investigations across the present study area (Table 6). The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

Table 6 Aboriginal site prediction statements

Site type	Site description	Potential
Flaked stone artefact scatters and isolated artefacts	Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.	Low: Stone artefact sites have been previously recorded in the region in the region on level, well-drained topographies in close proximity to reliable sources of fresh water However, due to the level of disturbance within the study area, it is unlikely that any cultural material remains. There is low potential for this site type to be found within the study area.
PADs	Potential sub surface deposits of cultural material.	Low: PADs have been previously recorded in the region across a wide range of landforms. However, due to the immense disturbance within the study area it is unlikely that any PAD sites would be encountered. There is low potential for this site type to be found within the study area.
Rock shelters with art and/or deposit	Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground 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.	Low: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, none of which occur within the study area. Sandstone outcrops are less likely to occur within the Ashfield Shale unit that consists of middle Triassic black to light grey shale and laminite.
Quarries	Raw stone material procurement sites.	Low: There is no record of any quarries being within or surrounding the study area.

Site type	Site description	Potential
Aboriginal Ceremony and Dreaming sites	Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal informants.	Low: There are currently no recorded mythological stories for the study area.
Post-contact sites	These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use.	Low: There are no post-contact sites previously recorded in the study area and historical sources do not identify one.
Aboriginal Places	Aboriginal Places may not contain any 'archaeological' indicators of a site but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events commenced or particular buildings.	Low: There are currently no recorded Aboriginal historical associations for the study area.
Water Hole	A source of fresh water for Aboriginal groups which may have traditional ceremonial or dreaming significance and/or may also be used to the present day as a rich resource gathering area.	Low: One water hole has been identified within the vicinity of the study area, 3km north-west of the study area in Berowra Valley National Park. The site location is completely undisturbed and located within different soil landscapes on a steeper landform. These variations in environmental contexts as well as the level of disturbance within the study area and distance to permanent water sources indicates there is a low potential for this site type to be present.
Aboriginal Resource and Gathering	Resource gathering locations are places where food, medicines and plant material used as twine, in weaving or tool making by Aboriginal people exist. Many such locations are still accessed by contemporary Aboriginal people.	Low: Two Aboriginal Resource and Gathering sites were identified in the AHIMS search. The levels of disturbance and land clearance within the study area indicate any Aboriginal resources that may have been present have since been removed. Furthermore, based on desktop research, it is likely the study area was used for transitory purposes rather than occupational ones due to the distance from water sources which would have promoted areas for Aboriginal resources and gathering activities. There is therefore low potential for Aboriginal Resource and Gathering sites within the study area.
Habitation structures	Structures constructed by Aboriginal people for short- or long-term shelter. More temporary structures are commonly preserved away from the NSW coastline, may include historic camps or contemporary significance.	Low: Whilst one habitation structure site was identified in the AHIMS search, disturbances and long-term European use indicates there is low potential for habitation structures to be present.

Site type	Site description	Potential
Grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	Nil: No suitable horizontal sandstone rock outcrops are present within the study area. Sandstone outcrops are less likely to occur within the Ashfield Shale unit that consists of middle Triassic black to light grey shale and laminite.
Modified trees	Trees with cultural modifications	Nil: Aerial imagery suggests it is unlikely that remnant vegetation has survived within the study area due to past development. This level of disturbance within the study area has likely destroyed the possibility of locating scarred trees.
Burials	Aboriginal burial sites.	Nil: 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 profile associated with the study area are not commonly associated with burials.
Shell middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Nil: There are no suitable watercourse in proximity to the study area, therefore, the potential for shell midden sites has been deemed as nil.

4 Archaeological investigation

An archaeological survey of the study area was undertaken on 5 August 2025 by Bronte Baonza (Biosis, Heritage Consultant), Megan Porter (Biosis, Graduate Heritage Consultant), and Raymond Weatherall (Metropolitan LALC). The survey sampling strategy, methodology and a discussion of results are provided below.

4.1 Archaeological survey aims

The principle aims of the survey were to:

- Undertake a systematic survey of the study area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of Aboriginal archaeological and cultural sensitivity.

4.2 Survey methods

The survey was conducted on foot. Recording during the survey followed the archaeological survey requirements of the Code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially been exploited by Aboriginal people.
- Landform elements, distinguishable areas of land approximately 40 metres across or with a 20 metre radius (CSIRO 2009).
- Photographs of the site indicating landform.
- Ground surface visibility (GSV) and areas of exposure.
- Observable past or present disturbances to the landscape from human or animal activities.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, the 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 and the Map Grid of Australia (94) coordinate system.

4.3 Constraints to the survey

With any archaeological survey there are several factors that influence the effectiveness (the likelihood of finding sites) of the survey. The factors that had the most influence on the effectiveness of the survey were

the extensive development that has already impacted large portions of the study area, and low visibility associated with grass coverage, formal gardens, and paving.

4.4 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 2010b). There was no visibility (0%) throughout the study area due to previous disturbances, including maintained lawns, paving for vehicle and pedestrian access and formal garden beds with introduced soils, pebble and flora (Photo 7,Photo 8,Photo 10, and Photo 11). Swimming pools are also present in the study area (Photo 9).

Photo 7 **Example of no GSV (0%) at 9 Nulla Nulla Road in the north-eastern portion of the study area, facing east**

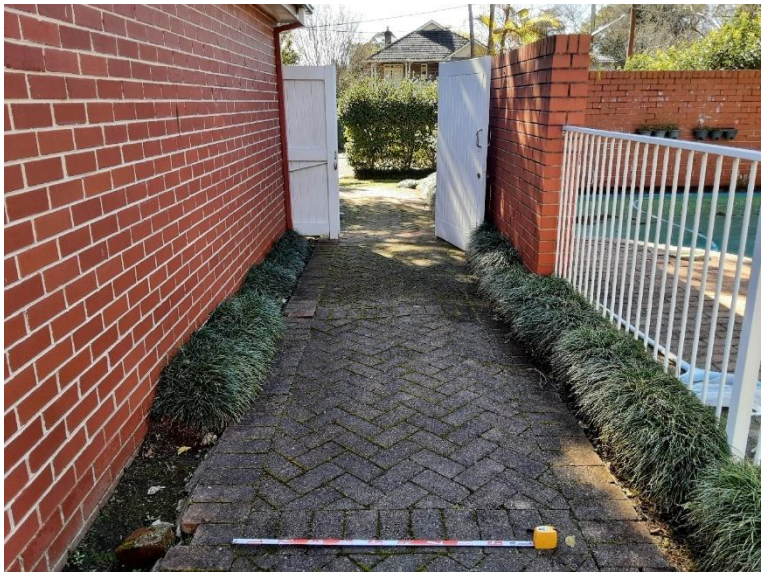


Photo 8 **Example of no GSV (0%) at 7 Nulla Nulla Road in the north-eastern portion of the study area, facing north**

Photo 9 **Example of no GSV (0%) at 5 Nulla Nulla Road in the central portion of the study area, facing north-east**

Photo 10 **Example of no GSV (0%) due to mulch at 6 Ku-ring-gai Road in the central portion of the study area, facing north-east**

Photo 11 **Example of no GSV (0%) at 4 Ku-ring-gai Road in the southern portion of the study area, facing north-east**

4.5 Exposure

Exposure differs from visibility in that it is a percentage estimate of the amount of ground surface in which buried artefacts or deposits may be identified rather than a simple observation of the amount of ground surface that is visible (Burke & Smith 2004, DECCW 2010b). Overall, the study area displayed no areas of exposure (0%). The residential properties within the study area were highly developed, with large portions of the landforms within each property altered and developed to include stone steps, retaining walls pavements (Photo 12,Photo 13,Photo 14, and Photo 15). Remaining areas of grass and vegetation were limited, and those that were present were highly maintained. While soils were visible in some areas associated with garden beds, it is likely that soils visible in the garden beds were imported for that purpose and do not represent natural soil landscapes (i.e. Glenorie).

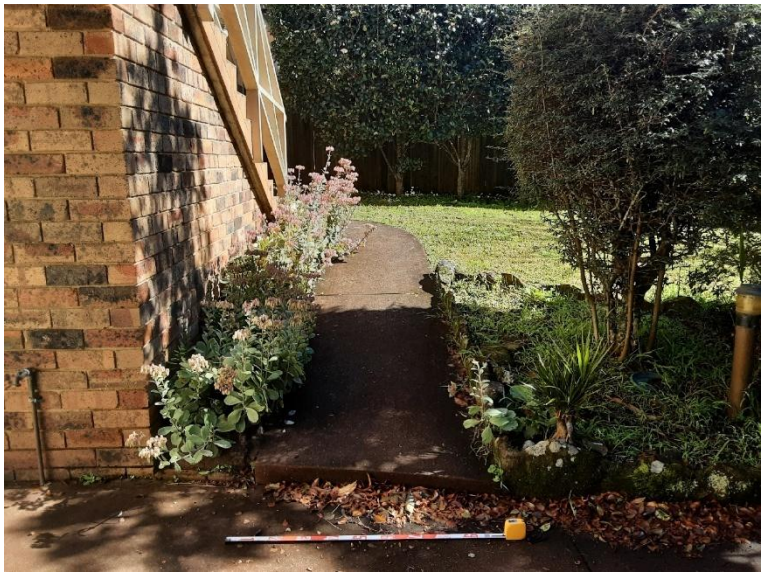


Photo 12 **Example of a lack of exposure (0%) due to residential development and landscaping at 9 Nulla Nulla Road in the north-eastern portion of the study area, facing east**

Photo 13 **Example of no exposure (0%) due to landscaping at 7 Nulla Nulla Road in the central portion of the study area, facing south**

Photo 14 **Example of no exposure (0%) due to landscaping at 6 Ku-ring-gai Road in the central portion of the study area, facing south-east**

Photo 15 **Example of no exposure (0%) due to landscaping at 4 Ku-ring-gai Road in the southern portion of the study area, facing north-west**

4.6 Disturbances

Disturbance in the study area is associated with natural and human agents. Natural agents generally affect small areas and include the burrowing and scratching in soil by animals, such as wombats, foxes, rabbits and wallabies, and sometimes exposure from slumping or scouring. Disturbances associated with recent human action are prevalent in the study area and cover large sections of the land surface. The agents include residential development such as landscaping and construction of residential buildings, subsurface infrastructure, landform cutting and levelling and earth works.

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.

- 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*.

High levels of disturbances associated with recent human action are prevalent across the study area and cover large sections of the land surface. These agents are primarily residential developments, including the construction of dwellings, formal landscaping and vegetation clearance, and recreational features such as swimming pools. Associated disturbances also include subsurface utilities (such as plumbing) and vehicle or pedestrian access. Modern excavations, landscaping, and levelling of the landform across the study area has resulted in extreme and intensive impacts to the local soil profiles. It is therefore highly unlikely that the natural soils that may contain Aboriginal archaeological deposits have survived *in situ.* The high-level disturbances associated with the residential developments across the study area are visualised below (Photo 16,Photo 17,Photo 18,Photo 19, and Photo 20.

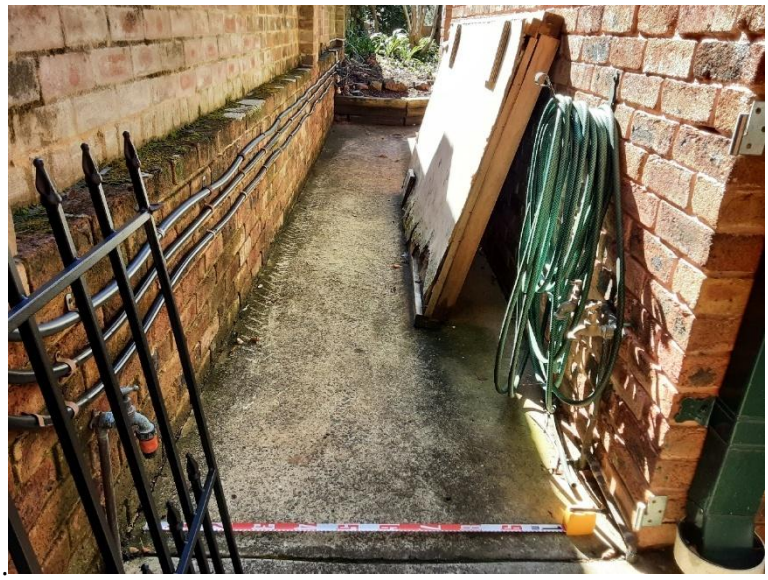


Photo 16 **Example of residential development and subsurface utilities at 4 Ku-ring-gai Road in the southern portion of the study area, facing south**

Photo 17 **Example of residential development and utilities at 6 Ku-ring-gai Road in the central portion of the study area, facing south**

Photo 18 **Example of residential development at 7 Nulla Nulla Drive in the northern portion of the study area, facing south**

Photo 19 **Example of residential development and subsurface drainage at 5 Nulla Nulla Drive in the central portion of the study area, facing south**

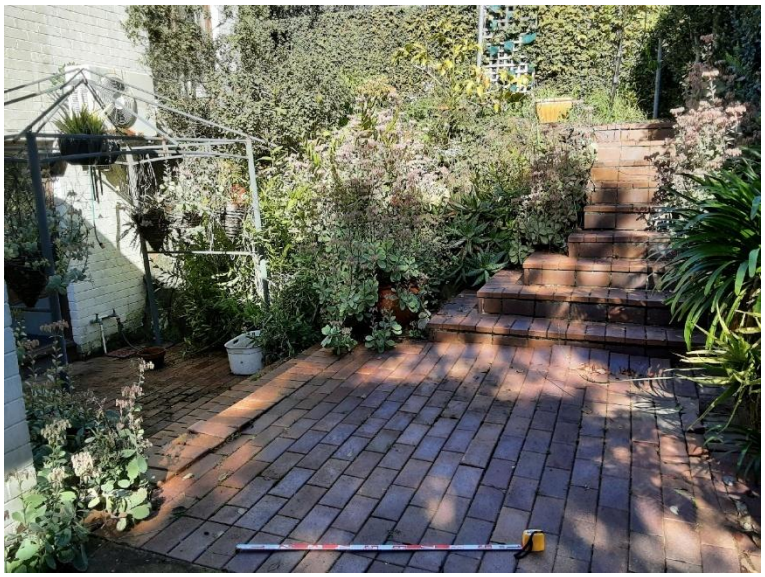


Photo 20 **Example of residential development and subsurface drainage at 5 Nulla Nulla Drive in the central portion of the study area, facing south**

4.7 Investigation results and discussion

The archaeological investigation consisted of a total of three meandering transects walked within the study area. The results of the archaeological survey have been summarised below and transect locations walked by two Biosis staff members are provided in Figure 7. The transect walked by Raymond Weatherall from Metropolitan LALC was not GPS-mapped.

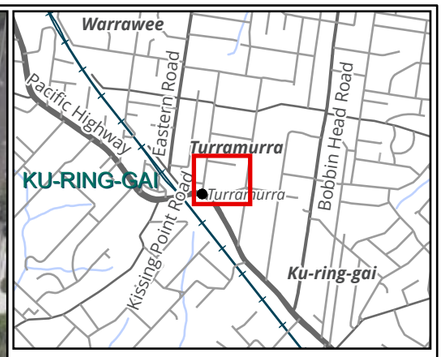
Background research identified that the study area lies within the broader Sydney Basin, contained by the Ashfield Shale unit within the Wianamatta Group. As sandstone outcrops are therefore less likely to occur in this geological landscape, artefact sites are more commonly identified. However, the study area is also underlain by the erosional Glenorie soil landscape. Erosional soils are prone to shallow movement of soils resulting in extensive levels of erosion when exacerbated by the comprehensive timber clearing and residential vegetation clearance that has taken place within the study area since at least the 1940s. Considering the soil depths (70–200 centimetres) and high levels of disturbance in the study area, it is probable that archaeological evidence such as artefacts may no longer be *in situ* (Chapman et al. 2009, p. 70).

The nearest water source to the study area is a first-order, nonperennial waterway located approximately 478 meters south of the study area. Other nearby watercourses include Cowan Creek approximately 1 kilometre to the east and Lovers Jump Creek approximately 1 kilometre to the north. The closest permanent waterbody to the study area is Middle Harbour Creek a fourth order nonperennial waterway located approximately 5.6 kilometres southeast of the study area. Background research established that previous Aboriginal occupation of the wider Ku-ring-gai area was likely more intensive in areas that had more reliable and convenient access to water, decreasing the likelihood of sites being present within the study area.

An extensive search of the AHIMS database identified no sites located within the study area, and that the most common site types located in the vicinity are art (pigment or engraved), artefact and grinding groove. The absence of underlying sandstone geology limits the potential for art and grinding groove sites. The lack of favourable landscape characteristics, combined with high levels of disturbance, limits the potential of artefact sites to be within the study area. With the high levels of disturbances, including the removal of topsoils, the study area has low potential for sites to be present.

Raymond Weatherall from Metropolitan LALC attended the archaeological investigation on 5 August 2025. He commented via email (12 August 2025) on the heavily disturbed landscapes and that there was no sign of lived or living Aboriginal people available in the study area, with the sandstone outcrops present displaying no markings. He noted that the Darramuragal people maintained a physical and spiritual connection to the land and water of the area for thousands of years.

The result of the field investigation is consistent with predictive statements stated above (Section3.3.2). Due to the considerable distance to reliable water sources, unfavourable landforms and underlying geology, and the presence of erosional soils within a highly disturbed study area, no areas have been identified as having potential for Aboriginal sites or objects. Therefore, the entire study area has been assessed as posing low Aboriginal archaeological potential (Figure 7).



Legend

Study area

Survey tracks

Surveyor 1

Surveyor 2

Landform

Modified

Archaeological potential

Low

Figure 7 Survey results and coverage

0 10 20 30 40

Metres

Scale: 1:1,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

N

biosis

APEM Group

Matter: 43193, Date: 12 August 2025,
Prepared for: LKS, Prepared by: LH, Last edited by: hliswoyo
Location: P:\43100s\43193\Mapping\
43193_NullaNullaSt_KuRingGaiAve_ADDA,
Layout: 43193_ADDA_F7_SurveyResults

5 Conclusions and recommendations

5.1 Conclusions

The field investigation undertaken by Biosis did not identify any Aboriginal sites or objects, or areas with the potential to contain Aboriginal archaeological deposits. This assessment has determined that there is low potential for Aboriginal sites to be located within the study area due to the unfavourable environmental characteristics for long-term occupation and the extensive disturbances associated with residential land use and development. Therefore, no further archaeological works are required. The results of this assessment are also demonstrated in the due diligence flow chart provided by the Code (Figure 8).

5.2 Recommendations

The following management recommendations have been developed 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:
  - the 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 assessed as having low archaeological potential for Aboriginal objects or sites to be present within the study area.

Recommendation 2: Discovery of Unanticipated Aboriginal Objects

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

Recommendation 3: Discovery of Aboriginal Ancestral Remains

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

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and 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.

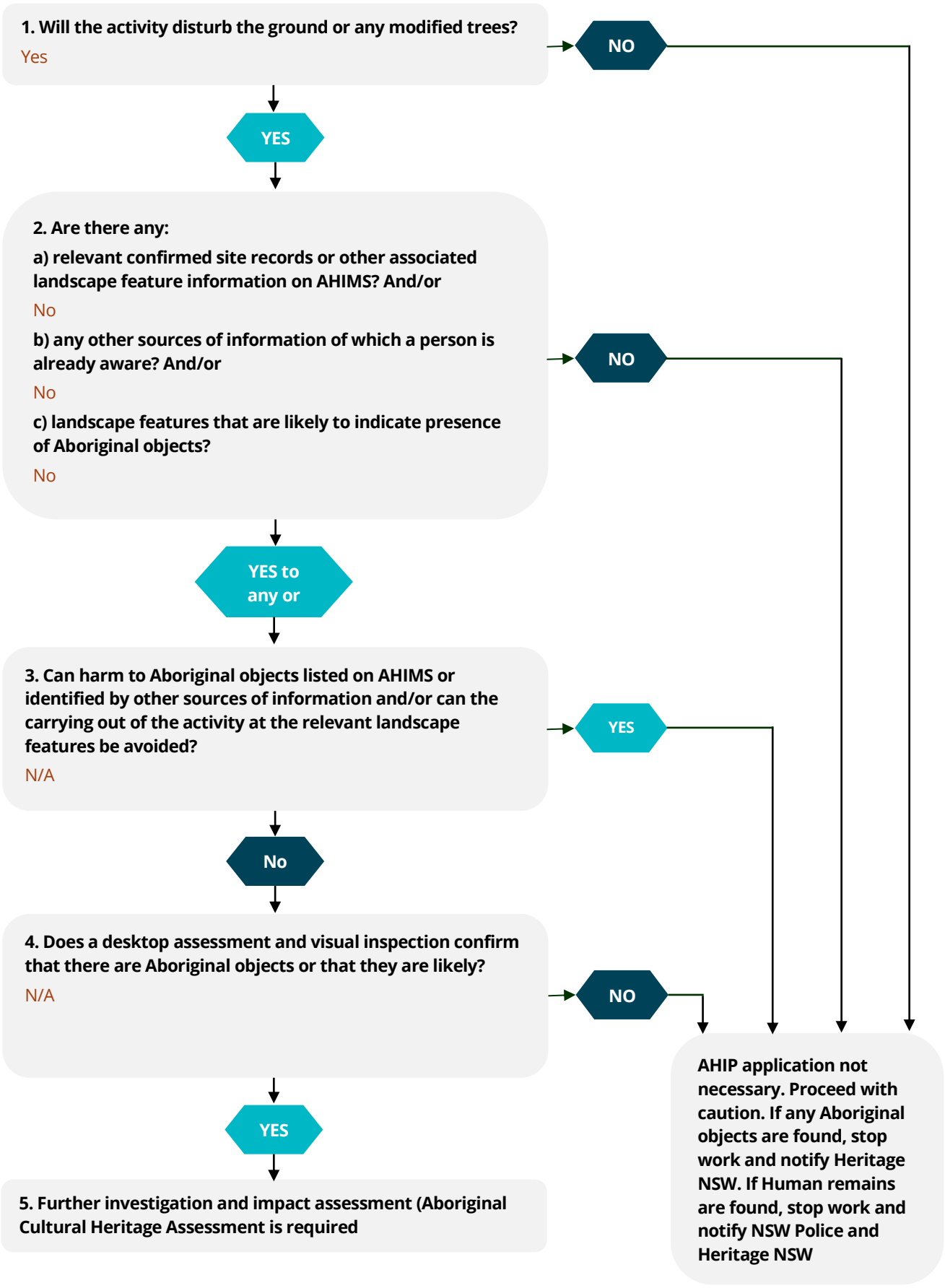
5.3 Standard Statement of Inclusion

I, Ashley Bridge of Biosis Pty Ltd, confirm this ADDA report addresses the requirement of SEARs Item No. 21 and relevant State and local legislation, policies, and guidelines including the Due Diligence Code (DECCW 2010a) and the Code (DECCW 2010b). I further confirm that none of the information contained in the ADDA assessment is false or misleading.

Ashley Bridge
Senior Heritage Consultant and Learning and Development Lead (NSW Heritage)

MArchSci (Advanced, Hons), BA

Figure 8 Due diligence flow chart



References

Aboriginal Heritage Office 2011. *City of Ryde: Aboriginal Site Management Report*, Report to City of Ryde.

Archaeological & Heritage Management Solutions 2015. *Preliminary Aboriginal Heritage Assessment. 14 Schofields Road, Schofields [Draft].*, Prepared for Toplace Pty Ltd.

Artefact Heritage 2014. *Lindfield Substation: Aboriginal heritage due diligence assessment*, Prepared for Parsons Brinckerhof. Author: Symons. J, Artefact Heritage, Rose Bay, NSW., https://www.transport.nsw.gov.au/sites/default/files/media/documents/2017/technical-paper-6-aboriginal-heritage.pdf.

Artefact Heritage 2017. *Aboriginal heritage due diligence assessment for cable replacement between Pittwater Road and Rene Street, East Ryde*, Report to Ausgrid.

Artefact Heritage 2021. *Grey House Precinct, Pymble Ladies' College. Aboriginal Cultural Heritage Assessment Report (ACHAR)*, Prepared for Pymble Ladies' College. Authors: Marshall. B, Artefact Heritage Services, Sydney, NSW.

Attenbrow V 2002. *Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records*, UNSW Press, Sydney, NSW.

Attenbrow V 2010. *Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records*, 2nd edn, University of New South Wales Press, Sydney, NSW.

Australia ICOMOS 1999. 'Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter) revised edition', Canberra, Australia.

Australian Museum Business Services 1998. *Mungerie Park Town Centre Archaeological Survey for Aboriginal Sites. Report to Department of Urban Affairs and Planning.*,.

Australian Museum Business Services 2000. *Mungerie Park Town Centre Archaeological Salvage Excavations near Kellyville, Cumberland Plain, NSW. Report to Department of Urban Affairs and Planning.*,.

Biosis 2011. *Aboriginal Due Diligence Assessment of Ausgrid. Proposed 11kV access from Addison Road to Bloodwood Road, Ingleside.*, Prepared for Ausgrid. Authors: Higgs. S, Gibbins. S, Nardis. A. Biosis Pty Ltd, Sydney, NSW. Project no. 13553.

Biosis 2012. *Due Diligence Advice for Aboriginal archaeological heritage for Ausgrid access track from McCallums Avenue, Berrilee, to Calabash Bay*, Prepared for Ausgrid. Author: Higgs, S. Biosis Pty Ltd, Sydney, NSW. Report number 15548.

Biosis 2017. *Vincent Street medical centre, Cessnock Aboriginal cultural heritage assessment report*, Report prepared for Community Healthcare Trustees. Author: Sinclair. L, Biosis Pty Ltd, Newcastle, NSW. Project no. 23118.

Biosis 2019. *Site 2 – Sydney Olympic Park: Archaeological Report*, Report prepared for Ecove Group. Authors: Keevers-Eastman. A, Gooley. T, Biosis Pty Ltd, Wollongong, NSW. Project no. 28338.

Biosis 2020a. *Aboriginal Archaeological Assessment: Former Roche Factory, 100 South Creek Road, Cromer*, Report prepared for Heritage 21 on behalf of EG. Authors: Vella, A and Allen, C. Biosis Pty Ltd, Sydney, NSW. Project No. 33726.

Biosis 2020b. *Macquarie University Station Bus Interchange Aboriginal and Historical Cultural Heritage Constraints Assessment*, Report prepared for GHD Pty Ltd. Authors: Bridge. A, Lucas. M, Smith. M, Biosis Pty Ltd, Sydney, NSW. Project no. 30219.

Biosis 2021. *94 Hopetoun Avenue, Vaucluse Aboriginal Due Diligence Assessment*, Report prepared for CSA Architects. Author: Bridge. A, Biosis Pty Ltd, Sydney, NSW. Project no. 35224.

Biosis 2023. *Pathways Cremorne, Seniors Housing: Archaeological Report*, Report prepared for Morrison Design Partnership Architects. Author: Garabedian. C. Biosis Pty Ltd, Sydney, NSW. Project no. 38545.

Biosis 2024. *Patyegarang Project, Morgan Road, Belrose Aboriginal Cultural Heritage Assessment*, Report for Gyde Consulting on behalf of Metropolitan Local Aboriginal Land Council. Authors: Bridge. A, Windram. N, Biosis Pty Ltd, Sydney, NSW. Project no. 40261.

Biosis 2025. *Aboriginal Heritage DD – Preliminary Indigenous Heritage Assessment Impact – Hornsby South Public School*, Report for School Infrastructure NSW. Authors: Whitton, R., Baonza, B., Biosis Pty Ltd, Sydney, NSW. Project no. 42838.

Biosis Pty Ltd 2016. *Rouse Road upgrade between Cudgegong Road and Windsor Road, Rouse Hill: Aboriginal Cultural Heritage Assessment Report. Prepared for Opus International Consultants (Australia) Pty Ltd on behalf of Blacktown City Council*,.

Brookes & Associates, Taylor Barner Landscape Architects, & Mary Dallas Consulting Archaeologists 2003. *Mamre St Marys – Conservation Management Plan*,.

Burke H & Smith C 2004. *The Archaeologists Field Handbook*, Allen & Unwin, Crows Nest, NSW.

Chapman G, Murphy C, Tille P, Atkinson G, & Morse RJ 1989. *Soil Landscapes of the Sydney 1:100,000 Sheet map*, Department of Environment, Climate Change and Water, Sydney.

Chapman GA, Murphy, C.L, Tille PJ, & Morse RJ 2009. 'Soil Landscapes of the Sydney 1:100,000 Sheet map',.

Clarkson C, Jacobs Z, Marwick B, Fullagar R, Wallis L, Smith M, Roberts RG, Hayes E, Lowe K, Carah X, & Florin SA 2017. 'Human occupation of northern Australia by 65,000 years ago', *Nature*, 547, 7663: 306–10.

Comber Consultants Pty Ltd 2016. *Aboriginal Archaeological Assessment 56 Cudgegong Road, Rouse Hill. Report to Bureau SRH on behalf of Dyldam*,.

Conyers B 1990. *Survey for Aboriginal Archaeological Sites: Lane Cove River State Recreation Area*,.

Corkill T 1991. *A Survey of the CSIRO Site in North Ryde, NSW*, Report to The Rice Daubney Group. Author: Corkill. T.

Corkill T 1997. *Test Excavation of Rockshelter, CSIRO PAD 1, Site 2 Riverside Corporate Park, North Ryde, NSW*, Report to Australia Pacific Projects.Author: Corkill. T.

CSIRO 2009. *Australian soil and land survey field handbook*, 3rd edn, CSIRO Publishing, Collingwood, VIC.

Dean-Jones P 1990. *Newcastle Bight Aboriginal Sites Study*, NSW National Parks and Wildlife Service, and National Estate Grants Committee.

DECCW 2008. *Soil and Land Resources of the Hawkesbury-Nepean Catchment*, New South Wales Government Department of Environment, Climate Change and Water.

DECCW 2010a. *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*, Department of Environment, Climate Change and Water, Sydney NSW.

DECCW 2010b. 'Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW', Department of Environment, Climate Change and Water NSW, Sydney, NSW. https://www.environment.nsw.gov.au/research-and-publications/publications-search/code-of-practice-for-archaeological-investigation-of-aboriginal-objects-in-nsw.

DSCA 2012. 'Aboriginal Archaeological & Cultural Heritage Impact Assessment: Proposed Subdivision for 100 South Creek Road, Dee Why, NSW',.

Dyall L 1979. *Report on Aboriginal Relics in Area of Proposed Smelter at Farley, NSW Report to Alumax of Australia Pty Ltd.*, Report prepared to Alumax of Australia Pty Ltd. Authors: Dyall. L, NSW.

Eco Logical Australia 2019. *Loreto Normanhurst Masterplan - Aboriginal Cultural Heritage Assessment*, Prepared for AJ+C Architects on behalf of Loreto Normanhurst. Authors: Claggett. D, Eco Logical Australia Pty Ltd, Southbank, VIC. Project no. 19SYD-12671.

Extent 2017. *172 Guntawong Road, Riverstone*, Report prepared for Guntawong Estate Pty Ltd.

HLA-Envirosciences 2003. *Archaeological Subsurface Testing Program: Eden Gardens, Macquarie Park, NSW*, HLA-Envirosciences.

Horton D 1996. 'AIATSIS map of Indigenous Australia', Aboriginal Studies Press, AIATSIS, and Auslig/Sinclair, Knight, Merz.

Irish, P. 2004. 'When Is a Scar a Scar? Evaluating Scarred and Marked Trees at Sydney Olympic Park', *Australian Archaeology*, 59: 59–61.

JMCHM 2005a. *Archaeological Assessment of a Proposed Fauna Fence in the Blacktown LGA of the St Marys Property, NSW*, Report prepared for Delfin Lend Lease. Jo McDonald Cultural Heritage Management Pty Ltd.

JMCHM 2005b. *Archaeological Salvage Excavation of Eight Archaeological Landscapes in the Second Ponds Creek Valley Rouse Hill Development Area, NSW*, Report prepared for Rouse Hill Infrastructure Pty Ltd and Landcom. Jo McDonald Cultural Heritage Management Pty Ltd.

JMCHM 2005c. *Archaeological Salvage Excavation of Site RTA-G1 109-113 George Street Parramatta, NSW*, Report prepared for Landcom. Jo McDonald Cultural Heritage Management Pty Ltd.

JMCHM 2006. *Archaeological Salvage Excavation of Site CG3 101A-105 George Street, Parramatta, NSW*, Report prepared for Rahi Developments Pty Ltd. Jo McDonald Cultural Heritage Management Pty Ltd.

JMCHM 2008. *Archaeological Mitigation of the Sediment Pond at RH/CD7, Caddies Creek*, Report prepared for Lend LeaseGPT (Rouse Hill) Pty Ltd. Jo McDonald Cultural Heritage Management Pty Ltd.

Jo McDonald Cultural Heritage Management 2002. *Rouse Hill Infrastructure Project (Stage 3) Development Areas 2, 5, 20, 22 and 24B Second Ponds Creek area, Indigenous and European Heritage Issues. Report to RHI Pty Ltd*,.

Kelleher Nightingale Consulting 2010. *Area 20 Precinct North West Growth Centre Aboriginal Heritage Assessment. Report to NSW Department of Planning*,.

NSW National Parks and Wildlife Service 2003. *The Bioregions of New South Wales: their biodiversity, conservation and history*, National Parks and Wildlife Service (NSW), Hurstville.

Oakley B 2000. *Indigenous Heritage Assessment – Proposed Sewerage Upgrade REF, Lane Cove National Park*, Report to Australian Water Technologies Pty. Ltd.

Ritter DF, Kochel RC, & Miller JR 1995. *Process Geomorphology*, William C Brown Pub, Pennsylvania, USA.

Stephanie Garling Archaeological Consulting 2000. *Archaeological survey for Aboriginal Sites. proposed Rouse Hill Anglican School, Rouse Road, Rouse Hill, NSW. Report to Noel Bell, Ridley Smith and Partners on behalf of the Anglican Schools Corporation*,.

Strahler A 1952. 'Hypsometric (area-altitude) analysis of erosional topology', *Geological Society of America Bulletin*, 63, 11: 1117–42.

Therin M 2007. *Aboriginal Heritage Assessment of 84a McCarrs Creek Road, Church Point. Report to Sylvia Dove.*,.

Umwelt (Australia) Pty Limited 2016. *Aboriginal Cultural Heritage and Archaeological Assessment. Haerses Road Quarry*, Report prepared for Dixon Sand. Umwelt Pty Ltd.

White, B & McDonald, J 2010. 'Lithic Artefact Distribution in the Rouse Hill Development Area', *Australian Archaeology*, 70: 29–38.

Appendix 1 AHIMS search results

THIS APPENDIX IS NOT TO BE MADE PUBLIC.


biosis
APEM Group